



Proceedings
the Second
International
Conference
on

STUDENT RESEARCH INTERNATIONAL CONFERENCE FOR YOUNG RESEARCHERS IN ECONOMICS AND BUSINESS 2023

(SR-ICYREB 2023)

Volume **2**



FINANCIAL PUBLISHING HOUSE

**PROCEEDINGS THE SECOND INTERNATIONAL CONFERENCE ON
STUDENT RESEARCH – INTERNATIONAL
CONFERENCE FOR YOUNG RESEARCHERS IN ECONOMICS AND BUSINESS 2023
(SR-ICYREB 2023)**

**ACADEMY OF FINANCE (AOF), UNIVERSITY OF ECONOMICS - THE UNIVERSITY OF DANANG (DUE),
NATIONAL ECONOMICS UNIVERSITY (NEU), THUONGMAI UNIVERSITY (TMU), BANKING ACADEMY OF VIETNAM (BAV),
UNIVERSITY OF ECONOMICS & BUSINESS - VIETNAM NATIONAL UNIVERSITY (VNU-UEB),
FOREIGN TRADE UNIVERSITY (FTU), HUE COLLEGE OF ECONOMICS - HUE UNIVERSITY (HCE),
UNIVERSITY OF ECONOMICS HO CHI MINH CITY (UEH), AND UNIVERSITY OF ECONOMICS AND LAW HO CHI MINH CITY (UEL)**

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WELCOME NOTES

Dear Friends and Colleagues,

On behalf of the ten leading economic universities in Vietnam: *Academy of Finance (AOF), University of Economics - The University of Danang (DUE), National Economics University (NEU), Thuongmai University (TMU), Banking Academy of Vietnam (BAV), University of Economics & Business – Vietnam National University (VNU-UEB), Foreign Trade University (FTU), Hue College of Economics – Hue University (HCE), University of Economics Ho Chi Minh City (UEH), and University of Economics and Law Ho Chi Minh City (UEL)*, we are delighted to extend our warmest greetings to all participants, students, and researchers attending this prestigious event. It is with immense pleasure that we come together to explore, discuss, and enrich our understanding of the dynamic fields of economics and business.

The International Conference for Young Researchers in Economics and Business 2023 (SR-ICYREB2023) is organized by the ten leading economic universities in Vietnam, and with the participation of students from these universities with the goal to create and develop an academic exchange environment with new ideas and research outcomes of students from economic and business universities. It also promotes experience exchange and enhances local and international coordination between students in scientific research to adapt to the new context.

The next few days are packed with engaging sessions, keynote speeches from renowned experts (Minh Tuan Bui - Tax Partner, Deloitte Vietnam and Aaron Saw, Head of Corporate Reporting Insights, ACCA), interactive workshops, and opportunities to connect with fellow enthusiasts. We encourage you to actively participate, share your thoughts, challenge assumptions, and contribute to the collective growth of knowledge in these vital disciplines.

We extend our heartfelt gratitude to all the organizers, sponsors, and speakers who have dedicated their time and efforts to this conference. Your contributions are invaluable to the success of this event.

Let's embark on this intellectual journey with open minds, ready to absorb new ideas and forge lasting connections. May this conference be a catalyst for inspiration, innovation, and collaboration that resonates far beyond its closing remarks.

Once again, a warm welcome to the International Conference for Young Researchers in Economics and Business 2023 (SR-ICYREB2023).

Best regards,

On behalf of the Organizing Committee

Assoc. Prof. Dr. Co Trong Nguyen

People's teacher, President

Academy of Finance

**ASSOCIATE PROFESSOR NGUYEN TRONG CO
PEOPLE’S TEACHER, PRESIDENT OF THE ACADEMY OF FINANCE**



Assoc. Prof. Nguyen Trong Co is the President of the Academy of Finance. He has been working for the Academy of Finance since he was young and held different positions such as lecturer, Head of Financial Analysis Department, Deputy Head of Human Resources Department, and Vice President before being nominated the President of Academy of Finance in 2014.

He is the Editor of the Journal of Finance and Accounting Research and serves the Scientific Board of Finance Research Sector as Vice President and a member of *Scientific Board of Banking Research Sector*.

He was also nominated as honour member of FCPA Australia.

Assoc. Prof. Nguyen Trong Co is the author/coauthor of more than 21 valuable text books and supplementary materials such as “Financial Analysis”, Finance Publishing House, 2017, “Auditing management and usage of mineral resources for sustainable development in Viet Nam”, Finance Publishing House, 2016 and etc.

He has researched actively with more than 20 research projects spread on different fields: corporate finance and public finance, and technological markets. In the Academy of Finance, he has published more than 70 articles in both local and international journals.

KEYNOTE SPEAKERS:

Keynote 1:

Minh Tuan Bui - Tax Partner, Deloitte Vietnam

Keynote topic: “BEPS 2.0 – Global Minimum Tax (Pillar 2) and Investment Attraction in Vietnam”



Minh is Deloitte Private Leader with nearly 20 years of professional experience serving in tax and business advisory services. He holds Tax & Legal Leader position of Deloitte South East Asia in Industrial Products & Construction sector. In Vietnam, he is Leader of Korean Service Group, Tax Leader of Deloitte Private market segment; Global Investment and Innovation Incentives (GI3) Lead Partner. Minh brings a wealth of accumulated knowledge and expertise in various areas of global taxation and in Vietnam to provide his clients with prominence in strategic tax advisory, particularly in strategic tax advice to Vietnamese and international corporations operating in Vietnam; tax due diligence; corporate tax system health check; and tax controversy. With broad experience, Minh has a proven track record of successfully helping corporate clients access the financial reporting of complex tax positions as well as assisting them in negotiating with all levels of tax, customs authorities to obtain currency and certainty.

Minh has contributed significantly to the development of Vietnamese taxation system through his public speeches, quality articles, and interviews, and providing comments on draft tax laws and regulations.

Minh has been recognized as Vietnam’s Tax Controversy Leader by the International Tax Review for four consecutive years (2016-2019).

Keynote 2:

Arron Saw, Head of Corporate Reporting Insights

Keynote topic: “Reporting of R&D: Disclosure without recognitions?”



Aaron drives corporate reporting-related research activities and policies within the Policy and Insights team at ACCA to deliver high quality, professional and innovative inputs on key issues in the global corporate reporting agenda. Aaron believes in sharing knowledge widely. He focuses on making practical and relevant propositions to professional accountants and their organisations on improving the quality of financial and sustainability reporting.

His areas of interest include financial and sustainability reporting, business resilience, digital technology, and improving audit quality. He has designed the framework for a community that supports the professional development of SMPs – the SMP100.

Prior to this role, Aaron was the head of policy and technical for ACCA Maritime Southeast Asia (comprising Malaysia, Brunei, Indonesia, and the Philippines). He also had a decade of experience in a Big Four accounting firm in Malaysia where he was involved in providing audit and assurance services to multinationals and small and medium-sized enterprises operating in a wide range of industries, as well as technical consultancy, developing training programmes and conducting trainings.

Aaron has a Bachelor of Commerce (Honours) Accounting. He is a fellow of ACCA and a member of the Malaysian Institute of Accountants.

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10	MSc. Nguyen Xuan Lam	Communist Party and Trade Union Office, Academy of Finance	Member
11	MSc. Tran Thi Phuong Lien	Member of Standing Committee, Youth Union, Academy of Finance	Member

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STUDENT RESEARCH - INTERNATIONAL CONFERENCE FOR YOUNG RESEARCHERS IN ECONOMIC AND BUSINESS 2023 (SR-ICYREB2023)

The Fourth Industrial Revolution (Industry 4.0) is the era of everything being connected to the Internet, marked by disruptive technologies in digitalization, virtual reality, artificial intelligence, and more. As soon as this revolution formed, it had a significant impact on the social lives of humans, gradually permeating every corner of existence. It replaces all manual labor in factories, workshops, and production lines. Any repetitive tasks, no matter how skilled, can be replaced by machines. Therefore, a high-quality workforce is an essential factor for the development of a nation, enabling the exploitation of other resources, leveraging strengths, and enhancing competitiveness in the global market.

At the same time, the Industry 4.0 demands that universities transition from traditional teaching and scientific research models to enterprise-oriented university models to fulfill three main tasks: education, scientific research, and community service. Vietnam is immersing into the regional and global economies as well as the trend of globalization, Vietnamese students and economic students in particular, are facing competitive pressures in both domestic and international labor markets.

Currently, the revised Higher Education Law provides an important legal basis to promote the implementation of autonomous universities, efficient utilization of resources, improvement of higher education quality, ensuring international integration, and better meeting the demand for human resources training in the socialist market-oriented economy and contributing to the socio-economic development of the country.

Hence, in order to reach beyond the boundaries of a nation or region and find one's place, Vietnamese students need to become global citizens, capable of meeting all recruitment needs and adapting to life and work anywhere in the world. Scientific research plays a role in equipping students with knowledge, skills, and scientific methods for learning and research. Engaging in scientific research helps students accumulate experience in report writing, information collection, and other skills needed to meet social demands.

Within the framework of the comprehensive cooperation agreement among universities in the economics and business sector, the Academy of Finance has collaborated with various universities including the University of Economics - The University of Da Nang, University of Economics Ho Chi Minh City, University of Economics and Law Ho Chi Minh City, Thuongmai University, Banking Academy of Vietnam, National Economics University, Hue College of Economics – Hue University, University of Economics - Vietnam National University Hanoi, and Foreign Trade University to jointly organize the international conference “Student Research International Conference for Young Researchers in Economics and Business (SR-ICYREB2023)”. The goal of the SR-ICYREB2023 is to establish and develop an environment for academic exchange, new ideas, and scientific research results of students from various universities in the economics and business. Sharing experiences and enhancing collaboration in management and scientific research activities among students are intended to promote the scientific research endeavors of students from these universities in the new context.

The articles and presentations at the SR-ICYREB2023 hold value not only from a theoretical perspective but also from a practical standpoint. In this conference, the Organizing Committee received more than 300 submissions from student authors and selected 235 papers for publication in the proceedings. The content of these published articles focuses on key issues such as economics, finance, accounting, business administration, socio-economic development, etc... he conference will serve as a platform for students from various economic and business universities to exchange ideas, provide academic opinions, share research experiences, analyze current situations, forecast contemporary issues, and discuss opportunities and challenges for the upcoming phase of socio-economic development.

CONFERENCE ORGANIZING COMMITTEE

Part 2
Business Administration
(NEXT PART)

THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY (CSR) ON EMPLOYEE ENGAGEMENT AND EMPLOYEE CUSTOMER ORIENTATION WITHIN SMALL AND MEDIUM-SIZED ENTERPRISES (SMES) IN VIETNAM

Author: Vu Ngoc Minh Thu¹, Le Cong Thao Linh², Duong Cong Doan², Phan Ha Tram Anh²

Mentor: Tran Thi Bich Nhung²

ABSTRACT: This paper seeks to investigate the influence of CSR on employee engagement and their customer orientation, with a focus on sustainable development in Vietnamese SMEs. We use a combination of qualitative and quantitative research to develop CSR models and measurements. With a model size of 200 respondents, the results show that: CSR has a direct positive effect on both employee engagement and their customer orientation; on both of which ethical responsibility has the greatest influence. Contrary to previous studies, the research does not find a visible impact of philanthropic responsibility on employee engagement in SMEs in Vietnam. The results are thus discussed and thereby leading to a number of practical implications for Vietnamese SMEs.

Key words: CSR; SMEs; employee engagement; customer orientation; Vietnam; sustainable.

1. INTRODUCTION

In the past few decades, CSR initiatives have received cumulative attention from businesses around the world (Kolk et al., 2015). However, CSR studies have mainly focused on developed countries, while expectations about the social responsibility of business organizations in developing countries such as Vietnam may differ due to the influence of culture and national ethics (Visser, 2008). Therefore, a scholarly imperative lies in the expansion of research endeavors to investigate the matter of CSR within the intricate tapestry of Vietnam, in order to develop a comprehensive understanding of its interplay with the local business landscape.

Under the increasing pressure of human demand, businesses are required to address sustainability issues. Sustainability encapsulates a shift in societal values and goals, advocating for a holistic approach that addresses the challenges posed by resource depletion, environmental degradation, social inequality, and economic instability. It becomes imperative to undertake a comprehensive reassessment of CSR concepts and models, aiming to foster and enhance sustainability endeavors encompassing economic, social, and environmental dimensions (Hoque et al., 2018). In Vietnam, CSR research has been relatively well developed, however, there are still limitations in linking CSR with sustainable development objectives of the business.

Employee engagement is an important concept in organizational management. However, to date, few empirical studies have been conducted to investigate the impact of CSR on employees and their work attitudes (Ali et al., 2010; Aguilera et al., 2007). Since employee is generally accepted to be the most important stakeholder of any corporations (Saks, 2006), is necessary to focus on researching more practical issues about the attitudes and behaviors of employees in business settings. In addition, Saks (2006) and Robinson et al. (2004) argue that current studies on employee engagement in academia are not sufficient. The scarcity of scholars investigating the relationship between CSR and employee engagement in developing countries like Vietnam necessitates a call for further studies to explore these dynamics.

¹ Foreign Trade University, Email: vungocminhthu235@gmail.com

² Foreign Trade University.

Customer orientation also plays a crucial role in fostering a strong bond between employees and customers within the framework of customer-employee identification. Customer-focused behaviors lead to the long-term development of the relationship between organizations and customers, yielding mutual benefits for both parties (Dunlap et al., 1988; Saxe & Weitz, 1982). Numerous global studies have indeed examined the positive association between CSR and employee customer orientation in business contexts, exemplified by the works of Ana Patrícia (2019) and Choong-Ki Lee (2013). However, in Vietnam, only a few studies have addressed the influence of CSR and employee customer orientation within enterprises, and empirical research on this matter remains limited, underscoring the need to fill this research gap.

Prior research on the impact of social responsibility has predominantly focused on large corporations and international brands. However, the characteristics of SMEs differ from those of large enterprises. For instance, in SMEs, ownership and management rights are typically not separated, allowing owners to make business decisions based on personal preferences (Spence, 1999). Acceptance of CSR within SMEs may depend on the owner's or manager's perspectives and understanding of CSR, warranting further investigation into this matter. Through a comprehensive review of available literature, our research team has observed that CSR research in Vietnam often concentrates on the consumer perspective rather than the employee viewpoint, particularly in relation to SMEs, indicating that this research, which examines CSR from the employee perspective, holds significant value for future literature. Furthermore, no existing studies in Vietnam have truly addressed the relationship between employee engagement and employee customer orientation as distinct dependent variables.

Based on these reasons, our research team has decided to embark on the topic: **'The Impact of Corporate Social Responsibility (CSR) on Employee Engagement and Employee Customer Orientation within Small and Medium-sized Enterprises (SMEs) in Vietnam.'** By revising prominent models and theories based on a combination of intensive literature review and qualitative research, we developed a CSR model gravitating towards sustainability in the context of SMEs in Vietnam to measure the impact of CSR on employee engagement and employee customer orientation.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

2.1. Corporate Social Responsibility

Corporate Social Responsibility (CSR) is a topic that has been studied for decades. All organizations, businesses, and governments perceive social responsibility from their own perspective and context, depending on their characteristics and level of development (Kapferer, 2008). As a result, there is no universally accepted or definitive concept of CSR to date (Skudiene and Auruskeviciene, 2010). This paper does not intend to adopt or defend a singular CSR concept since this is outside the realm of the present scope. However, for the purpose of this paper, the definition of CSR is scrutinized under Elkington's (1997) sustainable approach, which is a management method to balance the interests of business leaders and administrators with internal and external stakeholders, through a comprehensive, appropriate, and complete theory.

2.2. Employee Engagement

To date, a universally accepted and comprehensive definition of employee engagement remains elusive. Nevertheless, there is a growing consensus that distinguishes this concept from other management-related constructs such as employee commitment, organizational citizenship behavior (OCB), or job satisfaction (Solomon Markos, 2010). In 1990, Kahn (1990) introduced the concept of employee engagement, which encompasses the utilization and management of an organization by its members in the context of their job responsibilities. Engaged individuals actively and enthusiastically carry out their roles and tasks. Employee engagement serves as a valuable tool for organizations striving to gain a competitive edge over their counterparts. It recognizes that human resources are an invaluable and unique asset that cannot be replicated

or imitated by competitors. Consequently, effectively managing and fostering employee engagement is crucial. Baumruk (2004) underscored this perspective by highlighting employee engagement as the most potent factor for gauging a company's vitality.

2.3. Employee Customer Orientation

In the realm of marketing management theory and practice, employee customer orientation holds a pivotal position. Previous research has approached the concept of employee customer orientation from two distinct perspectives:

1. *The first perspective focuses on the behavioral orientation of employees (Saxe and Weitz, 1982).*
2. *The second perspective delves into the psychological orientation of employees (Brown et al., 2002).*

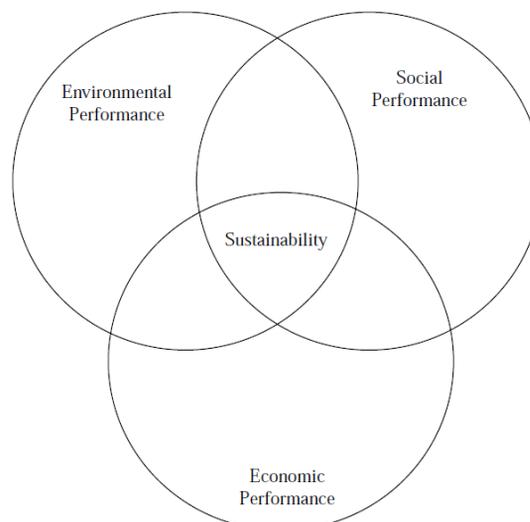
Numerous notable studies have demonstrated that successful organizations exhibit a strong emphasis on employee customer orientation (Deshpandé, Farley, and Webster, 1993; Narver and Slater, 1990). Comprehensive studies such as Narver and Slater (1990) and Brown et al. (2002) highlight the importance of assessing employee customer orientation from the employees' own standpoint, exploring their beliefs, values, and thoughts through specific questions. This research topic also adopts an employee-centric approach in evaluating employee customer orientation. Thereby, we define customer orientation as an employee's inclination or predisposition to fulfill customer requirements within a work environment. Following Brown et. al (2002) theories, we suggest that customer orientation comprises two aspects. The first aspect, known as the needs dimension, reflects employees' beliefs regarding their capacity to meet customer needs, drawing upon Saxe and Weitz's (1982) understanding of customer orientation. The second aspect, referred to as the enjoyment dimension, gauges the extent to which engaging with and assisting customers is inherently pleasurable for an employee.

2.4. Triple Bottom Line Theory and Development Direction

2.4.1. Triple Bottom Line Theory

Most CSR theories recognize that the foundation of this concept is the Triple Bottom Line (TBL) theory, which was introduced in 1987 at the Brundtland Commission (Paulina et al., 2017). This theory was officially named by John Elkington in 1997, focusing on three key points: economic, environmental, and social - the model.

Figure 1: Elkington (1994) Sustainable CSR Model



Economic aspect is considered the key point of a company and the profit figure used in income reports for each share. Uddin et al. (2008) argue that the economic dimension of CSR is closely related to the direct and indirect impacts of business activities on communities, localities, and other stakeholders.

Environmental aspect, TBL emphasizes the company's actions to make the living environment increasingly safe and beautiful. Because businesses are usually the primary cause of environmental damage, the minimum they can do is to minimize or eliminate negative impacts on the environment (Gupta, 2011).

Social aspect, the variables refer to the social aspects of a community or region and may include measurements of education, equity, and access to social resources, health and welfare, quality of life, and social capital. This is extremely important for small and medium-sized enterprises because they often recruit labor from the areas where they operate, so their responsibility is doubled: employees are also the local community.

2.4.2. Development of Triple Bottom Line Theory

After selecting and studying to apply the TBL theory to building a model, the authors proposes: In terms of social aspects, divided into 2 factors including Ethical and Philanthropic.

The TBL method has been subject to several limitations and concerns (Freudenberg and Keating, 1982; Dale et al., 1997). Research indicates that the social aspect of the TBL should not be viewed as a determining factor alone. Reflecting on the definition of the social aspect within the Triple Bottom Line framework, it entails the measurement and evaluation of an organization's impact on society as a whole, encompassing local, national, and global levels (Elkington, 1997). Hence, it becomes essential to enhance a model that facilitates the easy measurement of the social factor, particularly for the targeted SMEs group addressed by the research team. Expanding on his CSR model, Carroll (2008) emphasized that Ethical and Philanthropic are two core responsibilities in this model. The importance of ethical and philanthropic responsibilities has been widely observed. These two responsibilities fully constitute the social aspect in the CSR of an organization (Carroll, 1979, 1999, 2010), so they can be added to the TBL model in terms of social aspect (Jintao Lu et al., 2020). In addition, one of the latest in-depth studies on CSR by Visser (2014) has developed the concept of CSR 2.0, in which he emphasizes that the DNA of CSR includes 4 aspects, of which two new aspects are "good governance" and "social contribution", emphasizing the implementation of ethical and philanthropic responsibilities of businesses.

Hence, in order to address the limitations of the TBL model, this study incorporates the principles presented in the Carroll (2008) and Visser (2014) models, integrating the ethical and philanthropic responsibilities as additional components within the social dimension of the TBL framework.

2.5. Research Hypotheses

2.5.1. CSR and Employee Engagement

In previous studies on employee outcomes, engagement has been considered a higher-level construct, encompassing commitment, job satisfaction, and organizational citizenship behavior (Solomon Markos, 2010). Organizations increasingly promote CSR implementation to respond to competition and pressure from various stakeholders (Chaudhary, 2017). Therefore, this study investigates the impact of CSR on the first dependent variable, employee engagement. Past research demonstrates that the involvement in CSR can build a strong bond between employees and the organization, leading to better employee engagement and firm performance over time. As developed from our literature review, four dimensions of sustainable CSR, supported by Carroll's pyramid, including economic, environmental, ethical and philanthropic responsibilities, can be hypothesized to have a positive effect on employee engagement.

Firstly, with economic responsibilities, there exists a consensus among past researchers that individuals contribute and exchange their attitudes and behaviors with others, with the desire to benefit from what they receive, therefore, when a business supports its employees economically, employees tend to react with gratitude, thereby increasing their level of commitment to the organization (Blau, 1964; David Casey & Sebastian Sieber, 2016). On environmental responsibility, according to the research results of Gill, R. (2015), employees who have faith in environmental responsibility have a higher level of engagement than those who believe that their organization has a negative impact on the ecosystem. Moreover, according to the research results of Ali et al. (2020), ethical responsibility strongly influences employee engagement. Aiming for a culture of corporate integrity, in which ethical behavior becomes everyone's responsibility, helps build a stronger relationship between employees and the company (Mirvis, P., 2012). Lastly, with philanthropic responsibility, workers tend to be proud when they are part of a humane and sharing company, and therefore, employees will want to be attached to the organization in the long run (Tran et al., 2018). Studies by Lee et al. (2009) also come to the same conclusion with low employee turnover in companies that practice good philanthropic responsibility. All dimensions of CSR has been proved to have a direct positive impact on employee engagement, hence the research team proposes these hypotheses:

H1: Economic factors have a positive impact on employee engagement

H2: Environmental factors have a positive impact on employee engagement

H3: Ethical factors have a positive impact on employee engagement

H4: Philanthropic factors have a positive impact on employee engagement

2.5.2. CSR and Employee Customer Orientation

Recent research suggests that CSR studies need to expand beyond the outcome variables mentioned in previous literature to achieve a more comprehensive understanding of the impact of CSR awareness on business outcomes (Aguilera et al., 2007). Based on the theoretical foundation and to suggest directions for future research on customer-oriented outcomes while ensuring a detailed analysis of the impact of CSR from the employee perspective, this study focuses on investigating the second dependent variable, employee customer orientation. According to Binghu et al. (2020), empirical results indicate that employees' perception of both internal and external CSR not only directly influences employees' customer orientation but also indirectly affects their customer orientation through job engagement.

The impact of all four dimensions of CSR in our model on employee customer orientation has been analyzed in past research. According to the research results of Mahmood, S. and Khan, Z. (2023) and Wood (2010), good implementation of the economic aspect in CSR positively affects employee perception and practice of customer orientation. The research results of Lars Isaksson and Timothy Kiessling (2016) also proves a close relationship between a company's environmental responsibility and employee customer orientation, indicating that with widespread environmental responsibility practices and communication, employees' customer-oriented mindset will also spread within the organization, driven by pride and motivation to better serve their customers. According to the research results of Binghu et al. (2020), a company with ethical values has a strong influence on the customer orientation of their employees as this makes employees feel that their actions are meaningful and have a positive impact on customers. According to Kiessling et al. (2016), the philanthropic aspect of CSR is a prerequisite and has a positive impact on employee customer orientation. Therefore, these hypotheses are proposed:

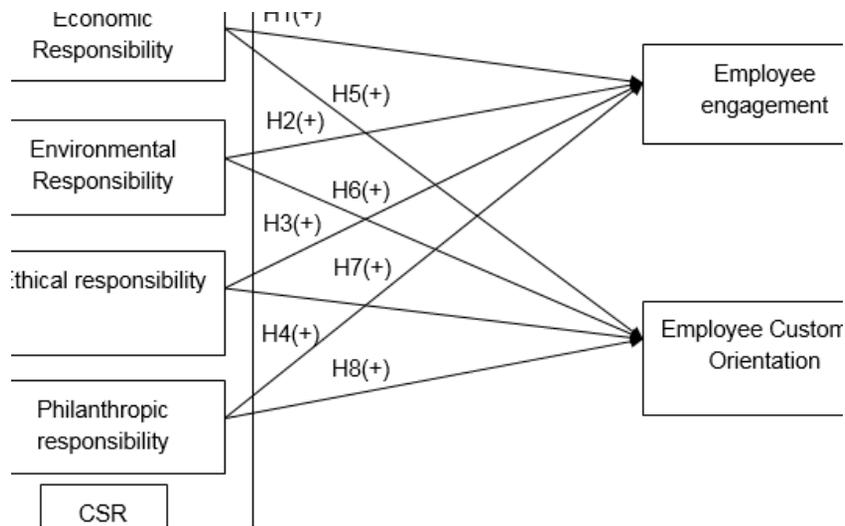
H5: Economic factors have a positive impact on employee customer orientation

H6: Environmental factors have a positive impact on employee customer orientation

H7: Ethical factors have a positive impact on employee customer orientation

H8: Philanthropic factors have a positive impact on employee customer orientation

Figure 2: Complete Research Model and Hypotheses



3. RESEARCH METHODOLOGY

Recognizing that the practice of CSR may vary from country to country due to the influence of social context, the authors realize that it is necessary to adjust the measurement tools from previous studies to fit the context, regulations, and operating environment of businesses in Vietnam. Therefore, the topic uses a mixed research method.

3.1. Qualitative research

To fit with SMEs in Vietnam, the author conducted a qualitative study by group discussion with 6 participants who are employees, both male and female, aged 25-52, working at two companies that the group considers to perform CSR well and convenient for surveying, which are Thoi Thanh Binh Co., Ltd. and Minh Minh Fashion Co., Ltd. The discussions were conducted from February 2023 to March 2023 to create conditions for all participants to arrange their work and have time for exchanging ideas.

3.2. Scale design

The scales are inherited from the scales of Uddin et al. (2008); Fadun et al. (2014); Solomon Markos (2010) and Brown et al. (2002), through group discussion with adjustments to fit.

Table 1: Scale development

No.	Factor	Observed variable	Code	Reference
1	Economic responsibility (KT)	The company uses profits appropriately to increase social welfare (the multiplier effect)	KT1	Uddin et al. (2008), developed from Triple Bottom Line.
2		The company fulfills tax responsibilities well	KT2	
3		The company conducts business activities reliably and fairly	KT3	
4	Environmental responsibility (MT)	The company ensures that production and business activities do not harm the environment	MT1	Uddin et al. (2008), developed from Triple Bottom Line.
5		The company ensures that production and business activities do not harm the environment	MT2	
6		The company encourages employees to perform sustainable environmental responsibilities	MT3	

7		The company performs appropriately to social expectations and ethical standards	DD1	
8	Ethical responsibility (DD)	The company acknowledges and respects accepted ethical standards/developing ethical standards	DD2	Fadun et al. (2014), developed from the CSR model of Caroll.
9		The company prevents ethical standards from being violated to achieve the company's goals	DD3	
10	Philanthropic responsibility (TN)	The company contributes resources to community development	TN1	Fadun et al. (2014), developed from the CSR model of Caroll.
11		The company performs philanthropic activities appropriately and according to social expectations	TN2	
12		The company voluntarily supports projects to improve the value and quality of community life	TN3	
13	Employee engagement (GK)	Employees support the organization for colleagues and introduce the organization to potential employees and customers	GK1	Solomon Markos (2010)
14		Employees have a strong desire to become members of the organization despite opportunities to work elsewhere	GK2	
15		Employees spend extra time, effort, and innovation to contribute to the company's success	GK3	
16		Employees feel that they are an important part of the company	GK4	Added through group discussion
17		Employees feel that their work is meaningful and purposeful	GK5	
18	Customer orientation (DHHK)	Employees want to maximize customer needs	DHHK1	Brown et al. (2002)
19		Employees want to build long-term relationships with customers	DHHK2	
20		Employees feel more motivated to work when customer needs are met	DHHK3	Added through group discussion

3.3. Quantitative research

3.3.1. Sampling method

Due to the large number of businesses and the limited time for conducting the research, the research team discussed and chose the non-probability sampling method as the most suitable method for the study.

3.3.2. Data collection method

To address the research questions, the study collected data from primary sources - through social and demographic surveys conducted via questionnaires. The authors designed a questionnaire to collect primary data related to CSR from individuals who are currently or previously employed. All observed variables used a 5-point Likert scale. The number 1 indicates “strongly disagree” and the number 5 indicates “strongly agree”.

The survey process involved a pilot survey and the main survey. The authors conducted a preliminary quantitative study with a sample size of $n = 100$ by conducting surveys on paper and sending online questionnaires to the research subjects. The convenience and non-probability sampling method were used to collect the samples. The collected data were then processed using SPSS software to evaluate the Cronbach's alpha coefficient. After evaluating the Cronbach's alpha coefficient, all the Cronbach's alpha coefficients for each observed variable were greater than 0.6, and no observed variable had a correlation coefficient smaller than 0.3. Therefore, the authors retained these observed variables.

For the official study, the team collected data by surveying employees from 45 small and medium-sized businesses in Vietnam and employees who have worked for companies that the authors identified based on their scale. The survey period started from March 06, 2023 to March 30, 2023. The questionnaire was sent to the businesses identified within the scope by the authors.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Statistical Analysis

Descriptive Statistical Analysis

Table 2: Descriptive Statistical Analysis

		Frequency	Percent
Gender	Male	78	39.0
	Female	122	61.0
Living area	Ho Chi Minh City	152	76.0
	Hanoi	24	12.0
	Other	24	12.0
Number of employees (people)	Under 10	5	11.0
	From 10 to 50	21	47.0
	From 50 to 100	5	11.0
	Over 100	14	31.0
Annual turnover (VND)	Under 1 billion	11	25.0
	From 1 to 3 billion	9	20.0
	From 3 to 10 billion	17	38.0
	From 10 to 50 billion	4	9.0
	From 50 to 100 billion	2	4.0
	Over 100 billion	2	4.0

Among a total of 200 survey responses, 39% were male and 61% were female. The majority of respondents resided in Ho Chi Minh city, accounting for 76% of the survey participants. Hanoi and other provinces accounted for 12% of the survey population. Among the 45 surveyed SMEs, the majority operated in the 10-50 employee segment (47%). In terms of revenue, the largest proportion (38%) came from businesses with revenues ranging from 3 to 10 billion.

4.1.2. Assessment of Measurement Models

Table 3: Evaluation of the Outer Measurement Model

Latent Variables	Indicators	Factor loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Ethical responsibility (DD)	DD1	0.864	0.768	0.866	0.684
	DD2	0.803			
	DD3	0.813			
Employee Engagement (GK)	GK1	0.823	0.856	0.897	0.635
	GK2	0.733			
	GK3	0.797			
	GK4	0.83			
	GK5	0.797			
Economic responsibility (KT)	KT1	0.84	0.734	0.849	0.652
	KT2	0.75			
	KT3	0.83			

Latent Variables	Indicators	Factor loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Environmental responsibility (MT)	MT1	0.868	0.738	0.85	0.654
	MT2	0.81			
	MT3	0.744			
Philanthropic responsibility (TN)	TN1	0.855	0.804	0.884	0.717
	TN2	0.862			
	TN3	0.823			
Employee Customer Orientation (DHKH)	DHKh1	0.82	0.754	0.858	0.669
	DHKh2	0.851			
	DHKh3	0.782			

Factor Loadings

The authors utilized the Outer Loading coefficient in SmartPLS4 to assess the quality of observed variables. According to Hair et al. (2019), an outer loading coefficient > 0.7 indicates a strong connection between observed variables and the latent construct. After assessing the measurement quality using the outer loading coefficient, none of the observed variables were excluded based on cross-loading. All 20 observed variables were accepted, and they will be analyzed in the subsequent steps alongside the 6 latent factors.

Cronbach's Alpha and Composite Reliability

After examining the loading coefficients, the authors assessed the reliability of the measurement using two indices: Cronbach's Alpha and Composite Reliability (CR). Cronbach's Alpha should be > 0.7, and the total variance extracted should be > 0.3. CR values ranging from 0.7 to 0.9 meet the required criteria (Hair et al., 2019). The test results indicate that all latent variables have Cronbach's Alpha coefficients greater than 0.7, demonstrating the reliability of the measurement scale. Additionally, all latent variables exhibit good internal consistency reliability (0.7 < Alpha < 0.9). The CR values for all measurement scales range from 0.7 to 0.9, indicating that the measurement scale meets the reliability requirement.

Average Variance Extracted

To assess the convergent validity of the measurement scale, the authors relied on the Average Variance Extracted (AVE) index. Hock and Ringle (2010) suggest that a measurement scale achieves convergence if the AVE value is equal to or greater than 0.5. The test results reveal that the AVE values of the research measurement scales all exceed 0.6, indicating that the measurement scale achieves convergence.

4.1.3. Assessment of Structural Model

Multicollinearity analysis

Table 4: Multicollinearity analysis

	DD	GK	KT	MT	TN	DHKh
DD		2.094				2.094
GK						
KT		2.069				2.069
MT		1.507				1.507
TN		1.582				1.582
DHKh						

According to Hair et al. (2019), the VIF evaluation thresholds are proposed as follows: $VIF \geq 5$: There is a high likelihood of multicollinearity; $3 \leq VIF \leq 5$: Multicollinearity may be present; $VIF < 3$: Multicollinearity is unlikely. The results show that the VIF coefficients in the research model, as shown in Table 3, are all less than 3. Therefore, multicollinearity does not occur in the model.

Correlation Matrix and Discriminant Validity

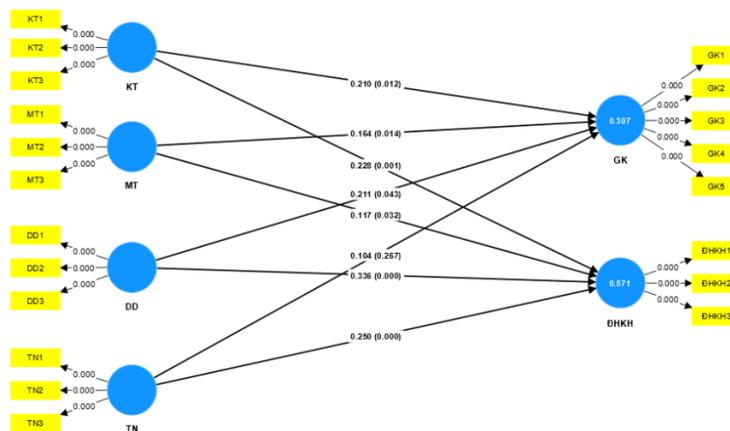
Table 5: Correlation Matrix and Discriminant Validity

	DD	GK	KT	MT	TN	ĐHKH
DD						
GK	0.58					
KT	0.836	0.607				
MT	0.595	0.49	0.763			
TN	0.739	0.436	0.611	0.288		
ĐHKH	0.888	0.657	0.826	0.595	0.736	

The discriminant validity indicates the differentiation of one construct from other constructs within the model. Henseler et al. (2015) demonstrated that the Heterotrait-Monotrait (HTMT) ratio they proposed is an optimal method for assessing discriminant validity. Regarding the HTMT ratio, an HTMT ratio below 0.9 indicates discriminant validity of the measurement scale (Henseler et al., 2014). Table 5 displays the coefficients in the model testing, all of which are below 0.9, thus confirming that the measurement scale satisfies the condition of discriminant validity.

PLS Algorithm and Bootstrapping

Figure 3: PLS Algorithm and Bootstrapping



Hair et al. (2017) proposed that an acceptable range for R² values is 20%, with R² values of 25%, 50%, and 75% indicating weak, moderate, and strong predictive ability of the independent variable on the dependent variable, respectively. According to the analysis results, the adjusted R² value for Variable GK (0.571) can be considered moderate, while the R² value for Variable B (0.307) is relatively weak.

Research Hypotheses Testing

Table 6: Research Hypotheses Testing

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Support
DD→GK	0.211	0.216	0.104	2.022	0.043	Yes
DD→ĐHKH	0.336	0.34	0.075	4.461	0	Yes
KT→GK	0.21	0.215	0.084	2.499	0.012	Yes
KT→ĐHKH	0.228	0.228	0.069	3.308	0.001	Yes
MT→GK	0.164	0.169	0.067	2.462	0.014	Yes
MT→ĐHKH	0.117	0.121	0.055	2.149	0.032	Yes
TN→GK	0.104	0.96	0.093	1.111	0.267	No
TN→ĐHKH	0.25	0.247	0.07	3.551	0	Yes

A bootstrapping method was conducted in SmartPLS4 to determine the path coefficient and its

associated p-value for the model. The research paper suggested eight hypotheses, all of which are direct relationships. The SmartPLS results indicated that all the direct impacts of the four dimensions of CSR are positive and significant on employee customer orientation: economic ($\beta = 0.228$, $p < 0.001$); environmental ($\beta = 0.164$, $p = 0.014$); ethical ($\beta = 0.336$, $p < 0.001$); and philanthropic ($\beta = 0.25$, $p < 0.001$), consequently, hypotheses H5, H6, H7, H8 were supported. Meanwhile, the results revealed that all the direct impacts of CSR on employee engagement (except philanthropic) are positive and significant: economic ($\beta = 0.21$, $p = 0.012$); environment ($\beta = 0.164$, $p = 0.014$); ethical ($\beta = 0.211$, $p = 0.043$), hence hypotheses H1, H2, H3, were supported. One exception is the impact of philanthropic CSR on employee engagement which was found to be positive but insignificant ($\beta = 0.104$, $p < 0.257$) hence hypothesis H4 was not supported.

4.2. Discussion and Implications:

4.2.1. Discussion

In both relationships with employee engagement and customer orientation, ethical responsibility is the factor with the highest influence ($\beta = 0.211$ and $\beta = 0.336$). The research findings align with previous studies, showing that ethical responsibility has the strongest impact on employee motivation and commitment in businesses. One of the reasons for this strong relationship is that ethical responsibility, although voluntary, plays a central role in CSR models, influencing the decisions of individuals and organizations, particularly in issues with a high level of voluntarism like CSR (Hoa, T., and Minh, C. N., 2013). While ethical issues and ethical responsibility are considered a separate aspect of CSR, it is important to emphasize that ethical responsibility exists within all other responsibilities (Carroll, A.B., 2010). Another possible reason stems from the aspect of tradition and culture. Scholars have highlighted the importance of considering long-standing ethical traditions before applying CSR in the context of developing countries (Visser et al., 2008). In Vietnam, tradition is seen as the soul of the nation and has a certain influence on how individuals think and behave in society. Based on the analysis by Nguyen et al. (2018), traditional factors such as Confucian values, religious beliefs, and others strongly address the ethical aspect in all aspects of life.

The results show that the environmental factor has very little impact on both employee engagement and customer orientation within SMEs in Vietnam ($\beta = 0.164$; $\beta = 0.117$). This can also be explained by the fact that employees may not directly see the connection between the company's environmental protection activities and their own work, especially when their job is not directly related to the environment. In the context of this study, out of the 200 samples collected from 45 SMEs, hardly any businesses were engaged in environmental activities. It should be noted that the research focused on SMEs, a segment often described as "difficult to access" and slow in adopting "green business" practices due to management and resource constraints inherent in SMEs (Sue Cassells, Kate Lewis, 2011).

The results revealed that philanthropic CSR had no significant impact on employee engagement. This is a rather new finding as it contradicts many previous foundational studies that found a positive impact of philanthropic responsibility on employee engagement. This may be due to the fact that CSR is influenced by the context in which it is applied (Ortenblad, 2016). SMEs in Vietnam only engage in corporate social responsibility (CSR) if they have sufficient financial and human resources. While other three responsibilities are the most fundamental obligations of a business, philanthropic responsibility is somewhat secondary. In his model, Carroll placed philanthropic responsibility at the highest level while emphasizing that to achieve philanthropic responsibility, businesses need to first fulfill their economic, legal, and ethical responsibilities. Philanthropic responsibility is the least important responsibility in the model (Carroll, 1991). Regarding the employee aspect, Maslow's hierarchy of needs theory can be applied to explain why this relationship

is not accepted. In many previous studies, philanthropic responsibility has been strongly linked to the need for self-actualization, the highest level in Maslow's hierarchy of needs (Meyers, R., and Weaver, L., 2018). In the current era, especially in developing countries and post-Covid-19, many employees may not focus on this need because they need to prioritize stability in their work and safety in both their professional and personal lives (Ertel S., 2020). This can explain why philanthropic responsibility does not have a significant impact on employee commitment in small and medium-sized enterprises in Vietnam.

4.2.2. Implications

The results emphasize the prioritization of ethical responsibilities within a business to achieve positive employee outcomes. The research team supports the view that merely implementing ethical rules or providing ethics training is insufficient. Instead, managers should strive to foster an atmosphere of ethical respect within the organization, including role models who actively demonstrate the company's ethical values.

Economic responsibility strongly influences both aspects of employee outcomes within the organization. Economic responsibility is considered the focal point of CSR debates, particularly regarding the shift from harm reduction to value creation (Luetkenhorst, 2004). This suggests that business managers should not only focus on company profits but also create value for society at large.

In terms of the environment, based on theoretical foundations, it can be inferred that the environmental responsibility is not emphasized in previous studies conducted globally. However, the research team has found that environmental responsibility does impact employee outcomes in Vietnamese SMEs, albeit to a small extent. Therefore, the research findings encourage businesses to reconsider their programs aimed at raising environmental awareness among their employees. In addition to developing educational and training programs on environmental responsibility, businesses can also signal to their employees that they care about certain social and environmental issues through the development of products and services that reflect this concern.

Philanthropic responsibility is difficult to measure and implement, and it can only be fully realized when other responsibilities are effectively fulfilled (Carroll, 1979, 1991). Given the limited capital and human resources of SMEs in Vietnam, the study suggests that philanthropic responsibility should be considered last after other responsibilities have been effectively addressed.

CONCLUSION

This study aims to demonstrate the relationship between corporate social responsibility (CSR) of small and medium-sized enterprises (SMEs) in Vietnam and the level of employee engagement and customer orientation. Regarding the research findings, most of the results are consistent with previous studies, indicating that economic responsibility, environmental responsibility, ethical responsibility, and philanthropic responsibility of the business all have a positive impact on employee engagement and customer orientation within the company to varying degrees. A new finding in the formal quantitative research process is that philanthropic responsibility does not significantly influence employee engagement but has a rather strong impact on employee customer orientation. From a theoretical perspective, the study provides additional foundational theories for researching CSR in Vietnam. Consequently, the study demonstrates the need for a more formal and appropriate measurement scale for CSR in the context of SMEs in Vietnam. The scale used can contribute to the development of more comprehensive and suitable measurement scales for future research. On a practical level, SMEs in Vietnam can recognize the importance of CSR to their business outcomes and understand the prioritization of various component responsibilities for resource allocation. Additionally, the research can help establish evaluation standards for businesses and societal expectations of accepted corporate behavior.

Although this study has achieved certain results and identified new variables, it cannot avoid certain limitations that need to be supplemented and adjusted by future research: There is a lack of foundational theories on the sustainable CSR model when combining this model with other fundamental theories such as those of Carroll (1991) and Visser (2014). Although this model is new and has appropriate characteristics for research, overcoming the limitations of previous models, the sustainable CSR model and the separation of social aspects into ethical and philanthropic dimensions will affect the evaluation of outcomes and managerial implications without any research testing the reliability of this model. Future studies should further explore related theories, examine the reliability of this model through expert interviews, and employ various research methods such as analysis and extraction.

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THE EFFECT OF SOCIAL CAPITAL AND TEAM EFFICACY ON INNOVATIVE TEAM PERFORMANCE: THE MODERATED MEDIATION OF SHARED LEADERSHIP

Author: Luu Khanh Linh¹, Pham Mai Linh², Le Thi Ngoc Khanh², Do Duy Tien²

Mentor: Nguyen Thi Hanh²

ABSTRACT: *The present research paper explores the correlation among social capital resources, team efficacy, and innovative team performance. The present study employs Partial Least Squares Structural Equation Modelling (PLS-SEM) to analyse the data gathered from a sample of 200 innovative teams. The findings reveal that team mentors positively affect team performance while team efficacy mediates the relationship between members and leaders as well as in communities to achieve better team performance; finally suggest that shared leadership moderates the relationship between social capital and team performance. This paper is the first study that examines shared leadership as a moderated mediator variable underlying the relationship between social capital, team efficacy, and innovative team performance. The results demonstrate a significant positive influence of social capital and team efficacy on innovative team performance through shared leadership.*

Keywords: *social capital, internal social capital, external social capital, team efficacy, shared leadership, innovative team performance, moderated mediation.*

1. INTRODUCTION

In today's rapidly changing global environment, innovation has become crucial for organizations to gain competitive advantages. Innovative teams play a critical role in developing and improving traditional procedures. However, connecting team members and their ideas to maximize team performance presents unique challenges. Social capital, defined as an individual's ability to gain advantages through their social networks, has been found to positively affect innovative team performance. Nonetheless, the concept of social capital and its influence on innovative team performance is not yet fully understood. Traditional leadership has limitations in promoting social capital within teams, particularly in innovative work, and shared leadership may be more suitable for enhancing collaboration, individual satisfaction, and moderating the relationship between social capital and innovative team performance. However, research on the role of shared leadership in enhancing innovative team performance is limited. The study investigates the mediating role of shared leadership in the relationship between social capital and innovative team performance and provides evidence of how shared leadership leverages innovative team performance in student startups.

In this study, we analyze the effects of social capital on innovative team performance. First, this study tries to systemize the literature on the related matters and our empirical results may provide important evidence so that innovative student startups can adjust their teamwork performance to generate more innovation and achieve remarkable achievement through utilizing social capital and implementing the role of shared leadership in daily operation.

In particular, our analysis is centered on four key questions as follows:

1. What are the definition and theoretical underpinnings of social capital? How does social capital affect innovative student startups?
2. What is shared leadership? How does social capital affect innovative team performance in student startups?

¹ Foreign Trade University, Email: linhk02.ftu@gmail.com

² Foreign Trade University.

3. Do Team efficacy and Shared leadership moderate or mediate the relationship between social capital and innovative team performance?

4. How does shared leadership leverage innovative team performance in student startups?

2. THEORY BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1. Social capital

2.1.1. Literature review of Social capital

The concept of social capital was first introduced as a contextual complement to human capital by sociologists. During its early development, social capital was viewed as a fundamental resource for individuals and communities, as it has the potential to provide access to valuable resources such as information, social support, and political power (Portes, 1998).

In contemporary times, social capital has become a vital resource for firms, as it enables access to information, resources, and opportunities via the establishment of networks and the development of relationships based on trust and shared norms (Adler and Kwon, 2002). According to Wang et al (2020), the quality of social networks was quantified as the level of integration, coordination, connection, and cohesiveness, and was found to enhance team collaboration and knowledge sharing, leading to a significant increase in overall team performance.

2.1.2. Literature review of Team performance

Zaccaro et al (2009) argued that most previous studies on entrepreneurial teams have predominantly defined team performance as the extent to which teams accomplish their desired strategic visions and valued objectives. The focus of these studies has primarily been on productivity as a fundamental measure of team performance. However, as early as the 90s, there has been a growing interest in incorporating team effectiveness and team efficiency as additional criteria for evaluating team performance (Hackman, 1987).

In a broader sense, team performance is conceptualized as an emergent phenomenon that arises from the goal-oriented process in which teams and their members utilize their individual and shared resources to meet expected or unexpected demands in taskwork and core processes (Burke et al., 2006). This approach serves as the foundation for our study, which investigates various dimensions of team performance within the context of entrepreneurial teams.

2.1.3. Literature review about social capital and team performance

The concept of social capital is well-supported by empirical evidence, indicating its substantial influence on team performance. For instance, Tsai and Ghoshal (1998) yielded compelling results, highlighting the superior performance outcomes of teams with high levels of social capital, including enhanced innovation and productivity. In a similar vein, a meta-analysis raised by Wang et al. (2019) corroborated the significant positive impact of social capital on team performance across diverse industries and contexts. Teams characterized by heightened social capital exhibit superior abilities in organizing and synchronizing their efforts, engaging in productive communication, and establishing a foundation of trust among team members. Consequently, these teams are better equipped to address complex problems and make well-informed decisions, thereby leading to overall improved performance.

The assertion that social capital directly influences team performance is substantiated by the following hypotheses, as supported by empirical evidence:

Extensive research has focused on establishing the positive impact of strong leader-member relationships, characterized by high-quality communication, trust, and cooperation, on team performance. Li and Liao (2014) provided empirical validation for the positive correlation between high-quality leader-member relationships and team performance. Similarly, Gerstner and Day (1997) with a meta-analysis,

which further supports the notion that positive leader-member relationships are significantly associated with higher levels of team performance, as well as other favorable outcomes such as job satisfaction and organizational commitment.

H1a: Leader members' relationships have a positive effect on Team performance.

Liang et al. (2012) showed that there is a positive relationship between social network centrality and team performance, thereby indicating that robust connections among team members can enhance overall team efficacy. These findings underscore the significance of cultivating favorable interpersonal relationships within teams to optimize their performance. Existing research has consistently demonstrated that increased levels of relationship conflict are inversely associated with team performance, whereas stronger relationships and greater social network centrality exhibit positive correlations with team performance.

H1b: Relationships among members have a positive effect on Team performance.

The existing body of literature provides evidence supporting the notion that team investment positively influences team performance. Numerous studies have underscored the critical role of accessing financial resources in determining team success. For instance, Li and Hambrick (2005) revealed that teams with access to financial resources outperformed those lacking such resources. The authors attributed this finding to the fact that financial resources enable teams to invest in essential elements like training and equipment, which are pivotal in achieving optimal performance. Furthermore, Scandura and Williams (2004) state firmly that corroborating that teams receiving investor support demonstrated superior levels of job performance and team efficacy.

H1c: Team investors have a positive effect on Team performance.

Several studies suggest that team mentors can serve as a valuable asset for teams, facilitating positive team dynamics that contribute to enhanced team performance. Sosik and Godshalk (2000) revealed teams receiving mentorship support exhibited higher levels of job satisfaction and commitment to the team, consequently leading to enhanced performance. Furthermore, the study highlighted the significance of mentors who demonstrated transformational leadership behaviors, such as offering individualized support and encouraging team members' personal growth and development, as they had a notably positive effect on team performance

H1d: Team mentors have a positive effect on Team performance.

The question of whether a sense of community can positively influence team performance has garnered increasing scholarly attention. Li and Hambrick (2005) put forth the proposition that teams characterized by a strong sense of community are more likely to exhibit heightened levels of cooperation, commitment, and trust among team members, which subsequently leads to improved performance outcomes. Similarly, Lu et al. (2019) found a correlation between community and team creativity and innovation. Their research demonstrated that teams with a strong sense of community displayed a greater propensity for knowledge and resource sharing, engaged in collaborative problem-solving, and generated novel ideas, thereby fostering innovation within team processes and positively impacting performance outcomes.

H1e: Community has a positive effect on Team performance.

2.2. Team efficacy

2.2.1. Literature review of Team efficacy

“Team efficacy” originates from “self-efficacy” and emerges as a result of team processes that involve social interaction and mutual task execution experience, where the personal efficacy beliefs of team members converge into a collective factor at the team level (Kozlowski and Klein 2000). Despite having individual efficacy beliefs, team members may also possess beliefs about the collective abilities of the team (Bandura 1986; Mesch, Farh, & Podsakoff, 1989; Shamir, 1990). Many scholars have focused their investigation on team efficacy as a shared attribute of groups, which is possessed collectively by each member (Bandura, 1997; Zaccaro et al., 1995).

2.2.2. Literature review about Team efficacy and Team performance

Earlier scholars have advocated the belief that team efficacy has a positive impact on team performance. For instance, William S. Silver and Kristina M. Bufanio (1996) investigated the correlation between team efficacy and task performance of the team, and the findings of their study provided empirical evidence that team efficacy had a strong and significant relationship with task performance. Additionally, Fuller et al. (2006) showed that virtual teams with higher levels of team efficacy had better performance outcomes and achieved more favorable team results. Consequently, we formulate the following hypothesis:

H2: Team efficacy have a positive effect on team performance

2.2.3. Literature review about the mediating role of Team efficacy

Previous scholarly investigations have indicated that social capital holds the potential to serve as a valuable asset (e.g. Bolino et al., 2002) owing to its diverse array of outcomes that are inherently linked to it. Given that social capital is a comprehensive metric encompassing various factors, including two primary dimensions: internal and external social capital, several studies have proposed that several dimensions of social capital, such as trust, team identity, and task execution abilities, well-being at work (Rich, 1997), and more cooperative behavior (Costa et al, 2009). When individuals possess the autonomy, confidence, and expectations to execute their responsibilities effectively, they tend to be more motivated and dedicated to their teams, thus enhancing team performance (Kara A. Arnold, et al, 2001). These aforementioned aspects correspond to team efficacy dimensions, such as efficacy beliefs and members' expectations for their team performance. In light of these findings, we arrive at the following hypotheses:

H3a: Team efficacy mediates relationship between Relationships among members and Team performance.

H3b: Team efficacy mediates relationship between Leader members' relationships and Team performance.

H3c: Team efficacy mediates relationship between Team investors and Team performance.

H3d: Team efficacy mediates relationship between Team mentors and Team performance.

H3e: Team efficacy mediates relationship between Communities and Team performance.

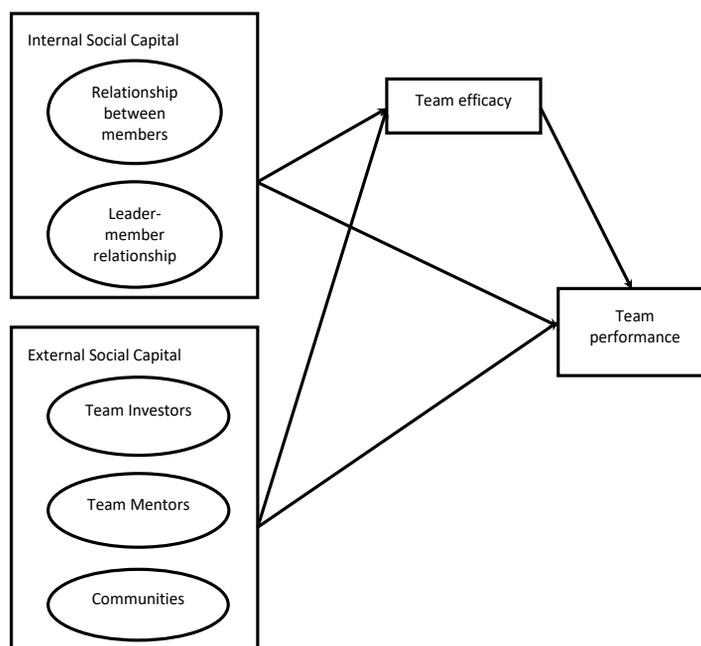


Figure 1. Model 1 – Impact of Social capital on Team performance via Mediating role of Team efficacy

2.3. Shared leadership

2.3.1. Literature review of Shared leadership

The genesis of the study into shared leadership can be traced back to Gibb’s (1954) proposition of two leadership forms: distributed and focused leadership. Elaborating on Gibbs’ original idea, shared leadership can be defined as the collective influence of team members on each other (Sivasubramaniam et al, 2002). In the current research, shared leadership is predominantly explored in unpredictable contexts and dynamic environments, such as global virtual teams and the Covid-19 pandemic (Nordback et al., 2019; Castellano et al., 2021). As the global economy and society are in a state of constant evolution, these research trends are anticipated to be further developed.

2.3.2. Literature review about the moderated mediator of Shared leadership

Many empirical studies have illustrated the positive impact of shared leadership on team performance in diverse contexts, such as undergraduate student teams (Avolio et al., 1996), change management teams (Pearce and Sims, 2002), and virtual teams (Pearce et al., 2004). External social capital facilitates access to valuable resources (Mizruchi, 1996; Pfeffer and Salancik, 1978) and opportunities to collaborate with other organizations (Koenig et al., 1979), while internal social capital can result in knowledge exchange and combination, leading to knowledge integration, which in turn affects the competitive advantage of organizations. Therefore, teams with a shared sense of collective competence among members are more likely to integrate their resources and knowledge to achieve successful concerted responses to specific situational tasks. Similarly, Wencang Zhou et al. (2013) have suggested that shared leadership can promote this resource combination process within innovative teams and enhance the efficacy of social capital. Thus, we posit that the effective combination of social capital significantly impacts team performance. Thus, we propose the following hypotheses:

H4a: Shared leadership moderates the mediating role of Team efficacy of relationship between Leader members’ relationships to Team performance.

H4b: Shared leadership moderates the mediating role of Team efficacy of relationship between Relationships among members to Team performance.

H4c: Shared leadership moderates the mediating role of Team efficacy of relationship between Team investors to Team performance.

H4d: Shared leadership moderates the mediating role of Team efficacy of relationship between Team mentors to Team performance.

H4e: Shared leadership moderates the mediating role of Team efficacy of relationship between Community to Team performance.

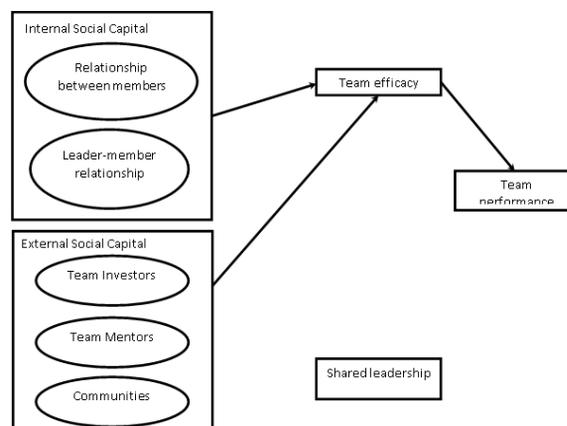


Figure 2. Model 2 – Impact of Social capital on Team performance via Moderated mediating role of Shared leadership

3. METHODOLOGY

3.1. Measurement

The survey comprises four main sections: Part I - General information; Part II - Evaluation of the impact of social capital (using factors identified in the research model); Part III - Evaluation of the influence of shared leadership (using factors derived from prior studies); Part IV - Evaluation of the significance of team efficacy (using factors derived from prior studies); Part V - Assessment of the performance of innovative teams.

The research team employs a Likert scale ranging from 1 to 7 (1 - Strongly disagree to 7 - Strongly agree) to measure the components of social capital, team efficacy, shared leadership, and team performance.

3.1.1. Measurement of "Internal social capital" variable

The measurement of Internal social capital in this study encompasses two primary scales: Relationship between members and Leader-member relationship. The measurement of relationships between members is based on the previous studies conducted by Pastoriza and Ariño (2013) and Ruiz-Palomino et al. (2021). It consists of 10 questions, including items such as "In my team, members engage in open and honest communication with one another" and "Our members share the same ambitions and vision with others at work." Furthermore, the measurement of Leader-member relationship draws upon the research conducted by Graen et al. (1995), Qi et al. (2019), and Tran et al. (2020). It includes items such as "My leader would be personally inclined to help me solve problems in my task" and "My leader and I are suited to each other."

3.1.2. Measurement of "External social capital" variable

The concept of external social capital in this study comprises three key elements: Team investors, Team mentors, and Communities. The measurement of Team investors is based on the seminal work of Lowell W. Busenitz et al. (1997), with the questionnaire adapted to the specific context of innovative team performance. Illustrative questions include "Our investors demonstrate a willingness to compromise with us" and "Our investors actively support the development of new team ideas." Similarly, the measurement of Team mentors draws upon the research conducted by C-Y Huang et al. (2015), with questions such as "We have a positive rapport with our mentors" and "The expertise of our mentors aligns well with our pursuits." While Communities represent a novel variable in social capital research, the authors identified pertinent prior studies and formulated questions, such as "Our team experiences enhanced team cohesion and identification when positively recognized by the community."

3.1.3. Measurement of "Shared leadership" variable

The authors have drawn upon research conducted by Mayo et al. (2003), Carson et al. (2007), Mathieu et al. (2015), Chiu et al. (2016), and Siangchokyoo et al. (2021) to formulate questions related to Shared leadership. The selected questions from these studies, deemed most suitable for measuring the Shared leadership variable in this study, include statements such as "My team leader provides a clear vision of where our team is going" and "My team leader works with me to develop my performance goals."

3.1.4. Measurement of "Team efficacy" variable

In order to assess Team efficacy, the authors have incorporated four questions inspired by the study conducted by Short et al. (2005). These questions include statements such as "Our team has the ability to perform under pressure" and "Our team has the ability to demonstrate a strong work ethic."

3.1.5. Measurement of “Innovative team performance” variable

The dependent variable, Innovative team performance, is assessed through six statements. These statements have been selected and modified by the authors based on the study conducted by Pearce et al. (1994), in order to align with the specific context of this research. Examples of these statements include “Our resource planning and allocation are superior to those of similar teams in other organizations” and “This team has achieved high performance.”

3.2. Data collection

The study collected data from leaders and members of innovative startup teams participating in notable student competitions in Vietnam, including “Kawai Business Startup” (KBS) and “Vietnam Social Innovation Challenge” (VSIC).

A minimum sample size of 115 participants was determined based on the formula of $5 \cdot m$, where m represents the number of observed variables. The study received a total of 201 responses over a 4-month period, out of which 199 responses were deemed valid for analysis, after excluding incomplete submissions.

Descriptive statistics were calculated using SPSS 20.0, while SmartPLS 4.0 was utilized to perform PLS-SEM analysis. The analysis aimed to assess the impact of Social capital on Innovative team performance, as well as examine the mediator role and moderated mediator effects of the Team efficacy and Shared leadership variables.

4. RESULTS

4.1. Statistics description

Although 201 responses have been collected nationwide, only 199 have been deemed valid for use in statistics and analysis. Results of variable descriptive statistics are displayed in the table below. Each variable has 199 observations. In this table, “RB” stands for “Relationship between members”, “LMR” shows “Leader-member relationships”, “TI” shows “Team investors”, “TM” presents “Team mentors”, “C” indicates “Communities”, “SL” is “Shared leadership”, “TE” is “Team efficacy” and “TP” shows “Team performance”.

According to the Table 1 below, all observations reached the highest score – 7 (strongly agree). Shared leadership has the largest mean (5.469849) while Team investor has the smallest mean (4.545226). Leader-member relationships have the smallest standard deviation (1.170453) and Communities have the largest standard deviation (1.294437).

Table 1. Descriptive statistics of variables

Variable	Mean	Standard deviation	Min	Max
RB	5.114322	1.455505	1	7
LMR	5.275544	1.170453	1	7
TI	4.545226	1.208332	1.5	7
TM	5.00691	1.192635	1	7
C	5.041876	1.294437	1	7
SL	5.469849	1.124243	1.375	7
TE	5.221106	1.278792	1	7
TP	5.043551	1.212103	1	7

Source: Authors’ calculation.

4.2. Reliability and Validity of Measurement Scales

All factors satisfy the minimum requirements (Table 2), with a composite reliability (CR) of ≥ 0.7 and an average variance extracted (AVE) of ≥ 0.5 . The (unreported) variance inflation factor (VIF) values are all below 3, indicating there is no significant multicollinearity among the independent variables.

Table 2. Properties for measurement

	Cronbach's alpha	Composite reliability	AVE
C	0.898	0.936	0.83
LMR	0.919	0.934	0.704
RB	0.946	0.961	0.86
SL	0.933	0.946	0.715
TE	0.95	0.961	0.832
TI	0.81	0.912	0.838
TM	0.935	0.947	0.692
TP	0.937	0.95	0.761

Source: Authors.

4.3. Hypothesis testing

Table 3. Results of structural model

	Original sample	Sample mean	SE	t	P values
C -> TE	0.566	0.564	0.079	7.176	0.000
C -> TP	0.058	0.065	0.081	0.717	0.474
LMR -> TE	-0.041	-0.037	0.055	0.747	0.455
LMR -> TP	0.017	0.019	0.056	0.299	0.765
RB -> TE	0.171	0.165	0.077	2.229	0.026
RB -> TP	0.047	0.045	0.041	1.148	0.251
TE -> TP	0.625	0.619	0.080	7.804	0.000
TI -> TE	-0.008	-0.010	0.040	0.194	0.846
TI -> TP	0.074	0.074	0.041	1.796	0.073
TM -> TE	0.203	0.208	0.075	2.700	0.007
TM -> TP	0.158	0.158	0.074	2.136	0.033
C -> TE -> TP	0.354	0.348	0.063	5.654	0.000
TI -> TE -> TP	-0.005	-0.006	0.025	0.195	0.845
TM -> TE -> TP	0.127	0.128	0.048	2.629	0.009
LMR -> TE -> TP	-0.026	-0.024	0.035	0.730	0.466
RB -> TE -> TP	0.107	0.103	0.053	2.014	0.044

Source: Authors.

We used Bootstrap analysis to examine hypotheses H1, H2 and H3. Table 3 indicates that TM has a positive correlation with TP ($\beta = 0.203$, $p = 0.007$), while TE has a strong positive effect on TP ($\beta = 0.625$, $p = 0.000$), thereby validating H1d and H2. The outcomes of Model 1 reveal that there were no significant relationships between RB and TP ($p = 0.251 > 0.05$), LMR and TP ($p = 0.455$), TI and TP ($p = 0.846$), and C and TP ($p = 0.474$), leading to the rejection of hypotheses H1a, H1b, H1c, and H1e.

According to the analysis of the data and hypotheses, the indirect effects of LMR and TI on TP through TE were found to be statistically insignificant (p values = 0.845 and 0.466 respectively > 0.005), which leads to the rejection of H3b and H3c. Only the paths of C -> TE -> TP, TM -> TE -> TP, and RB -> TE -> TP were supported by the empirical data (p values < 0.05) (H3a and H3e were supported). Thus, there is

an intermediate effect in the research model, where team efficacy acts as a mediator in the transmission of effects from RB, TM, and C to TP. Although RB -> TE -> TP and C -> TE -> TP are statistically significant, the direct effects of RB -> TP and C -> TP are not statistically significant. Hence, the team efficacy variable serves as a full mediator in the relationship between RB, C to TP.

Table 4. Results of 2.5% and 97.5% percentile values

PERCENTILE LOWER (2,5%)	0.196
PERCENTILE UPPER (97,5%)	0.888

Source: Authors.

The representative VAF value is calculated as:

$$VAF = \frac{0.127}{0.285} = 0.45$$

After conducting 5000 Bootstrap samples of both the total indirect effect and total effect, and calculating by Excel, the results (Table 4) show that VAF values in the range of the 2.5th to 97.5th percentile vary between 0.196 and 0.888, not including zero. The above equation signifies that 45% of the impact of team mentors on team performance can be elucidated through team efficacy. Therefore, H3d is partially mediated.

4.3.1. Testing for moderated mediation

Table 5. Process macro testing

Path	Hypothesis	β	p	LLCI	ULCI	Decision
Conditional indirect effect:						
SL x RB -> TE -> TP	H4a	0.077	0.027	0.221	0.259	Rejected
High: +1 SD		0.022	0.159	0.070	0.108	
Low: -1SD		0.101	0.121	0.001	0.201	
SL x LMR -> TE -> TP	H4b	0.057	0.001	0.001	0.016	Supported
High: +1 SD		0.138	0.005	0.0004	0.0157	
Low: -1SD		0.062	0.003	0.0125	0.0038	
SL x TI -> TE -> TP	H4c	0.053	0.053	-0.002	0.105	Rejected
High: +1 SD		0.119	0.031	0.22	0.48	
Low: -1SD		0.082	0.034	0.01	0.13	
SL x TM -> TE -> TP	H4d	0.233	0.002	0.1	0.453	Supported
High: +1 SD		0.254	0.001	0.08	1.11	
Low: -1SD		0.129	0.001	-0.01	-0.63	
SL x C -> TE -> TP	H4e	0.34	0.007	0.127	0.573	Supported
High: +1 SD		0.41	0.036	0.25	0.41	
Low: -1SD		0.101	0.027	0.09	0.14	

Note: N = 199; Bootstrap sample size = 5000, BC 95%, CI = Bias - corrected 95% Confidence Interval; LLCI = Lower limit of confidence interval; ULCI = Upper limit of confidence interval

Source: Authors.

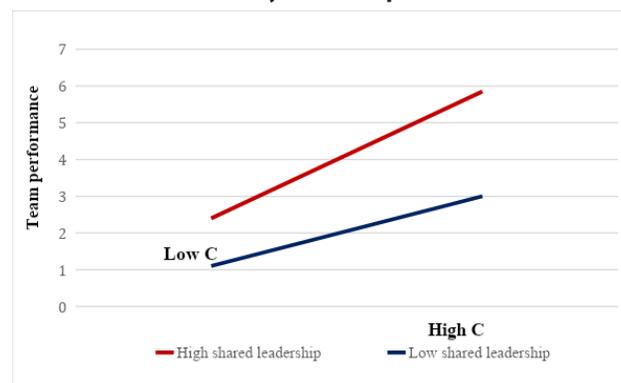
To examine the fourth hypothesis, we used the outcome obtained from the PROCESS macro for model 2. The bootstrapping results presented in Table 5 indicate that the conditional indirect effect of RB on TP was not significant at both high ($\beta = 0.022$, $p = 0.159 > 0.05$, LLCI = 0.07, ULCI = 0.108) and low levels of

SL ($\beta = 101, p = 0.121 > 0.05, LLCI = 0.001, ULCI = 0.201$). As moderated mediation was not evident, H4a was rejected. Similarly, the indirect relationship between TI and TP through TE was insignificant at a high level of SL ($\beta = 0.053, p = 0.053 > 0.05, LLCI = -0.002, ULCI = 0.105$). Thus, the outcome rejects H4c.

When SL was higher (+1 SD), the indirect effects of LMR on TP through TE became stronger ($\beta = 0.138, p = 0.005, LLCI = 0.07, ULCI = 0.108$). The indirect effects were weaker when SL was lower (-1 SD) ($\beta = 0.101, p = 0.041, LLCI = 0.0004, ULCI = 0.0157$). These findings indicate that SL moderates the mediated relationship between LMR and TP through TE, supporting Hypothesis 4b.

As shown in Table 5, the conditional indirect association between TM and TP was found to be statistically significant across all three levels of SL. However, the indirect relationship was stronger with higher SL as opposed to lower SL, supporting H4d.

Figure 3. Moderated mediation effect of shared leadership on the correlation between community and team performance



Source: Authors.

Finally, the results (Table 5) indicated that SL plays a positive moderating role in the relationship between C and TP ($\beta = 0.340, p = 0.007, LLCI = 0.127, ULCI = 0.573$). Figure 3 illustrated a strong interaction effect between C and TP in fostering a positive C, where a steeper slope was observed for higher levels of SL compared to lower levels. Therefore, it can be concluded that hypothesis H4e was accepted.

5. DISCUSSION

This study investigates the roles of shared leadership, or mediated mediator, in the relationship between social capital and the performance of innovative teams. In the context of sales teams (Mehra et al. 2006), undergraduate student teams (Avolio et al. 1996), etc., the effects of shared leadership on team performance have also been thoroughly researched in the past. It has also been previously suggested that shared leadership plays a mediating role in the relationship between social capital and team performance (Nicolaidis, VC et al., 2014; Hoch, JE, 2014). In contrast to earlier studies, the role of shared leadership in this investigation is that of a moderated mediator.

Despite the fact that only Team mentors have a positive impact on Team performance (hypothesis H1d), the remaining hypotheses are disproved by the findings on the effects of each independent variable on the dependent variable. The dependent variable is not directly impacted by the two independent variables (relationships between members and communities), but they do impact other independent variables indirectly through the mediating factor team efficacy.

First, hypothesis 1d predicted that the team performance would be directly and positively influenced by team mentors (direct effect = 0.203, 90%). Overall, the team mentors had a direct

impact on team performance. Because the mentors are the ones who oversee, counsel, and direct the team throughout the competition from research to implementation. The team's performance would be directly impacted by these orientations. On the other hand, by offering techniques for the team to use, mentors also provide feedback, which the teams may use to make adjustments and improve performance. This result is also supported by the research of (Iacob and Faily, 2020), during the two academic years from 2018 to 2019, team performance correlated significantly with the team attendance record in the mentorship sessions ($r=0.52$, $p<.01$).

In addition, the results of this study (Hypothesis H2 supported) add to prior research and advanced empirical study of the factor, showing that team efficacy influences innovative teams, aiding teams in overcoming challenges, fostering higher team performance, encouraging teams to achieve goals, and producing excellent results. The outcome additionally demonstrates that team mentors have a favorable, indirect association through team potency with team performance ($r=0.127$, 90%) (Hypothesis H3d).

Through team efficacy acting as the mediator, it was hypothesized that leader member relationships (LMR) and community were related to team performance ($r=0.107$, 95%, and $r=0.354$, 99%, respectively) (Hypothesis H3a, H3e). Through the mediating variable, both of the two factors have an indirect effect on the team's performance. However, the community variable has a bigger impact on the regression coefficient than the LMR variable. This demonstrates how crucial it is for the team to have community support when innovating.

The results showed that SL has a moderated mediating influence on the relationships between TM and TP, C, and TP via TE, as was expected. These findings imply that team efficacy may be enhanced by shared leadership in mediating the relationship between TM and TP as well as C and TP. More precisely, creative teams with strong shared leadership can foster communication and knowledge sharing among all team members and mentors, which strengthens mutual trust and boosts team productivity. On the other side, members are more likely to use community resources when a team adopts a high level of shared leadership (SL), as SL places an emphasis on equal positions for all people.

6. IMPLICATIONS AND LIMITATIONS

This study contributes to the understanding of the impact of social capital and shared leadership on the performance of innovative teams. The use of shared leadership as a mediator/moderator is highlighted as a key factor in promoting innovation and collaboration within teams. The study suggests that stakeholders such as government, organizations, students, and universities can benefit from promoting shared leadership training programs and incorporating shared leadership principles into their practices to foster a collaborative culture that supports innovation. The authors suggest that start-up teams should consider setting up mentor positions to improve team performance, and that shared leadership has a positive effect on team performance, making it a valuable leadership style for promoting innovative team performance.

This study aimed to evaluate the mediating role of team efficacy and the moderating role of shared leadership in the relationship between internal social capital (including relationships among members and leader-member relationships) and innovative team performance. However, the study found no direct relationship between internal social capital and innovative team performance. The study proposed and adjusted the measurement of two new variables, team investors and communities, based on relevant research and the Vietnamese context. The literature review was limited due to time constraints and availability of documents. The study was conducted in Northern Vietnam, which may limit the generalizability of the results to other regions.

7. CONCLUSION

This study introduces different dimensions of social capital, encompassing internal social capital (relationship among members; leader-member relationships) and external social capital (team investors, team mentors, and communities). These comprehensive dimensions shed light on the influence of social capital on team performance in student innovative teams.

The research examines the association between social capital and team performance through the lenses of team efficacy and the moderating role of shared leadership. While the direct positive effect of team mentors on team performance was observed, this study breaks new ground by considering other valuable resources such as financial investment and mentor guidance. Previous research has primarily focused on intangible aspects of social capital, making this study unique in its broader perspective.

A significant finding of this study is the full mediation effect of team efficacy, which mediates the relationships between relationships among members, communities, and team performance. Additionally, team efficacy partially mediates the association between team mentors and team performance, as team mentors still exert direct effects on performance.

In summary, this study adopts a comprehensive evaluation of social capital, investigates the mediating role of team efficacy, and reveals the concept of shared leadership as a moderated mediator. By expanding the understanding of social capital's influence on team performance, this research contributes to the existing literature and offers valuable insights for practitioners and scholars alike.

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FACTORS AFFECTING ENTREPRENEURIAL INTENTION OF STUDENTS AT FOREIGN TRADE UNIVERSITY IN HO CHI MINH CITY

**Author: Nguyen Le Yen Nhi¹, Nguyen Thi Khanh Ngoc²,
Dang Ngoc Phuong Mai², Nguyen Thanh Lam²
Mentor: Huynh Dang Khoa²**

ABSTRACT: *As entrepreneurship plays a crucial role in providing job opportunities, fostering economic growth, and ensuring a stable society, it should be encouraged among people. Therefore, it is necessary that entrepreneurial intention should be nurtured, especially in students, who will make up the majority of the workforce in the future. This research aims to examine the effect of individual entrepreneurial orientation elements, family environment, and entrepreneurial education on entrepreneurial intention to create a new business among students of Foreign Trade University in Ho Chi Minh City. Furthermore, feasible ways the university can help students prepare for future entrepreneurship were also proposed in the research. Also, the impact of gender, a moderating factor, is also evaluated. The set of hypotheses was tested via a survey to a sample of over 200 students of this university, using both qualitative and quantitative methods with statistical analysis including descriptive statistics, Cronbach's Alpha, EFA, correlation and regression. The results have shown that individual entrepreneurial orientation and entrepreneurial education have strong influence on entrepreneurial intention while family background and gender show no significant impact.*

Key words: *entrepreneurial intention, IEO, entrepreneurial education, family environment, gender*

1. INTRODUCTION

Entrepreneurship is one of the chosen strategies to be adopted and acknowledged in order to provide jobs for young people, foster economic progress, and ensure a stable and peaceful society (Schumpeter, 2000). The entrepreneurship sector has experienced tremendous growth these years, and Vietnam is no exception, ranking 54th of 100 nations globally (Startupblink, 2021). To support and promote the Career and Entrepreneurship activities of young people, the Prime Minister signed a decree to promulgate the Project “Supporting Students to Start a Business by 2025”. However, in reality, the start-up rate among students is still low, most students after graduating from colleges and universities tend to apply for jobs in operating businesses, and only a few want to start a business by themselves. Almost 66% of Vietnamese students are not really interested in start-up (VCCI, 2019).

Foreign Trade University in Ho Chi Minh City is known as one of the leading economics universities in the south of Vietnam. Many contests and projects related to entrepreneurial activities are offered to aim at giving students the chance to brainstorm, form and make feasible plans to execute workable business strategies. However, most ideas just stop there. Even students studying majoring in economics typically opt to work for an organization with competitive pay rather than launch their startup after graduation. This can be attributed to the fear of failure due to the fierce competition they might encounter or the lack of knowledge, skills, experience, or financial support.

According to Krueger and Brazeal (1994), the intention for entrepreneurship is the foundation for entrepreneurship behavior. Much research have been conducted in this field of entrepreneurial intention among universities in order to figure out the most effective methods for teaching students to be properly

¹ Foreign Trade University, Email: nguyenleyennhi2011155421@ftu.edu.vn

² Foreign Trade University.

prepared before engaging in entrepreneurial activity. Research by Wei-Loon Koe (2016) assessed the impact of Individual Entrepreneurial Orientation on the entrepreneurial intention of university students, implying the intention was affected by the quality of proactiveness and innovativeness within themselves. Also, Vodã et al. (2019) found that personality traits matter to entrepreneurial intention of business students, explaining that one who has a high level of need for achievement and control, which in practice would predict a high potential for entrepreneurial intent. Regarding the same research, many factors are worth discussing, including entrepreneurial education and gender. Entrepreneurial education has a significant positive impact on college students' entrepreneurial intention, however, it does not have a significant impact on their entrepreneurial attitude. Earlier research by Zhao and Seibert (2005) and Ibrahim et al. (2016) indicated that engagement in education positively impacts entrepreneurial intentions; and later by Rui Fragoso et al (2019). In terms of gender, research of Vodã found out that women have lower intentions to engage in start-up activities than males, which is also supported by research of Zhao and Seibert (2005). Finally, other research results show that family also impacts the intention to start a business Lindquist et al., (2015) and Fatoki (2015).

There are so many ways of researching the topics of entrepreneurial intention, each provides valuable findings. However, because the researches were conducted across many countries, with different methods, scopes, scales and sample sizes, results vary significantly. Therefore, results of one research are doubtfully applicable to other contexts. In order to provide a thorough and effective research and suggestion to the subject herein Foreign Trade University in Ho Chi Minh City, the author decided to combine all of the statistically proven as positive and relevant factors derived from empirical researches to this paper. Other factors that have signs of positive relationship but have not been cleared and well-developed yet are modified as independent variables for further investigation. The author also uses qualitative research methods in the process of collecting, synthesizing, and analyzing theoretical bases to develop appropriate research models as well as build scales to evaluate and analyze data. clarify the results of quantitative research. The research process is conducted through two main stages: (1) Preliminary research and (2) Formal research through field survey and primary data analysis based on collected data. In addition, this study was conducted with the aim to determine the factors affecting the entrepreneurial intention of students studying at Foreign Trade University in Ho Chi Minh City.

2. THEORETICAL FRAMEWORK

2.1. IEO elements

Some of the individual entrepreneurial orientation (IEO) elements were proven to have a positive relationship with business performance (Chien, 2014; Bolton (2012). Robinson and Stubberud (2014) defined IOE as an individual level construct, originating from the concept of entrepreneurial orientation (EO) by Miller (1983) which consists of three dimensions, namely innovativeness, pro-activeness and risk-taking. Specifically, proactiveness requires entrepreneurs to seek, secure and utilize valuable business opportunities (Bolton and Lane, 2012). Meanwhile, innovativeness is related to engaging new ideas to produce new products, services or processes against the increasing competitive business landscape. Finally, risk-taking ability assumes an individual's intention on taking up entrepreneurial activities (Yurtkoru et al., 2014; Bolton and Lane, 2012).

At Foreign Trade university of HCM city (FTU2), the education program is designed to develop the strengths of their students and improve their weaknesses by allowing them to be proactive, independent, and responsible for their learning and participating in extracurricular activities, especially in organizing a school club. To manage a club, the board of management has to master the human & risk management skills, innovations skills and . Therefore, with the experience in being responsible for an organization, challenging in creating concepts for every event of the organization, the author confides that the skills of IEO is fully equipped within every student of FTU2.

2.2. Family environment

For gifted individuals, the family has been regarded as the most important factor in transforming talent, skill, and promise into achievement (Olszewski et al., 1987). Family shapes their behavior, their ways of solving problems, and in particular, how they make decisions (Figueiredo & Dias, 2012). Creatively gifted children have family environments that stress independence rather than interdependence, are less child-centered, have tense family relationships and more expression of negative affect resulting in both a cognitive freeing and motivation to attain power or leadership (Olszewski et al., 1987). According to research conducted by Lindquist et al. (2015) and Fatoki (2015), the home environment (i.e., transitions, resources, and norms, attitudes, and values) has a beneficial influence on an individual's eagerness to launch a business venture (i.e., identify opportunities, determine whether to launch, mobilize resources, and put founding strategies, processes, and structures into place). Parental support will influence the willingness in doing entrepreneurship (Irine, 2017).

FTU2 students have a good family background. Their family supports them in achieving skills and knowledge in many ways such as supporting financial conditions, and emotional sharing. Thus, FTU2 students are assured to follow their dream and to pursue their passion to become the one that they want to be in the future even become a businessman or business woman.

2.3. Education

According to Bates (1995) and Bowen and Hisrich (1986), those who establish their own businesses have a greater level of education compared to those who do not. Nevertheless, it has been argued that formal education, in general, does not promote entrepreneurship. However, specialized courses and education in enterprises have been associated with promoting entrepreneurial behavior through the study provided by Peterman and Kennedy (2003). A positive relationship between education and business set-up was established by Lüthje and Frank (2003). Kimwolo, Saina, and Cheserek (2012) stated that training and entrepreneurial education could enable students to acquire the skills required to create a new venture and manage a business. Early exposure to entrepreneurial training and education might be particularly effective in promoting interest in entrepreneurship as discussed by Dyer (1994).

When it comes to entrepreneurial education, Foreign Trade University in Ho Chi Minh City has organized various courses, seminars, workshops, and office visits to orient students towards entrepreneurship. Also, different entrepreneurial contests have been held to raise students' interest in entrepreneurship.

In this paper, we would examine whether entrepreneurial training courses at the university leaves a significant effect on the entrepreneurial intention of students. Also, the rate of participation in extracurricular activities of students should be considered.

2.4. Moderating factor: Gender

Fagenson and Marcus (1991) illustrated that male dominance was more linked to entrepreneurship. Seibert et al. also had the same conclusion that entrepreneurial intention in men is higher than in women in their research in 2005. Females having fewer opportunities to be self-employed can be explained by the continuation of gender-specific restrictions, according to Verheul et al., (2012). From the research of Haus et al. (2013), it could be implied that compared to men, women typically exhibit lower levels of entrepreneurial attitudes, perceived behavior control, and subjective norms.

This paper will examine the difference in entrepreneurial intention between male and female students of Foreign Trade University in Ho Chi Minh City. The author would concentrate on analyzing the potential moderating effect of gender along with IEO elements, family environment, and entrepreneurial education on the students' intention to engage in entrepreneurial activities in accordance with the theoretical conclusions above.

2.5. Research model and hypotheses

Based on the above three sub-sections on theoretical and empirical contributions to explaining business start-ups, the research model is presented in Illustration 2.4.

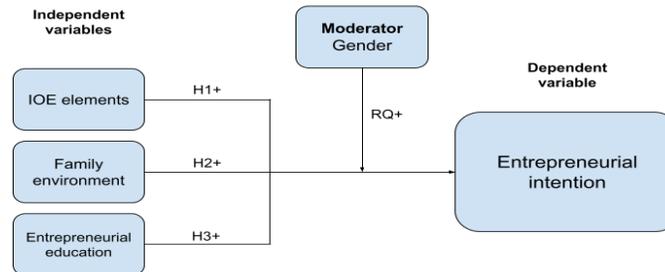


Illustration 2.1. Author’s suggested research model

Based on the referred theory and the model above, we set forth the following hypotheses for empirical analyses in this paper:

H1: Individual entrepreneurial orientation has a positive relationship to the entrepreneurial intention of university students.

H2: The family environment has a positive relationship to the entrepreneurial intention of university students.

H3: Entrepreneurial education has a positive relationship to the entrepreneurial intention of university students.

RQ: Will gender modify the impact of IEO elements, self-efficacy, family environment, and entrepreneurial education on the entrepreneurial intention of university students?

3. RESEARCH METHOD

3.1. Research design

3.1.1. Research procedure

The research procedure was divided into two periods, that is preliminary research and official research. During the periods, the author used both qualitative and quantitative research based on empirical study and direct survey results from Google Form platform, then performed analysis on the data gathered.

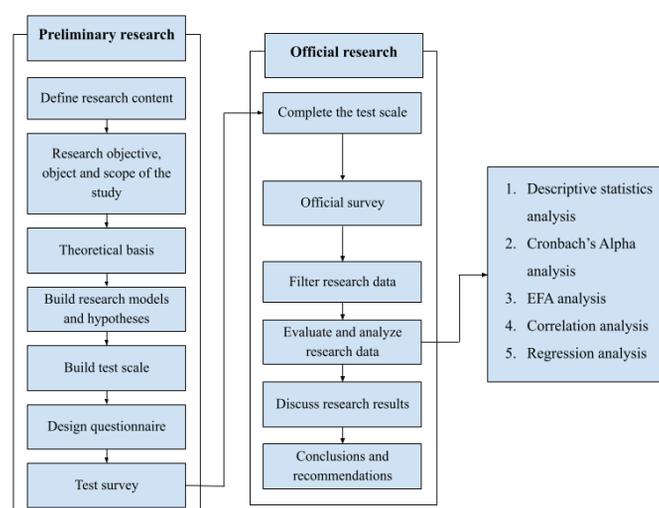


Illustration 3.1: Research procedure

The author uses Likert five-point scale to measure how much individuals agree or disagree with specific statements as observed variables which will raise the participant's response rate as according to Babakus et al. (1992). From there, the author has a complete survey with 21 questions and divided into 2 main parts. Part one consists of filtered questions such as gender, and level of education with two options "Yes" or "No. Part two includes 18 main questions expressed in the form of statements and is evaluated by the Likert 5 scale (1 - Totally disagree; 5- Totally agree). For each element in the research model, the author uses 5 - 6 questions to ask the opinions of students studying at Foreign Trade University in Ho Chi Minh City.

3.2. Sources and data collecting methods**3.2.1. Preliminary research**

Before official research, the author conducted a trial online research with the participants of 90 university students in Ho Chi Minh City from February 1 to March 1, 2023. Conducting this trial research helps the author to assess the understandable and reasonable rate of the questions and complete the scale of this research. In addition to the process, the author also contacted M.S Huynh Dang Khoa, a lecturer of Foreign Trade University at Ho Chi Minh City for instructions and advice via email.

3.2.2. Official research

In this step, the author conducted a survey of students of Foreign Trade University in Ho Chi Minh City about their intention to start their own business. The survey was carried out from March 1, 2023 to March 25, 2023 and the data was only collected online through Google Form and was sent through different social networking sites such as Email, Facebook, and Zalo. In order to ensure the reliability, validity, and representativeness of the research, the author needs the sample size being at least 5 times greater than the number of observable variables examined (Hair et al., 1998). The author has 19 observed variables in total, and at the same time, the number of acceptable and reasonable answers are 209 out of 223 answers received, which accounts for 93.27%. Therefore, it is clear that the sample size meets the requirements for further EFA analysis.

3.3. Data analysis methods

Firstly, descriptive statistics methods were used to present the results obtained in a systematic and intuitive manner. Then, the author used Cronbach's Alpha test to check the accuracy and internal consistency of the observed variables in the scale and determine the reliability of the questions. After that, the exploratory factor analysis EFA was used to examine the relationship between variables in all different factor groups and check if there were any observed variables that had not reached the standard load factor due to too little contribution to the model. Next, correlation analysis was used to analyze quantitative data collected through research methods like surveys and live polls. This method helped to identify the relationship, patterns, significant connections, and trends between two variables or datasets. Furthermore, the author included Multiple Linear Regression in the paper to analyze the relationship between the independent variable and dependent variables, using three tables ANOVA, Model Summary, Coefficients. Finally, a macro process was applied to analyze the moderating variable Gender. According to Baron and Kenny (1986), the moderator variable acts as a factor that changes the strength/weakness of the independent variable on the dependent variable, or in other words, adjusts the strength of the relationship between two variables.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Descriptive statistics analysis

a) Genders

GEND					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	107	51,2	51,2	51,2
	2	102	48,8	48,8	100,0
	Total	209	100,0	100,0	

Table 4.1. Descriptive statistics of variable: gender

Source: Author's analysis on SPSS

Based on the numbers given from the survey, in terms of gender, the proportions of men and women were 51.2% and 48.8% respectively, a fairly balanced ratio.

b) Descriptive statistics of scale

Table 4.2. Descriptive statistics of scale

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EI	209	1	5	3,43	1,179	-,498	,168	-,523	,335
IEO1	209	1	5	3,43	1,311	-,501	,168	-,857	,335
IEO2	209	1	5	3,44	1,296	-,545	,168	-,746	,335
IEO3	209	1	5	3,32	1,255	-,346	,168	-,885	,335
IEO4	209	1	5	3,34	1,002	-,406	,168	-,356	,335
IEO5	209	1	5	3,47	1,042	-,238	,168	-,799	,335
IEO6	209	1	5	3,29	1,281	-,409	,168	-,849	,335
FAM1	209	1	5	3,71	,812	-,178	,168	-,173	,335
FAM2	209	2	5	3,84	,761	-,114	,168	-,506	,335
FAM3	209	2	5	3,43	,731	-,038	,168	-,295	,335
FAM4	209	1	5	2,92	1,242	-,066	,168	-1,016	,335
FAM5	209	1	5	3,79	,793	-,248	,168	-,046	,335
EDU1	209	1	4	2,55	,627	-,724	,168	-,024	,335
EDU2	209	1	4	2,34	,770	-,488	,168	-,836	,335
EDU3	209	1	5	3,33	1,101	-,270	,168	-,696	,335
EDU4	209	1	5	3,10	1,089	-,427	,168	-,544	,335
EDU5	209	1	5	2,74	1,152	,138	,168	-,798	,335
EDU6	209	1	5	2,88	,951	-,233	,168	-,505	,335
Valid N (listwise)	209								

Source: Author's analysis on SPSS

Regarding the scale of dependent variables, the dependent variable EI had a mean value of 3.43, indicating that many participants had the intention to become an entrepreneur in the future.

Regarding the scale of the independent variables, there were numerous independent variables, all of which had an average value of at least 3.4 and above. It meant that the majority of respondents had a lot of favorable opinions about the elements. Statistical results showed that the variable FAM2 had the highest mean value (3.84), showing that many participants agreed that their family maintained good relationships with those around them. The second variable that had the highest mean value was FAM5 (3.79), indicating that a large number of participants agreed with the view that their families had been maintaining positive

values, traditions, and habits for many generations. There were, however, a few elements below level 3, two of which were connected to university entrepreneurship education, EDU1 (2.55) and EDU2 (2.34). This indicated that the majority of respondents disagreed with the claim that universities had provided them with the knowledge and skills they required to become successful entrepreneurs.

4.1.2. Cronbach's Alpha analysis

a) For the independent variables' scales

Table 4.3. Cronbach's Alpha results of individual entrepreneurial orientation (IEO)

IOE elements (6 items): Cronbach's Alpha = 0.944				
Observable variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
IE01	16.86	27.335	0.858	0.931
IE02	18.85	27.127	0.926	0.926
IE03	16.97	27.696	0.928	0.928
IE04	16.95	31.021	0.787	0.940
IE05	16.82	30.351	0.816	0.936
IE06	17.00	28.418	0.787	0.939

Source: Author's analysis on SPSS

Entrepreneurial education (6 items): Cronbach's Alpha = 0.808				
Observable variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
EDU1	14.40	14.654	0.447	0.804
EDU2	14.60	11.991	0.454	0.801
EDU3	13.62	11.324	0.628	0.764
EDU4	13.85	11.005	0.692	0.747
EDU5	14.21	11.472	0.563	0.783
EDU6	14.07	11,947	0.661	0.757

Table 4.4. Cronbach's Alpha results of entrepreneurial education (EDU)

Source: Author's analysis on SPSS

Cronbach's alpha coefficients of IEO elements and entrepreneurial education were 0.944, and 0.808 respectively, which were all greater than 0.8, which indicated relatively high internal reliability.

The Corrected item – Total correlation values of the observable variables of the aforementioned independent variables were all greater than 0.3, which proved themselves to have a strong positive correlation with the remaining observed variables in the scale and thus were reliable to be used together to illustrate the parent factor.

Table 4.5. Cronbach's Alpha results of family environment (FAM) - first run

Family environment (5 items): Cronbach's Alpha = 0.662				
Observable variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
FAM1	13.98	5.937	0.451	0.596
FAM2	13.85	5.928	0.505	0.577
FAM3	14.26	7.144	0.180	0.697
FAM4	14.76	4.269	0.501	0.583
FAM5	13.89	5.806	0.509	0.572

Source: Author's analysis on SPSS

Table 4.6. Cronbach’s Alpha results of family environment (FAM) - second run

Family environment (4 items): Cronbach’s Alpha = 0.697				
Observable variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Cronbach’s Alpha if Item Deleted
FAM1	10.55	4.854	0.456	0.650
FAM2	10.42	4.803	0.528	0.616
FAM4	11.33	3.349	0.496	0.664
FAM5	10.47	4.693	0.531	0.611

Source: Author’s analysis on SPSS

In the first run, the Cronbach’s alpha coefficient of family environment was acceptable, but the Corrected item – Total correlation value of FAM3 stood at 0.180 which was much lower than 0.3. This indicated that financial pressure did not have a significant correlation with other remaining observed variables in the factor and was removed from the analysis.

In the second run, the new Cronbach’s Alpha coefficient of FAM was at an acceptable level of 0.697. Furthermore, no other Corrected item – Total correlation values were lower than 0.3. This scale finally had its internal consistency.

For the dependent variable’s scale, there was only one observable variable of this factor, so there was no need to check the internal reliability.

For the moderator’s scale, the author used only one moderator which was gender, so there was no need to check the internal reliability of this specific moderator.

4.1.3. EFA analysis

Table 4.7. KMO and Bartlett’s Test - first run

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.928
Bartlett’s Test of Sphericity	Approx. Chi-Square	2111.141
	df	120
	Sig.	.000

Source: Author’s analysis on SPSS

Table 4.8. Total Variance Explained - first run

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,833	48,959	48,959	7,833	48,959	48,959	5,823	36,396	36,396
2	1,570	9,810	58,769	1,570	9,810	58,769	2,496	15,601	51,997
3	1,119	6,995	65,763	1,119	6,995	65,763	2,203	13,767	65,763
4	,965	6,029	71,793						
5	,655	4,094	75,886						
6	,625	3,904	79,790						
7	,561	3,505	83,295						
8	,475	2,967	86,262						
9	,434	2,712	88,974						
10	,366	2,290	91,264						
11	,332	2,075	93,339						
12	,278	1,735	95,074						
13	,250	1,562	96,636						
14	,223	1,394	98,030						
15	,181	1,132	99,163						
16	,134	,837	100,000						

Source: Author’s analysis on SPSS

Exploratory Factor Analysis was used to determine the convergence of the factor groups. The principal components method was the extraction method used, along with the Varimax rotation. The author wished to select quality observed variables, the loading factor threshold of 0.45 was used.

In the first run, KMO measure equaling 0.928 (much higher than 0.5) and sig Bartlett’s Test result being 0.000, (lower than 0.05) proved that EFA was appropriate to be used in this research. From Table 4.8, there were three factors extracted with Eigenvalue greater than 1, which met the requirements. And the Total variance explained was 65.763 (greater than 50), which indicated that the extracted factors had explained 65.763% of the data variation of 16 observed variables used in the EFA analysis (FAM3 was already eliminated).

Table 4.9. Rotated Component Matrix - first run

Observable variables	Component		
	1	2	3
IEO1	.853		
IEO2	.845		
IEO3	.860		
IEO4	.776		
IEO5	.779		
IEO6	.842		
FAM1	.469	.477	
FAM2		.659	
FAM4		.649	
FAM5		.842	
EDU1			.784
EDU2			.845
EDU3	.586		
EDU4	.583		
EDU5	.550		.451
EDU6	.523		.456

Source: Author’s analysis on SPSS

As seen in the Rotated Component Matrix, the observable variables were classified into three groups of factors. EDU3 and EDU4 were placed in the same column as other observed variables of IEO elements, indicating a certain correlation. Therefore, the author considered EDU3 and EDU4 as the observed variables of IEO elements.

Also, from Table 4.9, some observed variables were loaded into more than one component:

- FAM1 was loaded into Components 1 and 2 with factor loadings 0.469 and 0.477 respectively.
- EDU5 was loaded into Components 1 and 3 with factor loadings 0.523 and 0.451 respectively.
- EDU6 was loaded into Components 1 and 3 with factor loadings 0.550 and 0.446 respectively.

However, the difference in the loading factors between the two components was less than 0.3 for the three cases above.

Since these observed variables could not explain their factors well, the author decided to remove FAM1, EDU5, and EDU6 and run the EFA analysis again.

Table 4.10. KMO and Bartlett’s Test - second run

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.924
Bartlett’s Test of Sphericity	Approx. Chi-Square	1775.839
	df	78
	Sig.	.000

Source: Author’s analysis on SPSS

Table 4.11. Total Variance Explained - second run

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6,765	52,041	52,041	6,765	52,041	52,041	5,346	41,121	41,121
2	1,443	11,102	63,143	1,443	11,102	63,143	2,157	16,590	57,711
3	1,109	8,529	71,672	1,109	8,529	71,672	1,815	13,960	71,672
4	,744	5,725	77,397						
5	,563	4,333	81,730						
6	,484	3,722	85,452						
7	,392	3,016	88,468						
8	,365	2,808	91,275						
9	,300	2,306	93,581						
10	,274	2,104	95,685						
11	,232	1,786	97,471						
12	,190	1,463	98,934						
13	,139	1,066	100,000						

Source: Author’s analysis on SPSS

Table 4.12. Rotated Component Matrix - second run

Observable variables	Component		
	1	2	3
IE01	.873		
IE02	.864		
IE03	.883		
IE04	.807		
IE05	.857		
IE06	.797		
FAM2		.578	
FAM4		.711	
FAM5		.886	
EDU1			.824
EDU2			.887
EDU3	.607		
EDU4	.593		

Source: Author’s analysis on SPSS

In the second run, KMO measure equaling 0.922 (higher than 0.5) and sig Bartlett’s Test result equaling 0.000 (lower than the 0.05) proved that EFA was still appropriate. From Table 4.12, there were still three factors extracted with Eigenvalue greater than 1, which met the requirements. The extracted factors were able to explain 71.672% of the data variation of 13 observed variables used, which was approximately 5% higher than the previous run.

Based on the Rotated Component Matrix, the observable variables were still classified into three groups of factors, with EDU3 and EDU4 still placed in the same column as other observed variables of IEO elements.

Also, as seen from Table 4.12, there was no more disturbance with any observed variables being loaded into more than one component.

4.1.4. Correlation analysis

Table 4.13. Correlations analysis

		Correlations				
		GEND	EI	IEO	FAM	EDU
GEND	Pearson Correlation	1	-.154*	-.122	-.140*	-.010
	Sig. (2-tailed)		.026	.078	.043	.888
	N	209	209	209	209	209
EI	Pearson Correlation	-.154*	1	.853**	.550**	.374**
	Sig. (2-tailed)	.026		.000	.000	.000
	N	209	209	209	209	209
IEO	Pearson Correlation	-.122	.853**	1	.594**	.356**
	Sig. (2-tailed)	.078	.000		.000	.000
	N	209	209	209	209	209
FAM	Pearson Correlation	-.140*	.550**	.594**	1	.154*
	Sig. (2-tailed)	.043	.000	.000		.026
	N	209	209	209	209	209
EDU	Pearson Correlation	-.010	.374**	.356**	.154*	1
	Sig. (2-tailed)	.888	.000	.000	.026	
	N	209	209	209	209	209

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Source: Author's analysis on SPSS

a) Relationship between dependent variable (EI) and other independent variables:

As seen from table 1, EI had a linear relationship with all of the independent variables (IEO, FAM, and EDU) with sig < 0.05. Among those independent variables, dependent variables EI had a strong positive relationship with IEO and FAM with Pearson correlation value = 0.853 and 0.550 respectively.

b) Relationship between independent variables:

EDU had a linear relationship with FAM with sig < 0.05. However, the Pearson correlation was not higher than 0.7. Therefore, there was no collinearity between EDU and FAM. EDU and IEO also had a linear relationship with each other due to sig < 0.05. However, r > 0.7. It meant that there was no collinearity happening between them.

4.1.5. Regression analysis

a) ANOVA table

The Analysis of Variance (ANOVA) table measured the goodness of fit (how well the data fits the regression model). F-test was used for this method. The author set up the null hypothesis H0: R²=0 statistically significant. If sig < 0.05, reject H0, R² ≠ 0 statistically significant. If sig > 0.05, accept H0, R² = 0 statistically significant.

Table 4.14. ANOVA

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	213.240	3	71.080	191.718	.000 ^b
	Residual	76.004	205	.371		
	Total	289.244	208			

a. Dependent Variable: EI

b. Predictors: (Constant), EDU, FAM, IEO

Source: Author's analysis on SPSS

The ANOVA table showed that $\text{sig} = 0.000 < 0.05$, which means $R^2=0$ statistically significant. Therefore, the regression model fit the data set.

b) Model Summary table

The author used another method to measure the goodness of fit of the regression model called the coefficient of determination (R square). When most of the data points are centered close to the regression line, the R^2 value will be high, conversely, if the data points are scattered far away from the regression line, R^2 will be low. The R^2 index is in the Model Summary table.

R^2 and adjusted R^2 both fluctuate within the range from 0 to 1. The closer R^2 is to 1, the more the independent variables explain for the dependent variable, conversely, the closer R^2 is to 0, the less the independent variables establish the explanation for the dependent variable. There is no standard for exactly how much R^2 is required for the model to qualify. The author defines 0.5 as the middle value. If $R^2 < 0.5$, the model does not fit the data; whereas $R^2 > 0.5$ means the regression model fits the data.

Table 4.15. Model Summary

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.859 ^a	.737	.733	.609	1.888

a. Predictors: (Constant), EDU, FAM, IEO

b. Dependent Variable: EI

Source: Author's analysis on SPSS

Results showed that $R^2 = 0.859$ and adjusted $R^2 = 0.733$. The adjusted R-squared value of 0.766 meant that the independent variables included in the regression analysis affect 73.3% of the variation of the dependent variable, the remaining 26.7% were due to other variables outside the model and random errors.

The table also detected the Durbin–Watson value of 1.888, which determined the autocorrelation in the data. The value recorded was in the range of 1.5 and 2.5, meaning there was no first-order autocorrelation.

c) Coefficient table

T-test (student) is used to determine whether the regression coefficient of each independent variable is significant in the model with the hypothesis H_0 : regression coefficient of independent variable equals 0. If $\text{sig} < 0.05$: reject H_0 , the regression coefficient of the independent variable is statistically different from zero, and has an impact on the dependent variable. If $\text{sig} > 0.05$: accept H_0 , that is, the regression coefficient of the independent variable is zero statistically significant, the variable X_i has no impact on the dependent variable.

Table 4.16. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.472	.249		-1.897	.059		
	IEO	.923	.056	.778	16.484	.000	.575	1.739
	FAM	.120	.072	.075	1.674	.096	.643	1.555
	EDU	.163	.073	.086	2.226	.027	.868	1.152

a. Dependent Variable: EI

Source: Author's analysis on SPSS

VIF (variance magnification factor) is an indicator of collinearity in a regression model. The smaller the VIF, the less likely there is to be multicollinearity. According to Nguyen Dinh Tho (2012), a VIF > 2 can be a sign of multicollinearity, causing biased regression estimates. However, there are no adjustments to be made to this table because no variable exceeds the standard value.

The independent variables that satisfied the requirement of sig < 0.05, meaning these independent variables are statistically different from zero are IEO and EDU. The author presents the standardized and unstandardized regression equations in the following order:

$$EI = 0.778*IEO + 0.086*EDU + \varepsilon$$

$$EI = 0.923*IEO + 0.163*EDU + \varepsilon$$

4.1.6. Moderating variable analysis

The author suggests an hypothesis that moderating variable Gender (GEND) has an impact on the relationship of independent variables (IEO, FAM, EDU) and dependent variables (EI). Macro process is used to analyze this moderating variable, with X representing a mean value of the independent variables, and Int_1 representing the product of independent variables and moderating variables.

Table 4.17. Macro process analysis of moderating variables Gender (GEND)

```

[DataSet1]
Run MATRIX procedure:
***** PROCESS Procedure for SPSS Version 4.2 *****
Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2022). www.guilford.com/p/hayes3
-----
Model : 1
Y : EI
X : X
M : GEND
Sample
Size: 209
-----
OUTCOME VARIABLE:
EI
Model Summary
R          R-sq      MSE      F          df1      df2      p
.8120     .6594     .4806   132.2679   3.0000   205.0000 .0000
-----
Model
      coeff      se      t          p      LLCI      ULCI
constant  3.6127   .1518   23.8070   .0000   3.3135   3.9119
X         1.7199   .2469    6.9660   .0000   1.2331   2.2066
GEND     -.1233   .0967   -1.2959   .1965   -.3160   .0653
Int_1    -.1147   .1590   -.7216   .4714   -.4282   .1988
-----
Product term key:
Int_1      X      GEND

```

Source: Author's analysis on SPSS

The result from the process shows that gender has no impact on the relationship between the independent variables and dependent variables, as p-value of Int_1 equals 0.4714 < 0.05. In conclusion, the two factors affecting entrepreneurial intention are IEO elements and education, no other factors suggested have an influence on the entrepreneurial intention.

4.2. Discussion

4.2.1. Discussion of the research

From the execution of the survey and the data analysis above, the author has reached the statements as below:

Firstly, the survey has been provided to a significantly distributed audience for a variable and comprehensive sample. Participants of the survey mostly show satisfaction with the general condition of IEO elements, family environment and entrepreneurial education.

Secondly, regarding the survey design, several observed variables are intertwined in more than one component. Because of that, amendments have been made to clear off uncorrelated or corresponding observed variables for better representation of independent variables.

Thirdly, regarding validation of research hypotheses, the author has learned from the analysis results that Individual entrepreneurial orientation has a significant impact on entrepreneurial intention of students (77.8%), followed by Entrepreneurial education (8.6%). Family environment, however, is reported as having no effect on entrepreneurial intention. Therefore, the hypotheses presented at the beginning of the research are concluded as follows:

Table 4.18. Results of research hypothesis validation

Hypothesis	Conclusion
H1: Individual entrepreneurial orientation has a positive relationship to the entrepreneurial intention of the students.	Accept
H2: The family environment has a positive relationship to the entrepreneurial intention of the students.	Decline
H3: Entrepreneurial education has a positive relationship to the entrepreneurial intention of the students.	Accept

Source: Author's synthesis based on research results

Finally, regarding the moderating effect of gender, results from analysis show that gender has no impact on how the factors IEO and Entrepreneurial education influence entrepreneurial intention of the students. There is no specific entrepreneurship linkage to either of the genders, which is different from what was previously perceived by Fagenson and Marcus and their research in 1991. This also goes against what has been stated in research of Hauset et al. (2013) that male exhibit higher levels of entrepreneurial attitudes, and behavior control compared to women. Furthermore, this finding can be one of the supporting points for gender equality as to how entrepreneurship is perceived.

Results from this paper indicate that individual entrepreneurial orientation displays a strong correlation with entrepreneurial intention. The results indicated that the participants agreed with having behaviors of innovativeness, pro-activeness, and risk-taking along with positive entrepreneurial intention. The author understands that the students of Foreign Trade University in Ho Chi Minh City have either or both of the following: Students are packed with adequate skills that complement their entrepreneurial orientation; Students highly assess themselves regarding their quality of innovativeness, risk-taking, and proactiveness. Other findings resulting from the former statement, yet have not been cleared depending on the data collected alone, are about how and where these students acquire the skills needed. Further investigation is required for an explanation of this question. Aside from that, with the result of Entrepreneurial education as an external factor that affects students' entrepreneurial intentions, the author may now assume that students utilize entrepreneurial education and training systems as methods to develop their individual entrepreneurial orientation, thus their entrepreneurial intention.

Entrepreneurial education has a small yet visible impact on entrepreneurial intention. However, EDU1 and EDU2 mean value equals below average level. However, results show that students of Foreign Trade University in Ho Chi Minh city are not satisfied with support from the university itself.

4.2.2. Proposal

As IEO elements positively impact the entrepreneurial intention of the students, it is necessary that Foreign Trade University in Ho Chi Minh City should take action to help students improve their innovativeness, risk-taking abilities and proactiveness, in order to prepare for their entrepreneurship. Firstly, besides theoretical knowledge, entrepreneurial courses offered by the university should create opportunities for students to “learn by doing” and permit students to immerse in real business situations, through entrepreneur incubators or hubs. Secondly, encouraging students to participate in invention and innovation competitions can help them become more innovative in their thinking, proactive in their planning and executing to achieve the best results, and also more ready to take risks if necessary.

Proposals regarding education include intertwining IEO elements into educational activities. The university itself should organize an entrepreneur course under various forms of which topic should focus on the factors that influence the intention to conduct start-up business among students. Moreover, in order to enlarge and diversify the sources to support the educational systems, the university ought to promote different methods to learn strategies from other well-known universities worldwide. These strategies include but are not limited to providing guidance to students when starting new projects and facing hard challenges. Finally, Foreign Trade University should utilize the policy of the Vietnamese government in creating a startup ecosystem, that is to support students with adequate resources in different fields of production, business and services, those that are expanding with significant capital investment.

5. CONCLUSION

Firstly, this paper is based on empirical research and outlines the factors influencing students’ entrepreneurial intention. From which, the research emphasizes the importance of development and entrepreneurship orientation for students.

Secondly, the paper has organized the factors with a suitable theoretical framework in order to achieve reliable results. The author hopes that the findings will serve as a base model for later interpretation on development strategies for entrepreneurship orientation for students, which is still a difficult topic in the organization.

Thirdly, the analysis results provide a more specific view on how much the factors affect the entrepreneurial intention among the students. For instance, Individual entrepreneurial orientation (innovativeness, pro-activeness and risk-taking) has the largest impact on entrepreneurial intention, and Entrepreneurial education also plays a role despite less importance. Thus, the research shows how important IEO elements should be discovered and perceived among the individuals in order to enhance entrepreneurial intention.

Finally, through the results of the research and analyzing process, the author indicates the relationship between entrepreneurial intention and the most important factors. Therefore, the author suggests several strategies to enhance the entrepreneurial thoughts and behavior throughout activities that are related to entrepreneur intended candidates.

6. APPENDIX

Survey

Dear Sir/Madam/Friend,

We are a group of Scientific Research Students of Foreign Trade University, campus II in Ho Chi Minh City. Currently, our group is conducting research on the topic “Factors affecting entrepreneurial intention of students at Foreign Trade University in Ho Chi Minh City”.

In order to have the database for the research, we hope you can spend some of your valuable time to participate in answering this survey, based on your opinion. Your help and support will certainly contribute to the success of this study (Please note that the information you provide will be confidential and used only for the research purpose of this study). The research team would like to express our gratitude by GIFT SET offered to you after you have completed the survey.

If you have any questions or feedback, please contact the research team via this email.

Best regards./.

PART 1: INDIVIDUAL INFORMATION

1. Are you studying at FTU2 at HCMC?

Yes No

2. Which year are you in?

1st year 2nd year 3rd year 4th year

3. What is your biological gender?

Male Female

PART 2: FACTORS AFFECTING ENTREPRENEURIAL INTENTION OF FTU2 STUDENT

Could you please give your opinion on the following statements on different levels as follows:

1. Totally Disagree; 2. Disagree; 3. Normal; 4. Agree; 5. Totally Agree

	1	2	3	4	5
Entrepreneurial Intention					
I always want to start up in the future					
Individual Entrepreneurial Orientation Elements (Proactiveness-Innovativeness-Risk taking)					
I usually make plans for my start-up intention.					
I have high entrepreneurial awareness and entrepreneurship.					
I have a good entrepreneurial orientation.					
I have the spirit of innovation and creativity in business (the ability to create and apply achievements, technical and technological solutions, and management solutions to improve the efficiency of socio-economic development, enhance productivity, quality, and added value of products, goods,...).					
I am proactive in business (flexible in finding, identifying, and optimizing business opportunities,...).					
I have a risk-taking spirit in business (taking high risks such as competition, fraud, bankruptcy, etc.).					
Family environment					
My family has an effective method of educating children about independence.					
My family maintains a good relationship with the people around (gentle attitude, mutual respect,...).					
My family is not under the pressure of resources (financial, facilities, healthcare, education,...).					
Education					
My family has a tradition of starting a business (parents and relatives are successful entrepreneurs).					
My family has always maintained good values, customs, and practices for generations.					
I received a thorough education in the knowledge needed to start a business from the school (through courses, extracurriculars, seminars ...).					

I received thorough training in the skills needed to start a business from the school (through courses, extracurricular sessions, seminars,...).					
I participate in many and varied extracurricular activities that help me accumulate knowledge and entrepreneurial skills in organizations inside and outside the school.					
I often participate in competitions related to startups.					
I participate in many and varied courses outside of school to accumulate knowledge and entrepreneurial skills.					
I have a lot of knowledge about the actual business environment.					

Once again, our research team would like to thank you for taking the time to participate in the survey.

We sincerely wish you a good day, with effective study and work.

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CORPORATE SOCIAL RESPONSIBILITY ON CUSTOMER BEHAVIOUR OF UNIVERSITY STUDENTS IN THE COSMETICS INDUSTRY: THE MEDIATING ROLE OF CORPORATE IMAGE, CUSTOMER SATISFACTION AND CUSTOMER LOYALTY.

**Author: Le Phu Thien¹, Bui Tran Quoc Dat², Nguyen Ngoc Dong Nghi²,
Ngo Quoc Vinh², Do Thi Mai Hoa²
Mentor: Pham Thi Chau Quyen²**

ABSTRACT: *This research investigated the impact of CSR on the cosmetics industry and explores the connection between CSR and customer behavior among undergraduate students. The study also examines whether CSR is considered a critical marketing strategy for sustainable development. The study specifically looked at the cosmetics industry and collected 358 valid questionnaires from consumers. These questionnaires were then analyzed using Partial Least Squares Structural Equation Modeling. Additionally, the study finds that CSR has a positive effect on corporate image, customer loyalty, purchase intention, and price premium by using these variables as mediating factors. Furthermore, CSR can influence customer behavior through improving corporate image, customer satisfaction and customer loyalty. These results may benefit future studies and useful applications concerning CSR and consumer behavior.*

Keywords: corporate social responsibility; Partial Least Squares Structural Equation Modeling; cosmetics industry; corporate image; customer loyalty; customer satisfaction; purchase intention; price premium.

1. INTRODUCTION

Corporate Social Responsibility (CSR) is a vital aspect of contemporary business practices, providing a framework for businesses to pursue their economic goals while also fulfilling their social responsibilities. This viewpoint is supported by numerous scholarly sources, such as Carroll's CSR Pyramid, which outlines the key areas of responsibility that businesses must address to achieve sustainable success. Additionally, research by KPMG has found that consumers are increasingly prioritizing companies with strong CSR practices.

Corporate Social Responsibility (CSR) has become an important issue in the context of climate change, which has had direct impacts on human life, socio-economic development, and the environment. 87% of the largest companies worldwide have issued CSR reports, and recent focus on climate change has contributed to the growing interest in CSR. The cosmetic market in Vietnam is an emerging market with potential for growth, with an average spending level of 4 USD/person/month. Vietnamese cosmetic companies only account for 10% of the market share, with 90% controlled by foreign firms. CSR initiatives can also help build a better brand image, leading to increased customer satisfaction and loyalty. Businesses should consider the impact of their operations on the environment and society, and take steps towards responsible and sustainable practices.

This study aims to fill the research gap by examining the impacts of Corporate Social Responsibility (CSR) on undergraduate students' consumer behavior in the cosmetics industry. It will consider the mediating effect of corporate image, customer satisfaction, and customer loyalty, which is represented by two components: price premium and purchase intention. It will also consider the mediating effect of corporate image, customer satisfaction, and customer loyalty. The latter is represented by two components: price premium and purchase intention.

¹ Foreign Trade University Campus Ho Chi Minh City; Email: lephuthien2012255565@ftu.edu.vn

² Foreign Trade University Campus Ho Chi Minh City.

First, a literature review will be conducted on CSR, university students’ customer behavior, corporate image, customer satisfaction, and customer loyalty. The study will then examine the effects of CSR on university students’ customer behavior in the cosmetics industry, as well as the mediating effects of corporate image, customer satisfaction, and customer loyalty on these factors.

Second, based on the findings, this study will recommend measures that stakeholders can take to better understand university students’ customer behavior in the cosmetics industry, leading to improvements in corporate performance.

The target population (respondents) for this study is college students residing in HCM City, ranging from their first to sixth years of study, depending on their field of study. Given their heightened awareness of the prevailing environmental conditions and their health, particularly with regards to cosmetic and skincare products, university students are expected to play a key role in the expansion and diversification of the cosmetics industry, making them a potential source of human capital.

2. THEORETICAL FRAMEWORK

2.1. Literature review

2.1.1. Corporate social responsibility (CSR)

CSR seeks to help businesses meet a variety of goals, including maximizing profits and shareholder value, satisfying social expectations, meeting the needs of various stakeholders, including employees, customers, suppliers, and communities, adhering to the law, and voluntarily taking on social responsibility (Carroll, 1979; Smith, 2003; Stubbs & Cocklin, 2007). Carroll first introduced the CSR Pyramid concept in 1991, and it has been frequently used in earlier studies (Galbreath & Shum, 2012; He & Lai, 2012; Ramasamy & Yeung, 2009; Xiao, Heo, & Lee, 2017). Here is a further explanation of these four CSR ideas:



Figure 2.1 Carroll's Pyramid of Corporate Social Responsibility

Source: Schwartz and Carroll, 2003

(1) Economic responsibility: A responsibility to produce the goods or services that a society requires, to deliver them at prices that are socially acceptable, to make profits using the proper methods to maintain corporate growth and profitability, to create jobs, and to protect the interests of stakeholders.

(2) Legal responsibility: The obligation to conduct business in accordance with all relevant labor laws, environmental regulations, consumer protection laws, and tax laws.

(3) Ethical responsibility: A voluntary, internal duty to uphold moral principles, or, in other words, to act in a way that is just, fair, and right while protecting stakeholders. This obligation is not legally bindable.

(4) Philanthropic responsibility, also known as “voluntary responsibility” in early research (Carroll, 1979), refers to the obligation to voluntarily and unconditionally advance the wellbeing of others, engage in charitable endeavors, make donations, and uphold civic duties.

CSR is increasingly seen as a corporate duty, a kind of corporate citizenship, and a strategic embodiment of corporate proactiveness. Research has shifted away from the relationships between CSR and financial performance and towards those between CSR and corporate reputation, corporate image, and consumers. CSR significantly affects a company's financial results and its efforts to build a solid reputation or image in a crowded market.

2.1.2. Customer behavior

The stakeholder theory, put forth by Freeman in 1984, states that customers are a company's main stakeholders and are essential to its growth and profitability. Previous research has demonstrated the importance of purchase intentions and price premiums, both of which are indicators of customer behavior, for a company's performance and profitability. Purchase intentions are crucial indications that precede actual buying activity, and the amount that a consumer is willing to pay over the market price of a product, the gap between the selling price and the product's perceived worth, and the percentage by which a product's selling price exceeds its market price are all examples of price premiums. Companies that sell products at larger price premiums produce more cash flow and are more sensitive to consumer price changes than their competitors (Aaker & Keller, 1990; Klein & Leffler, 1981).

2.1.3. Corporate image

An individual's sentiments, impressions, trust, experiences, thoughts, and beliefs about an object are combined to form their image of the object (Aaker, 1996; Kotler, 2003). Corporate image is the term used to describe how customers feel about a company as a whole and whether they have a positive or negative opinion of it based on how well the organization performs, produces, or provides services (Aaker, 1996; Nandan, 2005; Walters, 1978).

Depending on the study or application topic, many methods of corporate image assessment are used (Nguyen & Leblanc, 2001). A vital intangible corporate asset that requires ongoing upkeep is corporate image (Aaker, 1996; Kotler, 2003). A strong brand's reputation attracts capital, fosters consumer trust, lowers uncertainty, increases customer loyalty and buy intent, and boosts profits and sales (Bataineh, 2015; Cretu & Brodie, 2007; Martinez & Pina, 2005; Ryu, Lee, & Kim, 2012). Also, customers are more inclined to buy goods or services from a company with a positive corporate image than from one with a shady or poor reputation (Liou & Chuang, 2008; Nguyen & Leblanc, 2001).

2.1.4. Customer satisfaction

Consumer satisfaction is of utmost importance in business management, as it leads to increased customer trust, repurchase intention, profitability, and competition (Ranaweera & Prabhu, 2003). It is the degree of pleasure or dissatisfaction that an individual experiences as a result of comparing their actual experiences with the product or service to their initial expectations (Kotler, 2003; Oliver, 1997). Oliver (1980) proposed the expectation disconfirmation hypothesis, which has been frequently applied to research consumer satisfaction. According to the theory, customer satisfaction results from contrasting the product's or service's actual performance with the user's initial expectations. Positive disconfirmation took place when the performance felt to have exceeded these expectations, leading to great satisfaction. expectations, negative disconfirmation happens when the perceived performance does not meet these expectations, resulting in poor satisfaction. When perceived performance meets initial expectations, neither positive disconfirmation nor negative disconfirmation takes place, and satisfaction levels stay the same. Businesses should value such client input in their attempts to raise customer happiness and loyalty.

2.1.5. Customer loyalty

Customer loyalty is defined as a lasting relationship between individual attitudes and repurchases, representing the rate, coordination, and likelihood of an acquisition with the same supplier Dick & Basu (1994). The research on customer loyalty has many different approaches: the behavioral approach of Seiders & Associates (2005) and the attitude and perspective of Jacoby & Chesnut (1978). Behavioral loyalty is often expressed in a behavioral approach based on future repurchase behavior, the number and frequency of repurchases, and the change in brand per time according to Bandyopadhyay and Martel (2007); Liang et al. (2009). Attitudinal loyalty is an attitudinal approach, which emphasizes the role of experience and affective aspects in customer loyalty and reflects customer actions; related past purchase limits of customers to a particular brand or a group of brands that are likely to purchase in the future based on past purchasing behavior Evanschitzky et al. (2006).

2.2. Related theories and research models

2.2.1. The Stakeholder theory

The word “stakeholder” first appeared in an internal memorandum at the Stanford Research Institute (now SRI International, Inc.) in 1963. It was meant to challenge the notion that stockholders are the only group to whom management needs to be responsive. Early research in the area of stakeholder management defines a stakeholder as any group or individual who can affect or is affected by the achievement of the organization’s objectives (Freeman, 1984). Primary stakeholder groups consist of shareholders and investors, employees, customers, suppliers, public entities, and trade associations and environmental groups (Clarkson, 1995). Secondary stakeholders include those who are not directly engaged in the organization’s economic activities but are able to exert influence or are affected by the organization (Savage, Nix, Whitehead and Blair, 1991)

Stakeholder theory suggests that firms are motivated to broaden their objectives to include other goals in addition to profit maximization. Companies embrace a CSR program as a way to promote socially responsible actions and policies and to effectively respond to stakeholder demands (Maignan & Ferrell, 2004)

2.2.2. The Social Identity theory

Positive social identity formation is enhanced when individuals differentiate their in-group from out-groups in a favorable way. This satisfies basic human needs like self-esteem and certainty. Creating positive group distinctiveness helps individuals define their position in society, giving them a sense of belonging and guidance in their behavior. Research by Abrams and Hogg (1988) and Scheepers et al. (2006) highlights the importance of positive group distinctiveness in shaping social identities.

Social identity theory has been applied in the domain of consumer behavior to examine the effects of individuals’ social identities and group memberships on their attitudes, behaviors, and purchasing decisions. Scholars have investigated the role of social identity in diverse areas such as brand loyalty, brand communities, social influence, and consumer activism. The theory has proven to be a valuable framework that illuminates the cognitive, motivational, and social processes that shape individuals’ behavior and decision-making across different contexts (Ellemers, Kortekaas, & Ouwerkerk, 1999).

2.2.3. CBBE model (Keller’s Brand Equity Model)

Keller (1993) proposed that consumer-based brand equity at the individual level originates from brand knowledge, which is characterized as an associative network composed of nodes of associations.

In 2003, Keller extended this definition, defining brand equity as the variation in customer response to marketing activity. The fundamental concept behind brand equity is to influence customers’ cognitive,

emotional, and perceptual responses to a product or service based on positive experiences. To accomplish this, a company should strive to create a favorable environment that fosters positive brand thoughts, feelings, and perceptions among customers. Keller's model outlines six dimensions that contribute to consumer-based brand equity, which include brand salience, brand performance, brand imagery, brand feelings, brand judgments, and brand relationships. By prioritizing these factors, companies can cultivate a robust brand equity that can foster customer loyalty, trust, and positive word-of-mouth marketing.

3. PROPOSED FRAMEWORK AND HYPOTHESIS DEVELOPMENT

This research examines how CSR affects customer behavior intentions from the standpoint of the consumer. Based on the reviewed literature and related theories and models, the conceptual framework of the CSR drivers, consumer behavior related to company image, customer satisfaction, and customer loyalty are displayed in Figure 4.1 below. We will create the research model used in our paper in the parts that follow, based on the findings of previous studies.

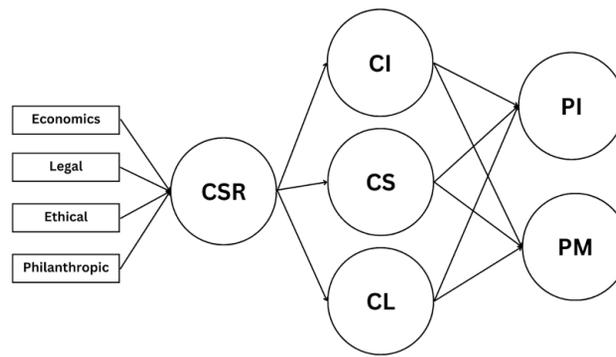


Figure 4.1 Conceptual model

Source: Conducted by authors, 2023

3.1. Impact of CSR on customer behavior

Research has shown that customers consider CSR when making purchase decisions and are willing to pay a premium for products or services offered by socially responsible firms (Creyer & Ross, 1997). The perceived value of a company's offerings can be enhanced when the business not only sells CSR products but also takes actions to promote social well-being and environmental protection, resulting in increased support for the company's CSR efforts and improved purchase intentions (Luo & Bhattacharya, 2006; Wu et al., 2016).

Several empirical studies (Devinney, 2009; Homburg et al., 2005; Mohr & Webb, 2005; Wang & Chen, 2016; Yuen et al., 2016) have confirmed that CSR positively influences customer purchase intentions and evaluation of companies. Customers prefer products or services offered by socially responsible firms and are willing to pay higher prices for them, particularly when given a choice between similar products of the same price.

H1a. The relationship between CSR and purchase intention is positive.

H1b. The relationship between CSR and price premium is positive.

3.2. Impact of CSR on corporate image, customer satisfaction, and customer loyalty

Dichter's (1985) research found that consumers' initial perceptions of product or service quality and external company activities are the key components of a corporate image. CSR serves as an essential

piece of external information about a company, raising its profile in the market and shaping its corporate image, while simultaneously enhancing consumer attitudes. Engaging in CSR activities has been shown to generate intangible benefits such as enhancing customer satisfaction and projecting a positive corporate image (Basdeo, Smith, Grimm, Rindova, & Derfus, 2006; Ellen, Mohr, & Webb, 2000). Enterprises also strive to encourage customer loyalty, which is considered a fundamental behavior. Servera Francés and Piqueras Tomás (2019) found that CSR positively impacts customer loyalty through the perceived value of customers. Zhang (2019) also discovered that charitable responsibility and customer responsibility have a positive effect on customer loyalty. In the cosmetics industry, Osakwe and Yusuf (2021) concluded that CSR has a positive impact on customer loyalty with reputation and trust serving as intermediary variables.

H2a. The relationship between CSR and corporate image is positive.

H2b. The relationship between CSR and customer satisfaction is positive.

H2c. The relationship between CSR and customer loyalty is positive.

3.3. Impact of corporate image, customer satisfaction, and customer loyalty on customer behavior

Kevork and Vrechopoulos (2009) have found that customer identification and emotional support are critical for businesses seeking to boost customer behavioral intentions. Prior studies (Cretu & Brodie, 2007; Ryu et al., 2012) have emphasized the importance of developing a strong corporate image and attaining high levels of customer satisfaction to achieve this goal. Social identity theory suggests that customers tend to establish relationships with companies with solid reputations and high levels of customer satisfaction, leading to increased purchase intentions, willingness to pay higher prices, positive word-of-mouth, and a greater sense of uniqueness and self-worth (Bhattacharya & Sen, 2003; Keh & Xie, 2009; Matute-Vallejo et al., 2011). A strong corporate image can also help differentiate a company from its rivals, reducing consumer uncertainty, while high levels of customer satisfaction can increase consumer confidence and positive attitudes towards a company (Bataineh, 2015; He & Lai, 2012; Luo & Bhattacharya, 2006; Martinez & Pina, 2005). Consumer loyalty to a brand can mitigate the impact of price on buying behavior, as consumers are often willing to pay more for their preferred brand (Evans, Moutinho, & Raaij, 1996). These findings suggest that developing a strong corporate image and high levels of customer satisfaction are crucial for businesses seeking to enhance customer behavior and their customer relations strategies, thereby achieving a competitive advantage in the market (Kevork & Vrechopoulos, 2009).

H3a. The relationship between corporate image and customer purchase intention is positive.

H3b. The relationship between corporate image and price premium is positive.

H3c. The relationship between customer satisfaction and customer purchase intention is positive.

H3d. The relationship between customer satisfaction and price premium is positive.

H3e. The relationship between customer loyalty and customer purchase intention is positive.

H3f. The relationship between customer loyalty and price premium is positive.

3.4. The mediating roles of corporate image, customer satisfaction, and customer loyalty in the relationship of CSR and customer behavior

This study proposes that corporate image and customer satisfaction mediate the relationship between corporate social responsibility (CSR) and customer behavior. Social exchange theory suggests that individuals maintain reciprocal relationships with groups, providing intrinsic or extrinsic benefits in exchange for benefits received (Blau, 1964). CSR initiatives can promote national economic growth or social well-being, leading consumers to identify with the firm and perceive high value in its products or services.

Previous studies suggest that consumers tend to favor companies that demonstrate social responsibility and philanthropy, and CSR participation can enhance corporate image, strengthen consumer identification, improve competitiveness, and increase purchase intention and loyalty (Carroll & Shabana, 2010; He & Lai, 2012; Porter & Kramer, 2006; Wu et al., 2016).

H4a. The influence of CSR on customer purchase intention is mediated by corporate image.

H4b. The influence of CSR on price premium is mediated by corporate image.

H4c. The influence of CSR on customer purchase intention is mediated by customer satisfaction.

H4d. The influence of CSR on price premium is mediated by customer satisfaction.

H4e. The influence of CSR on customer purchase intention is mediated by customer loyalty.

H4f. The influence of CSR on price premium is mediated by customer loyalty.

4. RESEARCH METHOD:

4.1. Instruments:

4.1.1. Demographic questions:

In addition to their phone number or email address, which will be used to distribute materials later, respondents were asked to answer six questions about their basic demographic information. This allowed the author to categorize and confirm that the obtained samples accurately represented Ho Chi Minh City's demographic makeup.

4.1.2. Official measurement scale:

This study chose Cocoon as the representative company for the questionnaire. Cocoon is a well-established and reputable cosmetic company in Vietnam, with a significant presence in the industry due to its brand recognition, market share, and customer base. The results of the study can be applied across the industry, as Cocoon's CSR initiatives and their impact on customer behavior are representative of other cosmetic companies in Vietnam. The questionnaire was amended once the pilot research and pretest were finished, and a final version was produced. The questionnaire used a 7-point Likert scale to assess respondents' opinions toward CSR in the economic, legal, ethical, and philanthropic dimensions, as well as corporate image, customer satisfaction, customer loyalty, and customer behavior represented by price premium and purchase intention.

4.2. Procedure:

4.2.1. Data collection:

This study employed convenience sampling, a non-probability sampling technique that includes members of the target population who meet particular practical criteria (Etikan et al., 2016). Eligible individuals were sent a study survey online through social media and email. The bulk of entries were approved, with the exception of people who don't reside in HCM City. Out of the 404 responses received, 358 were legitimate, providing data for statistical analysis.

4.2.2. Participants:

The author gathered 404 observations after distributing questionnaire questionnaires via email and social media. 358 Ho Chi Minh City university students made up the final sample, representing 28 of the 39 universities in HCMC. The survey's greatest participation percentage was at the Foreign Trade University in Ho Chi Minh City, with 22.35% of the student body participating. UEH and Open University accounted for

19.27% of the poll respondents, with 32.96% of all respondents being sophomores and students in their third year having the second-highest participation rate (25.42%). This is due to the corporate social responsibility (CSR) of cosmetics companies, which give attention to health, society, and environmental sustainability.

4.2.3. Data analysis:

Descriptive statistics were used to describe the sample characteristics and identify any out-of-the-ordinary values in the samples. To evaluate the research model (PLS-SEM), a structural equation model with variance-based assumptions was used. Stata 16.0 and SmartPLS 4.0 were used to analyze the data in two stages. In the first stage, repeated observed variable procedures were used to determine the LOC score. In the second stage, LOC scores were saved as LOC variables in the data.

A new model was created in the second step using variables that have LOC weights. Finally, the common method bias and multicollinearity of the gathered data were evaluated using SmartPLS. The measurement assessment involves internal consistency, convergent validity, and discriminant validity. Cronbach’s alpha is used to evaluate internal consistency, while item loadings, average variance extracted (AVE), and composite reliability (CR) are all parts of the convergent validity. Items are deemed genuine if their loadings are equal to or greater than 0.5.

The structural model assessment and hypothesis testing is carried out using the bootstrapping technique of 5000 re-sampling. The initial phase involves testing for path-relationships utilizing coefficient, t, and p values. The predictive power (R-squared value) is presented, and a blindfolding test is performed to assess the predictive relevance (Q-squared) of the model. When Q-squared value is greater than zero, the PLS path model has predictive importance for that construct.

5. RESULT AND DISCUSSION:

5.1. Measurement model

First, we use the repeated observed variable technique. In this step, we do two things: (1) Assess the reflective measurement model for the LOCs and (2) Add the weighted data of the LOCs to serve the next step.

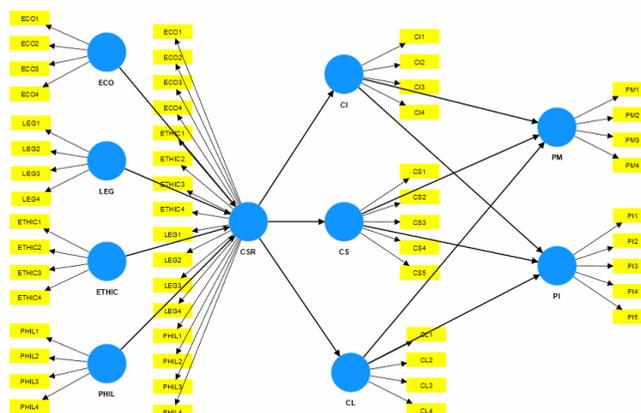


Figure 6.1 Stage 1 of the measurement model.

Source: Conducted by authors, 2023

The study used Cronbach’s Alpha and Composite Reliability (CR) to assess the scale’s dependability, and the AVE index to assess consistency. The results showed that the model was reliable and consistent, with high individual and aggregate reliability and Cronbach’s Alpha values exceeding the minimum threshold of 0.7 established by Nunnally and Bernstein (1994).

The Fornell-Larcker and HTMT Analysis shows that the square root of average variance extracted in the diagonal elements is greater than the off-diagonal elements, which represent correlations between constructs. This indicates that the latent constructs in the pattern are discriminant valid, as noted by Barclay et al. (1995). The results confirm the measurement model’s validity of the authors’ model.

5.2. Structural model

The examination of the PLS-SEM structural model came next after the measurement model was evaluated. A new diagram shows the LOC variables obtained from the factor weights.

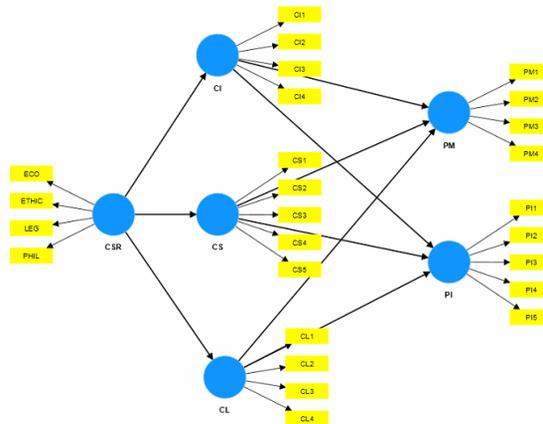


Figure 6.2 Stage 2 of the measurement model.

Source: Conducted by authors, 2023

A comprehensive assessment approach was used to check for common method bias in this study, and Kock’s (2015) findings confirmed that it did not pose a significant risk to the study’s validity. Multicollinearity was not a problem for the study, as indicated by the inner VIF values for each component, which were all below the 3.33 threshold value (Kock & Lynn, 2012).

5.3. Hypothesis testing result

The relationship between corporate social responsibility (CSR), price premium (PM), and price image (PI) is shown to be direct and in favor. The PLS path model has predictive validity for this concept when Q-squared value is greater than zero. Both the price image and the students’ price premium had excellent R-squared results, meaning the model’s predictions regarding the price premium and purchase intention of students can explain 27,7% and 23,9% of the variance, respectively. Random error and variables outside of the model account for the remaining 48.9%.

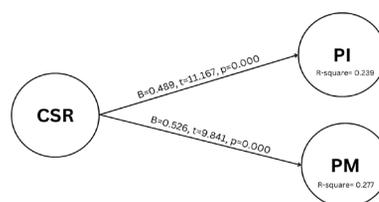


Figure 6.3 Relationship between corporate social responsibility and price premium and price image

Source: Conducted by authors, 2023

The path coefficients obtained from the bootstrap analysis were used to evaluate impact relationships, and the results are displayed in Table 6.6. The results indicated that Corporate Social Responsibility has

a significantly positive relationship with corporate image ($\beta=0.632$, $t=14.361$, $p<0.001$), customer loyalty ($\beta=0.557$, $t=13.985$, $p<0.001$) and customer satisfaction ($\beta=0.617$, $t=15.495$, $p<0.001$). The results also identify that corporate image has a considerably positive relationship with price premium ($\beta=0.247$, $t=3.217$, $p<0.005$), and so does customer loyalty ($\beta=0.196$, $t=2.375$, $p<0.02$) and customer satisfaction ($\beta=0.200$, $t=2.401$, $p<0.02$). Besides, the result showed that both corporate image ($\beta=0.144$, $t=2.342$, $p<0.02$) and customer loyalty ($\beta=0.578$, $t=10.145$, $p<0.001$) have a positive relationship with purchase intention. The results in the table show that there is no significant correlation between CS and PI ($\beta=0.087$, $t=1.270$, $p>0.2$). Therefore, the positive effects between CSR and dependent variables (PI, PM) are all statistically significant.

Hypotheses 2a, 2b and 2c claimed that corporate social responsibility would have a favorable impact on business image, customer satisfaction, and consumer loyalty. Similarly, the hypotheses from 3a to 3f suggested that these three factors would lead to positive outcomes in terms of consumer behavior, as reflected by purchase intention and price premium. As a result, all of the hypotheses in sections 2 and 3 are supported except for 3c, which was found to be insignificant based on the statistical analysis and thus rejected.

Moreover, the specific indirect effects among the variables were also tested. Preacher, Rucker, and Hayes' (2007) strategy emphasizes the importance of the indirect effect to create a mediating connection. All distinct indirect effects had p-values less than 0.05, suggesting that Corporate Image, Customer Satisfaction, and Customer Loyalty mediate the relationship between CSR and Purchase Intention and Price Premium. The indirect effect of CSR on Purchasing Intention through Customer Loyalty had the highest regression coefficient of 0.322, while the indirect effect of CSR on Price Premium had the lowest regression coefficient of 0.109. Furthermore, the indirect effect of CSR on Price Premium, with the mediating role of Customer Loyalty, had the lowest regression coefficient of 0.109

Hypotheses 4a, 4b, 4e, 4f, and 4d were developed to explore the mediating effect of corporate image, customer satisfaction, and customer loyalty on the relationship between CSR and customer purchase intention and price premium. The results showed that companies with higher levels of corporate social responsibility tend to have better corporate image, customer satisfaction, and customer loyalty, leading to increased purchase intention and willingness to pay a premium price. Hypothesis 4c, which posited that customer satisfaction would mediate the relationship between CSR and customer purchase intention, was rejected.

Table 6.8 Testing results

Hypothesis	Content	Result
H1a	The relationship between CSR and customer purchase intention is positive.	Supported
H1b	The relationship between CSR and price premium is positive.	Supported
H2a	The relationship between CSR and corporate image is positive.	Supported
H2b	The relationship between CSR and customer satisfaction is positive.	Supported
H2c	The relationship between CSR and customer loyalty is positive.	Supported
H3a	The relationship between corporate image and customer purchase intention is positive.	Supported
H3b	The relationship between corporate image and price premium is positive.	Supported
H3c	The relationship between customer satisfaction and customer purchase intention is positive.	Not Supported
H3d	The relationship between customer satisfaction and price premium is positive.	Supported
H3e	The relationship between customer loyalty and customer purchase intention is positive.	Supported
H3f	The relationship between customer loyalty and price premium is positive.	Supported
H4a	The influence of CSR on customer purchase intention is mediated by corporate image.	Supported
H4b	The influence of CSR on price premium is mediated by corporate image.	Supported
H4c	The influence of CSR on customer purchase intention is mediated by customer satisfaction.	Not Supported
H4d	The influence of CSR on price premium is mediated by customer satisfaction.	Supported
H4e	The influence of CSR on customer purchase intention is mediated by customer loyalty.	Supported
H4f	The influence of CSR on price premium is mediated by customer loyalty.	Supported

5.4. Discussion

This research investigated the impact of corporate social responsibility (CSR) on customer behavior, specifically purchase intention and price premium, in the cosmetics industry in Vietnam. The study was conducted among university students in Ho Chi Minh City, using a sample size of 358 respondents. The findings revealed that CSR has a positive impact on both price premium and purchase intention, with the impact being influenced by corporate image and customer loyalty. Customer satisfaction only affects price premium, not purchase intention. Therefore, should there be a positive change in either CSR or customer behavior, it would result in a similar pattern of increase in price premium, while purchase intention would remain unchanged. Overall, this study contributes to the understanding of how CSR impacts customer behavior in the cosmetics industry in Vietnam, and further research could explore the impact of CSR on other industries and in different regions.

6. CONCLUSION

From the perspective of the consumer, this study examines how CSR affects consumer behavior. On the basis of the mediating elements, we analyze the mechanism determining the impact of CSR on consumer behavior based on the social identity and social exchange theories and our prior research (including corporate image and customer loyalty). According to our research, CSR best practices can increase consumer support for businesses by helping to create a favorable perception of those businesses, which in turn improves customer purchase intention and price premium. CSR can therefore be a valuable and promising marketing tactic to improve customers' satisfaction, favorable opinions of businesses, and purchasing patterns. This can help businesses establish distinctive traits and good perceptions that could result in significant financial gain.

This study identified three key managerial implications for cosmetics firms in Vietnam: participating in corporate social responsibility initiatives, effectively disseminating information about their CSR activities, and offering products and services at reasonable prices. To enhance customer-perceived value, firms should customize products, develop products from environmentally friendly or recyclable materials, establish feedback mechanisms, and support charity organizations or community services. Compliance with legal requirements, along with a focus on customer satisfaction and perceived value, should be integral considerations for cosmetics firms to effectively leverage CSR activities and achieve desired outcomes.

7. APPENDIX:

Appendix 1. Official Measurement Scale

FACTORS	OBSERVED ITEMS	SOURCES	CODE
Dependent Factor	Purchase Intention:	Richard, J.E., & Zhang, A. (2012)	PI
	1. I will continue to buy products from this firm in the next few years.		PI1
	2. I will encourage friends and relatives to purchase products from this firm.		PI2
	3. I consider this firm to be my first choice among other competitors.		PI3
	4. I will say positive things about this firm to other people.		PI4
	5. I will recommend this firm to someone who asks for my advice on cosmetics products.		PI5
	Price Premium:	Zeithaml et al. (1996)	PM
	1. I am willing to buy products or services of this firm even though they are more expensive due to the CSR.		PM1
	2. I'm willing to buy items with CSR features when given a choice between similar products of the same price.		PM2
	3. I continue to purchase products with this firm even if its prices increase due to CSR.		PM3
	4. I will pay a higher price than its competitors charge for the benefits that this firm currently brings to society.		PM4

<p>Mediating Factors</p>	<p>Corporate Image</p> <ol style="list-style-type: none"> 1. I have always had a good impression of this firm. 2. In my opinion, this firm has a good image in the minds of customers. 3. I believe that this firm has a better image than its competitors. 4. This firm is a leading brand in its immediate industry in my opinion. <p>Customer Satisfaction</p> <ol style="list-style-type: none"> 1. I am satisfied with the products and services of this firm. 2. My experience at this firm has always been very rewarding. 3. I am satisfied with my overall experience with this firm. 4. This firm's products and services meet my expectations. 5. I am happy that I have bought this firm's products. <p>Customer Loyalty</p> <ol style="list-style-type: none"> 1. I consider this firm as my first choice for cosmetics products. 2. I have an intention to continue to buy products from this company. 3. I have an intention to recommend this company as the best in the area. 4. I have an intention to encourage friends and relatives to buy cosmetics products from this company. 	<p>Nguyen and Leblanc (2001)</p> <p>Hanzaee and Sadeghian (2014)</p> <p>Zeithaml et. al (1996)</p>	<p>CI</p> <p>CI1</p> <p>CI2</p> <p>CI3</p> <p>CI4</p> <p>CS</p> <p>CS1</p> <p>CS2</p> <p>CS3</p> <p>CS4</p> <p>CS5</p> <p>CL</p> <p>CL1</p> <p>CL2</p> <p>CL3</p> <p>CL4</p>
<p>Independent Factors</p>	<p>Corporate Social Responsibility</p> <p>Economics</p> <ol style="list-style-type: none"> 1. This firm focuses on maximizing earnings. 2. This firm is committed to profitability. 3. This firm has a strong competitive position. 4. This firm seeks a profitable business. <p>Ethical</p> <ol style="list-style-type: none"> 1. This firm operates in a manner consistent with expectations of societal and ethical norms. 2. This firm recognizes and respects new ethical/moral norms. 3. This firm prevents unethical behaviors in order to achieve organizational goals. 4. This firm makes efforts to be good citizenship. <p>Legal</p> <ol style="list-style-type: none"> 1. This firm operates business in a manner consistent with expectations of government and law. 2. This firm obeys various federal, state and local regulations. 3. This firm fulfills its legal obligations. 4. This firm meets minimal legal requirements related to products. <p>Philanthropic</p> <ol style="list-style-type: none"> 1. This firm supports the culture and art activities of the local community. 2. Managers and employees participate in charitable activities of the local communities. 3. This firm supports private and public educational institutions. 4. This firm assists to enhance quality of life in the local community. 	<p>Caroll & Shabana (2010)</p>	<p>CSR</p> <p>ECO</p> <p>ECO1</p> <p>ECO2</p> <p>ECO3</p> <p>ECO4</p> <p>ETHIC</p> <p>ETHIC1</p> <p>ETHIC2</p> <p>ETHIC3</p> <p>ETHIC4</p> <p>LEG</p> <p>LEG1</p> <p>LEG2</p> <p>LEG3</p> <p>LEG4</p> <p>PHIL</p> <p>PHIL1</p> <p>PHIL2</p> <p>PHIL3</p> <p>PHIL4</p>

APPENDIX 2. PILOT TEST

. alpha ECO1 ECO2 ECO3 ECO4, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
ECO1	50	+	0.8089	0.6339	.9165986	0.7857
ECO2	50	+	0.8347	0.6937	.8930612	0.7571
ECO3	50	+	0.7970	0.6405	.9760544	0.7819
ECO4	50	+	0.7971	0.6274	.9555102	0.7874
Test scale					.9353061	0.8238

. alpha LEG1 LEG2 LEG3 LEG4, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
LEG1	50	+	0.6557	0.4375	1.198776	0.8594
LEG2	50	+	0.8249	0.6827	.8970068	0.7578
LEG3	50	+	0.8541	0.7026	.7892517	0.7469
LEG4	50	+	0.8837	0.7742	.7696599	0.7118
Test scale					.9136735	0.8211

. alpha ETHIC1 ETHIC2 ETHIC3 ETHIC4, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
ETHIC1	50	+	0.8886	0.7561	.6536054	0.7609
ETHIC2	50	+	0.7362	0.5597	.9817687	0.8415
ETHIC3	50	+	0.8408	0.7058	.7980952	0.7813
ETHIC4	50	+	0.8215	0.6948	.8688435	0.7902
Test scale					.8255782	0.8391

. alpha PHIL1 PHIL2 PHIL3 PHIL4, item

Test scale = mean(unstandardized items)

. alpha CI1 CI2 CI3 CI4, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
CI1	50	+	0.8696	0.7707	1.039864	0.7788
CI2	50	+	0.8433	0.7297	1.092653	0.7956
CI3	50	+	0.8278	0.6958	1.094286	0.8066
CI4	50	+	0.8171	0.6148	1.022721	0.8607
Test scale					1.062381	0.8495

. alpha CS1 CS2 CS3 CS4 CS5, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
CS1	50	+	0.8473	0.7606	1.103061	0.8683
CS2	50	+	0.9029	0.8412	1.018163	0.8496
CS3	50	+	0.8938	0.8284	1.038163	0.8530
CS4	50	+	0.9116	0.8511	.9841497	0.8462
CS5	50	+	0.6585	0.4719	1.290136	0.9331
Test scale					1.086735	0.8949

. alpha CL1 CL2 CL3 CL4, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
CL1	50	+	0.8866	0.7958	1.942993	0.8864
CL2	50	+	0.8782	0.7783	1.945578	0.8926
CL3	50	+	0.8850	0.7932	1.948571	0.8873
CL4	50	+	0.9061	0.8277	1.868163	0.8750
Test scale					1.926327	0.9115

. alpha PM1 PM2 PM3 PM4, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
PM1	50	+	0.8361	0.6956	.9659864	0.8288
PM2	50	+	0.8044	0.6512	1.036735	0.8462
PM3	50	+	0.8359	0.7079	.9945578	0.8238
PM4	50	+	0.8852	0.7807	.877551	0.7922
Test scale					.9687075	0.8614

. alpha PI1 PI2 PI3 PI4 PI5, item

Test scale = mean(unstandardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem covariance	alpha
PI1	50	+	0.7892	0.6804	1.243469	0.8887
PI2	50	+	0.8626	0.7809	1.132993	0.8674
PI3	50	+	0.8065	0.6739	1.141088	0.8945
PI4	50	+	0.8786	0.7966	1.073401	0.8633
PI5	50	+	0.8889	0.8257	1.128639	0.8593
Test scale					1.143918	0.8973

APPENDIX 3. DESCRIPTIVE ANALYSIS

Variable		Frequency (N)	Valid Percent (%)
Gender	Male	124	34.54
	Female	234	65.36
	Total	358	100.00
University student grades	First Year	87	24.30
	Second Year	118	32.96
	Third Year	91	25.42
	Fourth Year	39	10.89
	Fifth Year	16	4.47
	Sixth Year	7	1.96
	Total	358	100.00
University	Foreign Trade University Campus HCMC	80	22.35
	University of Medicine & Pharmacy HCMC	76	21.23
	Ho Chi Minh City University of Technology	50	13.97
	UEH	42	11.73
	Open University	41	11.45
	Others	69	19.27
	Total	358	100.00

APPENDIX 4. DATA ANALYSIS IN SMARTPLS*Original scales' Outer Loading*

	CI	CL	CS	↑ CSR	ECO	ETHIC	LEG	PHIL	PI	PM
CI1	0.877									
CI2	0.888									
CI3	0.868									
CI4	0.746									
CL1		0.885								
CL2		0.903								
CL3		0.867								
CL4		0.883								
CS1			0.840							
CS2			0.893							
CS3			0.878							
CS4			0.870							
CS5			0.821							
ECO1					0.687					
ECO2					0.806					
ECO3					0.779					
ECO4					0.759					
ETHIC1						0.748				
ETHIC2						0.748				
ETHIC3						0.828				
ETHIC4						0.825				

Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CI	0.867	0.875	0.910	0.717
CL	0.908	0.911	0.935	0.783
CS	0.913	0.914	0.935	0.741
CSR	0.918	0.922	0.930	0.470
ECO	0.739	0.740	0.852	0.657
ETHIC	0.797	0.808	0.867	0.621
LEG	0.860	0.862	0.905	0.706
PHIL	0.868	0.869	0.910	0.718
PI	0.907	0.908	0.931	0.731
PM	0.850	0.858	0.899	0.689

Discriminant validity - Fornell Larcker Analysis

	CI	CL	CS	CSR	ECO	ETHIC	LEG	PHIL	PI	PM
CI	0.847									
CL	0.612	0.885								
CS	0.676	0.735	0.861							
CSR	0.627	0.556	0.612	0.685						
ECO	0.488	0.419	0.473	0.766	0.810					
ETHIC	0.620	0.509	0.609	0.859	0.574	0.788				
LEG	0.427	0.377	0.403	0.816	0.545	0.576	0.840			
PHIL	0.538	0.523	0.535	0.875	0.567	0.667	0.597	0.847		
PI	0.556	0.730	0.609	0.490	0.381	0.428	0.371	0.439	0.855	
PM	0.502	0.494	0.511	0.528	0.376	0.492	0.436	0.435	0.467	0.830

Discriminant validity - HTMT Analysis

	CI	CL	CS	CSR	ECO	ETHIC	LEG	PHIL	PI	PM
CI										
CL	0.695									
CS	0.756	0.803								
CSR	0.694	0.600	0.660							
ECO	0.601	0.506	0.568	0.940						
ETHIC	0.739	0.591	0.709	0.987	0.731					
LEG	0.489	0.425	0.452	0.932	0.680	0.686				
PHIL	0.619	0.587	0.598	0.966	0.705	0.791	0.691			
PI	0.628	0.802	0.666	0.533	0.462	0.497	0.419	0.494		
PM	0.579	0.552	0.571	0.593	0.467	0.594	0.509	0.504	0.526	

Inner VIF values

	CI	CL	CS	CSR	PI	PM
CI					1.944	1.944
CL					2.297	2.297
CS					2.649	2.649
CSR	1.000	1.000	1.000			
PI						
PM						

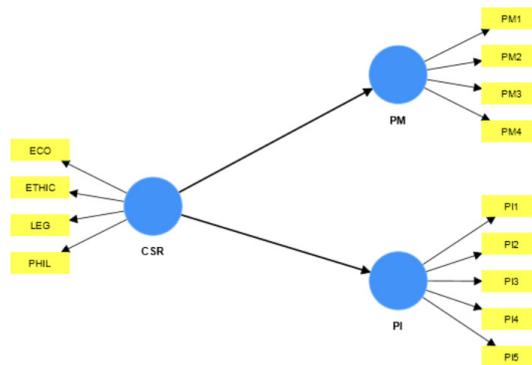
Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
CI -> PI	0.144	0.146	0.061	2.342	0.019
CI -> PM	0.247	0.248	0.077	3.217	0.001
CL -> PI	0.578	0.578	0.057	10.145	0.000
CL -> PM	0.196	0.192	0.082	2.375	0.018
CS -> PI	0.087	0.086	0.069	1.270	0.204
CS -> PM	0.200	0.204	0.083	2.401	0.016
CSR -> CI	0.632	0.634	0.044	14.361	0.000
CSR -> CL	0.557	0.560	0.040	13.985	0.000
CSR -> CS	0.617	0.619	0.039	15.945	0.000

Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
CSR -> CL -> PM	0.109	0.108	0.047	2.335	0.020
CSR -> CL -> PI	0.322	0.323	0.039	8.197	0.000
CSR -> CI -> PM	0.156	0.158	0.053	2.930	0.003
CSR -> CI -> PI	0.091	0.093	0.040	2.270	0.023
CSR -> CS -> PI	0.054	0.053	0.043	1.258	0.208
CSR -> CS -> PM	0.123	0.127	0.054	2.290	0.022

Direct effects between CSR and Customer Behavior (Purchase Intention and Price Premium)



	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
CSR -> PI	0.489	0.494	0.044	11.167	0.000
CSR -> PM	0.526	0.528	0.053	9.841	0.000

R-squared and adjusted R-squared

	R-square	R-square adjusted
PI	0.239	0.237
PM	0.277	0.275

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INFLUENCE OF REFERENCE GROUP ON ONLINE IMPULSE BUYING BEHAVIOR: A STIMULUS ORGANISM RESPONSE FRAMEWORK

Author : Tran Thi Kim Anh¹, Nguyen Le An², Ngo Kim Anh², Vo Thanh Nam²

Mentor: Le Hang My Hanh²

ABSTRACT: Based on Fisher and Rook's research in 1995, this research applies the Stimulus Organism Response framework to determine the influence of reference groups on impulse buying. The study examines two reference groups (Normative referents and Comparative referents) as two independent variables, working as stimuli and making an impact on impulse buying behavior through two intermediary variables as organisms, namely trust and normative evaluation. By adapting Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) to analyze the sample collected from questionnaires, the research provides a confirmation of the relationships among Normative referents (family and close friends), Comparative referents (celebrities), impulsive customers' Trust and Normative evaluation as well as the influence of these variables on customers' impulsive buying behavior.

Keywords: impulse buying; reference group; SOR model; normative evaluation; trust.

1. INTRODUCTION

According to a survey conducted in 2022, over 60 percent of internet users in Vietnam reported having purchased a product or service online. The number of online shoppers in the country has been growing steadily in recent years, reaching over 57.6 million people in 2022 (Nguyen, 2023). It is necessary for marketers and business owners to have a deep insight into consumers' online purchasing behavior.

The reference groups are factors that have considerable influence on impulse buying tendency. The reference groups expose people to lifestyles and behavior, which helps shape their attitudes and behavior to conform to social norms (Xiurong et al., 2010).

Reference groups resulting in online impulse buying behavior have not been thoroughly researched. The research gap was noticed when most research focused on impulse buying behavior occurring in-store (Lu, & Su, 2018). Empirical studies emphasized environmental stimuli such as the ambiance, website design and online feedback (Liu & Hu, 2013; Hong, Zulkiffli & Amran, 2021) rather than social factors like reference groups.

The Stimulus Organism Response (SOR) framework is widely used, signifying the relationship among (S) stimulus in the environment (reference groups), (O) organism related to emotional states of people, and (R) response illustrated by particular final behavior (online impulse buying behavior) (Mehrabian and Russell, 1974). Therefore, this study is to identify the moderating effect of two specific reference groups as a social stimulus on impulse purchasing behavior through two proven organisms: trust and normative evaluation. While trust increases consumers' confidence on the purchase (Thuong, 2020), normative evaluation is the subjective assessment towards the values of products and services (Zafar, 2021).

In conclusion, the influence of reference groups shall be further research to fill the gap in impulsive shopping online field, especially in Viet Nam. Particularly, the topic "*Influence of Reference group on*

¹ Foreign Trade University; Email: kimanhtranthi24@gmail.com

² Foreign Trade University.

Online Impulse Buying Behavior: a Stimulus Organism Response framework” will be presented at length with the data collected and analyzed in Ho Chi Minh city, which is known as a mega-city in Viet Nam with a high population.

2. THEORETICAL FRAMEWORK

2.1. Impulse buying theory

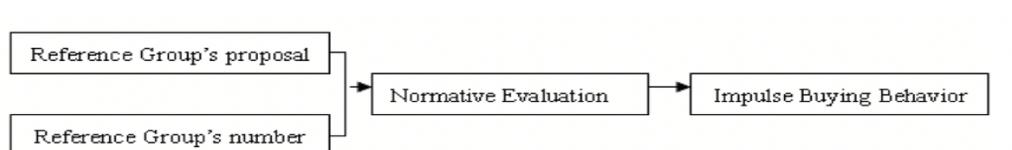
The term “Impulse buying” was first used by Hawkins Stern in 1962 to emphasize the phenomenon of “unplanned buying”: any purchase had not been planned, with the decision made in a shop. In contrast to earlier researches, the study of Rook (1987) claimed that not all unplanned purchases are impulsive buying but impulse buying should be clearly defined as “a sudden, often powerful and persistent urge to buy something immediately”. The definition of impulse buying extends along the development of shopping environment to online platforms. Piron (1991) described online impulse shopping as an immediate, unplanned purchase made through the internet.

The factors influencing impulse buying are divided into two kinds: internal motivators and external motivators. (Xiao & Nicholson 2013). However, Bussolari (2020) specialized these two factors into four: internal motivators, external motivators, demographic factors and situational factors.

Internal motivators refer to subjective factors such as behavioral trait (Atantra, 2022), self-discrepancy (Pupelis & Šeinauskienė, 2023), self-enhancement (Shrum, Chaplin, & Lowrey, 2022), high-arousal emotions (Jain, 2021); self-regulatory (Pacheco, 2022). Moreover, purchasing impulses can be significantly motivated by external motivators as well when a customer incidentally encounters a relevant visual stimulus in the retail environment such as in-store promotions and advertising, triggering shoppers to impulse buying (Grigsby et al., 2021), using mobile devices in-store as a guide for shopping (Aiolfi et al., 2022), self-agency as mediator in the influence on impulse buying behavior (Moes et al., 2022). Besides internal and external motivators, Demographic and Socio – Cultural factors related to age, gender and culture backgrounds (Bussolari, 2020). There are some social factors that incentivise customers to make impulsive purchases such as reference groups (Liu Xiurong & Liang Chenglei, 2010) and celebrities endorsement (Chen, Xie, Zhang & Li, 2021).

To research the influence of reference groups on impulse buying behavior, Liu Xiurong and Liang Chenglei (2010) used the SOR framework. The SOR model was originally invented by Mehrabian and Russell (1974) in order to analyze consumer purchases. This model includes three aspects: Stimulus (S) - the effect of environmental cues, Organism (O) is an internal process or condition that results in emotional responses. Response (R) is the outcome related to consumer behavior or avoidance. Stimuli are factors that are beyond a person’s control and have an impact on an organism’s internal states when they are exposed to external stimuli. An organism serves as a conduit for the connection between stimuli and behavior, and it also controls the outcome of the reaction to the stimulus. Liu Xiurong and Liang Chenglei (2010) considers the reference groups’ proposal (approving, neutral or discouraging) and reference groups’ number (multi-referent group or single-referent group). These two categories of reference groups work as stimuli and Normative Evaluation is Organism.

Figure 2.1. S-O-R model developed by Liu Xiurong and Liang Chenglei (2010)

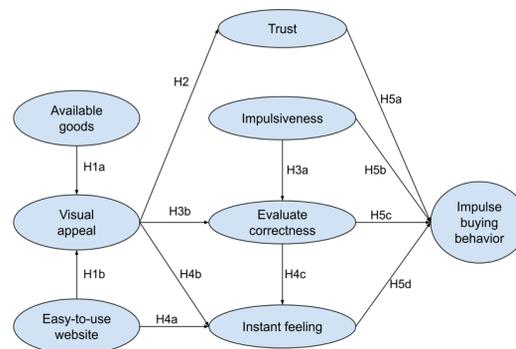


Source: Liu & Liang, 2010

This prior research shares the same objectives of our research that is to evaluate the impact of reference groups on impulse buying. However, this prior research does not focus on online contexts and divides reference groups into normative and comparative referents but has a different approach considering two perspectives reference groups.

Recently, although the SOR model is the most popular theoretical in the last decade, it is not only used to discover consumer behavior in stores but also to uncover online behavior. In Vietnamese context, the visual appeal characteristic of the online shopping websites which is contributed by the availability of products and the ease to use of shopping websites have been surveyed by Pham Quoc Trung and Nguyen Ngoc Thai Ha (2016) and Le Thi Kim Tuyet (2019) using the SOR model.

Figure 2.2. S-O-R model developed by Pham Quoc Trung and Nguyen Ngoc Hai Ha (2016)



Source: Pham & Nguyen, 2016

The SOR framework is widely applied to many studies by international researchers. It is used to identify impulse buying in live streaming commerce (Lee, & Chen, 2021), consumer online repurchase intention (Zhu, Kowatthanaku & Satanasavapak, 2020) or brand-related user-generated content through Facebook (Arif, Aslam & Siddiqui, 2020). Similarly, the SOR model offers an effective way of assessing online impulsive buying behavior with a comprehensive mechanism to explain the proposed relationships of variables.

2.2. Reference group theory

A reference group is a group of people that has a huge impact on one's behavior due to psychological Social group members who are psychologically significant to one's decision-making are referred to as the reference group (White & Dahl, 2006).

In fact, consumers consider the recommendations made by others as a benchmark when making purchases (Hwang, Mark, Jerry & Lin, 1999). When being unsure about adopting an e-marketplace or having insufficient knowledge, e-vendors frequently turn to informational reference groups to form a value standard and perception towards products (Lee et al., 2011). Moreover, reference groups can intervene in customers' needs and urge them to impulsively make a purchase.

Though there are many classifications of reference groups named differently, this study conclude them into two main groups based on their functions, impacts, and membership status: normative referents (primary or direct membership groups) and comparative referents (secondary or indirect aspiration groups) (Lessig & Park, 1978; Escalas & Bettman, 2003; Kelley, 1974).

2.2.1. Normative referents

Normative referents refer to reference groups to which an individual currently belongs to such as family and close friends. Most people hold a desire to meet expectations and gain acceptance from normative referents like parents, teachers, and peers (Myers, 2008, Pentina et. al., 2008).

2.2.2. Comparative referents

Meanwhile, comparative referents are reference groups which an individual desires to belong such as sports heroes and celebrities. A comparative reference group is a group whose lifestyles and activities are used as a model for others to follow (Childers & Rao, 1992).

2.2.3. Consumers' trust

Impulsive purchases may result from consumer behavior that is influenced by factors including security, usability, and trust (Donn, 2022). Trust is defined as “the willingness of a party to be vulnerable to the acts of another party based on the expectation that the other will perform a specific activity, regardless of the ability to monitor or control that another party” (Mayer, Davis & Schoorman, 1995). According to McKnight et al. (2002), consumers' intentions to buy are significantly impacted by the trust since it reduces uncertainty and risk perception in various online store contexts (Jarvenpaa et al, 2000, Sun & Wu, 2011).

2.2.4. Consumers' normative evaluation theory

Normative evaluations are defined as consumers' assessments of whether making an impulsive purchase in a specific buying scenario is suitable (Rook & Fisher, 1995). Moreover, Fishbein's Theory of Reasoned Action also points out that subjective norms stem from people's expectations of how important social referents will respond to a considered behavior and their motivation to do so. Recent consumer polls have revealed that while the majority of customers do not view their impulse purchases as being incorrect or wrong, a small percentage of consumers feel regret and guilt after making them (Hausman, 2000).

3. RESEARCH METHOD

3.1. Hypotheses

3.1.1 Normative referents and Trust

More than anything else, people build trust based on the experiences of their friends and relatives and place their confidence in their family (Hillman, Neustaedter, Bowes & Antle, 2012). Family recommendations or suggestions are significant not only in a person's life (AlArfaj, Solaiman & Marshall, 2019) but also purchasing behavior (Kotler et al., 2017).

H1: Normative referents (family and close friends) have a positive impact (+) impulsive customers' Trust.

3.1.2. Comparative referents and Trust

According to studies, celebrity endorsements increase consumers' trust in brands and advertised products (Chen, Xie, Zhang & Li, 2021; Dwivedi & Johnson 2013; Takaya 2017). Internet celebrities and regular consumers' recommendations may seem more genuine and powerful in fostering trust and boosting online sales (Hsu, Lin, Chiang & Sen, 2013).

H2: Comparative referents (celebrities) have a positive impact on (+) impulsive customers' Trust.

3.1.3. Normative referents and Normative Evaluation

Family and other close relationships which are considered to be important social subjects can impart norms, attitudes, and values through a lot of daily interactions. According to Li et al study (2008), people frequently follow key referents such as their family and close friends while making decisions. Receiving disapproval from important people (particularly family or friends) or the contrast of consumers' buying intent to social expectation (Shang, Pei & Jin, 2017) can prevent them from making decisions to purchase.

H3: Normative referents (family and close friends) have a positive impact on (+) impulsive customers' Normative Evaluation.

3.1.4. Comparative referents and Normative Evaluation

Celebrities and brand ambassadors can be utilized as a reference for evaluating and perceiving a brand normatively (Nofiwati et al., 2020). Most celebrities are seen as representatives of the community, leading trends and embodying common standards of the community. The presence of products in celebrities’ daily lives or advertisements works as recommendation that their fans will listen to (Kotler, Armstrong, Saunders & Wong 1999). Indeed, when celebrities advertise the product’s benefits, buyers can realize the perceived value and have a better assessment (Chi, Yeh & Tsai, 2011).

H4: Comparative referents (celebrities) have a positive impact on (+) impulsive customers’ Normative Evaluation.

3.1.5 Trust and Online Impulse Buying Behavior

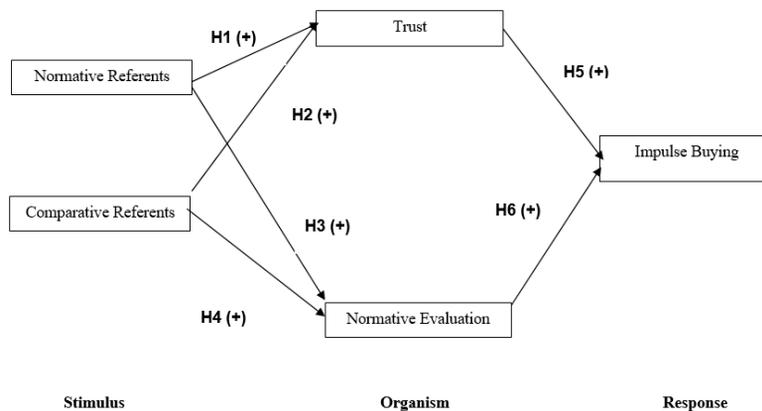
The emotive aspect of trust is associated with a willingness to take risks, whereas impulsive buying is viewed as a “risky” decision that may lead to decision errors (Chen, Xie, Zhang & Li, 2021). Trust can lessen the stress associated with impulsive behavior and enable transactions in the face of uncertainty (Verplanken & Sato, 2011). The SOR models examined in Vietnamese context by Tuyet (2019) and Trung and Hà (2017) suggested that trust is a decisive organism leading to online impulse buying behavior.

H5: Trust has a positive impact on (+) Online Impulse Buying Behavior.

3.1.6. Normative Evaluation and Online Impulse Buying Behavior

Impulsive purchase behavior is significantly and directly influenced by normative evaluations (Lim, 2015, Rook & Fisher, 1995). Consumers with higher normative assessment levels are more inclined to buy things on impulse because they believe it to be the proper thing to do (Yi, 2019). Therefore, researchers suggest the following hypothesis:

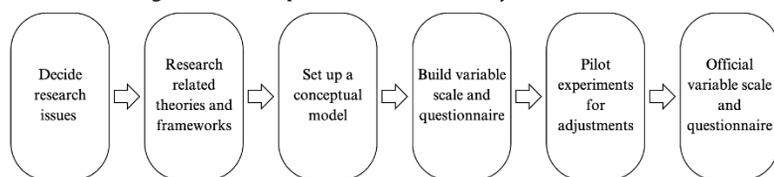
H6: Normative Evaluation has a positive impact on (+) Online Impulse Buying Behavior.



3.2. Research process

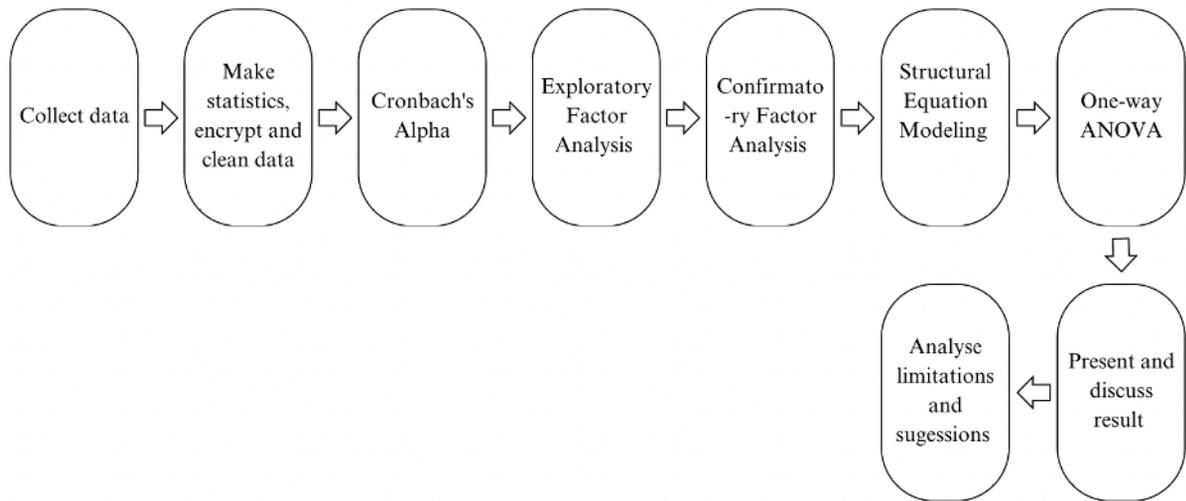
The research process of the thesis included two main stages: preliminary research and formal research.

Figure 3.2. The process of Preliminary research



Source: Authors’ compilation

Figure 3.3. The process of Formal research



Source: Authors' compilation

3.2.1. Questionnaire development

The researchers set up a questionnaire that applied the scale of measurement and research items based on the consultants from the empirical studies. The questionnaire has three sections to separately collect the information about demographic characteristics of participants (gender, age, average monthly expenditure, frequency of online purchases, time spent on browsing online group shopping websites), popularity of impulse purchases among online group shopping users (consulted from the questionnaire of Liu & Hu (2013)) and designated questions for test items.

Participants were asked to respond using a 7-point Likert scale, with 1 is “strongly disagree”, 2 is “disagree”, 3 is “somewhat disagree”, 4 is “neutral”, 5 is “somewhat agree”, 6 is “agree”, 7 is “strongly agree” for questions in the third section of the questionnaire.

Table 3.1. Scale development

Variable	Official scale	Source	Item (code)
Normative Referents (NR)	I purchase items that my family, friends and acquaintances recommend on online shopping websites.	Muslim et al. (2019)	NR1
	I purchase items that my family, friends and acquaintances give reliable reference information on online shopping websites.	Anh (2015)	NR2
	I purchase items with whom my family, friends and acquaintances have already had a positive purchase experience on online shopping websites.	Anh (2015)	NR3
	I purchase items that my family, friends and acquaintances use to adjust to the trend among the environment on online shopping websites.	Muslim et al. (2019)	NR4
Comparative Referents (CR)	The celebrities I follow raise things that catch my attention and response	Maltby et al. (2006)	CR1
	The celebrities I follow describe items objectively.	Xiao and Benbasat (2007)	CR2
	The celebrities I follow understand and have genuine experience with the items	Till and Busler (2000), Ohanian (1990)	CR3
	The celebrities I follow affect my shopping interest	Schramm and Hartmann (2008), Auter and Palmgreen (2000)	CR4

Trust (TRU)	I believe the recommendations of items are trustworthy.	Hsiao, et al. (2010)	TRU1
	I believe the recommendations of items are honestly made.	Ashraf et al. (2020)	TRU2
	I have confidence in the promises that the recommendations of items have made.	Doney and Cannon (1997), Kumar et al. (1995), Roy et al.(2001), Siguaw and Simpson (1998)	TRU3
Normative Evaluations (NE)	I find it acceptable to buy 4 items that I like on online shopping websites instead of buying 1 as planned.	Liu et al. (2013)	NE1
	I find it also fun to buy 4 items that I like on online shopping websites instead of buying 1 as planned.		NE2
	I find it makes sense to buy 4 items that I like on online shopping websites instead of buying 1 as planned		NE3
Online Impulse Buying Behavior (IB)	I had an urge to purchase items other than or in addition to my specific shopping goal when I browsed online shopping websites.	Valacich & Wells (2009)	IB1
	I had a desire to buy items that did not pertain to my specific shopping goal when I browsed online shopping websites.		IB2
	I had an inclination to purchase items outside my specific shopping goal.when I browsed online shopping websites.		IB3

3.2.2. Pilot experiment

The pilot experiment included an in-depth interview with 10 respondents and questionnaire distribution to another 30 respondents before the authors made appropriate adjustments to complete the official scale and questionnaire.

3.2.3. Sample collection

At the formal research stage, the authors collected 200 samples indirectly via an online network and the results obtained 193 satisfactory samples. Respondents are students in Ho Chi Minh City without any restriction regarding their universities. They are living in an area that is the most modern one in Viet Nam with a crowded e-commerce traffic for online shopping sites. At the age from 18 to 22, every participant is expected to have direct personal experiences making a purchase online. According to the research experience of Hair & Associates (1998), the minimum sample size should be from 100 - 150 . Besides, according to Bollen (1989), the selected sample will be representative if the sample size is at least 5 samples for an estimate. Here, the research model of the group includes 17 observed items, so the sample size to be selected should be 85 or more. Therefore, the research team decided to distribute 200 questionnaires to ensure the representativeness of the sample during the research.

3.2.4. Data analysis

After making statistics, encrypting and cleaning the collected data, the authors conducted analysis using SPSS and AMOS 21.0 analysis support software. The authors measured the reliability of the scale by Cronbach's Alpha reliability, evaluated the model fit by Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) and tested the hypotheses and qualitative variables by Structural Equation Modeling (SEM) and One-way ANOVA.

Structural Equation Modeling (SEM) is the main statistical analysis technique used in this study to analyze multidimensional relationships among many variables in a model (Haenlein & Kaplan et al. , 2004. . Specifically, a few recent typical studies in the research topic of buying behavior can be mentioned, Zhu, Kowatthanakul and Satanasavapak (2020) study the intention to continue buying online of customers of the generation Y is based on the Stimulus-Organism-Response (SOR) model on 401 survey samples, the SEM

model is illustrated and tested by AMOS 24; Iyer, Blut, Xiao and Grewal (2020) collected 231 survey samples and researched on the relationship between internal factors (traits, mood, motivation,...) and external factors (price, marketing strategy,...) with online impulse buying behavior by CB-SEM model deployed by LISREL 8.80; Chen, Xie, Zhang and Yingying Li (2021) study on celebrities affecting impulsive buying behavior of high-end fashion products with 245 data samples analyzed using PLS- SEM using SmartPLS 3.0 software. Moreover, the authors found that recent studies on impulse buying behavior with a research model having a similar SOR structure, most of them use SEM to analyze data and get results that are consistent with the theories. Ming, Jiangqiu and Bilal (2021) conducted a study about how social presence influences impulse buying behavior in live streaming commerce with a research model following S.O.R model, which has Stimulus group including four independent variables of different social presence factors, Organism group consisting intermediary variables of consumer trust and flow state that directly affects the impulsive buying behavior in Response group. Another recent study on online shopping experience affects online impulse buying behavior of customers (Gulfraz et al., 2022) with similar research model structure including independent variables of online customers' shopping experience, intermediary variable of loyalty towards e-commerce platform and dependent variable of online impulsive buying. Therefore, based on the properties of SEM and previous studies, both of which are feasible when testing by SEM, the authors believe that SEM is a good approach for this study based on covariance (CB-SEM) and processed by AMOS software.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Checking the scale by examining the Cronbach's Alpha reliability test

In the first analysis, the Cronbach's Alpha of the variables are more than 0.7 . Moreover, each item in corrected item-total correlation is greater than 0.3. The Cronbach's Alpha results are: 0.733 for Normative Referents; 0.850 for Comparative Referents; 0.870 for Trust; 0.866 for Normative Evaluations; 0.769 for Online Impulse Buying Behavior. The Cronbach's Alpha test findings indicate that the 17 significant items are reliable and qualified for further use in EFA exploratory component analysis.

4.1.2. Exploratory Factor Analysis (EFA)

Based on the consequences of rotating factors, there are 15/17 with loading coefficients greater than 0.5 . Particularly, the items NR1 and NR4 have small loading factors of 0.382 and 0.336, which are less than 0.5, so they will be excluded from the scale. The results of adjusted scale are:

Table 4.2. Summarizing the results of the coefficients in the EFA factor analysis for adjusted scale:

Assessed factors	Value	Compare to criteria
Sig value in Bartlett's test	0.000	0.000 < 0.05
KMO coefficient	0.808	0.5 < 0.808 < 1
Quoted variance	64.177	64.177% > 50%
Eigenvalue	1.169	1.169 > 1

Table 4.3. Summarizing the results of rotating the factors for the second time

Variable	Item	Factor				
		1	2	3	4	5
CR	CR2	.845				
	CR3	.776				
	CR1	.762				
	CR4	.709				
NE	NE1		.968			
	NE2		.768			
	NE3		.686			
TRU	TRU3			.854		
	TRU2			.838		
	TRU1			.803		
IB	IB2				.831	
	IB3				.652	
	IB1				.570	
NR	NR3					.715
	NR2					.662

Source: SPSS

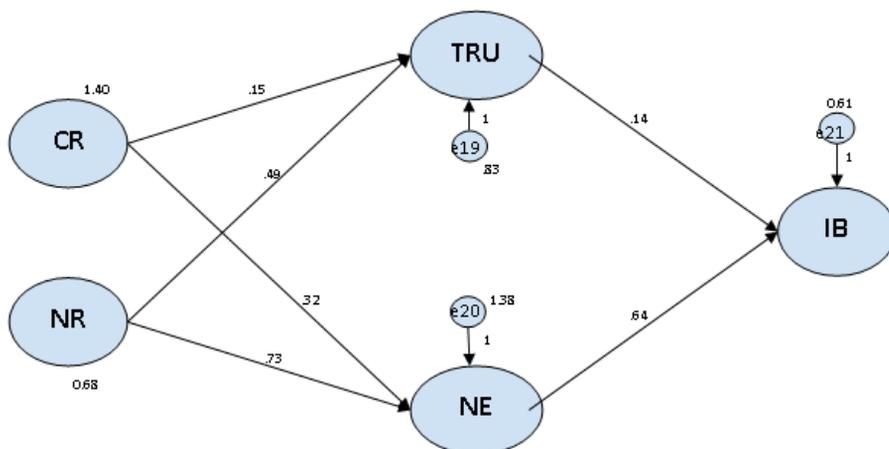
According to Figure 4.6, all 15 items have the loading coefficients greater than 0.5 and they are classified into 5 groups of factors as the original model.

4.1.3. Confirmatory Factor Analysis (CFA)

The results of CFA indicate that $\chi^2/DF = 1.642 < 3$ which is a good value; the model has $p\text{-value} = 0.000 < 0.05$; $CFI = 0.961 > 0.95$ which is a good value; $GFI = 0.915 > 0.9$ which is traditional value; $RMSEA = 0.062$ which is close to a good fit; $TLI = 0.949 > 0.9$ which is a good value. All values fall within the suggested values shown in figure 3.2.3. As a result, it can be said that there was a good fit between the model and the observed data.

4.1.4. Structural Equation Modeling (SEM)

Figure 4.1. Summarizing SEM diagram



After completing the construction of the diagram for SEM and conducting SEM analysis, the software produces 3 main results tables: Regression Weights, Standardized Regression Weights, Squared Multiple Correlations corresponding to the proposed hypotheses as follows:

Table 4.5. Summarizing the results of Regression weights

	Estimate	S.E.	C.R.	P	Result
H1: NR → TRU	.494	.126	3.914	.000	Supported
H2: CR → TRU	.146	.069	2.115	.034	Supported
H3: NR → NE	.734	.173	4.244	.000	Supported
H4: CR → NE	.322	.092	3.484	.000	Supported
H5: TRU → IB	.140	.103	1.363	.036	Supported
H6: NE → IB	.543	.074	7.350	.000	Supported

Source: AMOS

Using the 95% confidence standard, we have the hypothesis testing results as follow:

H1: Normative referents (family and close friends) have a positive impact (+) impulsive customers' Trust.

The positive impact of normative referents on customers' trust has been proved by empirical research. AlArfaj, Solaiman and Marshall (2019) concluded that the primary source of consumers' trust is normative referent group which are family and friends as well as family recommendations or suggestions are more significant in a person's life.

H2: Comparative referents (celebrities) have a positive impact on (+) impulsive customers' Trust.

This finding supports the conclusion that celebrity endorsements increase consumer trust in brands and advertised products (Chen, Xie, Zhang & Li, 2021)

H3: Normative referents (family and close friends) have a positive impact on (+) impulsive customers' Normative evaluations.

The result confirms that people will make a comparison with the social basis as the evaluation criteria if they lack objective standards to evaluate their own attitudes and activities (Hwang, Mark & Jerry, 1999). There is pressure for consumers to avoid buying items which are not in line with social expectations (Shang, Pei & Jin, 2017).

H4: Comparative referents (celebrities) have a positive impact on (+) impulsive customers' Normative evaluations.

The result can be interpreted that famous people have a certain degree of influence on customers' feelings when they decide to purchase impulsively. This also supports Jin and Ryu finding (2020) that celebrities and ambassadors who are well-liked and well-known will positively affect consumers' feelings and buying intentions. Moreover, celebrities and brand ambassadors can be utilized as a reference for evaluating and perceiving a brand normatively (Nofiawati et al., 2020).

H5: Trust has a positive impact on (+) Impulse Buying.

Although the estimated parameter of TRU is not very high, it is consistent with tested hypotheses that brand trust had a positive impact on purchase intention with a path coefficient was 0.250 (Cuong, 2020).

H6: Normative evaluation has a positive impact on (+) Impulse Buying.

The result is similar to the conclusion of Lim (2015) that impulsive purchase behavior is significantly and directly influenced by normative evaluations.

Continue to consider the Standardized Regression Weights table, this is the standardized regression coefficients table. We will rely on the estimated regression coefficient in this table to evaluate the impact of the independent variables on the dependent variable.

Table 4.6. Summarizing the results of Standardized regression weights

	Estimate
NR → TRU	.402
NR → NE	.441
CR → TRU	.171
CR → NE	.277
TRU → IB	.151
NE → IB	.685

Source: AMOS

Finally, the Squared Multiple Correlations table represents the R squared value of the impact of the independent variables on the dependent variable.

Table 4.7. Summarizing the results of Squared multiple correlations

	Estimate
TRU	.191
NE	.271
IB	.489

Source: AMOS

The R-squared value of TRU is $0.191 = 19.1\%$, so the independent variables affect 19.1% of the variation of TRU. Similarly, the R squared of NE is $0.271 = 27.1\%$, so the independent variables affect 27.1% of the variation of NE. R-squared for IB is $0.489 = 48.9\%$, so the independent variables affect 48.9% of the variation of IB.

4.1.6. Analysis of the influence of moderator variables on online impulse buying behavior

To statistically test the difference in means of the groups at each level of gender, age, monthly spending and surfing time on online sites moderators, the authors separately conducted ANOVA analysis of variance for each moderator. The results of ANOVA analysis reach the significance level of less than 5%, it can confirm that there is a difference in buying behavior between the categories of respondents.

Table 4.8. ANOVA analysis result for moderator variable

Moderator Variable	Sig. of Levene	Sig. Observed significance level	Result
gender	0.006	0.028	Significant difference
age	0.209	0.000	Significant difference
monthly spending	0.539	0.031	Significant difference
surfing time on online sites	0.706	0.013	Significant difference

There is a statistically significant difference between the two sample means from female and male data. The moderating effect of Gender on impulse buying has been proved by many empirical studies. The study about Gender difference in impulse buying conducted by Tifferet and Herstein (2012) concludes that women impulse buying levels are higher than men as sensual cues are more appealing to women than men.

The Sig. Observed significance level of the Age moderator variable is near to zero proving the significant difference between age groups with higher value for older groups, except the oldest. The reason for this exception is supposed to be that the age difference of the research subjects is not too much (from 18 to 23) and the number of survey samples in the older groups is significantly less compared to other age groups.

It is reasonable that the group whose higher monthly expenditure presents higher mean value of online impulse buying behavior variable. This finding supports Muruganantham and Bhakat’s study conclusion (2013) about the money available can leverage the impulse buying behavior in online shopping websites.

Our research confirms Beatty and Ferrell’s (1998) finding that the likelihood of making an impulse purchase increases with the amount of time spent by shoppers (i.e., available time). The amount of time that internet shoppers, especially with online shoppers who love purchasing experience, spend browsing online websites more idly may trigger their decision to impulsively buy goods.

4.2. Discussion

By testing the reliability of the scale and analyzing factor discovery, it was concluded that from the 17 initially proposed observed variables, only 15 independent observed variables remained and were grouped into 5 groups of factors to include in the SEM model: Comparative referents (CR), Normative referents (NR), Trust (TRU), Normative evaluation (NE) and Impulse buying (IB). In which, independent variables are CR and NR; intermediary variables are TRU and NE; dependent variables are IB.

After running the SEM model test using AMOS 21.0 software, the model shows that all four groups of factors have a positive influence on impulse buying behavior as the research hypotheses have proposed. Specific results are as follows:

The relationship between impulsive customers’ trust and normative referents (family and close friends) has an estimated value of 0.494 while Comparative referents (celebrities) is 0.146. The result of the relationship between normative referents (family and close friends) and impulsive customers’ trust is consistent with previous studies. Family recommendations or suggestions are more significant in a person’s life (AlArfaj, Solaiman & Marshall, 2019) as well as purchasing behavior (Kotler et al., 2017). However celebrities have an impact on impulse buying which is not as strong as preceding research had concluded.

The relationship between impulsive customers’ Normative evaluation and normative referents (family and close friends) has an estimated value of 0.734 and with Comparative referents (celebrities) is 0.322. It could be concluded that consumers pay more attention to the advice and recommendations of acquaintances when making impulse purchases. Therefore, customers’ standards in terms of assessing and purchasing products are likely to be heavily influenced by normative referents.

The relationship between Impulse Buying and Trust has an estimated value of 0.140 while with Normative Evaluation is 0.543. This shows that customers' normative evaluations influence their impulsive buying decisions more than their' trust factor does. The result of the impact of trust on impulse buying is quite inconsistent with the hypothesis that was supported in the past researches: In most online impulse buying behavior studies using the SOR model, trust is suggested as a decisive organism when examining a specific stimulus that leads to the response (Tuyet, 2019; Trung & Hà, 2017). This shows that today's young consumers in Ho Chi Minh City tend to prioritize their overall assessment of the utility which is based on perceptions between gain and loss (Moreover & Woodruff, 1997) over the certainty of feelings based on circumstantial evidence from the online marketplace (McKnight, Choudhury & Kacmar, 2002).

The adjusted R-squared coefficient of the impulsive buying factor 48.9% is not too high. The reason for this is that the error is included when the sample size is small and there are absent variables that have not been taken into the model.

In addition, the results of the analysis of the moderating variables all support the pre-existing theories. In terms of gender, female customers are significantly more likely to impulsively shop online than male customers (Tifferet & Herstein, 2012). When considering monthly spending as the ability to pay for shopping, people with higher spending levels tend to make a purchase more impulsively (Muruganatham & Bhakat, 2013). According to Beatty and Ferrell's study (1998), as surfing online shopping sites more enhances the shopper's experience, the increasing time spent on online shopping websites leverages the likelihood of customers making impulse purchases.

5. CONCLUSION

After the COVID pandemic, the trend of online shopping has become increasingly popular, notably the phenomenon of online impulse purchases. The research "*Influence of reference group on online impulse buying behavior: A stimulus-organism-response framework*" determines and evaluates the influence of reference group speed on online impulse buying behavior of university students in Ho Chi Minh City based on SOR model considered to be the most reliable conceptual framework in this field. At the same time, the study provides a number of results and recommendations to help buyers become more aware of their own shopping behavior to make appropriate adjustments and businesses create executions that indirectly affect customers' decision through the reference group to increase sales.

With 193 valid samples processed by SPSS and AMOS 21.0 software by Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM), the study showed the influence of two reference groups (Normative referents and Comparative referents) on online impulsive shopping behavior of students in universities in Ho Chi Minh City through two organisms, Trust and Normative evaluation. The results show that all variables have a positive impact on impulse buying behavior as the proposed hypotheses. In addition, the research results support the relationships between moderating variables such as gender, monthly spending level, time spent surfing online shopping websites and impulsive behavior of university students in Ho Chi Minh City.

With objective limitations in terms of time and funding, the study still has some limitations in terms of research scope, survey subjects and sampling method, leading to the research results not being highly generalizable. However, the study has produced positive results that support and complement previous studies in the field of research on impulse buying behavior. Future studies should include other factors of the organism group such as social-well being or self-control into the model to better explain the factors affecting impulse buying behavior of students in Ho Chi Minh City. In addition, The representativeness and

statistical efficiency of the study will be enhanced if further studies use probabilistic sampling with larger sample sizes.

6. APPENDIX

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IMPACT OF PERCEIVED VALUE AND PERCEIVED RISK ON ORGANIC FOOD CONSUMPTION IN VIETNAM

**Author: Pham Thi Ha¹, Dang Thi Hang², Nguyen Thi Xuan Mui²,
Than Thi Thu Phuong², Nguyen Hoai Nam²
Mentor: Phan Thi Thu Hien²**

ABSTRACT: This study aims to identify impact of perceived value, perceived risk on purchase intention in organic food of Vietnamese consumers. Data is obtained from 206 consumers, especially in Ha Noi. The reliability of measures was tested by using Cronbach's Alpha coefficient, measurement model, and structural model to evaluate the reliability of measures and model testing. Based on PLS-SEM method, positive impact of perceived value, perceived risk on intention of organic food consumption of Vietnamese consumers is found through expectation, confirmation and satisfaction. In fact, if consumers realize values and risks of organic food consumption for themselves and their families, intention of organic food consumption will be increased. In addition, a moderating role of trend is also found in this study. With the popularization of organic food consumption, consumers' intention to consume organic food will also increase. Finally, based on the research results, food companies can refer to it to determine new directions in the future, or researchers can re-study to verify the research results.

Keywords: perceived value, perceived risk, expectation-confirmation theory, organic food.

1. INTRODUCTION

In recent years, food hygiene has always been a concern for the whole society. There have been many food poisoning incidents in Vietnam, specifically: according to the Ministry of Health report, 54 food poisoning cases resulted in 1,359 poisoning cases, of which 18 died (Trang, 2022). As a result, health protection is at the forefront of consumers. As a result, the consumption of clean, healthy foods has increased, leading to the consumption of organic foods.

Worldwide, retail sales from organic food have truly reflected the growth of this food consumption trend. In 2000, sales from the organic agricultural market reached only \$18 billion but by 2018, the number had increased about 6 times, exceeding the \$100 billion mark, indicating the rapid growth of this new market. According to the latest data released by the Institute for Organic Agriculture (FiBL) and the Global Organic Organization IFOAM, in 2021, the market reached 125 billion euros, which is nearly 4 billion euros (about 3%) increase from 2020. The average Swiss consumer spends about 425 euros on organic food and is the world's largest consumer of this product. The consumption of organic food has also grown tremendously in Denmark with 13 percent of organic food market share, the highest in the world, followed by Australia (11.6 percent) and Luxembourg (11%) (Helga Willer, 2023).

In Vietnam, revenue is estimated to be over 2 million Euro (2014), but in just 2 years the figure has increased ninefold to 18 million Euro (2016) (Helga Willer, 2023). Compared to other organic food markets around the world, the number of 18 million is still modest, but the two-year growth rate has shown an increasing trend of demand for this food and the potential for the organic food market in Vietnam. The trend of organic food consumption is a new but thriving trend, which has attracted researchers. Many studies have been conducted in Viet Nam, on the intention of organic food consumption and commonly used factors: price,

1 Foreign Trade University, Email: k60.2114210031@ftu.edu.vn

2 Foreign Trade University.

attitude, beliefs, environmental knowledge, health, etc; there is no study on the impact of perceived value and perceived risk. Therefore, on the basis of evaluating the impact of perceived value and perceived risk on organic food consumption, the study aims to propose solutions to promote the positive impact of perceived value and minimize the impact of perceived risk in organic food consumption in Viet Nam. Specifically, the objectives of the study are building a model to analyze and evaluate the impact of perceived value and perceived risk on the intention to consume organic food of Vietnamese consumers; theoretical basis system about the impact of perceived value and perceived risk on organic food consumption of Vietnamese consumers; evaluating the current status of the impact on perceived value and perceived risk on intention consumption of organic food by Vietnamese consumers and proposing solutions and recommendations to improve the impact of perceived value and perceived risk of Vietnamese consumers' intention to buy organic food.

2. THEORETICAL FRAMEWORK

2.1. Perceived value theory

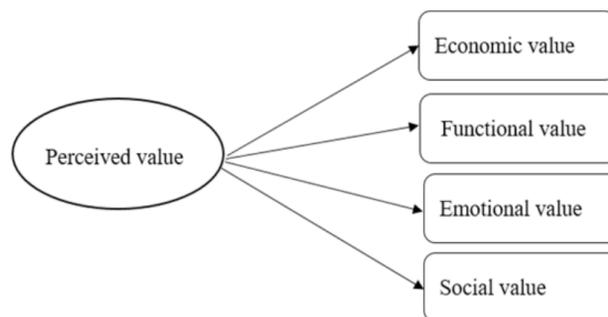


Figure 1. Perceived Value Model

Source: Sweeney and Soutar (2001)

Studies have shown that perceived value is the main factor affecting consumer buying attitude (Kim, Woo, and Nam 2018). Perceived value refers to the consumer's overall assessment of a product's utility and is based on perceptions of what is received and what is given (Zeithaml 1988). According to Sweeney and Soutar (Sweeney and Soutar 2001), perceived value includes quality, emotion, price, and social value. (Sheth, Newman, and Gross 1991) argues that perceived value includes functional, social, emotional, and conditional values.

2.2. Perceived risk theory

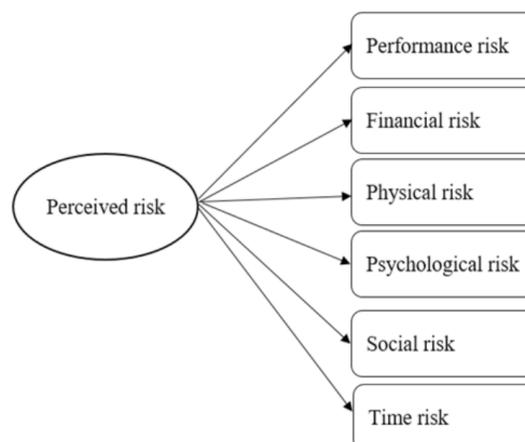


Figure 2. Perceived Risk Model

Source: Jacoby & Kaplan (1972)

Perceived risk refers to the nature and degree of risk that consumers perceive when considering a particular purchase decision (Cox and Rich 1964). (Mitchell and Vassos 1997) suggests that because consumers are often more motivated to avoid losses than to maximize utility in their purchases, perceived risk has a strong impact on explaining the behavior of consumers. The consumer’s behavior involves risk because the actions of the purchase “will produce consequences which he cannot anticipate with anything approximating certainty and some of which at least are likely to be unpleasant” (Baumer, 1960).

2.3. Expectation - Confirmation theory

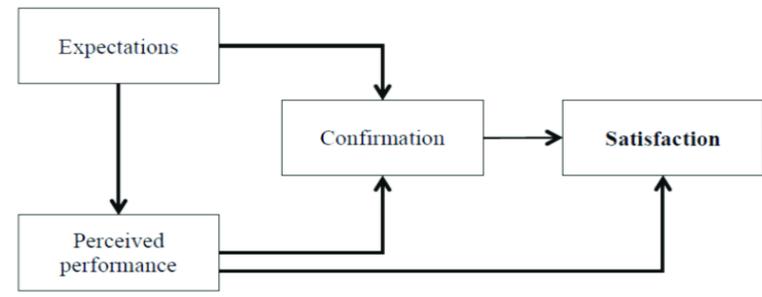


Figure 3. Expectation – Confirmation Model

Source: Oliver (1977)

The expectation-confirmation theory (ECT) of (Oliver R. L., 1977) (Oliver, 1980) posits that expectation, along with perceived performance, affects consumers’ satisfaction when using products and services. This effect is mediated by a positive or negative disconfirmation between expectations and performance. If perceived performance of a product is greater than expected (positive disconfirmation) then it will lead to satisfaction. If perceived performance of a product is lower than expected (negative disconfirmation), that can lead to dissatisfaction. In addition, the theory suggests that perceived performance directly affects satisfaction (Oliver, 1980). Finally, satisfaction affects intention or behavior.

2.4. Relationship between health benefit and environmental benefit with social value

With increasing public health awareness, more and more consumers are starting to think about consuming healthy food (Huang et al. 2022). This has also been fueled by an increase in marketing of organic and healthy foods, where many consumers fear being obese. Organic food is grown without the use of synthetic pesticides, fertilizers and other chemicals commonly used in conventional farming. Therefore, organic food is said to be healthier than conventionally farmed food. Choosing organic food is seen as a way of prioritizing personal health and well-being, which is a social value behavior.

Over the past few decades, consumers have become more aware of the environmental impact in their purchasing decisions (Kim & Chung, 2011). By choosing to consume organic food, individuals are contributing to a large movement to protect the environment, which is a socially appreciated behavior.

Thus, it was hypothesized that:

Hypothesis 1: Health benefit positively impact on social value.

Hypothesis 2: Environmental benefit positively impact on social value.

2.5. Relationship between product attribute with perceived quality

Product attribute is the features and uses of a product to satisfy customer needs. To distinguish and identify a product, product attribute plays an important role in the customer evaluation process. In a study of the motivations of organic food buying behavior (Davies, Titterington, and Cochrane 1995) revealed that

along with environmental and health-conscious concerns, safety, quality concerns and purchase motives were also attributed to specific product attributes, such as nutritional value, taste, freshness and price. Nigerian consumers believe that organic food is healthier, tastier, has no harmful effects, and is of better quality than inorganic food (Monroe & Krishnan, 1985). The nutritional properties of organic food have given it a competitive advantage over conventionally produced goods (Michaelidou and Hassan 2010).

Thus, it was hypothesized that:

Hypothesis 3: Product attribute positively impact on perceived quality.

2.6. Relationship between emotional appeal, perceived price, perceived quality and social value with perceived value

Emotional value is defined as the feelings or emotions caused by a product or service (Sheth et al. 1991). These emotions (positive or negative) vary in situations and individuals, which can influence consumer behavior. In addition, (Seegebarth, Behrens, Klarmann, Hennings, & Scribner, 2016) considers emotional value as a personal perception of the value of that product. Recent research has shown that these emotional values lead to organic food consumption (Testa, Sarti, and Frey 2019).

Perceived price is the monetary value of a product that has a significant influence on a customer's decision-making process. High prices have been pointed out as one of the reasons that hinder customers in making purchasing decisions (Perrini et al. 2010). Therefore, perceived price negatively affects perceived value. (Dodds, Monroe, and Grewal 1991) highlighted the negative effect of perceived price on perceived value.

Perceived quality is conceptualized as "the consumer's judgment about a product's overall excellence or superiority" (Zeithaml 1988), which affects positively on perceived value (Oxfam, 2002). Many past research studies suggested that perceived quality has a positive impact on perceived value (Grewal et al. 1998; Hartline and Jones 1996; Teas and Agarwal 2000; Zeithaml 1988). (Dodds et al. 1991) defined perceived value as "a cognitive trade-off between perceived quality and sacrifice". Therefore, perceived value is one of the determining factors of perceived value.

Social value is defined as the benefits produced through an individual's association with one or more social groups when choosing a product (Rahnama 2016). As a result, consumers often tend to consume products that are positively recognized in their social groups and strengthen their social status (Vindigni, 2002). Recent studies have also suggested that social values have a positive influence on consumers' organic food consumption behavior (Khan and Mohsin 2017).

Thus, it was hypothesized that:

Hypothesis 4: Positive emotional appeal contributes to higher perceived value, while negative emotional appeal reduces perceived value.

Hypothesis 5: Perceived price has an adverse effect on perceived value.

Hypothesis 6: Perceived quality has a direct impact on perceived value.

Hypothesis 7: Social value positively impacts on perceived value.

2.7. Relationship between food neophobia with consumer psychological risk

Neophobia refers to the fear or reluctance to try new, unfamiliar foods (Fischler, 1988), (Pliner & Hobden, 1992). Neophobia reflects a natural human tendency to dislike or be suspicious of novel foods (Pliner & Salvy, 2006) (Knaapila, et al., 2007) (Dovey, P.A., Gibson, & Halford, 2008). (Asperin, Philips, & Wolfe, 2011) defined Neophobia as a personality trait that exists in every human being, which influences the willingness to try and consume new foods.

Thus, it was hypothesized that:

Hypothesis 8: Food neophobia increases psychological risk.

2.8. Relationship between psychological risk and financial risk with perceived risk

Financial risk is defined as the probability of monetary loss associated with the purchase a product (Horton 1976). Financial composition refers to a customer's net financial loss (Horton 1976), which includes the possibility of product failure and may require repair or replacement. (Nhung et al.) points out that Vietnamese consumers need a basis to ensure to buy organic products that they accept to pay extra, more expensive than conventional products. However, consumers may be more worried about the risk that the value of organic food is not worth with the money they spend.

Psychological risk refers to the concern that purchasing a product will conflict with the consumer's self-image (Kim & Lennon, 2000), which causes frustration or disappointment from that purchase. In other words, it is the possibility that consumers will experience mental stress as a result of their buying behaviors. Thus, psychological risk increases consumers' perceived risk of organic food, making them less inclined to consume organic food.

Thus, it was hypothesized that:

Hypothesis 9: Psychological risk increase perceived risk.

Hypothesis 10: Financial risk increase perceived risk.

2.9. Relationship between perceived value and perceived risk with expectation

Perceived value plays an important role in exchange activities, considering that consumers evaluate the utility of products based on what they receive from what they give (Wu, Chen, Chen, & Cheng, 2014). (Lam, Lau, & Cheung, 2016) see perceived value of green products as the types of benefits or values that consumers can receive from green products compared to what they sacrifice for price and search time to make their purchasing decisions. It also plays an essential role in influencing purchasing intentions, purchasing decisions and actual consumption (Yee, San, & Khoon, 2011) (Zhuang, Cymiskey, Xiao, & Alford, 2010). For green products, (Lam, Lau, & Cheung, 2016) found that perceived value is a positive force of purchase intention.

Perceived risk is related to the expectation of loss from any purchase of organic food (Peter and Ryan 1976). (Bäckström, Pirttilä-Backman, and Tuorila 2004) find that people will worry about the risks associated with their food. If consumers have a high perceived risk, they may have lower expectation with the quality and value of organic products, and they tend to stay away from organic products. Therefore, it leads to a decline in the organic food production industry, as consumers lack trust to buy and use organic products.

Thus, it was hypothesized that:

Hypothesis 11: Perceived value positively impacts on expectation.

Hypothesis 12: Perceived risk negatively impacts on expectation.

2.10. Relationship between expectation with confirmation

If consumers have high expectation for organic products, they will tend to trust and be willing to buy them. However, if consumer's expectation is not met or organic products do not meet quality standards, consumers may lose trust and will have no confidence in organic products.

Thus, it was hypothesized that:

Hypothesis 13: Expectation positively impact on confirmation.

2.11. Relationship between confirmation with satisfaction

Liu et al.,(2020) believes that there is positive or negative disconfirmation of customer expectation through the performance of the product or service. With user experience from using the system, thoughts and attitudes can change. Contrary to customer expectation, customer evaluation of performance will affect perceived of expectation – disconfirmation (Liu et al. 2020).

Thus, it was hypothesized that:

Hypothesis 14: Confirmation has a favorable impact on satisfaction.

2.12. Relationship between satisfaction with purchase intention

Satisfaction is the response of the consumer, the measure of satisfaction is pleasant or unpleasant. (Oliver R. , 2009). (Johnson M. N., 1996) described two basic concepts of satisfaction are specific transactions and accumulation. A particular transaction satisfaction is a momentary assessment of a particular transaction experiencing a product or service, while accumulated satisfaction describes the total consumption experience of a product so far. Consumer satisfaction has been conceptualized on both sides (e.g., emotion) and cognitive response (Westboork & Oliver, 1991).

Purchase intention is considered to be intermediate between satisfaction and actual loyalty (Evanschitzky & Wunderlich, 2006) (Oliver R. , 2009), and different from repurchase behaviour (Mittal and Kamakura, 2001). A positive association between satisfaction and purchase intention is well established in the literature (Kassim & Abdullah, 2010), (Johnson, Herrmann, & Huber, 2006), (Mazursky and Geva, 1989), (Szymanski and Henard, 2001), (Walsh et al., 2008).

Thus, it was hypothesized that:

Hypothesis 15: Satisfaction has a direct impact on purchase intention.

2.13. Moderating of Trend and Government's food production support work

One reason for consumers buy organic products is the satisfaction of finding new trends in health food products (Roitner-Schobesberger, Darnhofer, & Vogl, 2008); (Sangkumchaliang & Huang, 2012). In this sense, the consumption of organic food has become a trend (Falguera, Aliguer, & Falguera, 2012). Consumers perceived organic food as fashionable (Costa et al., 2014; Petrescu and Petrescu-Mag, 2015) and buy it because it is considered such (Sharma and Singhvi, 2018)

The government can intervene in food production through subsidies in agriculture and preferential policies, as well as by controlling the use of poultry and livestock medicines, fertilizers and pesticides, maintaining and building agricultural land and living environment ecosystems (Scalvedi and Saba 2018), called "Government's food production support work". If people are satisfied with government support and monitoring of agricultural products, the trust in the production process and quality of organic food is strengthened, which increase the willingness to consume organic food (Chai, Meng, and Zhang 2022).

Thus, it was hypothesized that:

Hypothesis 16: Trend moderates from expectation to purchase intention.

Hypothesis 17: Government's food production support work moderates the impact from expectation to purchase intention.

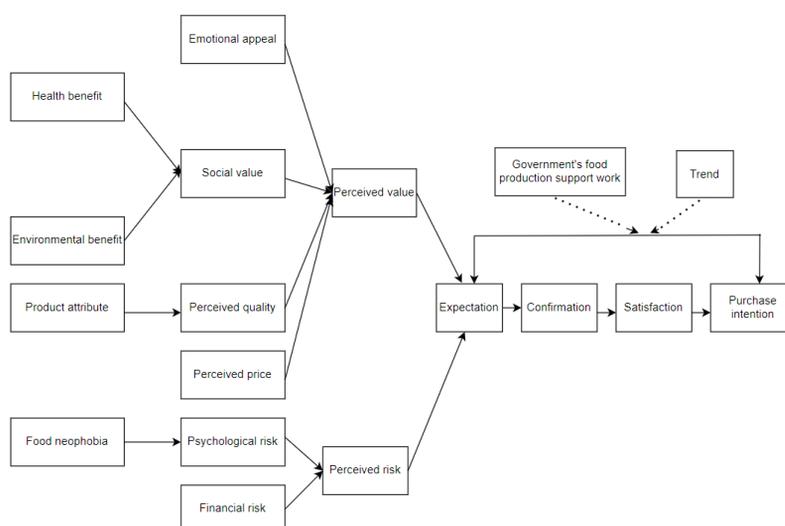


Figure 4. Research model

3. RESEARCH METHOD

This study examines the impact of perceived value, perceived risk on organic food consumption in Viet Nam based on perceived value theory, perceived risk theory and confirmation - expectation theory. In addition, the study also examines the moderating impact of Government’s food production support work and trends on the relationship between perceived value and perceived risk on organic food consumption in Viet Nam. Through the quantitative data collection method and using the questionnaire to collect data, this study analyzed the data based on PLS-SEM method. Based on a list of 215 people in Ha Noi that have been compiled through random sampling, the study surveyed consumers above. After the survey period from January to March 2023, the study collected 206 valid questionnaires, achieving a 95.81% response rate.

In this study, SPSS 20 and Smart PLS 4 software were used to conduct data analysis by PLS-SEM method. The two steps for implementing the PLS-SEM method include the measurement model evaluation and the structural model evaluation (Hair et al., 2017). According to Shiau et al (2019), in this case of this study, when the obtained sample size is relatively small, the PLS-SEM method should be applied. To measure variables in the study model, the scales inherited from previous studies were used.

Table 1. Variable, indicators, source of scales

Variable	Indicators	Source of scales	Encode
Health Benefit	HB1. Organic food is beneficial for health HB2. Organic food is produced in natural way HB3. I feel safe as organic food is free from chemical infusions	(Sumi and Kabir, 2018)	HB
Environmental Benefit	EB1. Organic food is more environment-friendly EB2. Organic food is produced from organic manure EB3. Organic food is produced by using natural pesticides	(Sumi and Kabir, 2018)	EB
Perceived Social Value	SV1. Organic food helps me to feel accepted by others. SV2. Organic food improves the way I am perceived. SV3. Organic food makes a good impression on other people. SV4. Organic food gives me social approval.	(Seegebarth et al., 2016)	SV

Product Attributes	PA1. Organic food is a natural product PA2. Nutrient value is more in organic food PA3. Organic food is tastier	(Sumi and Kabir, 2018)	PA
Perceived Quality	PQ1. I think quality of organic tea is superior than traditional PQ2. Positive image of organic food inspires me to buy organic tea PQ3. Organic tea is better substitute than conventional tea	(Sumi and Kabir, 2018)	PQ
Perceived Price	PP1. Price of organic food is affordable PP2. Less price difference from traditional food PP3. Paying more for organic food is worthy	(Sumi and Kabir, 2018)	PP
Emotional Appeal	EA1. Organic food helps you cope with stress EA2. Organic food helps you relax EA3. Organic food keeps you alert EA4. Organic food cheers you up EA5. Organic food makes you feel good	(Japutra et al., 2022)	EA
Perceived Value	PV1. I find positive value in terms of benefits and costs of organic tea PV2. High price of organic tea creates great value to me	(Sumi and Kabir, 2018)	PV
Financial Risk	FR1. I believe the value of organic food is more than the money I spend FR2. I believe the value that organic food brings is worth the money I spend FR3. I fear the value that organic food brings is not worth the money I spend	(Herrera and Blanco, 2011)	FR
Food Nephobia	FN1. I am constantly sampling new and different foods FN2. I do not trust new foods FN3. If I do not know what is in a food, I won't try it FN4. I am afraid to eat things I have never had before FN5. I will eat almost anything	(Ayyub et al., 2018)	FN
Physiological Risk	PS1. I am afraid that my purchase may make me feel uncomfortable PS2. I am afraid of feeling dissatisfied or frustrated	(Fandos Herrera and Flavián Blanco, 2011)	PS
Perceived Risk	PR1. I believe that consuming organic food is risky because it may not live up to my expectations PR2. I believe that consuming organic food is risky because the production process may not be standardized PR3. I believe that consuming organic food is risky because it can be time consuming to verify the origin	(Chang and Chen, 2008)	PR
Governments food Production support work	GP1. Supervise the use of livestock and poultry drugs GP2. Supervise the use of pesticides and fertilizers GP3. Protect farmland ecological environment GP4. Improve rural living environment GP5. Support agricultural science and technology research and development GP6. Agricultural subsidies	(Ogorevc et al., 2020)	GP
Trend	TR1. Organic food is trendy TR2. Organic food is in fashion	(Japutra et al., 2022)	TR
Expectation	EX1. If I use organic food, I will get more health benefits than traditional food EX2. If I use organic food, I feel better EX3. If I use organic food, I will have less negative impact on the environment than traditional food	(Alzahrani and Seth, 2021)	EX

Confirmation	CO1. My organic food experience was better than I expected CO2. Consumption of organic food meets my expectations	(Chen, 2012)	CO
Satisfaction	SA1. I'm interested in organic food SA2. My choice of organic food consumption is right SA3. I will recommend organic food to my family, friends	(Chen, 2012)	SA
Purchase Intention	PI1. I am willing to purchase organic foods if they are available PI2. I intend to buy organic foods if they are available PI3. I plan to consume organic foods if they are available for purchase. PI4. I try to consume organic foods if they are available for purchase.	(Jose et al., 2021)	PI

4. RESULTS AND DISCUSSION

4.1. Results

Assessment of the measurement model

First, the Outer Loading coefficient is considered to eliminate variables that do not guarantee convergence value (Hair et al., 2019). Based on Henseler et al., (2009), variables with an Outer Loading coefficient of less than 0.7 should be removed from the model as the convergence value is not guaranteed. Table 2 results show that all variables have an Outer Loading coefficient greater than or equal to 0.7. Moreover, the AVE coefficient (Table 2) is all greater than 0.5 so the scales ensure validity.

Table 2. Outer loading, Cronbach's Alpha, rho_A, Composite Reliability, AVE

	Item	Outer Loading	CA	rho_A	CR	AVE
PI	PI1	0.803	0.84	0.845	0.893	0.675
	PI2	0.869				
	PI3	0.829				
	PI4	0.784				
CO	CO1	0.883	0.761	0.772	0.893	0.806
	CO2	0.912				
SA	SA1	0.826	0.793	0.793	0.879	0.707
	SA2	0.853				
	SA3	0.844				
EA	EA1	0.835	0.878	0.88	0.912	0.675
	EA2	0.868				
	EA3	0.841				
	EA4	0.844				
	EA5	0.71				
EB	EB1	0.865	0.766	0.85	0.857	0.667
	EB2	0.832				
	EB3	0.75				
EX	EX1	0.882	0.73	0.754	0.847	0.65
	EX2	0.761				
	EX3	0.771				

FN	FN2	0.849	0.811	0.822	0.888	0.725
	FN3	0.816				
	FN4	0.887				
FR	FR1	0.834	0.724	0.739	0.878	0.783
	FR2	0.774				
	FR3	0.719				
GP	GP1	0.864	0.917	0.926	0.935	0.706
	GP2	0.851				
	GP3	0.868				
	GP4	0.87				
	GP5	0.788				
	GP6	0.799				
HB	HB1	0.899	0.762	0.817	0.861	0.676
	HB2	0.747				
	HB3	0.813				
PA	PA1	0.842	0.751	0.758	0.858	0.668
	PA2	0.85				
	PA3	0.757				
PS	PS1	0.917	0.733	0.768	0.88	0.787
	PS2	0.855				
PP	PP1	0.851	0.777	0.792	0.867	0.685
	PP2	0.837				
	PP3	0.794				
PQ	PQ1	0.835	0.786	0.79	0.875	0.7
	PQ2	0.844				
	PQ3	0.831				
PR	PR1	0.839	0.806	0.807	0.885	0.72
	PR2	0.867				
	PR3	0.841				
PV	PV1	0.895	0.759	0.759	0.892	0.806
	PV2	0.9				
SV	SV1	0.865	0.877	0.879	0.916	0.731
	SV2	0.837				
	SV3	0.842				
	SV4	0.876				
TR	TR1	0.886	0.708	0.709	0.873	0.774
	TR2	0.874				

To evaluate the reliability, the values Cronbach's Alpha, rho_A, Composite Reliability are used as suggested by Hair et al (2019). The results in Table 2 show that these values are in the range from 0.708 to

0.912, ensuring the reliability value proposed by Hair et al (2019). Regarding the discriminant validity, this study uses the criterion of HTMT < 0.9 as suggested by Henseler et al (2015). The results in Table 3 show that no HTMT values violate the above criteria. Therefore, discriminant validity was warranted in this study.

Table 3. Heterotrait-monotrait Ratio Coefficients Table

	PI	CO	SA	EA	EB	EX	FN	FR	GP	HB	PA	PS	PP	PQ	PR	PV	SV	TR
PI	0.822																	
CO	0.625	0.898																
SA	0.683	0.74	0.841															
EA	0.356	0.349	0.321	0.821														
EB	0.482	0.441	0.485	0.267	0.817													
EX	0.578	0.594	0.629	0.402	0.522	0.806												
FN	0.403	0.446	0.33	0.509	0.321	0.355	0.851											
FR	0.552	0.563	0.59	0.47	0.416	0.498	0.529	0.885										
GP	0.292	0.17	0.285	0.475	0.253	0.28	0.269	0.328	0.84									
HB	0.43	0.364	0.458	0.338	0.725	0.545	0.232	0.374	0.363	0.822								
PA	0.467	0.427	0.437	0.536	0.606	0.534	0.353	0.509	0.444	0.612	0.817							
PS	0.512	0.517	0.443	0.336	0.462	0.423	0.511	0.587	0.183	0.365	0.487	0.887						
PP	0.431	0.414	0.458	0.564	0.235	0.323	0.485	0.563	0.524	0.267	0.425	0.407	0.827					
PQ	0.567	0.555	0.584	0.498	0.622	0.575	0.414	0.581	0.376	0.566	0.662	0.453	0.481	0.837				
PR	0.488	0.493	0.401	0.287	0.398	0.501	0.414	0.511	0.068	0.284	0.371	0.586	0.256	0.348	0.849			
PV	0.441	0.437	0.539	0.63	0.347	0.481	0.445	0.548	0.513	0.394	0.539	0.356	0.632	0.564	0.266	0.898		
SV	0.381	0.343	0.396	0.682	0.363	0.417	0.459	0.411	0.613	0.416	0.533	0.421	0.573	0.489	0.266	0.664	0.855	
TR	0.588	0.528	0.622	0.254	0.436	0.517	0.221	0.409	0.405	0.438	0.398	0.394	0.387	0.503	0.366	0.411	0.365	0.88

Structural model assessment

The R-Square coefficient shows that PI, CO, PQ, PV are explained as 71.5%, 95%, 73.1%, and 83.2%, respectively. This is a good result that the variables used explain many variations of PI, CO, PQ, PV. Next, CC, EX, PS, PR, SV are explained respectively: 66.2%, 60.9%, 41.4%, 57.1%, 24.2% respectively, indicating that the variables used explain the relative variation of the above variables.

The research team found that the impact of EX on CO, CO on SA, and SA to PI was statistically significant at 5% because of the same P-value = 0.0005. The Impact factor of EX to CO, CO to SA and SA to PI are positive indicating that this effect is a positive effect. Thus, the research team found that consumer expectations have an equal impact on consumer confirmation, thereby affecting consumer satisfaction, thus creating an equal impact on people’s intention to consume organic food.

The impact of PV and PR on EX has the same P-value as 0.0005, indicating that these effects are statistically significant. The PV-to-EX and PR-to-EX impacts are both relatively large with the Impact factor of PV-to-EX of 0.374 and the PR-to-EX of 0.401 indicating that these effects are positive effects. In fact, when consumers are aware of the values and risks that organic food consumption is good for themselves and their families, their intention to consume this food will be further enhanced.

The effects of EA, PP, PQ, and SV on PV with P-value of 0.016; 0.00; 0.002 and 0.00±0.05, respectively, suggesting that these effects are statistically significant. The Impact factor of these effects all bear a positive sign, indicating that they all act in the same direction on PV. As such, it can be confirmed that the higher the value that evokes emotions, perceived price, perceived quality and social value, the higher the consumer’s awareness of the intention to consume organic food is also increasing.

In addition, the authors’ group also found that PS and FR’s effects on PR with P-value values of 0 and 0.001±0.05, respectively, should be statistically significant. PS’s and FR’s Impact factor on PR were 0.437

and 0.254, respectively, indicating that this was a positive effect. Indeed, financial and psychological risks are two types of risks that consumers encounter when making a decision to buy a certain product, so it is reasonable that financial and psychological risks increase with the perception of people’s risks.

The impact of EB on SV has P-value=0.162>0.05, indicating that the impact is not statistically significant, or EB has no impact on SV. In contrast, the impact of HB on SV has P-value=0.000.05, indicating that the impact is statistically significant. Impact factor is 0.323, with a positive sign indicating that this is the same-dimensional effect. It can be confirmed that, when people are aware that organic food consumption has health benefits for themselves and their families, their social value will also be enhanced.

The impact of the PA on the PQ with a numerical value P-value=0,0.05, shows statistically significant. The positive and relatively large impact factor = 0.662 indicates that this is a positive effect. In fact, as consumers identify more product attributes, they increase their awareness of the quality of the product.

In addition, the impact of FN on PS has a numerical value P-value=0.000.05, indicating statistically significant. Impact factor = 0.551 has a positive and relatively large sign indicating that this is the same-dimensional effect. The research team found that consumers often experience “new type of food consumption fear syndrome” due to concerns over hygiene and food safety issues, as this “fear” increases with consumer psychological risk.

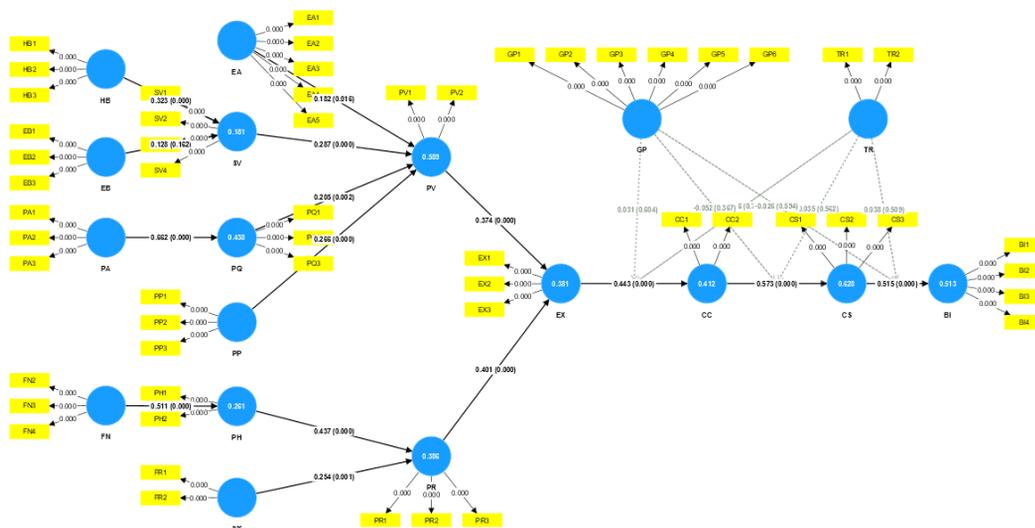


Figure 5. Model Reliability Results

On the impact of two moderating items on the purchasing behavior of organic food by consumers. The authors found that the impact of GP on PI, CO, and SA with P-value was all greater than 0.05, respectively. Therefore, it is not statistically significant. Thus, it can be argued that the Government’s Production Assistance has no regulatory role to affect consumers’ buying of organic food from expectations. In addition, the impact of TR on PI, CO, and SA respectively has a P-value of 0.003; 0.00; 0.0000.05, respectively, indicating statistically significant. Impact factor is 0.255; 0.306 and 0.289 have positive indications that this is the same-dimensional effect, respectively. In which, TR has the strongest impact on CO. It can be argued that the Trend variable plays a regulatory role in influencing consumers’ buying of organic food from expectation.

4.2. Discussion

In Vietnam, 86% of consumers give preference to organic food products for their daily meals (AC Nielsen). However, according to the results of research conducted in Vietnam, 12.6% of consumers fear

that the value that organic food brings is not worth the money they spend; nearly 17% of respondents fear feeling unsatisfied or disappointed about consuming organic food.

In recent years, the whole world tends to gradually switch to organic food consumption. The production and consumption of organic food is considered an alternative solution, optimizing the outstanding aspects left in the traditional production model. This promotes sustainable development and sustainable consumption, providing health benefits and both environmental and social values.

Besides the positive aspects that organic food brings to consumers, there are still risks of organic food hindering consumption intention in Vietnam. Organic food items are not diverse and not always available. What's more, organic food costs an average of 47% more than conventional food. However, if the quality of the product that consumers perceive is inversely proportional to the amount of money they spend to buy organic food, then this is a huge risk in the consumer's intention to buy the product again.

PV and PR are factors that directly affect the intention to consume organic food in Vietnam. Therefore, manufacturers need to conduct long-term research in order to grasp the needs of the market. The study hopes that the proposed model and theoretical basis can bring correct judgments to manufacturers.

5. CONCLUSION

5.1. Limitations in research

Based on the research and discussion of the results, the study found several limitations in the study:

Due to geographical and time factors, the study focused only on conducting surveys in specific areas. Because of this, the observation sample may not cover the factors affecting the intention to purchase organic food.

Moreover, although it may be seen that research has marked successful steps in developing a fairly detailed model of the impact of perceived value, perceived risk on intention of purchasing organic food. In fact, this cross-sectional study may have limited the ability to fully grasp the correlation of flexibility factors. At the same time, it is inevitable for the model to miss some relevant variables.

5.2. Future Research Orientation

Recognizing the above shortcomings, the study presented several suggestions for future research development as follows:

In order to bring about highly representative research results, upcoming studies can expand the size of the observational sample as well as cover the scope of the research across the country. In addition, this study was conducted in Vietnam - a developing economy. Therefore, future studies in this field can collect and survey data sets from developed countries and compare the results with current research. In another development direction, future studies may also look at similar or different contexts in other parts of the world that would increase the generalization of these findings.

In the face of constant domestic and international economic fluctuations, the development of regular and continuous research is necessary and important. Therefore, the study hopes that the above recommendations can contribute to the development of future research.

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LINKING TRANSFORMATIONAL LEADERSHIP AND ORGANIZATIONAL RESILIENCE: THE MEDIATOR ROLE OF ADAPTIVE CULTURE EVIDENCE FROM PETROLEUM ORGANIZATION

Nguyen Minh Tam¹

ABSTRACT: The aim of this research is to investigate the influence of transformational leadership on organizational resilience through mediator role of adaptive culture. This study employed a survey of 200 employees working at an aviation petroleum company of Vietnam. The findings revealed that transformational leadership positively impact adaptive culture, and in turns adaptive culture affected organizational resilience. Moreover, adaptive culture mediated the relationship between transformational leadership and organizational resilience. This results provide practical implications of enhancing transformational leadership as well as adaptive culture for better organizational resilience within petroleum industry. The detailed discussion and limitations will be stated at the end of this paper.

Keywords: Transformational leadership, adaptive culture, organizational resilience, SmartPLS

1. INTRODUCTION

Organizational resilience is the key to answer why many organizations collapse during crisis while others can tackle challenges and grow more resourceful. Organizational resilience provides organizations insight on how they achieve company's goals during hardship, tension and break barriers to adapt (Vogus & Sutcliffe, 2007). Business that have strong resilience are well-prepared for worst situations as well as builds company's own standards to response with unanticipated events rapidly (Kantur & İşeri-Say, 2012). Corona pandemic has negatively affected operation of both SMEs and large firms in Vietnam, increasing risk of default in business can lead to bankruptcy (Kroeger et al., 2020). Thus, organizational resilience becomes more crucial, especially after pandemic, it proves that company with low resilience will be eliminated from market.

According to Riolli and Savicki (2003), there are two main streams that affect organizational resilience are at organizational level and individual level. At individual level, individual dispositions, skills or values can affect to organizational resilience (Riolli & Savicki, 2003). Kim (2020) proves that employees with high adaptability, and proactiveness impact positively on firm's recovery process after crisis. Proximal environmental events happening individual level such as acute stressors and chronic situational factors also associate with resilience of organization (Riolli & Savicki, 2003). At organizational level, company's structure and functions have impact on organizational resilience (Riolli & Savicki, 2003). Power distribution, normative control along with organizational culture encourages organizational resilience (Andersson et al., 2019). Moreover, extra-organizational factors such as investing in information system also influence organizational resilience (Riolli & Savicki, 2003). Besides, there is another stream to investigate organizational resilience is the way leadership affects resilience of organization in which Odeh et al. (2021) and Valero, Jung and Andrew (2015) pointed out that organizational resilience is affected positively by transformational leadership.

When investigating the relationship between transformational leadership and organizational resilience, survey is a popular method used by researchers. Valera, Jung and Andrew (2021) survey 112 organizations in Southeastern Economic Region of South Korea operating in different fields and find the positive influence of transformational leadership on organizational resilience. After conducting online survey with 379 services

¹ Banking and Finance - International School of Banking Academy - Banking Academy - Vietnam.

firm in Dubai, Odeh et al. (2021) conclude that transformational leadership does not only positively impact organizational resilience but also adaptive culture and transformational leadership, organizational resilience are partially mediated by adaptive culture. Whereas, interview method is applied to examine the way transformational leadership impacts employees that strengthen resilience in organizations. Six elements including transformational leadership are pointed to support companies adapt successfully to alteration and increase organizational resilience after interviewing with focused group of two health non-profit organizations (Witmer & Mellinger, 2016). Teo, Lee and Lim (2017) use purposive sampling from literature regarding SARS in Singapore to conduct semi structured, open ended, face-to-face interviews with 7 healthcare leaders. Teo, Lee and Lim (2017) assert that correct, timely response of leaders in relational connections among staffs and modify their psychologically, emotionally, and socially behavior can enhance resilience.

This study is different from previous researches because previous ones focused on surveying, interviewing organizations or employees from various organizations, however, this study chooses participants from one organization only to make specific recommendations. Secondly, previous studies is done during and before pandemic time so the requirement for a research about this topic in post-pandemic period is necessary because working environment in post-pandemic changes very fast with technological changes and more flexible (Mangla, 2021). Thirdly, this is also the first research investigation about this topic in Vietnam. Vietnam is a developing country with socialist-oriented market economy and Vietnam's economic development orientation is industrialisation and modernisation (Fforde, 2016). Hence, Vietnamese firms have different features comparing to foreign firms based on different market economy and business environment.

Through this research, company can understand more about organizational resilience along with its importance to firm during and after crisis. Moreover, this study also provides not only organizations in petroleum industry but also other sectors understanding about influence of transformational leadership within business on organizational resilience along with adaptive culture to make right decisions. Besides, this research contributes understanding about current resilient capability of firm and suggests recommendations on how company can enhance it through transformational leadership and adaptive culture.

This research is important to company to enhance organizational resilience for better preparation for crisis may happen in future and fasten recovery process in post-pandemic. Many restrictions are implemented to airline transport to reduce spread of virus, experiencing Covid for a long time causes severe long-term impacts on international aviation activity (Nižetić, 2020). Vietnam's aviation industry is also impacted significantly, in 2020, aviation transportation's demand decreased by 34.5 to 65.9% comparing to 2019 (Lan, 2021). Low demand results in low profit and increases pressure on business operation.

2. LITERATURE REVIEW

2.1. Transformational leadership theory

Transformational leadership theory was created by Bass and Avolio in 1994. According to Bass and Avolio (1994), transformational leadership style has four dimensions are idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. Idealized influence is becoming a role model for employees and leader's behaviour is perceived by others to be consistent with ethical standards (Bass & Avolio, 1994). Inspirational motivation is motivating employees to achieve personal along with organizational objectives and making connections between organizational mission with employees' values, beliefs (Bass & Avolio, 1994). Intellectual stimulation is enhancing intelligence, rationality and innovative, creative working environment (Bass & Avolio, 1994). Individualized consideration is listening to each employee's demands, values, interests to support them on work and use these information for decision making (Bass & Avolio, 1994).

Theory of Bass and Avolio (1994) has been applied in many fields and industries. This theory was applied in investigating impact of transformational leadership on job involvement and job satisfaction among staffs in

hospitality and tourism industry (Vargas-Sevalle, Karami & Spector, 2020). Moreover, Bass and Avolio (1994) theory is used in banking sector to prove positive impact of transformational leadership on organizational efficiency (Koranteng et al., 2022). Theory of Bass and Avolio (1994) is chosen as theoretical background for this research is that it is applied in research of Valero, Jung and Andrew (2015) which investigates the impact of transformational leadership on organizational resilience. Organizational resilience can be strengthened through transformational leadership by setting common vision to tackle future disasters, disruptions and inspiring employees to work toward that vision with cooperation (Valero, Jung & Andrew, 2015).

2.2. Organizational resilience

Vogus and Sutcliffe (2007) define organizational resilience is the way organization keeps positive adjustments during challenging conditions so company can overcome more strongly and resourcefully. Suryaningtyas et al. (2019) define organizational resilience as company's capability to predict, prepare, respond and modify for changes caused by unanticipated disturbances to survive and even be more prosperous. Zehir and Narcikara (2016) define organizational resilience is capability to absorb stress and maintain operation despite of adversity as well as recover from unfortunate situations. Generally, organizational resilience is company's ability to predict, prepare and adapt with challenges to overcome them and even recover more strongly.

There are two dimensions of organizational resilience are planned which should exist in firm before crisis and adaptive which is generated after crisis (Prayag et al., 2018).

2.3. Transformational leadership

As mentioned above, Bass and Avolio (1994) concludes four characteristics to create transformational leadership are idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. Besides, there are some other traits of transformational leadership defined by other researchers. Omar (2017) states that transformational leaders have idealized influence, use inspirational motivation and intellectual stimulation towards organizational philosophy, success stories and enhance quality management. According to Rafferty and Griffin (2004) there are three main elements of transformational leadership. Vision is inspiring employees to work hard through difficulties to achieve future success (Rafferty & Griffin, 2004). Intellectual stimulation is igniting employees to create many problem-solving solutions, raising their awareness of challenges and improving their ability to think old issues in new way (Rafferty & Griffin, 2004). Inspirational motivation is visualizing good future, guiding employees how to achieve it, setting a role model and high performance standards and showing high determination, confidence (Rafferty & Griffin, 2004).

2.4. Adaptive culture

Costanza et al. (2015) defines adaptive culture as which allows as well as encourages risk taking, trust and has common believe in problem solving, opens to innovation. Odeh et al. (2021) defines adaptive culture as organizations that have culture with strong ability to adapt with change. Huynh and Luu (2021) finds out that organization with adaptive culture always supports employees to initiate change in culture to suit with environmental requirements and make ability for continuous innovation.

2.5. Hypothesis development and research model

Bass and Avolio (1993) find the close relationship between organizational culture and transformational leadership, many corporations have transformed their cultures based on four characteristics of transformational leadership stated in theory of Bass and Avolio (1994). In changing business environment, high adaptive culture assists organization in dealing with changes, adapting with new environment leading to higher potential to

survive (Costanza et al., 2015) and transformational leadership plays a crucial role in shaping the adaptive culture in organization (Xenikou & Simosi, 2006). Odeh et al. (2021) concludes that leaders who have vision, intellectual stimulation and inspirational motivation create strong impact on adaptive culture. Based on above analysis, I hypothesize that:

Hypothesis 1. Transformational leadership has positive influence on adaptive culture.

Boin et al. (2013) proves that in crisis period, traits of transformational leaders are important to strengthen resilience because leaders should generate sense of things should be done for staff, communicate messages, identify responsibilities and enhance learning from experiences. Organizational resilience and organizational resources are positively impacted by transformational leadership along with employee self-efficacy (Wang, Zhao & Zhang, 2022). Six elements consisting of transformational leadership are found to encourage companies adapt successfully to changes and increase organizational resilience (Witmer & Mellinger, 2016). Besides, Valera, Jung and Andrew (2021) indicates that transformational leadership associated positively with resilience of firms. Based on above analysis, I hypothesize that:

Hypothesis 2. Transformational leadership positively affects organizational resilience.

Adaptive culture along with resilient leadership play a mediate role in organizational performance and resilience (Suryaningtyas et al., 2019). In organization with adaptive culture that leaders view crisis in opportunistic view point is important element in deciding resilient of organization (McManus et al., 2008). Costanza et al. (2015) considers adaptive organizational culture as culture that allows employees to take risk, have common believe in problem solving and open to innovation which is crucial to adapt and be ready to change to respond, overcome crisis as well as enhance resilience. Based on above analysis, I hypothesize that:

Hypothesis 3. Organizational resilience is impacted positively by adaptive culture.

There is little research on the mediating role of adaptive culture on relationship of organizational resilience and transformational leadership. However, some empirical evidence showing the mediating effect of organizational culture on relationship of organizational performance and transformational leadership were published (Elshanti, 2017). Xenikou and Simosi (2006) states that organizational culture mediates the relation between transformational leadership style and performance. Transformational leadership and organizational resilience relationship are mediated by adaptive culture (Odeh et al., 2021). Based on above analysis, I hypothesize that:

Hypothesis 4. Adaptive culture mediates relationship of organizational resilience and transformational leadership.

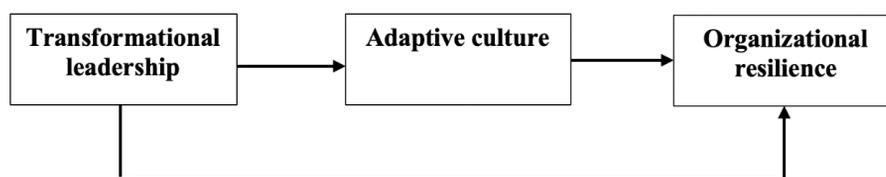


Figure 1: Research model

3. RESEARCH METHODOLOGY

3.1. Sample

Non-probability sampling method which is choosing units from a sample in a non-random way (Berndt, 2020) was used in this research. Specifically, snowball sampling technique was applied because

I only know some people in surveyed company while I needed to collect 200 responses from company’s employees so I sent survey to Mrs. Thu who is employee of company and asked her to forward the survey to other colleagues to gather enough data.

Sample size for the research was 200 which is taken from population of 1300. This is because in regression analysis, the sample size should be 100 or larger to analyze (Hair et al., 2010) so that the investigation of a part of population can represent results of a whole group as well as collect much responses to survey objectively. Moreover, the sample size must have minimum of 5:1 ratio with variables to reduce problems of overfitting data so the higher the ratio, the more researchers prefer (Hair et al., 2010).

Table 1: Demographic description of research’s participants

No.	Variables	Frequency	Percentage
1	Sex		
	Male	72	36%
	Female	128	64%
2	Working seniority		
	Under 5 years	84	42%
	5 – 10 years	59	29.5%
	10 – 15 years	28	14%
	Over 15 years	29	14.5%
3	Position		
	Employee	146	73%
	First line manager	37	18.5%
	Middle manager	15	7.5%
	Top manager	2	1%

After three weeks of collecting answers, demographic description of 200 participants was summarized in Table 1. From Table 1, it can be seen that this study was dominated by female with smaller than 5 years of working seniority in employee position. Female accounted for 64% of participants and the others were male. With working seniority, most of respondents were working under 5 years corresponding to 42% while 29.5% of respondents were who have worked in company from 5 to 10 years. With 10 – 15 years and over 15 years of seniority, proportion of respondents were 14% and 14.5% respectively. For position variable, the higher the job position, the smaller the number of respondents. Employees made up the largest percentage with 73% of participants while first line manager, middle manager and top manager only accounted for 18.5%, 7.5% and 1% only.

3.2. Measure

Transformational leadership is defined to have three main characteristics are vision, intellectual stimulation and inspirational motivation (Rafferty & Griffin, 2004). Items of Rafferty and Griffin (2004) was adopted because in research of Odeh et al. (2021), the researchers used these items to measure transformational leadership variable successfully. Vision was measured by three items are my leadership understands clearly about where we are going, my leadership knows what our team will be in 5 years, my leadership does not know about where company is going (Rafferty & Griffin, 2004). Inspirational motivation was measured by three items are my leadership makes staffs feel proud as part of company

through his/her words, my leadership tells about positive working unit, my leadership inspires employees to think environment shifts as opportunities (Rafferty & Griffin, 2004). Intellectual stimulation was measured by three items are my leadership pushes employees to look at old issues in innovative ways, my leadership has concepts forcing employees to reconsider about things that I never questioned, my leadership pushed employees to reconsider their basic assumptions of job opportunities (Rafferty & Griffin, 2004).

Items of Costanza et al. (2015) was adopted because in research of Odeh et al. (2021), the researchers used these items to measure adaptive culture variable successfully. Adaptive culture was measured by eight items adopted by Costanza et al. (2015) were obtaining fresh point of view to recognize and understand issue; predict new product has huge market demand; devoted to upgrading present products, including successful products, as well as creating new products; believe in the infinite of organizational future; to tackle future requirements, provide training or apprenticeship program to train workers about new, essential skills; do intra-organizational investigations to identify the way to create different product with industry; performing new work process in company's budget and ahead of time; collaborating with outside parties to implement policies which is beneficial for company in long-term.

Ten items adopted by Prayag et al. (2018) were used to measure two reflective variables of organizational resilience are planned and adaptive. Items of Prayag et al. (2018) was adopted because in research of Odeh et al. (2021), the researchers used these items to measure organizational resilience variable successfully. Planned resilience was measured by five items are given how much others depend on us, how we prepare for the unanticipated is proper; to make sure that plans for emergency is efficient, company is committed to practicing utilizing and testing them; we focus on being capable of responding to the unanticipated; we set up specific priorities for things that are essential during and after crisis; we track the industry proactively to get early alert of emerging problems (Prayag et al., 2018). Adaptive resilience was measured by five items are my company has adequate resources to deal with sudden change; in case key personnel fail to appear, company always has others to fill in their role; in case company suffered crisis, our company would have good leadership within business; we are known for capability of innovative use of knowledge; we are able to make difficult decisions immediately (Prayag et al., 2018).

3.3. Data collection and analysis

I contacted with Mrs. Thai Thi Minh Thu who is employee of company that was selected to survey. When collecting data, I designed survey on Google Form and sent the form to Mrs. Thai Thi Minh Thu through her mail. In order to make sure the link worked effectively and participants could understand the survey, I conducted pilot test with Mrs. Thu and 10 colleagues of her. Mrs. Thu. After that, I asked Mrs. Thu to forward my official survey link to other colleagues in north offices of company. Recruitment process only ended when there were no additional cases to reach and responses is collected adequately. In order to collect 200 valid responses, I sent the survey to 300 people with response rate is 66.7%. The error rate of responses was 0 because I set all requirements in Google Form to make sure that participants would answer all questions and choose only one option for each statement before submit.

PLS-SEM (partial least squares structural equation modeling) was employed to test the research model of this study. After analyzing diverse tools to analyze data, PLS-SEM was considered as the most suitable one because it is appropriate for small sample size (Hair et al., 2017) and it is also fit in exploratory research (Peng & Lai, 2012) like this study. Specifically, SmartPLS version 4 software was used to assess constructs' validity as well as reliability to test stated hypotheses.

Analysis of this model was done through some values such as outer loading - estimate the relationship in reflective measurement model; cronbach’s alpha – measurement of internal consistency of items (Nunnally & Beinstein, 1994); composite reliability – assessing internal consistency of reliability (Hair et al., 2014); HTMT – evaluation of discriminant validity (Hair, Ringle & Sarstedt, 2011); R square – indicating the explanatory power of endogenous variable by exogenous variables if $R^2 < 0.25$ is very weak, $0.25 \leq R^2 < 0.50$ is weak, $0.50 \leq R^2 < 0.75$ is moderate, $R^2 \geq 0.75$ is substantial (Hair, Ringle & Sarstedt, 2011); path coefficient – measurement of variables’ reliability and look for collinearity and VIF is expected to be less than 5 for absence of common method bias (Ringle, Da Silva & Bido, 2015).

This research model consisted of mediating variable was adaptive culture so to test direct and indirect effects, SmartPLS is the most effective software. I performed 1000 subsamples’ bootstrapping procedure with significance level was 0.05. If P values < 0.05 , indirect effect is significant and vice versa (Hair et al., 2011).

4. RESULTS

4.1. Measurement model results

4.1.1. Evaluation of reliability

Table 2: Outer loadings

	AC	ORAR	ORPR	TLIM	TLIS	TLV
AC1	0.843					
AC2	0.846					
AC3	0.889					
AC4	0.711					
AC5	0.525					
AC6	0.837					
AC7	0.844					
AC8	0.308					
ORAR1		0.847				
ORAR2		0.828				
ORAR3		0.899				
ORAR4		0.887				
ORAR5		0.862				
ORPR1			0.835			
ORPR2			0.877			
ORPR3			0.892			
ORPR4			0.870			
ORPR5			0.905			
TLIM1				0.879		
TLIM2				0.913		
TLIM3				0.865		

TLIS1					0.901	
TLIS2					0.939	
TLIS3					0.937	
TLV1						0.887
TLV2						0.924
TLV3						-0.232

Hair et al. (2017), outer loading is used to estimate the relationship in reflective measurement model. If outer loading value is less than 0.708, it reflects that observable variables may not be reliable to measure latent variables and it should be considered to remove that item (Hair et al., 2017). Based on Table 2, it can be seen that outer loadings of AC5, AC8 and TLV3 are smaller than threshold 0.708 so these three items were removed from the model.

Table 3: Cronbach’s alpha and composite reliability

	Cronbach’s alpha	Composite reliability
AC	0.909	0.930
ORAR	0.918	0.937
ORPR	0.924	0.943
TLIM	0.863	0.916
TLIS	0.917	0.947
TLV	0.783	0.901

Cronbach’s alpha is expected to range from 0.7 to 0.95 because between this range, internal reliability construct is achieved (Nunnally & Beinstein, 1994). After removing items AC5, AC8, TLV3 from model, it is seen from Table 3 that Cronbach’s alpha values indicate achievable internal reliability construct of this model.

Composite reliability also estimates internal reliability construct of model and composite reliability is preferred to be higher than 0.7 (Hair et al., 2014). Based on Table 3, results of composite reliability are higher than 0.7 and lower than 0.95 reflects good indicator for construct reliability.

4.1.2. Evaluation of validity

Table 4: Average variance extracted (AVE)

	AVE
AC	0.689
ORAR	0.748
ORPR	0.767
TLIM	0.785
TLIS	0.857
TLV	0.820

AVE illustrates that on average, more than half of the variance of its indicators can be explained by construct when AVE is higher than 0.5 and this result is desirable because it has convergent validity (Hair, Ringle & Sarstedt, 2011). Hence, from Table 4, AVE results of this model is acceptable.

Table 5: HTMT criterion results

	Heterotrait-monotrait ratio (HTMT)
ORAR <-> AC	0.447
ORPR <-> AC	0.553
ORPR <-> ORAR	0.326
TLIM <-> AC	0.718
TLIM <-> ORAR	0.513
TLIM <-> ORPR	0.554
TLIS <-> AC	0.647
TLIS <-> ORAR	0.346
TLIS <-> ORPR	0.411
TLIS <-> TLIM	0.705
TLV <-> AC	0.710
TLV <-> ORAR	0.440
TLV <-> ORPR	0.541
TLV <-> TLIM	0.699
TLV <-> TLIS	0.571

In order to examine the discriminant validity, HTMT results is used. HTMT indicator is expected to be lower than 0.9 because if it is higher, collinearity problem such as multicollinearity is existed among latent constructs and most of items of constructs estimates identical things (Hair, Ringle & Sarstedt, 2011). According to Table 5, it can be seen that HTMT results of the model reflect good discriminant validity.

4.2. Structural model results

Variance inflation factor (VIF) coefficient of inner model ranges from 1.561 to 2.159 indicates that there is no collinearity issue in the construct. If VIF is higher than 4, there will be a sign of multicollinearity (Ringle, Da Silva & Bido, 2015).

Table 6: Path coefficients, f-square and R-square results

	Path coefficients	f-square
AC -> ORAR	0.449	0.353
AC -> ORPR	0.515	0.360
TLIM -> AC	0.300	0.170
TLIS -> AC	0.260	0.164
TLV -> AC	0.307	0.159
TLIM -> ORAR	0.361	0.089
TLIS -> ORAR	0.202	0.047
TLV -> ORAR	0.281	0.038
TLIM -> ORPR	0.313	0.071
TLIS -> ORPR	0.157	0.062

TLV -> ORPR	0.260	0.069
R square: AC = 0.535 ORAR = 0.751 ORPR = 0.761		

R square reflects model’s predictive accuracy (Hair, Ringle & Sarstedt, 2011). From Table 6, 53.5% of adaptive culture is explained by transformational leadership which is a moderate level. While organizational resilience is explained by adaptive culture from 75.1% to 76.1% which is a substantial level.

Path coefficients fluctuates around +1 illustrates positive relationship of independent variables on dependent variables while path coefficients is closer to -1, it means that independent variables negatively affect dependent variables (Hair, Ringle & Sarstedt, 2011). Based on Table 6, it can be seen that transformational leadership has positive impact on adaptive culture. Besides, transformational leadership also positively affects organizational resilience. Meanwhile, adaptive culture also influences positively on organizational resilience.

Effect size f-square estimates the efficiency of independent variables on dependent variables (Cohen, 2013). If f-square < 0.2 is no effect, 0.2 ≤ f-square < 0.15 is weak effect, 0.15 ≤ f-square < 0.35 is moderate effect, f-square ≥ 0.35 is strong effect (Cohen, 2013). From Table 6, adaptive culture has strong impact on organizational resilience while transformational leadership has moderate impact on adaptive culture. Unexpectedly, the effect of transformational leadership on organizational resilience is weak.

4.3. Direct and indirect effects results

Table 7: Direct and indirect relationships value

Hypotheses	Relationship	P values	BCa CI 2.5%	BCa CI 97.5%
Hypothesis 3	AC -> ORAR	0.000	0.315	0.570
Hypothesis 3	AC -> ORPR	0.000	0.341	0.651
Hypothesis 1	TLIM -> AC	0.000	0.149	0.432
Hypothesis 1	TLIS -> AC	0.000	0.132	0.414
Hypothesis 1	TLV -> AC	0.000	0.195	0.427
Hypothesis 2	TLIM -> ORAR	0.001	0.055	0.220
Hypothesis 2	TLIM -> ORPR	0.001	0.068	0.247
Hypothesis 2	TLIS -> ORAR	0.001	0.053	0.195
Hypothesis 2	TLIS -> ORPR	0.002	0.063	0.227
Hypothesis 2	TLV -> ORAR	0.000	0.074	0.218
Hypothesis 2	TLV -> ORPR	0.000	0.086	0.245
Hypothesis 4	TLIS -> AC -> ORAR	0.001	0.053	0.195
Hypothesis 4	TLIS -> AC -> ORPR	0.002	0.063	0.227
Hypothesis 4	TLIM -> AC -> ORAR	0.001	0.055	0.220
Hypothesis 4	TLIM -> AC -> ORPR	0.001	0.068	0.247

Hypothesis 4	TLV -> AC -> ORPR	0.000	0.086	0.245
Hypothesis 4	TLV -> AC -> ORAR	0.000	0.074	0.218

According to Table 7, BCa CI 2.5% and 97.5% shows significance of the structural paths associated with hypotheses based on a 5% significance level. If P values < 0.05, indirect effect is significant (Hair et al., 2011). From P values of indirect relationship in Table 8, it can be concluded that adaptive culture plays mediator role in linking transformational leadership and organizational resilience. Especially, P values of both direct and indirect relationships is lower than 0.005 indicating that all proposed hypothesis 1, hypothesis 2, hypothesis 3, hypothesis 4 of this research are supported.

5. DISCUSSION AND LIMITATIONS

5.1. Discussion

The positive influence of transformational leadership on adaptive culture is supported. Based on aforementioned findings, it is concluded that transformational leadership impacts positively on adaptive culture in which inspirational motivation affects adaptive culture the most. Other researches of Odeh et al. (2021), Xenikou and Simosi (2006), Block (2003) found the same findings. Based on transformational leadership theory of Bass and Avolio (1994), three characteristics of transformational leaders are asserted to advance the tendency to considering risks as opportunities to learn, adapt and restructure organizational ability to fit in different organizational situations (Teece, 2016). Akkaya (2020) states that transformational leaders can create adaptive internal environment where employees has transformational role models to encourage and motivate them to be nippy and innovative. Even though transformational leadership results in positive effect on adaptive culture, the impact within company is quite moderate which is dissimilar with significant impact of Odeh et al. (2021) due to differences in research context and sectors. Aviation petroleum company belongs to Ministry of Transport (Skypec, 2019) so operation of company still has to follows and depends on the direction of Ministry and Government. As a result, leaders of company are not the one who can totally control company and influence organizational culture.

The positive effect of transformational leadership on organizational resilience is supported. The results indicate that transformational leadership impacts positively affects organizational resilience. Identical findings are supported by Boin, Kuipers and Overdijk (2013), Wang, Zhao and Zhang (2022), Suryaningtyas et al. (2019). Transformational leaders have focused vision, individual values and motivational behaviour to create positive emotions, self-esteem and increase capability, belief in company to overcome crisis (Brockner & James, 2008). Transformational leadership has characteristics to improve employees' enthusiasm to complete work successfully even in bad turbulent circumstances (Bass, 1985) and make employees dedicate to work and increase organization's survival (Ostroff, Kinicki & Muhammad, 2013). Nevertheless, the impact of transformational leadership on resilience of company is weak which is different from results of Valera, Jung and Andrew (2021) showing the strong influence. The cause of difference is because different of research time scope and sample, the previous study have sample from various companies in different industries.

Positive influence of adaptive culture on organizational resilience is supported. The findings illustrate that adaptive culture impacts positively and significantly on organizational resilience. This result is identical with earlier results of Costanza et al. (2015), Barasa, Mbau, and Gilson (2018) and Southwick et al. (2017). Odeh et al. (2021) pointed out that during normal or crisis period, adaptive culture improves decision making process and level of flexibility along with creativity of business. Adaptive culture creates conditions

for the development of adaptive quality and proactive response in uncertainty situation (McManus et al., 2018) and it increases positive behaviours for employees to make them consider difficulties as opportunity to develop and grow (Odeh et al., 2021). Specifically, the results reflect that although adaptive culture impacts strongly on both planned and adapted resilience, planned resilience is affected stronger. Weick and Sutcliffe (2007) stated adverse findings indicating that planning for threats will limit company from tackling with exceptional challenges. However, results of this study has denied previous findings and planning for organizational resilience in crisis is a requirement for all company including surveyed organization and that is why company can overcome Covid-19 pandemic as well as maintain normal operation.

The mediator role of adaptive culture is supported in the results of this research. The results indicate that adaptive culture mediates the relationship of transformational leadership and organizational resilience. As mentioned above, the positive direct effect of transformational leadership on organizational resilience is weak. As a result, it reflects the crucial role of adaptive culture as a mediator because only when transformational leadership creates and supports the development of adaptive culture in business, then it will enhance organizational resilience. This findings are in alignment with previous results showing mediator role of adaptive culture in the link between transformational leadership and organizational resilience of Odeh et al. (2021), Verdu-Jover, Alos-Simo and Gomez-Gras (2018) and Elshanti (2017).

5.2. Theoretical implications

The research questions that were raised to investigate within this study is built on existing theory of transformational leadership along with adaptive culture and organizational resilience. The findings of this study contributes to understanding of positive relationship between transformational leadership and organizational resilience through mediator effect of adaptive culture. It extends knowledge boundary related to the theory in new context which is company in north side of Viet Nam in post-pandemic period. Therefore, it will be helpful and attractive for academics and researchers interested in these topics. Although this research was conducted in a developing country in Southeast Asia, the results were supported by earlier researches with not much unexpected results. Additionally, this research employed quantitative method with expectation to provide more practical evidence than qualitative and case study method utilized in researching organizational resilience (Costanza et al., 2015) with hope to bridge the previous research gaps.

5.3. Practical implications

Based on stated findings and discussion, it provides for managers and leaders in petroleum organizations huge implications especially for further crisis like Covid-19 in the future. The results of this study indicates that transformational leadership has positive impacts on organizational resilience by nurturing adaptive culture, especially inspirational motivation with reasonable support through discussion is asserted to have stronger effect than other outcome variables. Thus, leaders should focus on advancing inspirational motivation trait to increase adaptive culture resulting in higher resilience of firm. However, the impact of transformational leadership on resilience is weak which means that transformational leadership style affects positively on resilience of company but it may not the leadership style that is the best for resilience of company. As a result, the mediator role of adaptive culture is important, only when transformational leadership creates and supports the development of adaptive culture in business, then it will enhance organizational resilience. Adaptive culture has a significant role in increasing resilience capacity of firm so practitioners and leaders can make use of this variable to increase organizational survival potentials. Leaders can extend knowledge on how adaptive culture is nurtured and navigates uncertainties for preparation and adaption with changes.

5.4. Limitations

Although this study provides considerable theoretical and practical contributions, it remains some limitations. Due to the fact that the time to complete this project is short so data was collected within only one month so it may not reflect the situation of surveyed company in a long-term situation but only for period of the research.

Additionally, the sample size of this research is small and only focus on north side of Vietnam so the sample is not diverse and the findings cannot reflect the different in perspectives and responses of participants from different sides. According to Table 1, most of participants were female so there will be different in personalities, point of views between male and female (Wille, 2018) so further research requires the equality in the number of male and female participants. As mentioned above, 300 surveys had been sent while this study only needed 200 responses because snowball technique has disadvantage in reaching participants due to researcher cannot contact directly with participants rather using assist of others (Berndt, 2020).

6. CONCLUSION

This research has fully answered all the research questions as well as achieved research aim and objectives. The study investigated hypotheses of relationships between transformational leadership, adaptive culture and organizational resilience by using quantitative research method and employing survey based on pre-validated measures to make better understanding in post-pandemic period. Proposed hypotheses were supported by results of the study: transformational leadership has positive influence on adaptive culture, transformational leadership positively affects organizational resilience, organizational resilience is impacted positively by adaptive culture and adaptive culture mediates relationship of organizational resilience and transformational leadership. These results contribute to understanding of academia and practitioners on the effect of transformational leadership on organizational resilience through the mediator role of adaptive culture to survive during hard time and recover after crisis.

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THE FACTORS IMPACT THE REVISIT INTENTION TO DA NANG DESTINATION OF GEN Z: THE CASE OF DOMESTIC TOURISTS

Author: Phan Thi Ngoc Anh¹

Mentor: Pham Tien Manh

ABSTRACT: *The purpose of the research is to discover the factors influencing the revisit intention of gen Z tourists to Da Nang city. From this perspective, Da Nang images will be encouraged to customers' perceptions of future returns, improving Da Nang's tourism sector. A clustering questionnaire was used to gather information from 170 gen Z respondents. The association between variables was examined using partial least squares modeling (PLS), a method of structural equation modeling (SEM). The result indicates the push and pull motivations of gen Z when travel to Da Nang. Lastly, destination marketing also significantly mediates the city's image and revisit intention. The results demonstrates that destination images have a significant impact on tourists' intentions to return.*

Keywords: *destination image's components; revisit intention; gen Z; Da Nang city; travel motivation; destination marketing*

1. INTRODUCTION

The tourism industry plays a crucial role in Vietnam's GDP, contributing to 584.884 billion VND (13.9%) (MOF, 2021). However, the Covid-19 pandemic negatively impacted travel and tourism, preventing both domestic and foreign tourists from travelling as a consequence of social distance measures during the outbreak (Le, 2021). This led to the closure of tourism-related businesses, causing 90% of employees in Hanoi to quit their jobs and 90% of businesses in Da Nang to close. The pandemic has forced many businesses to shut down, affecting the overall economy and the growth of related industries (Le, 2020).

Given these details, numerous academic studies have emphasized the impact of the Covid epidemic on the tourism sector and covered the post-Covid tourism recovery in Vietnam. However, the majority of these studies are directed either towards domestic tourists or generic study topics (the national tourism business). As a result, this study paper will pay close attention to how domestic tourists, or gen Z, perceive the tourism business in Da Nang. From there, it may learn more about the travel intentions and behaviors of young Vietnamese people while also coming up with solutions to encourage repeat visitors to Da Nang.

The study investigates the impact of destination images on customer satisfaction and revisit intention in Da Nang. It explores push and pull motivations and aims to analyze the consistency between perceived and projected images. The study also examines the advantages of destination marketing in image congruence and revisit intention. The ultimate goal is to make recommendations for boosting tourism in Da Nang during the post-"new normal" era. To clarify the objective of the research, this paper will specifically answer the following research question:

Firstly, which factors influence revisit intention in the context of Vietnamese Gen Z domestic travel?

Secondly, how are visitors motivated intrinsically and extrinsically to revisit Da Nang by push and pull factors?

¹ Banking Academy.

Thirdly, how is the perceived image congruent with the projected image to build the destination brand in visitor perception?

Lastly, how does destination marketing convey the project image to stimulate revisit intention of customers?

2. Theoretical framework

2.1. Destination Image Classifications

In some researchs, Destination images was classified into two dimensions: perceptual and cognitive (Lin and Hsu, 2015; Stylos *et al.*, 2016), which evaluates the physical features of environments and attractiveness that motivate tourists to visit the destination (Govers, Go and Kumar, 2007), and secondly is affective image, which encompasses feelings and emotions raised towards and by the destination (Stylos *et al.*, 2016).

Other studies have categorized destination pictures using the hierarchy of effects models, which are composed of various cognitive, affective, and conative components that positively influence consumer satisfaction and revisit intention (Tran, Nguyen and Tran, 2021). The cognitive picture is explicitly conveyed through the sum of beliefs and knowledge, indicating evaluations of the perceived features of the destination, in accordance with Martín and Rodríguez del Bosque, 2008; Stylos *et al.*, 2017). According to (Hallmann, Zehrer and Müller, 2015), The affective component of destination image refers to an individual's emotional responses or assessments, which being expressed towards the destination. Before making travel plans, travelers develop a favorable affective image of the place when emotions are in alignment with goals and anticipated outcomes (Tran, Nguyen and Tran, 2021). Despite the fact that many experts believe that conative destination image is synonymous with intention, it explains how and why the feelings of first-time or returning visitors affect the decision to visit a particular destination (Pike & Ryan, 2004; Tasci *et al.*, 2007).

2.2. Motivation theory in tourism field

Motivation is the term used to describe the factors that influence people's behavior (Solomon *et al.*, 2019). From a psychological perspective, motivation happens when a client wants to satisfy what they want. This desire can be utilitarian (wanting to achieve a functional or practical benefit) or hedonistic (wanting to experience emotional responses and fantasies) (Lopes, 2011). In tourism studies, scholars agreed that motivation was the main factor in interpreting an individual's behaviour, especially in image formation and decision-making processes (Lopes, 2011; Khuong and Ha, 2014).

An extension of utilitarian needs in the tourism context have argued that a tourist's motivation is driven by 2 forces: push factors (an internal motivation) and pull factors (an external motivation) (Rashid and Patwar, 2016). Crompton proposed seven-psychological motives of push factors, including escape, self-explanatory, relaxation, prestige, social interaction, and skin-ship enhancement (Crompton, 1979). By utilizing an integrated approach, Yoon and Uysal aimed to increase the theoretical and empirical data about the relationship between push and pull motives, satisfaction, and destination loyalty (Yoon and Uysal, 2005). This paper found that tourists to Northern Cyprus were more inclined to destination loyalty if it satisfied their internal (push) motivation; and pull motivation was only significant in predicting tourist satisfaction. In later research, Mai and Huynh re-validated push motivation's role in influencing revisit intention in the context of Ho Chi Minh City (Khuong and Ha, 2014). It's interesting to note that the report builds on earlier research by asserting through empirical evidence that the pull element had a greater impact on revisit intention than the push factor. According to these findings, it is necessary to link push and pull

aspects in promotional materials for certain audiences and to modify marketing strategies to support revisit intention (Khuong and Ha, 2014).

2.2.1. Motivation to travel among gen Z Vietnam

Vietnamese travelers are driven by both external and internal motivations when making travel decisions considering shopping, novelty-seeking, and relaxation as core motivations (Khuong and Ha, 2014; Thammadee, 2015; Ha *et al.*, 2020). To analyze the connection between travel motivation and revisit intention among Generation Z, four push motivation components were chosen: Escape/Relax, Relationship, Nature, and Stimulation (Nguyen, 2014). According to research of Ha *et al.*, tourists visiting Ba Ria Vung Tau are highly inclined to return to enjoy nature and bond with family and friends (2020). Additionally, research by Airbnb found that booking for adventure travel – Stimulation among gen Z globally has increased drastically (190%) (*What's Next in Travel: The Rise of Gen Z, Adventures and Conscious Dining*, 2020), with the need to explore the unknown, feeling excitement and having adventurous experiences (Pearce and Lee, 2005). Two elements of pull motivation were considered in this context: Accessibility and the natural environment and man-made attractions (Preko, Doe and Dadzie, 2019). By incorporating results from Truong and, it is expected that accessibility and attributes are significant factors that pull gen Z to visit and revisit Da Nang (Nguyen, 2014; Truong, 2019).

2.3 Destination Branding

2.3.1. Concept of destination branding

According to Professor John Urry's theory in 2003: *Pushing Tourism to the Boundaries*, a destination brand can be thought of as a "collective hallucination" (Pike, 2012, p.6). Indeed, destinations are more complicated than goods and services, leading to a more multi-dimensional destination branding concept (Pike, 2005) that comprises both tangible and intangible components (Salehzadeh, Khazaei Pool and Soleimani, 2016). Blain and friends viewed branding concepts from the organization's point of view and viewed the concept of destination image, adopting the stance that the brand should influence the tourists' choice of destinations (Blain, Levy and Ritchie, 2005). In this study, it adopt Aaker's conceptualization of branding, comprising brand identity (brand's perspective) and brand image (tourist's perspective) (Pike *et al.*, 2010; Pike, 2012).

2.3.2.1. Brand identity as projected image

Brand identity plays a key role in formulating decision making powers of tourism managers and internal stakeholders which is created by DMOs and reflects the contribution of all brand elements to image and awareness (Govers, Go and Kumar, 2007); which provides a direction and meaning to the destination brand and its strategic vision (Tsaur, Yen and Yan, 2016). Scholars referred to brand identity as projected image (Govers, Go and Kumar, 2007; Pike, 2012). Brand identity can be reflected as an induced image in travel experience as discussed in earlier sections, more specifically, a set of secondary images in their perception (Duan *et al.*, 2020). As such, the impact of projected destination image on DI can positively differentiate a destination from the others in the tourist decision making process. According to Picazo and Moreno-gill, visual content is a crucial element for creating a positive first impression since it makes individuals simpler to recognize than written content (Picazo and Moreno-Gil, 2019). Destinations "produce promotional materials to promote, reaffirm, or advocate the decision to attract visitors" about the perceptions of the destination as a valuable asset for a place (Duan *et al.*, 2020a, p.8). Due to the prevalence of the Internet and social media in pre- and post-trip preparation, the consumption of visual content and images is emerging as the new paradigm in tourist communication (Pabel and Prideaux, 2016).

Danang’s projected image:

Da Nang city is famous for long historical development with political incidents, however, it is considered a young city (Truong, 2019) - city with nature characteristic and human touch, catering to Gen Z lifestyle. In fact, Gen Z values sustainable tourism and gives it a lot of attention, while also protecting the natural world’s beauty and seeking out the most novel and intriguing experiences in every place they visit (*Gen Z đi du lịch khác gì so với thế hệ còn lại (Phần 1)*, 2022). To position itself as a fantastic and dynamic city towards tourists and visitors, Da Nang was proposed to be a “Fantasticity” since 2014, hence, all future Danang tourist advertisements and communications are based on this slogan (Thien, 2022). In fact, Danang’s values include freshness and proximity to nature, its golden beach, its distinctive and contemporary bridges that signify its rapid growth, its young vigor and strong drive to rise, and, most importantly, its people’s warmth and friendliness with smiles on their faces. Additionally, it is important to recognise that Danang’s environmental orientation is one of the most important components that make up Danang’s identity. This side of identity has been agreed between internal stakeholders, with a high agreement in relics and landscapes as the most prominent identity of the city (Truong, 2019).

2.3.2.2. Brand image as perceived image

The phrase “brand image” relates to the actual perception that a traveler has of a particular location. Kim and Lehto (2013) examined brand image as the result of gathering data from both direct and indirect experiences at the destination. Since perception is the process by which a person selects, arranges, and interprets a variety of inputs (sights, sounds, color, etc.) to create a meaningful and cohesive picture of a location (Solomon et al., 2020a), perceived image presents a much more complex and comprehensive image after visiting a destination, which aids them in making decisions on whether they will revisit the destination. Motivation and experience significantly impact a tourist’s perceived image, which predicts their behavior, satisfaction, and decision-making (Marine-Roig and Clavé, 2016). In Danang context, a city known for its luxurious destinations, beaches, tropical sun, friendliness, youth, and quality infrastructure, is considered a desirable destination.

2.4. Destination marketing

Destination marketing aims to influence potential travelers’ decisions about their travels, with images playing a crucial role. Hence, tourism marketers aim to create, enhance, and overrate the image of the destination, as it significantly affects how people perceive tourism products (Chi & Qu, 2008). The reputation of a destination significantly impacts a destination brand’s success, as a result, it is clear that image issues are directly related to issues with tourism marketing and have a significant impact on a destination’s capacity to draw tourists (Tasci and Gartner, 2007).

2.5. Relationship and hypothesis development

2.5.1. The relationship of DI and Revisit Intention

Revisit intention is defined as the likelihood of tourists returning to a place of destination at a later time by Gitelson and Crompton (Gitelson and Crompton, 1984), and is a type of post-consumer behavior (Hallak, Assaker and El-Haddad, 2018) that is described as an increase in consumers’ pleasure. Also, expressing a want to return is demonstrated by a readiness to suggest a place to family and other similar social groups (Tran, Nguyen and Tran, 2021). Many studies have been conducted using revisit intention as a dependent variable, and it has been discovered that perceptions of values, service quality, perceived risk, subjective norms, and destination perception significantly influence tourists’ attitudes and probability to travel there

(Abbasi et al., 2021). In revisit intention, service's quality, satisfaction, destination image and perceived values are deemed as prime predictors that significantly impact tourist behaviour (Chen and Tsai, 2007; Assaker, Vinzi and O'Connor, 2011).

Stylos also offered a conceptual model of DI as a predictor of intention to revisit, with a focus in investigating the complicated link between destination image components and behavioural intents (Stylos *et al.*, 2016). Nevertheless, research conducted by Duan and colleagues states that customers' revisited purpose can be positively influenced by the destination image (Duan *et al.*, 2020a). In the conditions of outbound tourism from Russia to Greece, Stylos and colleagues re-confirmed the impact positively of destination image in terms of affective and conative images on tourists' intention to retravel a destination (Stylos *et al.*, 2017). Moreover, in the research of Ba Ria -Vung Tau context, the factors including: Infrastructure, Variety Seeking, Accessibility, Local food, Atmosphere, Environment, Price Value, Leisure and Entertainment were all found to have a positive impact on the intention of visitors in this area (Ha *et al.*, 2020). In detail, six components of Vietnam DI are: Appealing cultural elements; Cuisine; Natural environment; Travel infrastructure; Socio-economic environment; Natural resources and language; and Atmosphere of the place (Nocca, 2017). From this standpoint, the paper will develop the first hypothesis as follows:

H1: the destination images contribute to the tourist's revisit intention to destination.

2.5.2. The relationship of motivation to revisit intention

According to Maslow's theory, the desires of travellers were organized into a hierarchy, with the lowest level being relaxation. Based on Maslow's hierarchy of needs, (Pearce and Lee, 2005) developed a travel motivation theory labeled the Travel Career Ladder. Broadly, the theory states that with the accumulation of travel experiences, a tourist will progress upward through the levels of motivation. Meaning that, the more people travel, the more likely their motivation is to move upwards in Maslow's model. Tourists are also being pulled to destinations because of their accessibility, historical-cultural attractions, natural-ecological heritage, and service delivery (Preko, Doe and Dadzie, 2019). These elements are thought to have a direct and significant impact on tourist satisfaction, with a positive increase in pull factors increasing a traveler's satisfaction with the location (Mulia Sirait *et al.*, 2019) Destination images are well known to be strong "pull" considerations when choosing a place (Prayag, 2010). Researchers found a symbiotic relationship between these motivations, with push factors stimulating the need and desire to travel and pull factors simultaneously pulling them toward a specific destination that satisfies those needs and desires (Kim and Lehto, 2013; Whyte, 2017). These forces not only have positive impacts on tourist satisfaction, but also their future revisit intention (Qiao *et al.*, 2008).

In this context, we take into account how travel motivation can influence how a holistic image affects travel intention. It's expected that:

H2: Travel motivation including push and pull are promote the tourist's intention to revisit a destination.

2.5.3. The congruence of projected image and perceived image

Studies from both theoretical and empirical perspectives have been conducted to understand the relationship of sender-and-receiver image relationship. Generally, it was accepted that "the closer projected image and perceived image are, the better" ((Marine-Roig and Clavé, 2016). It is addressed that a potential mismatch in demand-and-supply-side images can lead to a gap between the fact and visitors' perceived image; and the more reality differs from the expectations, the less likely they are to consider the destination in their evaluation for next holiday (Goodall and Ashworth, 2013; Govers, Go and Kumar, 2007; Tsaor, Yen and Yan, 2016; Duan *et al.*, 2020a). The measurement of the image gap outlined the need for internal

stakeholders to rectify the gap between perception and reality. Therefore, the closer the gap between projected image and the perceived image, the stronger their satisfaction, thus, revisit intention (Marine-Roig and Clavé, 2016). With its beneficial impacts, achieving a good level of congruence between the projected and perceived image has become a key objective for NTOs and DMOs (Duan *et al.*, 2020b). Additionally, the congruence between images can assist tourism organisations in evaluating their activity in promoting destination image and whether or not it has been accepted by their target audience. In this regard, “gap bridging” was proposed by (Govers, Go and Kumar, 2007) as a key component in brand image analysis with the goal of addressing and closing brand image gaps at various levels (Marine-Roig and Clavé, 2016). The significance of the congruence can be hypothesized as:

H3: The concurrency between projected image and perceived image impact revisit intention.

Danang’s projected image and perceived image and revisit intention

Despite the popularity of destination images in tourism research, not much has been written about communicating DI between DMO (sender) and external stakeholders (receiver) in the context of Vietnam tourism. The review of key contributors (Nguyen, 2014; Truong, 2019) investigated the destination image from the destination’s point of view highlight as: Da Nang has long been pursuing the image of a nature and human touch city, which is defined in the “Danang fantasticity” holistic image that is central to promoting their talent attraction policy. When advocating urban design that “improves long-term community well-being and meets key unmet requirements originating from the nature of twentieth-century urban development,” the image of nature is vital (Goodall and Ashworth, 2013). However, this study only explains how tourists are perceived through secondary sources; it does not address how they perceive Vietnam from their own experiences. So, based on the Danang’s holistic image and identity, it can be expected that: *Environmental and psychological factors of Danang are the most crucial components that tourists seek for in their visit; in exchange, the policy of nature and human touch city effectively delivers the images that are meaningful to them.*

While designed to attract talent and start-ups, (Truong, 2019) argued that Da Nang was (and is) struggling with the criteria of a liveable city as investors and tourists are not benefiting from the policy. The author then discussed the recent idea of Danang as an inspiring city by (Le, 2019) in an internal unpublished document. Inspiring places was approached from peak experience: inspiring places facilitates the peak experience and personal journey beyond interaction with other people and culture to reach one’s inner self (Keken, 2015). Following that, an inspiring city highlights the importance of interaction with the other, a sense of accomplishment and creating emotional attachment through human touch. However, this theory is inappropriate with the Gen Z, besides, base on the fantasticity slogan, to orient Danang’s destination image to Gen Z, it can be considered:

- *Tourist’s perception of Danang as an fantatisticity can be effectively delivered through nature attributes: Luxurious destination, Beaches, Tropical Sun, and quality infrastructure*
- *Tourist’s perception of Danang as an fantatisticity can be effectively delivered through human touch attributes: friendliness, young, and dynamic*

2.5.4. Destination Marketing in the relation of Congruence among images and revisit intention

The rapid advancement of communication technology and internet information has led to a “eyeball economy” phase in the travel sector. Tourism advertising plays a crucial role in marketing activities (Feng *et al.*, 2022; Malvica *et al.*, 2022), since people use their cellphones to access apps, browse the internet, update their status, and share their moods on social media (Decré and Cloonan, 2019; Rao and Ko, 2021).

Advertising studies show that consumers' visual attention to advertisements is influenced by viewing tasks and viewing duration. Consumers typically spend more time watching images in commercials if they want to recall a brand. As a result, Liu et al. (2002) found that customers' perceptions, decisions, and even behaviors are significantly influenced by the visual display of information and the subsequent visual experience, Thus, it is anticipated that:

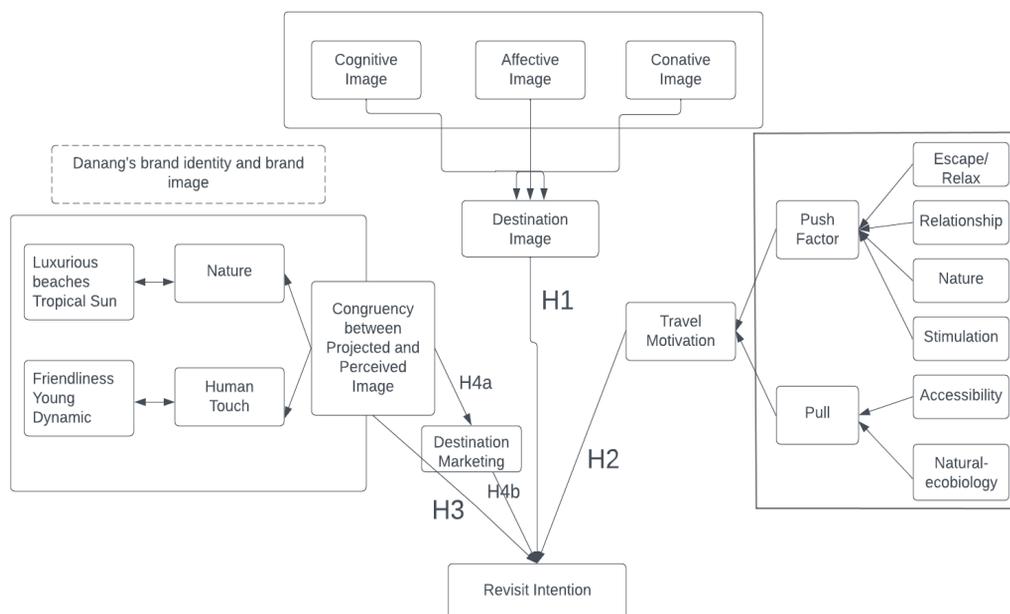
Hypothesis 4a: The congruence between images impact on the destination marketing

Hypothesis 4b: The destination marketing impact on the revisit intention of customers.

2.6. Model

In this research, there are 3 types of variables includes: 3 independent variables were employed for the destination images, congruence of images and travel motivation factors. Besides, the revisit intention considered as the dependent variable. Lastly, the destination marketing considered as the moderate variable which moderate the relationship of congruence between images and revisit intention of customers.

Figure 1: Factors impacts revisit intention of domestic tourists



Source: Author, (2023)

3. RESEARCH METHOD

3.1. Data collection

The questionnaire was chosen for efficient data collection in this study, as it improves content validity, reliability, and morality. Clustering sampling, specifically probability sampling, divides the total population into group representing a population, hence, this study was select gen Z as presentative with 200 participants in Vietnam. The age stratification was predetermined, ensuring precise conclusions for the population.

3.2. Data processing

This study utilized structural equation modeling (S.E.M.) to measure the impact of tourism destination image, motivation factors, and Da Nang's images on visitor revisit intention. The P.L.S. approach was found

to be the most effective substitute for S.E.M. S.E.M. models are considered confirmatory, as they contrast theoretical knowledge and hypotheses with actual facts. As a result, as opposed to being exploratory, these models are thought of being confirmatory. The measurement model interprets relationships between constructs and indicators, while the structural model outlines the relationships between them (Henseler, 2017).

3.3. Measurement and variable scale

The study using the Likert-scale measurement to estimate 5 variables as follow

Table 1: List of variables in the research

Variables	Types	Items	Measurement	Sources
Destination image image	Independent	20	Likert scale	(Chen and Tsai, 2007; Stylos <i>et al.</i> , 2016)
Travel motivation	Independent	18	Likert scale	(Moscardo <i>et al.</i> , 1996; Said and Maryono, 2018)
The congruence of projected image and perceived image	Independent	7	Likert scale	(Bharuchi and Rasheed, 2022)
Destination marketing	Moderate	4	Likert scale	(Diukova <i>et al.</i> , 2013)
Revisit intention	Dependent	3	Likert scale	(Kour, Jasrotia and Gupta, 2021)

4. DISCUSSION

This paper aims to identify the impact of destination image and how to motivate the tourist to (re) visit the destination, using the SEM-PLS model. Data from 170 respondents was collected and analyzed, focusing on explaining and analyzing hypotheses. The chapter compares these hypotheses to previous theories to reach the objective set.

Table 2: Hypothesis result

Hypothesis	Relationship	Path-coefficient	P values	Result
H1	DI -> RI	0.112	0.015	Supported
H2	TM -> RI	0.488	0.000	Supported
H3	CI -> RI	0.272	0.030	Supported
H4a	CI -> DM	0.643	0.000	Supported
H4b	DM-> RI	-0.134	0.045	Supported

Source: Author, (2023)

4.1. The relationship between destination image and revisit intention

Hypothesis 1: *the destination images contribute to the tourist's revisit intention to a destination.*

The first hypothesis focuses at how the DI affects a tourist's (re)visit to a destination, and the results show a significant correlation between the two variables. The hypothesis's P-value is 0.015, which is less than 0.05 and indicates a statistically significant relationship between the destination image and revisit intention. Additionally, the path coefficient value is 0.112; hence, the hypothesis concludes that DI has a favorable effect on RI.

The study found that perceptions of a destination significantly impact respondents' intentions to revisit. While cognitive and affective images have a greater impact on return intention, conative images hasnot. It emphasized that negative impressions of destination images can reduce visitors' likelihood to return and encourage alternative locations (also see tin Chi and Qu research 2018; Prayogo and Kusumawardhani (2016); Assaker and Hallak (2013) who found that perceptions of a destination could influence travelers' intentions to return there. Tourist satisfaction and behavior, such as destination selections, assessments of the destination, and plans for future behavior, will be impacted by the destination's image (Bigne *et al.*, 2001).

In detail, in terms of the cognitive image, the items have strong influence on the revisit intention for the destination including quality infrastructure (COI 1), quality service (COI 12), attractive culture festival (COI 13), adventure game (COI 14), attract cuisines (COI 12) which have the outer loading higher than 7.8, the rest are lower than 7.8 index but still have impact significantly. In terms of affective image, the relax (AI 3), excited (AI2), AI5, AI4 and AI1 have contribute to the destination images to stimulate the revisit intention of customers respectively. However, both items of the conative images have eliminated from the destination images, which mean it does has effective impact on the revisit intention of gen Z in the Da Nang context.

4.2. The relationship between travel motivation and revisit intention

Hypothesis 2: travel motivation in terms of push and pull motivation have a positive impact on the revisit intention of tourists.

Investigating how push and pull motivation can heighten a tourist's desire to (re)visit a specific region is the aim of this theory. The results indicate a strong link between the two variables. The hypothesis' P-value, which is equal to 0.000, demonstrates the strong link between travel motivation and intention to return. The hypothesis is supported by the path coefficient value is 0.488 and that TM positively affects RI.

This finding confirmed the idea that higher levels of intrinsic and extrinsic travel motivation increase visitors' likelihood of returning to a place. According to past studies (Nguyen, 2014; Chu and Luckanavanich, 2018), understanding the motivations behind people's travel can help us identify the key elements that significantly influence why they choose to visit a particular area. According to studies (Hasan, Ahmad and Ismail, 2018; Lemy, Nursiana and Pramono, 2020), when push and pull variables are satisfied, tourists' motivations may be connected to their intentions to visit or return to a particular location in the future.

Based on the items selected in PLS, it is highlighted that in the perception of Vietnam's gen Z, push motives have a higher impact on the desire to revisit than do pull motivations. In detail, the push motivation of tourists to Da Nang was to rest and relax (TMS1); connect with relatives (TMS4) ; feel belonging (TMS6); get a better appreciation about nature (TMS9); and find excitement (TMS10). Besides, the pull motivations are: trip and foods' price are affordable (TML1); quality infrastructure (TML3); attractive beaches (TML5); and impressive nature sightseeing (TML4). This finding will contribute effectively for NGOs and tourist institutions in attracting tourists' intention.

4.3. The relationship of Congruence among images and Revisit intention

Hypothesis 3: Congruence among images has positive impact on the revisit intention of tourist

The hypothesis examines the impact of local characteristics on visitors' intentions to return to Da Nang. A strong correlation (P-value 0.030) and path coefficient (0.272) are found, indicating that consistency between projected and perceived images influences RI. The findings suggest that CI has a favorable effect on RI.

The findings show that there is little difference between projected (supply) and perceived (demand) pictures of Da Nang when all have a positive effect on travelers' intentions to return and their degree of satisfaction. Other investigations have confirmed this conclusion, stating that "the closer projected image and perceived image are, the better" is true for tourists' intentions to return (Marine-Roig and Clavé, 2016). The issue of a potential mismatch between supply and demand-side perceptions is discussed. The more the reality deviates from visitors' expectations, the less likely it is that they will take the location into consideration when deciding where to go on their next vacation (Goodall and Ashworth, 2013). Thus, impact effectively on the revisit intention of congruence between images indicating the close gap between the projected images and perceived images of Da Nang city.

4.4. The Destination marketing role in the relationship of Congruence among images and revisit intention.

Hypothesis 4a: *The congruence between images impact positively on the destination marketing*

Hypothesis 4b: *The destination marketing has an inverse impact on the revisit intention of customers.*

Firstly is the H4a which indicates the impact of CI on the DM, the result shows that the CI has impact effectively in the positive way when the path-coefficient at 0.634 and is supported by the P - value.

This is because make tourists take an eye on destination's image, particularly projected visuals, is difficult. The NGOs and institutions must devise a means of getting the picture and its significance to the audience. The best option is to use destination marketing to tell clients about the destination and promote its image. visitor information has been shown to be a useful notion in understanding destination image and the visitor decision-making process (Gursoy and McCleary, 2004). The findings concur with those of the 2010 study by Monilia, Gomez, and Consuegra.. Additionally, based on the responses to the table 2, the social media technique (DM2) was identified as the most appropriate by respondents to obtain destination information among the destination marketing methods. According to Bertot et al. (2010), social media (DM2) has actually greatly improved customers' ability to acquire knowledge about travel information. Individual travel plans and leisure-time consumption patterns are significantly altered by social media because it improves information exchange, reduces uncertainty, and develops a sense of community among users (Zehrer and Grabmüller, 2012). Therefore, when customers search for travel-related information online, social media has become an essential avenue for creating, sharing, and marketing user-specific content (Xiang and Gretzel, 2010; Sin et al., 2020). Even in the middle of the COVID-19 outbreak, a large number of consumers are being persuaded to travel by the expanding UGC content pertaining to tourism (Flores-Ruiz et al., 2021).

Second, the H4b illustrates the inverse effect of destination marketing on the intention to return, which is corroborated by the path coefficient of -0.134 and the P-value of 0.045. With the contrary result, it is evident that increased advertising may result in fewer tourists returning, and vice versa. This can be interpreted in terms of the fact that marketing that exaggerates Da Nang's image would result in less repeat visits and a negative perception of the city among tourists. Travelers must rely on the information provided to them through marketing channels because the tourism productions are ethereal and cannot be physically experienced before being purchased. Although it's common practice to use exaggerated images to pitch products, marketers frequently aren't aware of how this can influence future product evaluations (Alcocer and Lopez, 2019). The commercials lose their utility and credibility when passengers found that the experience is different from what they were shown in the advertisements, which leads to dissatisfaction. Hence, Delivering on promises made as destination marketing is crucial (Kotler, Bowen, and Makens, 2020).

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This research examines the impact of destination images, travel motivations, and image congruence on revisit intention in Da Nang's tourist recovery post-Covid. The SEM panel data model was used to examine the relationship between variables. Results show that destination images positively influence customer revisit intentions, travel motivation significantly affects revisit intention, and congruence between images indicates a close-gap, encouraging revisitation. Destination marketing moderates the association between pictures and visitors' intentions to return, but has the opposite effect on customers' intentions to return due to unrealistic marketing.

5.2. Recommendations

First of all, destination images are a crucial predicate for consumer revisit intentions based on the association between customer revisit intentions and destination images. It is critical to establish a strong brand identity and promote it successfully. Influential people in the tourism industry are aware of the destination's reputation, which could be a competitive advantage (Foroudi et al., 2018). Therefore, organizations like NGOs and universities need to create positive, enticing destination images of Da Nang that encourage customers to feel content and at home before continuing their journey. Visitors believe that the cognitive picture is the most appropriate when traveling, therefore their intention to return will be greatly influenced by their experience and beliefs. In detail the company should focus on the COI 1 (infrastructure), COI 3 (famous destination), COI 7 (night entertainment service); COI 12 (attract cuisines); COI 13 (quality service). Moreover, the company should emphasize the feeling that the destination can bring to customers, which are AI2 (excited), AI3 (relax), and AI5 (fun).

Based on the result, destination marketing effectively conveys images through word-of-mouth and social media, but deceptive advertisements can reduce customer revisit intention. It is crucial for destination marketing to ensure realistic, suitable images that convey the destination's inner meaning. Besides, the images of Danang has highly perceived as CI1-friendly, CI2-youthful and CI3-dynamic which suitable with the spirit of gen Z. This finding has important implications for rural destination marketing when promoting Da Nang's projected and perceived images, noting that the positive meaning and images should be conveyed significantly through social media to reach more audiences.

Last but not least, the motivation to make revisit decision is vital. Based on the aforementioned findings, NGOs and travel agencies have a responsibility to grow and improve the pull motive; specifically, the TML 3 (infrastructures) needs to be developed which is an advantage compared to other tourist destination like Quang Ngai city. In addition, it is necessary to maintain the quality of food and its price (TML 1), green and clean beaches (TML 5) to improve the satisfaction of visitors when traveling.

5.3. Limitation and further research

There are certain shortcomings in the study. For convenience, the constructions related to before and after the visit were measured simultaneously, that is, after the site visit. As a result, it was impossible to determine respondents' impressions of the site before they visited. The estimated items for the variables continue to overlap as well, which makes the analysis more difficult. Last but not least, the research was restricted to Da Nang destination and specifically gen Z owing to time limits, therefore it did not cover the full tourism industry.

So, the future research is expected to recover these limitations and aim for both domestic and foreign tourists to compare the difference in two types of tourists' behaviors and tendencies when traveling.

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IMPROVE PRODUCTIVITY AND QUALITY OF CONSTRUCTION ENTERPRISES LISTED ON VIETNAM'S STOCK MARKET

**Author: Phan Bich Ngoc¹, Tran Anh Duong¹, Ho Thi Phuong Thao¹,
Nguyen Mai Phuong¹, Tran Anh Ngoc¹
Mentor: Doan Huong Quynh¹**

ABSTRACT: The renovation of the country over the past 40 years has achieved many achievements, in which the construction industry has made outstanding contributions. Along with different economic sectors such as: agriculture, industry, services, the construction industry is one of the key economic sectors of each country. Bearing those responsibilities, it is impossible not to mention the role of the construction enterprises, especially construction enterprises listed on Vietnam's stock market. To be able to survive and develop in the fiercely competitive environment of the market economy, construction enterprises in general and our country's construction enterprises in particular are facing great opportunities and challenges. To be able to stand firm in the market, it is required that each construction company greatly improve its productivity and quality. The improvement of productivity and quality for enterprises in general and construction enterprises in particular is an urgent requirement in the current integration context.

Keywords: construction industry, opportunities, challenges, the improvement of productivity and quality

1. INTRODUCTION

1.1. Context of the research

- Research topic on factors affecting productivity and quality for enterprises, specifically construction enterprises listed on the stock market in Vietnam.
- The authors have surveyed the financial statements of typical construction companies listed on the stock market in the period of 2017-2021, from which to analyze and give comments as well as objective solutions to improve productivity. quality performance for the above enterprises.

1.2. The results of the research project

The study identified two main groups of criteria that affect the productivity and quality of listed construction companies: the group of overall productivity indicators, the group of divisional productivity indicators. Evaluation and analysis of the above groups of indicators let readers know the ability to raise capital of listed construction enterprises in Vietnam over the years in terms of scale and method of mobilization; The profitability of some listed construction companies is also affected by the Covid-19 epidemic; solvency of listed construction enterprises; the setting up of annual reserve funds of enterprises and the outstanding limitations and risks that need to be resolved and handled.

1.3. Rationale for conducting the research

Overall research purpose: improving productivity and quality of construction companies listed on the Vietnam stock market.

Specific research purpose:

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- Determine the factors affecting the productivity and quality of construction enterprises listed on the Vietnamese stock market
- Measuring the impact of factors on the productivity and quality of construction enterprises listed on the Vietnamese stock market
- Proposing solutions and recommendations to overcome and improve the productivity and quality of construction enterprises listed on the Vietnam stock market

2. THEORETICAL FRAMEWORK

2.1. The concept of productivity and quality of enterprises

Productivity is not a new concept, which has gradually appeared in the process of production and exchange of goods. The producer of goods has been very interested in how to produce many products at the same time. more products – in a simple meaning, productivity. However, over time, the concept of productivity is no longer limited to how many products are made per unit of time or how many products a worker produces in a day, but is a factor of productivity. productivity is associated with the market, and the competition and therefore will go hand in hand with the quality factor.

Quality is a familiar and commonly used concept in the field of human activities. However, quality is also a complex category, an issue that causes much controversy and disagreement. In enterprises, quality is understood as product quality and broadly understood to ensure benefits between the parties including the interests of customers, the business, and society related to environmental protection, sustainable development

2.2. The role of productivity and quality in enterprises

Currently, the enterprise is in the period of resuming production and business after a prolonged period of the Covid-19 pandemic; Competition is becoming more and more fierce. In that context, enhancing productivity and corporate quality is an important factor to support business development.

A highly productive organization is more likely to return on investment. Such institutions are also more resistant to any state of the economy. For a less productive organization, it is possible to achieve a relative surplus due to other competitive business conditions, but is very vulnerable to crisis in recession economy

The productivity of a business has an important impact on national issues such as inflation, domestic and international competition, employment levels, and national budgets. A study conducted by the American Institute of Industrial Engineers found that 60% of senior industrial managers consider productivity to be one of the top two or three most important issues facing each country. They also point out that the consequences of low productivity include:

- Difficulty in selling products and services domestically as well as abroad.
- Reduces quality of life as well as international attraction and influence.
- Failure to meet health, education and social welfare needs.

Productivity and production costs have an inverse relationship. This means improving productivity reduces production costs and increases sales efficiency, thereby increasing the output of the value-added system, creating more jobs. Countries such as Germany, Japan, Taiwan, and Singapore are proof of how productivity enhancement has enhanced their competitive position in the international arena.

3. THE SITUATION OF PRODUCTIVE QUALITY OF CONSTRUCTION ENTERPRISES LISTED ON VIETNAM STOCK MARKET

Firstly, some enterprises face difficulties in capital flow, costs, escalating prices, lack of human resources...Some enterprises have low self-financing and debt mobilization, which greatly affects productivity

and quality. of enterprises, the capital structure is not reasonable, not suitable with the business plan and development strategy of the enterprise. This is continuing to become a great burden for businesses and construction contractors, forcing many units to switch from speeding to “defensive”. The capital growth rate among groups of construction enterprises is uneven, even decreasing such as construction enterprises with a scale of less than 500 billion VND, the group of construction enterprises with more than 50% contributed capital by the State, and the group of construction enterprises. Self-financing ability of some enterprises is low, typically the group of construction enterprises with capital scale of over 1000 billion, the group of construction enterprises with more than 50% capital contributed by the State and the group of construction enterprises. Besides, the group of construction enterprises with capital scale of less than 500 billion, the group of construction enterprises without state capital contribution, the group of construction enterprises with low debt capital. The low capital scale causes these groups of enterprises to face many difficulties in the process of production and business activities, in the expansion of production scale, in technological innovation, etc. The capital structure of the majority of construction enterprises is not reasonable and appropriate, which makes business performance not as good as expected. Having an optimal capital structure, enterprises will be guaranteed to operate efficiently and safely. However, the operating efficiency of the construction enterprises in the industry is markedly different. There are businesses with high growth and strong development, but on the contrary, there are many businesses that operate inefficiently, leading to heavy losses.

Secondly, the profitability of some construction enterprises is not high. It means that the use of capital is not efficient, productivity is poor, investment projects have not been rigorously appraised, and effectiveness is not guaranteed of the project. During the five years of research, profitability of state-owned enterprises has fluctuated, although these indicators have increased during this period, but still at a modest level. From that, it shows that the appraisal and assessment of investment efficiency of the project is not good, many projects are delayed, not up to the construction schedule and the management and use of capital of these groups of enterprises is still poor. many limitations.

Thirdly, the ability to compensate for losses when risks occur in production and business activities of enterprises have not been paid due attention. Besides the construction enterprises that have taken measures to set up provisions such as buying insurance for works and projects to compensate for business risks, there are still many enterprises that have not paid much attention to this work. Because these deductions are mostly used to encourage implementation, not mandatory. Therefore, in practice, the setting up of provisions for construction enterprises listed on the Vietnam stock market is rarely done or when implemented is only a formality, not suitable for its purpose and meaning. Many businesses even take advantage of this provision to make provisions when in fact these amounts are not included in expenses just to reduce taxable income and evade CIT. There are very few construction enterprises listed on the Vietnam stock market that buy insurance to prevent risks in production and business, risks of natural disasters, etc. Even though they have enough conditions to set aside, they still want to take advantage of this provision for investment.

Fourthly, the ability to ensure financial safety is low. The quick solvency of the construction enterprises showed signs of steady increase, although the increase was not remarkable, and the two current solvency indicators, the instant solvency, tended to change unstably. With such solvency plus the characteristic that the industry uses a large capital scale, construction enterprises listed on the Vietnam stock market will be at a disadvantage when raising capital. In addition, this indicator is also a warning sign of potential financial difficulties in the future for construction enterprises listed on the Vietnam stock market. In addition, if the ability to compensate for losses when risks occur in business activities is low, unable to compensate for the risks that occur, the enterprise will be insolvent, leading to bankruptcy.

4. SOLUTIONS TO IMPROVE THE PRODUCTIVITY AND QUALITY OF CONSTRUCTION ENTERPRISES LISTED ON VIETNAM'S STOCK MARKET

First of all, build a suitable raising capital strategy for listed construction companies

Due to the characteristics of construction enterprises that need a very large amount of capital, for the financial managers of construction enterprises, the problem of building a capital mobilization strategy to both meet the capital needs for the business process and create favorable conditions for the construction industry plus the conditions to improve the efficiency of capital use for enterprises are very important issue. Currently, the forms of raising capital in construction listed enterprises are not diversified, the main ones are still traditional forms such as commercial credit, bank credit, prepayment by buyers, initial capital contribution and use of capital and use of retained earnings. Therefore, in the future, it is necessary to diversify forms of capital mobilization such as foreign direct investment, bond issuance, and financial leasing. Enterprises need to develop a detailed and specific raising capital strategy for each traditional raising capital channel, and at the same time research and plan to approach new raising capital channels. Beside the diversity of capital mobilization and detailed raising capital strategy, the solution is equally important for construction enterprises, which is to build a strong credit relationship network, create good relationships with credit institutions, applications, business partners, join mass organizations, associations, actively participate in forums and social activities to increase investment opportunities.

Moreover, good management of receivables, inventory, and cash capital helps to improve the solvency of the business, thereby helping to accelerate the cash generation cycle in the business.

Enterprises with high solvency will create trust with business partners, with customers and with commercial banks and credit institutions, thereby helping the enterprise's capital turnover turn faster. productivity and quality of capital of the enterprise will be improved. In order to improve the solvency of SMEs, it is necessary to pay attention to the following issues: Firstly, good management of receivables: Enterprises need to study and evaluate the financial situation of the investor, the ability to sell products to decide to participate in the bidding; It is necessary to clearly stipulate the sales policy, credit policy, discount policy, payment term, payment method, etc. When signing a contract with the investor, thereby serving as a basis for resolving disputes when signing a contract with the investor. necessary. Monitor the debt situation regularly, periodically, arrange the time of the receivables, take timely measures to urge the payment of the debts that are about to be due. Secondly, For inventory management of construction enterprises: Because of the specificity of the construction industry, which is the construction of large works and projects, the time is long, so inventory accounts for a very large proportion. Therefore, in order to improve inventory management, construction enterprises need to promote the centralized procurement and contract management model for main materials at the construction site; take advantage of finance to reduce the price of material supply; forecast market price situation; proactively implement contracts for early purchase and import of essential materials and equipment for the project; Actively looking for new sources of quality and reasonable prices; Upgrade the construction organization model with the participation of subcontractors to share risks. Third, the good management of capital in cash will help businesses not only help businesses have many favorable opportunities in production and business but also improve their reputation in the market. construction enterprises listed on the Vietnam stock market need to make plans to forecast their cash capital expenditure needs at different times of the year. Thanks to good cash flow management, enterprises always ensure that they have the necessary amount of cash to pay for expenses, thereby ensuring solvency in the enterprise, helping to maintain financial security, and contributing to ensuring financial capacity. main.

In addition, to build a reasonable capital structure in line with the business plan and development orientation of the construction enterprises listed on the Vietnam's stock market. Each SME can use one or more capital sources to finance production and business activities. With the characteristics of the construction industry that requires a very large amount of capital and the capital market, the construction time of works and projects of construction enterprises often takes a long time, therefore, construction enterprises need to have a capital mobilization strategy and structure. capital suitable to the production and business situation and development orientation of enterprises in the coming time. In order to do this well, construction enterprises need to establish a close relationship between the direct production and business departments and the capital management department of the enterprise to promptly grasp the production and business situation of enterprises. When grasping the capital needs of the enterprise and the current situation of the enterprise, the capital management department will calculate the capital sources that the enterprise can mobilize, the cost of mobilizing each of those capital sources, the advantages and disadvantages of each. disadvantages of each of those capital sources and taking into account the risks that may be encountered... In addition, regular supervision is required to promptly adjust capital structure due to changes in the macroeconomic situation as well as production and business activities of enterprises.

Furthermore, strengthen measures to prevent risks in production and business activities of construction enterprises. A risk is an unexpected bad event that occurs in production and business activities, leading to losses for enterprises. In order to overcome and minimize risks to the lowest level, the construction enterprises need to conduct an assessment of the probability of the occurrence of risks for each field and the extent of damage incurred when the risks occur. Also determine the type of insurance available for that type of risk and the cost of insurance. On that basis, decide whether to self-insure or buy appropriate insurance for each type of risk. In addition, businesses need to pay attention to the issuance of regulations and regulations on labor safety, and strengthen safety control at construction sites.

Last but not least, training and fostering the workforce and improving the skills of workers. The labor force is a decisive factor to the production and business efficiency of an enterprise. Therefore, in order to improve the efficiency of production and business, enterprises need to have a plan to train their staff, including: improving labor selection standards, ensuring the quality of specially recruited employees. for managers and in parallel with training, the regular inspection and assessment of qualifications as well as the progress of employees. At the same time, it is necessary to encourage employees to constantly learn and improve their knowledge to meet technical requirements. If the training does not have a positive change, the capacity as well as the health is not suitable, it is necessary to take tough measures such as rearranging work positions or even dismissing these subjects.

5. CONCLUSION

The construction industry in general and the construction enterprises on the Vietnamese stock market in particular play an important role in the economic development of the country. Every year, the contribution to GDP of construction enterprises accounts for a large proportion, creating jobs for a large number of workers and creating high added value for the economy.

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FACTORS INFLUENCING THE DEVELOPMENT OF E-COMMERCE IN VIETNAM

Author: Pham Thi Phuong¹

ABSTRACT: Before the Covid-19 pandemic began, consumers' level of access to technology as well as online shopping habits of Vietnamese customers have not equaled with the growth pace of the regional and international digital economy, leading to the E-commerce has not really taken advantage of the digital economy. The research analyzes factors affecting the development of Vietnam's e-commerce in the current booming digital economy. The papers also analyzes the impact of the Covid-19 pandemic on the economy as well as market restructuring, consumer spending habits, and technology revolutions. Besides, authors analyze the development of e-commerce in the current virtual economy and propose a sustainable development direction for Vietnam's e-commerce industry in the future.

Keywords: E-commerce, digital economy, economical factor, legal factor, human factor, technological factor.

1. INTRODUCTION

The more society develops, the more geographical limitations in the life and culture of citizens of each country reduce. Thanks to the exceeding advance of science and technology, people can now narrow the distance between continents all over the world. Science and technology developments as well as the increasing globalization of economies have bolstered the birth of e-commerce. Nowadays, online shopping has been more and more prevalent in normal life and has become one of the most important parts of the economic structure. This is a potential industry in the digital economy where technology renovations always change over time, especially in Vietnam where they are widely applied to social life in general and businesses in particular. On the one hand, e-commerce contributes to the formation of new business models, increases revenue, helps reduce costs, improves business efficiency and opens up a large market for both domestic and foreign customers. Moreover, e-commerce has enhanced convenience and speed for customers when helping buyers who are living far away but still be able to choose goods or services around the world by clicking just a few simple taps on a smartphone or computer. E-commerce is now one of the most important driving forces to promote social and economic developments, and is a key factor in accelerating the internationalization of world economic life. Thanks to the applicability of e-commerce, a wide range of businesses, even the poorest country or a remote area still has the ability to access larger markets through the Internet. E-commerce not only supports but also promotes commercial activities of businesses to get over the territory of the country to become a global and truly integrated activity.

2. RESEARCH OVERVIEW

Many studies have examined the relationship between information technology infrastructure, social cognitive infrastructure and the development of e-commerce. Tining Haryanti and Apol Pribadi Subriadi (2019) argue that "Trust" always appears as an important factor in the adoption of e-commerce, especially in the early beginning when e-commerce was introduced as an alternative to traditional stores. They believe that over time, the more e-commerce grows, the more "Trust" becomes an inherent part of the system and plays an important role in the sustainability of e-commerce. Meta&Bain (2022) argues that the rapid growth

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of e-commerce in the region, driven by increasing internet penetration, rising disposable income as well as the significant increase of mobile technology adoption and public awareness

There have been several researches on the impact of social cognitive infrastructure and information technology on e-commerce. Many factors and characteristics related to the influence of these factors have been explained by previous studies (Muhammad Dharma et al., 2018); (Vipin Jain, Bindoo Malviya, Satyendra Arya, 2021). However, previous research results did not mention social awareness and information technology factors, forgetting that legal and economic factors also have a profound influence on the promotion of online commerce. Moreover, the continuous changes of technology and the rapid development of online sales platforms along with the outbreak of the Covid 19 pandemic in many countries have completely changed people's point of views about online shopping. Therefore, insight research on the influence of four factors on the development of e-commerce is absolutely necessary. The main objective of the study is to clarify the impact of 4 factors Technology, Law, Society and Economy on e-commerce in Vietnam, and finally to propose several recommendations for the development of the Vietnam's e-commerce market in a sustainable way in the future.

3. RESEARCH METHODOLOGY

We use general methodological research methods. In addition, we also use a combination of other methods such as statistics, analysis, evaluation, synthesis, ...

- Descriptive statistics method: Through detailed descriptions of the indicators analyzed from the collected data source.

- Statistical method, comparing data of e-commerce development in 3 regions of the country through the period 2016 - 2022 in Vietnam in the context of the digital economy.

- Synthetic analysis method: the collected information and data are analyzed in terms of the necessity and unnecessary of the collected data to summarize and put into the research paper.

4. RESEARCH RESULTS

Overview of the current digital economy:

By the end of February 2023, there have been more than 78 million chip-based identification cards successfully issued in Vietnam, and online public services have been widely deployed with high efficiency. The percentage of people using the internet and online services is increasing significantly.

The contribution of the digital economy to GDP continues to increase; many businesses actively transform digitally. The proportion of added value of the digital economy in GDP by the end of the first 6 months of 2022 will reach 10.41% (this proportion will be 9.6% in 2021). The rate of enterprises paying taxes electronically reached 99%.

Many financial technology companies (fintech) have been established in Vietnam, such as: Online Mobile Services Joint Stock Company (M-Service) – MoMo e-wallet; Fiin Financial Technology Innovation Joint Stock Company – FIIN CREDIT; AirPay- ShopeePay Joint Stock Company... Along with fintech companies, the transportation sector also launched many digital technology - digital economy applications in business to compete with Grab, Uber such as FastGo, Be, etc. VATO... In the field of tourism, Vietnam has applications such as: Mytour, Luxstay ... competing with Booking, Agoda or AirB&B of the world...

The digital economy in Vietnam is experiencing positive changes in recent years. Not only the renovation of a wide range of technology applications but also the level of people's access to technology has dramatically risen. To take advantage of opportunities, especially the development of e-commerce - one of the most important components of the digital economy, Governments and enterprises need to have appropriate strategies.

Overview of current e-commerce:

E-commerce (Virtual shopping), is the buying and selling of products or services over electronic systems such as the Internet and computer networks. E-commerce is based on several technologies such as electronic money transfer, supply chain management, Internet marketing, online transaction process, electronic data interchange (EDI), inventory management systems. and automated data collection systems.

E-commerce today involves everything from ordering “digital” content such as instant online consumption, order goods and general services, “meta” services facilitate other forms of e-commerce. At the institutional level, large corporations and financial institutions use the Internet to exchange financial data to facilitate domestic and international business. Nowadays, data integrity and internet security in e-commerce are increasingly being focused on by businesses and governments.

Currently, there are many views on the forms of participation as well as how to divide these forms in e-commerce. If divided by participants, there are 3 main objects including: Government (G - Government), businesses (B - Business) and Customers (C - Customer or Consumer). The main forms of e-commerce include: business to business (B2B); Business to Customer (B2C); Business to Employee (B2E); business to government (B2G); Government to Business (G2B); Government to Government (G2G); Government to Citizens (G2C); Customer to Customer (C2C); Customer to Business (C2B); online-to-offline (O2O); Mobile commerce (m-commerce).

4.1. Technological factors**4.1.1. About Internet infrastructure**

Information technology (IT) is a term that includes software, internet networks, and computer systems used for the distribution and processing of data, exchange, storage and use of information under different forms and is also the foundation of “digital economy” in general and “e-commerce” in particular. Information technology (IT) is an integral part of the infrastructure for e-commerce in Vietnam. IT infrastructure for e-trade can be divided into many different components such as: Internet, Payment system, Information management system, Information security, Customer support service.

About the percentage of internet users across the country:

Year	Number of Internet Users	Percentage (%)
2016	49.063.762	52,68
2017	53.860.000	57,28
2018	55.190.000	58,15
2019	59.200.000	61,53
2020	68.170.000	70,53
2021	68.720.000	70,3
2022	71.100.000	73,2

Table 1: Number of Internet users over the years from 2010 to 2022.

Source: internetvietnam.net

+ It is noticeable that the growth of Internet users is the most different after the milestone of 2019. In the period before 2019, the average growth rate of the number of users in using the internet per year fell to 33,601,773 people per year, after 2019 to date has increased to 39,666,666 people per year.

+ The number of internet users in 2022 will reach 71.1 million users, 2.65 times higher than in 2010 and tend to increase in the following years.

Recently, Vietnam has advanced telecommunications - Internet with modern technology with a high Internet universality. The Internet not only has become an essential element in people’s lives but also bolsters the infrastructure of the economy and play an important factor in promoting the industrialization and modernization of the country.

+ After 25 years, Vietnam now has 72.1 million Vietnamese people using the Internet (accounting for 73.2% of the population) in daily life, ranking 13th in the world.

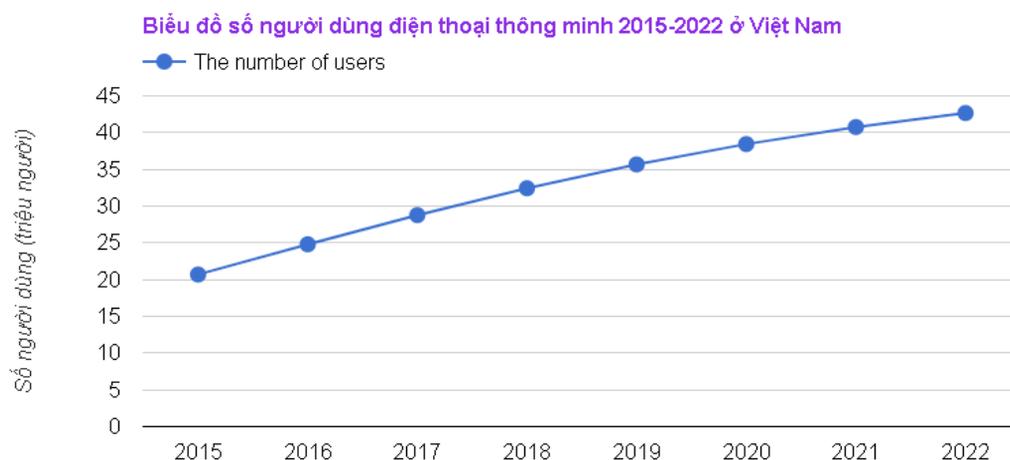


Figure 1: Number of smartphone users in the period 2015 - 2022 in Vietnam (Unit: Million people)

Source: Market research firm Statista

+ Mobile broadband infrastructure has covered 99.73% of villages nationwide; 19.79 million households have fiber optic cable, reaching 72.4%. Fiber optic cable systems have been deployed to 100% of communes, wards and townships, 91% of villages, 100% of schools.

+ The number of mobile phone subscribers using smartphones is 94.2 million; the number of mobile broadband subscribers is 82.2 million, accounting for 74.3% of the population. There are more than 564 thousand domain names “.vn” ranked 2nd in ASEAN, top 10 in Asia - Pacific region.

From that, it can be seen that, although starting slowly compared to the global process, after 25 years of constant efforts, Vietnam has risen to catch up and go with other countries in the region and the world. Despite being affected by the Covid-19 epidemic, Vietnam still maintains a stable growth in the number of mobile phone users every year.

Moreover, Vietnam’s 5G network has been tested and started to be deployed by the end of 2021. In Vietnam, Internet service charges are moderate, accessible, especially broadband Internet service charges rate is also the lowest in the Asia-Pacific region.

4.1.2 Protection and confidentiality of personal information

Kaspersky’s survey in April 2022 found that about 75% of individuals in Southeast Asia encountered at least one online threat when making digital payments. The survey also highlighted that a fraction of participants reported experiencing social engineering scams via text messages or calls (37%), encountering phishing websites (27%), becoming a victim to fake offers and transactions (27%) and a proportion of respondents admitted to having been scammed (25%) by such forms...

Social engineering scams are the biggest attack threat in most Southeast Asian countries such as

Indonesia (40%), Malaysia (45%), Philippines (42%), Singapore (32%) and Vietnam (38%). 52% of respondents reported losing money due to bank account and credit card fraud. Of these, 23% lost less than \$100, 13% lost between \$101-500, and 48% lost no money. The top five threats leading to financial loss in Southeast Asia are hacked accounts (47%), fake and phishing apps (45%), disguised malware (45%) and fake offers and deals (43%).

Some scam tricks through e-commerce platforms: Facing the situation that scams to appropriate property through e-commerce platforms are taking place increasingly popular. The Department of E-commerce and Digital Economy has issued a warning about the tricks to appropriate property through e-commerce platforms as follows:

The first form: The scammer often sets up a seller account with fake information on the e-commerce platform, then fakes the actual shops and business companies to create trust for customers.

Scammers offer products for 3-4 times less than the list price and use descriptions like “shock sale” or “liquidation”. These products are often small, high-value, easy-to-fake items such as electronics and phones. When a buyer places an order, their personal information is provided to the e-commerce platform. The scammers then use communication methods like Zalo or Facebook to contact buyers and entice them to buy discount codes (vouchers) for online transactions outside the e-commerce platform at low prices. . After the victim purchases the payment, the scammers will block communications or send parcels containing items of no value.

The second form: Scammers place orders in a suspended or canceled state but still creates shipping orders of shipping companies to the buyer’s address.

Scammers swap the real product for a fake or worthless item. Victims use prepaid payment, do not check the product when receiving or mistakenly think that the product they ordered on the e-commerce platform should be paid normally. Since the victim’s transactions take place outside of the e-commerce platform, product returns and refunds are not guaranteed because the e-commerce platform’s system does not record any purchases or identify damaged users.

The third form: Scammers claiming to be employees of e-commerce platforms support the return and exchange of orders that you have placed on previous e-commerce platforms.

In addition, there are many ways that personal information can be stolen on e-commerce platforms. A common method is exploiting security vulnerabilities to steal COD order information. They then create fake orders with the same information as the original order and send them to the customer, demanding payment. This is often successful because customers rarely check their orders before receiving them, and some shipping companies don’t allow customers to check their orders when they receive them.

4.2 Legal factors

The development of Vietnam’s legal infrastructure has been associated with economic growth and social progress over the past decades. Since the start of Doi Moi in 1986, Vietnam has transformed from one of the world’s poorest countries into a middle-income economy.

The government has promulgated many mechanisms and policies over the years to create a legal environment for the e-commerce market to develop. Some examples include Decree No. 52/2013/ND-CP on e-commerce, which establishes a legal framework for transparent and fair e-commerce transactions; Decree No. 124/2015/ND-CP amending and supplementing a number of articles of Decree No. 185/2013/ND-CP sanctioning administrative violations in commercial activities and protecting the interests of consumers;

and Decision No. 689/QD-TTg approving the E-commerce Development Program for the period 2014 - 2020. The Government has also established the Vietnam E-Commerce and Digital Economy Agency (iDEA) to monitor the development of e-commerce and digital infrastructure in the country. iDEA plays an important role in developing policies, driving innovation, and providing support services to businesses and consumers in the e-commerce sector. For example, it provides legal advice, helps businesses protect their intellectual property rights, and assists in resolving business-to-consumer disputes.

Furthermore, since 2005, the government has consistently implemented long-term policies for e-commerce development through Master Plans for each 5-year period. The most recent is the Prime Minister's Decision No. 645/QD-TTg dated May 15, 2020 approving the National E-commerce Development Master Plan for the 2021-2025 period. The objective of this plan is to make e-commerce a leading field in the digital economy by applying advanced technologies of the fourth industrial revolution to increase business efficiency, modernize distribution systems, improve the competitiveness of enterprises, and promote the development of domestic and export markets.

The plan sets specific goals by 2025, in which 55% of the population participates in online shopping with an average spending of 600 USD/person/year. B2C e-commerce sales are expected to increase by 25% per year and reach 35 billion USD, accounting for 10% of the total retail sales of the country. The plan also sets a target of non-cash payment in e-commerce reaching 50%, 80% of e-commerce websites integrating online ordering function and 40% of businesses participating in mobile e-commerce activities. In addition, the plan includes training courses on e-commerce application skills for one million businesses, business households, government officials and students.

Vietnam's e-commerce legal system has been perfected day by day, basically meeting and protecting the interests of domestic businesses and consumers.

4.3. Social factors

4.3.1. Social awareness

Consumers are more open-minded than the past to interaction and experimentation, which leads to a change in behavior. There are 64% of users reporting that they have interacted with a business's online sales and customer service account in the last year. In Vietnam, the average sales of entertainment, streaming and creator-related products in the three months before the survey increased 12 times. According to a report by Meta and Brain Company, Vietnam's adoption rate of future technologies such as financial technology and real technology is among the top in Southeast Asia. 58% of digital consumers in Vietnam have used Fintech solutions (Momo e-wallet, cashless payment...) in the past year. Virtual currency, NFT digital assets, virtual reality technology, etc. have been known and accepted by many Vietnamese people. For example, with virtual reality technology, 29% of people surveyed said they are interested and will likely use it in the future.

According to Tining Haryanti and Apol Pribadi Subriadi (2020), the importance of "Trust" cannot be underestimated when considering the adoption of e-commerce, especially during the initial rollout phase of traditional retail. The authors argue that the more e-commerce expands, the more "Trust" gradually ingrains in the system and assumes an important role in ensuring the long-term viability of e-commerce. Trust plays an essential role in shaping the growth and success of e-commerce. The foundation of any online transaction is built on trust, as customers need to ensure that their sensitive information, such as credit card details and personal data is handled safely. Trust affects a consumer's willingness to shop online, share personal information, and conduct financial transactions. It is a multifaceted concept that includes factors such as website security, data security, reliable customer service, transparent business practices,

and positive customer reviews. When e-commerce platforms prioritize confidence-building measures, such as implementing strong security protocols, providing clear privacy policies, and bolstering customer supporting systems in a faster and more trusted way, they can enhance customer trust and loyalty. On the contrary, a lack of trust can discourage potential customers, lead to cart abandonment, reduce sales, and negatively impact the overall growth of e-commerce.

Therefore, cultivating trust is vital for the sustainable development and prosperity of e-commerce businesses.

4.3.2. Human Resources

According to TopDev's Vietnam IT human resource market report 2021, the demand for IT human resources in Vietnam has continuously increased over the past 5 years. In 2021, Vietnam needs 450,000 IT personnel, but currently there are only 430,000 programmers in the country, and 20,000 positions will not be filled in the near future. This shortfall is due to the gap between the programmer's qualifications and the business requirements. Currently, only about 16,500 students (nearly 30%) out of 55,000 IT students have the skills and qualifications to meet the needs of businesses. This highlights the urgent need to improve the quality of IT education in Vietnam and promote IT career opportunities to attract more students into the field. The shortage of high-quality human resources in Vietnam could lead businesses to hire human resources from abroad.

4.4 Economic factors

According to the General Statistics Office, in the first three months of 2023, the gross domestic product increased by 3.3% over the same period last year. In which, the total retail sales of consumer goods and services was estimated at 1,505.3 trillion VND, up 13.9% over the same period last year. According to VECOM, business activities on e-commerce platforms and social networks are the highlights of Vietnam's e-commerce industry in the period of 2022 and the first quarter of 2023.

Notably, the survey results of VECOM show that up to 65% of businesses have implemented business activities on social networks. In addition, the number of employees in enterprises who regularly use tools such as Zalo, WhatsApp, Viber or Facebook Messenger has also significantly increased year by year. By the virality of Tiktok with young generations, TikTok Shop has surpassed Sendo and Tiki to rise to third place in the e-commerce market and become a strong competitor that big platforms like Shopee and Lazada have concern about.

According to We are social & Hootsuite's "Digital 2021 global overview report" by the end of 2021, there are 58.2% of Internet users in Vietnam participating in weekly online shopping, approximately the global average rate of gender reached 58.4%. Although the rate of participation in online shopping is approximately the same as in the world, "the proportion of e-commerce revenue compared to the total retail sales of consumer goods and services national consumption" of Vietnam in 2021 (approximately 6.7%) is much lower than many countries in ASEAN and oversea, compared to South Korea (approximately 42%), the United Kingdom (approximately 29.5%), Indonesia and mainland China (approximately 28.5%). This is also one of the reasons why we need to seriously review the situation of the e-commerce industry to develop more sustainable and stronger.

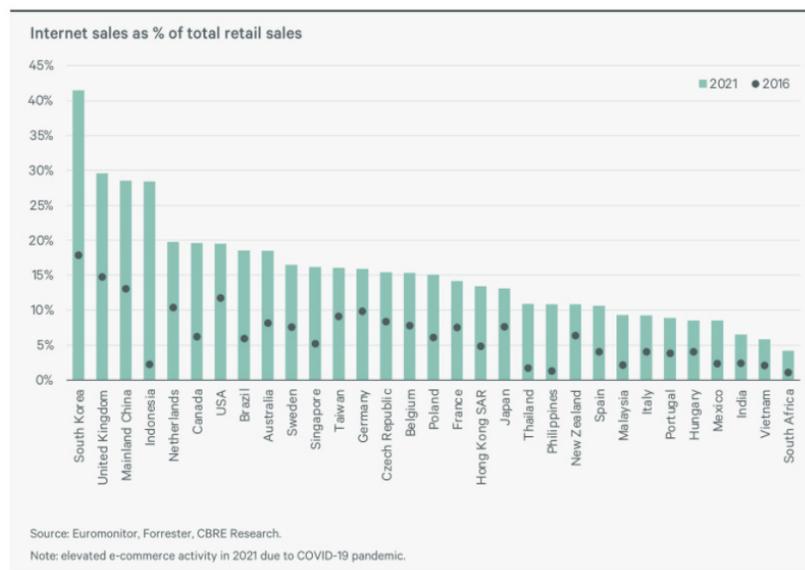


Figure 2: Internet sales as % of total retail sales

Source: Digital 2021 global overview report

From the beginning, E-commerce has always been associated with production and consumption activities. A country who has a strength in manufacturing domestic production would have a huge advantage in the long-term development of e-commerce among other factors.

Overview at the internal production capacity of Vietnam:

First launched in the Vietnamese market in October 2019, which was also the beginning of the pandemic, Amazon had a point of view “must consider this market”. About the domestic production capacity of Vietnam, Amazon argues that although Vietnam is one of the leading exporters in the world, most of the goods exported from Vietnam are from FDI enterprises located here. Most Vietnamese businesses only focus on the group of traditional goods such as rice, coffee, textiles, etc., but only for raw export.

According to the data released by the General Department of Customs, by the end of 2022, the total import and export turnover of the whole year will reach 730.2 billion USD, up 9.1% (equivalent to 61.2 billion USD) compared to the same period last year. This is a record number of Vietnam’s import and export activities. On the export side, Vietnam’s total export value reached 371.30 billion USD, up 10.5%, import was 358.9 billion USD, trade surplus was 12.4 billion USD. Notably, the total import-export turnover of enterprises with foreign direct investment (FDI) reached US\$506.83 billion, up 9.3% (equivalent to an increase of US\$43.2 billion) compared to 2021. FDI enterprises exported US\$273.63 billion, up 11.6% (equivalent to nearly US\$28.5 billion) compared to 2021, accounting for 73.7% of the country’s total export turnover.

It is clear that Vietnam’s import-export activities are too dependent on FDI enterprises. There are several risks that could be happened:

- + Economic dependence: When a country is overly dependent on foreign capital, the economy can become vulnerable to global financial fluctuations. If there is a change in the flow of foreign investment capital, the economy may face difficulties and bear significant risks.

- + Lack of diversification: Excessive dependence on foreign capital can reduce the diversification of the economy. If many important industries rely on FDI, the loss of other resources and development potential could create an imbalance in the economy.

+ Collateral to Power: In some cases, dependence on foreign capital can lead to the fact that foreign enterprises own and control a large portion of the nation's industry and resources. This can deprive the country of its independence and control over its resources and decision-making power over economic development.

+ Lack of capacity to improve domestic capacity: If a country is too dependent on foreign capital, it may lack investment and capacity to improve domestic capacity. The lack of investment in research and development, training of high-quality human resources and the development of domestic resources can reduce the competitiveness and sustainable development of the country.

In the future, when FTAs come into effect, import and export taxes would gradually decrease to zero and cross-border e-commerce platforms would dramatically climb. About the import of Vietnam, when cheap products from countries like China are available or high-quality products with beautiful designs from the EU and the US flooded the domestic market, Vietnamese enterprises hardly have a chance to compete. On the other hand, on the export side, FDI enterprises have a great advantage in the production of export products. Dr. Vu Tien Loc said that, in more than a third of a century, Vietnam's industry with the help and participation of 50% of the FDI business community, has basically just stopped at assembling and processing steps. It is clearly to be seen that the added value is not large. Moreover, domestic businesses always operate separately from each other and exist as "independent islands". In addition, it is also difficult for Vietnamese entrepreneurs to participate in the supply chains of FDI enterprises since domestic companies could meet the demand for high qualifications for FDI enterprises.

In conclusion, from the results of the analysis of the above 4 factors, we can see that the development of all 4 factors above is necessary. It is noticeable that the economic factor of Vietnam is incomplete, thereby researchers propose recommendations to overcome the above-mentioned weaknesses, especially in the development of the country's internal production resources.

5. SOME SOLUTIONS TO DEVELOP E-COMMERCE IN VIETNAM IN THE COMING TIME

- Technology solutions:

Firstly, Promote the construction and development of information technology and telecommunications infrastructure, reduce telecommunications charges and Internet access charges to increase access to everyone, and quickly deploy ADSL (Asymmetric Digital Subscribers Technology Lines), improve the capacity of the bandwidth.

Secondly, strengthening tax administration for organizations providing telecommunications services, advertising in the network environment, software products and services, digital information content products and services through domestic and cross-border digital platforms.

Thirdly, strengthening connection and data sharing between state management agencies and enterprises participating in e-commerce, building an e-commerce management database, applying risk management on a large database

Fourthly, Encourage and support enterprises to apply information technology to their business activities, improve the accessibility and use of e-commerce applications and solutions.

- Legal solutions

Firstly, finalize and submit for approval the Project on Digital Transformation of Industry and Trade, Digital Government of the Ministry of Industry and Trade.

Secondly, completing the system of legal documents on e-commerce, updating new regulations in line with the trends and advancements of information and communication technology, ensuring consistency and transparency and fairness in the management and regulation of e-commerce activities.

Thirdly, enforce a legal framework for electronic payments, establish a National Council on E-commerce, implement tax collection solutions for e-commerce activities, especially cross-border business activities to ensure the principles of fairness and transparency and to avoid tax loss and tax evasion.

- Social solutions

Firstly, the business side needs to raise the awareness and improve the computer and foreign language skills of the management team and employees in the company.

Secondly, strictly control model contracts, general trading conditions, and monitor defective product recalls and transactions in the e-commerce environment.

Thirdly, Implement Directive No. 30 of the Secretariat on strengthening the leadership of the Party and the management responsibility of the State for the protection of consumers' interests.

- Economic solutions

Firstly, Encourage and support Vietnamese businesses to build their brands and images in the e-commerce market. The Government should have policies to promote the production of Vietnamese goods, improve the competitiveness of Vietnamese goods, and reduce acts of selling pirated and counterfeit goods on e-commerce sites. Support campaigns such as: “Vietnamese people buy Vietnamese goods” should be usually held.

Secondly, introduce policies to attract domestic and foreign talents to build systems to control and assess the reputation of each wholesaler, retailer or product distributor on e-commerce platforms. Introduce a mandatory law to identify personal information as well as products to be sold, ... Completely using artificial intelligence or a secure operating system to reduce travel costs, checking transmissions systems, increasing accuracy, objectivity and universality to easily be widely used for the entire economy.

Thirdly, integrate trade promotion activities to develop the domestic market into consumer demand stimulus programs, initiatives to connect supply and demand of goods and well implement market stabilization programs. Support enterprises (especially small and medium enterprises, production facilities of craft villages, farmer households, cooperatives, etc.) in trade promotion activities; building and protecting brands for domestic wholesale and retail distribution chains; promote regional specialties and typical products of Vietnam.

Fourthly, promote international cooperation in the field of e-commerce, sign bilateral or multilateral agreements on e-commerce, support enterprises to participate in the international e-commerce market, especially especially big markets such as China, USA, EU, ASEAN

Fifthly, the current sales business is not only through e-commerce platforms, but also sales in many other forms such as selling via Zalo, Facebook, Instagram, etc. Therefore, the Government and the General Department of Taxation need to supervise and take measures to collect the arrear because sales methods through social networks are the best way to connect with the young generation and the sales are extremely enormous.

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CUSTOMS MANAGEMENT FOR CROSS-BORDER E-COMMERCE ACTIVITIES IN VIETNAM

Authors: Nguyen Thi Kim Anh¹, Nguyen Thi Duong¹, Hoang Thi Ngoan¹
Mentor: Ph.D Nguyen Hoang Tuan¹

ABSTRACT: Cross-border e-commerce is an opportunity to promote the digital economy, a favorable environment for business models, and a bridge for Vietnamese enterprises to reach the big playing field. In the context of the strong development of Industry 4.0 and deep international integration, cross-border e-commerce is forecasted to develop even more strongly. However, the parallel development between traditional cross-border transactions and cross-border e-commerce, problems arising in cross-border e-commerce transactions pose many problems for state management agencies to solve, especially the customs office. Therefore, research on customs management for cross-border e-commerce in Vietnam is essential. This topic has focused on comprehensively solving both the theoretical basis, the world practice and the practice of Vietnam as a basis for proposing solutions to strengthen the state management of customs for trade activities. cross-border e-commerce.

Keywords: Customs, cross-border e-commerce, state management

1. INTRODUCTION

The Industrial Revolution 4.0 taking place along with the development of the digital economy has become the driving force for e-commerce to develop strongly in the world as well as in Vietnam. Especially in the process of deepening international economic integration today, with the increasing demand for commercial goods exchange between countries and regions, cross-border e-commerce is currently an area of great attention. important and attract many stakeholders.

Only appeared since the 2000s, cross-border e-commerce has grown strongly in the European Union (EU), North America and spread to Asia - Pacific and other countries around the world. gender. Cross-border e-commerce is considered to be the fastest growing sector of world trade. This is an inevitable trend of development in all socio-economic aspects in all countries in the globalization era. With the rapid development, universality and international payment, cross-border e-commerce brings great benefits such as access to information, exchange of goods, quick search for services for customers. goods in a borderless environment, removing geographical and time distances. Cross-border e-commerce is rapidly becoming a core element of the global economy and an inevitable trend that no country can stand outside.

For Vietnam, international economic integration has facilitated the development of cross-border e-commerce, creating opportunities for Vietnamese businesses to participate in this potential playground. In recent years, Vietnam's e-commerce market has been increasingly expanded. In the context of the Covid-19 epidemic, the e-commerce market is becoming more and more exciting when we implement distance and restrict travel, people's consumer buying habits also gradually shift from buying traditional goods to online shopping through e-commerce. At the same time, cross-border e-commerce helps consumers through the internet to shop in international markets and become "global consumers". According to the Vietnam E-commerce White Paper, in 2020, the growth rate of e-commerce will reach 18%, the scale will reach 11.8 billion USD and is the only country in Southeast Asia with the growth of e-commerce numeral 2 numbers.

¹ Academy of Finance.

After Covid-19 and in the coming time, e-commerce is an area that is assessed to have the potential to develop even more strongly.

Participating in deeper integration into the world economy means that Vietnam has to compete more and more fiercely with other economies in the world. Meanwhile, cross-border e-commerce in Vietnam is still quite new with many complicated legal and customs procedures. In particular, the customs authority plays a very important role in strictly controlling and complying with the law on border goods transactions, to ensure that the transaction takes place safely and smoothly as well as to ensure the safety and security of the goods and tax revenue. Besides, along with the strong development of the Internet, modern technologies and services were born, and bad objects through which to conduct illegal business activities. Customs authorities have a great role to play in preventing such acts, so enhancing the role of Customs is necessary in the current context.

With the above reasons, the study of the topic “*Customs management for cross-border e-commerce activities in Vietnam*” is extremely necessary for the customs industry, contributing to facilitate the operation of the Customs, import and export via cross-border e-commerce, especially in the current globalization context.

2. OVERVIEW OF RESEARCH SITUATION RELATED TO THE TOPIC

2.1. Research situation abroad

E-commerce and cross-border e-commerce are issues of common concern of the World Customs Organization, many other organizations and scholars around the world. Through the research process, there are a number of works related to the topic as follows:

APEC report “Capacity Building Research on Customs control of Cross Border E-Commerce” – 2016. The report focuses on research on improving customs control capacity with cross-border e-commerce by quoting, analyzing analyze the overall research on cross-border e-commerce, from the perspective of customs supervision and risk control, summarize the experiences and methods of cooperation among other partners, and propose effective measures to improve control capacity and improve customs work.

The article “The Development of Cross Border E-commerce” - 2017, by Feeng Ding, Jiazhen Huo, Juliana Kucht Campos, published in *Advances in Economics, Business and Management Research (AEBMR)*, volume 37, in *Proceedings of the International Conference on Transformation and Innovation in Management (ICTIM 2017)*. The article points out the driving forces behind cross-border e-commerce development and barriers, points out development trends, and offers some solutions for the government, merchants and providers who provide cross-border e-commerce services.

The article “Framework of Standards on Cross - Border E-commerce” - 2018, published by WCO, builds a common standard framework for cross-border e-commerce management based on the experience and collective knowledge of customs experts, government agencies around the world. The article points out the main principles and standards of cross-border e-commerce management from both the support and control aspects, in order to promote certainty, transparency, safety and security, efficiency in e-commerce supply chain as well as creating a level playing field for parties involved in cross-border e-commerce.

The report “WCO Study report on Cross - Border E-commerce” - 2017, WCO, points out the problems and challenges of customs management for cross-border e-commerce, and proposes a number of solutions across the border. Customs management practices in China, Hong Kong, the United States, the European region...

2.2. Research situation in the country

There are many research topics on e-commerce and cross-border e-commerce, but as far as our team understands and knows, there is not a single research topic or thesis that delves deeply into the role of Vietnam Customs in controlling cross-border e-commerce. Some works in Vietnam related to the scope of research such as:

Academic research project (2018) by a group of authors, Ph. D Nguyen Thi Kim Oanh, Ph.D Nguyen Hoang Tuan, and Ph.D Nguyen Thi Lan Huong, “State management of customs for cross-border e-commerce“, has generalized the issues of customs management for cross-border e-commerce, analyzed, assessed the current situation and proposed solutions to strengthen the state management of customs for cross-border e-commerce in Vietnam.

Dao Anh Tuan, “State management of e-commerce” – 2013, doctoral thesis at National Economics University. The thesis points out the theoretical bases and lessons learned in state management of e-commerce, the reality of state management of e-commerce in Vietnam, and points out some shortcomings that still exist, thereby proposing solutions to improve the state management of e-commerce in Vietnam.

MA. Hoang Thuy Linh, “Discussion on cross-border e-commerce management in Vietnam” – No. 10(195)-2019, published in Accounting and Finance Research journal. The article points out the challenges that management agencies face in controlling cross-border e-commerce and then proposes some solutions to the customs authorities.

General comments from the review of research works:

Although the above works have not mentioned in depth the role of customs in controlling cross-border e-commerce, there are also some contents that have mentioned the management role of customs in cross-border electronics. A number of scientific works, including reports from the World Customs Organization (WCO), have proposed a number of customs management methods for cross-border e-commerce activities. A number of Vietnamese scientific studies have studied the experience of some countries on customs management for cross-border e-commerce and suggested some solutions. The above works provide theoretical and practical bases for e-commerce activities in Vietnam and around the world. These are studies that play an extremely important role for our team to carry out this topic.

3. THEORETICAL AND PRACTICAL BASIS ON RESEARCH SITUATION

3.1. Theoretical framework

3.1.1. The basic concepts

➤ Ecommerce

E-commerce is commercial activities carried out through telecommunications networks, the Internet and through electronic means between groups (individuals) through electronic tools, techniques and technologies.

➤ Cross-border e-commerce

According to WCO – World Customs Organization: “*Cross-border e-commerce is international e-commerce. Literally means “cross-border buying and selling of goods by e-commerce”, as opposed to domestic e-commerce transactions*”. Combined with the concepts of e-commerce, it can be understood that cross-border e-commerce means online buying and selling activities through

the Internet that take place between different countries and territories, buyers and sellers are not in the same nation. For example, exporting lychee from Vietnam to the European market by means of cross-border e-commerce on Vietnam's e-commerce platform - Voso Global, or selling goods from the US to Vietnam...

According to the Standard Framework on cross-border e-commerce published by the World Customs Organization (version 6/2022), the characteristics of cross-border e-commerce are mentioned as follows:

- Orders, sales, communications and, where possible, payments are made online. Refund/return requests are made according to a strict process.
- The transaction / delivery of goods is carried out across borders with large volume but packed into small packages of goods.
- Goods exist in physical form (tangible) and the flow of goods is sensitive to time.
- For consumers/buyers (for commercial and non-commercial purposes). This includes people who do not know each other.

Thus, according to the above concept, cross-border e-commerce can be understood as ordering, selling, contacting exchanges online, and the payment can be online or offline and at the same time physical goods. images are transported across borders.

➤ **Customs management for cross-border e-commerce activities**

Customs management in English is Custom management. Customs management is the process of influencing the customs administration on the subjects managed by the customs authorities in order to ensure compliance with the regulations and set objectives.

State management of customs means the management of the State over the organization and operation of the customs authority and the export, import, exit, entry and transit activities of organizations and individuals. to direct those activities to develop towards certain goals and orientations.

In Vietnam's regulatory system, Article 99 of the 2014 Customs Law clearly states:

“Contents of state management of customs include:

- 1. Formulate and direct the implementation of strategies, master plans and development plans of Vietnam Customs;*
- 2. Promulgating and organizing the implementation of legal documents on customs;*
- 3. Guiding, implementing and propagating the law on customs;*
- 4. Regulations on the organization and operation of Customs;*
- 5. Training, fostering and building a contingent of customs officers;*
- 6. Organize the research and application of science and technology and modern customs management methods;*
- 7. State statistics on customs;*
- 8. Inspect, examine, settle complaints and denunciations and handle violations of the law on customs;*
- 9. International cooperation on customs.”*

Currently, cross-border e-commerce business activities are developing more and more widely, it is necessary to develop and issue regulations on customs management in this field. With the main task is to enforce customs laws and regulations related to import and export activities, collect taxes and facilitate quick clearance of goods while ensuring compliance with legal regulations.

3.1.2. Practical basis of customs management experience for cross-border e-commerce

The study refers to the experience of customs management for cross-border e-commerce in some countries around the world such as China, Korea, Canada, Australia, Indonesia, Turkey, Norway, and the United States. From the above experiences of other countries, the study proposes some experiences in customs management for cross-border e-commerce activities in VietNam as follows:

First, customs operations need comprehensive reform and modernization in the direction of synchronous use of the IT system and application of risk management, thereby allowing most of the work to be carried out automatically. automation, thereby both reducing costs and improving inspection efficiency.

Second, along with perfecting the system of legal documents as a legal corridor for Customs activities, the General Department of Customs continues to improve professional regulations and processes.

Third, proactively control the situation, detect, fight, prevent and promptly and strictly handle acts of smuggling, commercial fraud, and illegal cross-border transportation of goods.

Fourth, building and developing infrastructure for customs management for cross-border e-commerce should be built on the foundation of IT infrastructure and modern scientific applications. invest in IT infrastructure, apply modern technologies to provide online public services for cross-border import and export of goods.

4. RESEARCH METHODS

General Research Methodology: Methodology of Dialectical Materialism and historical materialism to consider and evaluate the research objects of the topic is related to customs management for cross-border e-commerce activities in the common relationship, in the movement and development, with the interdependence effect to properly appreciate the nature of things, phenomenon, evaluate the cause and state the measures of the research object.

The study uses the following specific research methods:

Synthetic analysis method: to inherit the theories related to customs management for cross-border e-commerce, thereby forming the theoretical basis for the topic.

Statistical analysis methods: Statistical analysis assesses the nature and movement trends of the research subjects.

Document research method: Analyze documents related to the research problem to build a theoretical basis, write an overview of the research problem.

5. RESEARCH RESULTS AND DISCUSSION

Assessment of the current status of customs management for cross-border e-commerce in Vietnam

5.1. These achievements

It can be affirmed that in the past time, the Customs sector has effectively implemented customs management for cross-border e-commerce, specifically:

Since 2014, Vietnam has promoted the implementation of the national single window mechanism. From April 1, 2014, providing level 4 public services, implementing e-customs procedures through VNACCS/VCIS system and electronic payment gateway and starting to connect with ministries and sectors implementing NSW. As of 2017, the National Single Window has officially connected with 11 ministries and branches. In addition to goods clearance procedures (Ministry of Finance), 47 administrative procedures of

10 ministries and branches have been carried out through the National Single Window with a total of more than 645 thousand administrative records handled. ministry, about 15 thousand enterprises participated. Along with that, in the past time, the Customs sector has sharply reduced administrative procedures in the field of management from 239 to 183 current procedures. In addition, the current administrative procedures have also been reviewed, simplified in terms of documents, applied electronic methods to shorten the time and cost of carrying out customs procedures.

Along with cutting and simplifying administrative procedures, with the goal of supporting and creating favorable conditions for businesses and people, the Customs sector has signed with 37 commercial banks to collect electricity tax and currently accounts for about 90% of the industry's budget revenue.

The General Department of Customs, as the standing body of the Steering Committee 389 of the Ministry of Finance, has advised the Ministry of Finance to coordinate with other ministries, branches and functional agencies in strengthening the fight against smuggling commercial fraud and illegal cross-border transportation of goods; directing units to seriously and effectively implement many important measures, in which focusing on the synchronous use of professional measures, strengthening coordination, regular inspection and control at the key areas, sensitive items... At the same time, the Customs sector continues to build and perfect the legal basis; improve the capacity of specialized anti-smuggling forces; invest in modern equipment and means. According to data from 389 national steering committees, in 2022, the Customs sector detected and arrested more than 16,000 cases of smuggling and commercial fraud, worth 5.8 trillion VND, collecting and paying more than 425 billion VND to the state budget. 6 billion dong. Customs authorities prosecuted 45 cases and transferred to other agencies to prosecute more than 112 violations.

5.2. Limit and reason

➤ Limit:

For cross-border e-commerce activities, it is also difficult to determine the revenue source and the object when the taxpayer does not have business registration and has no fixed business establishment. Foreign enterprises often refer to tax agreements and determine that they do not have a fixed business establishment in Vietnam, so they do not declare and pay corporate income tax.

Because it is difficult to determine the source of income and the taxpayer, the tax authorities also have difficulty in determining the tax base. Because in the digital environment, business activities can be carried out through a website that is present in a certain market area, without the need for the physical presence of taxpayers there. That leads to the creation of loopholes for businesses and individuals doing business through the Internet to take advantage of, causing loss of revenue for the state budget.

In addition, this activity also has many potential risks such as individuals and organizations taking advantage of cross-border e-commerce methods to carry out trading acts of banned goods, goods of unknown origin, counterfeit goods, and imported goods. imitations, goods infringing intellectual property, goods of poor quality, providing false information to deceive consumers...

In terms of legislation and policies related to e-commerce activities, the Government has issued relevant documents. However, the fact that cross-border e-commerce has been developing diversely, so these regulations are not really comprehensive and synchronous, many issues have not been mentioned, leading to difficulties. inadequacies in management. Moreover, the lack of a legal framework for e-logistics activities in Vietnam is also a significant obstacle.

Technology and the internet also facilitate criminal activities through illegal business activities. The Internet makes it difficult for criminals to detect violations and customs will also face many difficulties in managing and dealing with complex cyber-related crimes.

In addition, due to the specialization in customs management, there are few customs officers who are well versed in both areas of expertise and the ability to apply IT.

➤ *The cause of the restriction*

About the loophole in the legal corridor

Up to now, there is no separate legal document on tax administration for e-commerce. The provisions of the tax law for e-commerce are scattered in many different documents such as the 2005 Law on Electronic Transactions, the Law on Tax Administration and a number of Decrees and Circulars. Therefore, some provisions of the Law on Tax Administration, VAT Law, Law on CIT, Law on Personal Income Tax, Law on Import-Export Tax and guiding documents do not cover all subjects and forms of business. cross-border e-commerce business arises in Vietnam. Therefore, the propaganda and dissemination of customs and tax laws and policies have not been effective, encouraging organizations and individuals to practice fulfill tax obligations.

The responsibilities of postal units and express delivery businesses have not been clearly defined for the declaration of goods information

In fact, there are many shipments, postal businesses, and courier companies that do not describe the goods in detail, merely relying on sketchy information from the sender to fill out the customs declaration.

About the team of civil servants

In recent years, the annual recruitment quota for additional civil servants and public employees for units in the Customs sector is not much, in addition, every year a number of officials retire, so the staff The customs sector is decreasing day by day. The number of elderly cadres is large, the number of trained young cadres is still low, and their qualifications are uneven, so they cannot meet modern scientific and technological management.

6. PROVIDING SOLUTIONS AND RECOMMENDATIONS

To ensure the management of the subjects participating in the above-mentioned e-commerce transactions and at the same time facilitate and promote the development of cross-border e-commerce activities in Vietnam, the research team proposes specific solutions such as: after:

First, improving the legal basis for customs management activities for cross-border e-commerce

Vietnam needs to quickly build a cross-border e-commerce legal framework that is founded on the principles of good governance, fairness, and transparency, while responding to new and emerging requirements, as well as balancing by the diverse interests of all stakeholders in Cross-Border E-Commerce. Legal frameworks and legal regulations Cross-border e-commerce needs to be balanced between enhancing convenience while ensuring safety and security, and controlling physical (tangible) goods through the provision of prior data.

Besides, it is necessary to soon supplement, correct and complete the legal infrastructure for e-commerce in general and cross-border e-commerce in particular. It is necessary to review, supplement, amend and promulgate new policies and legal documents to support and facilitate the development of e-commerce and be in line with international practices and commitments. international relations of Vietnam. Legal documents related to the recognition of the legal value of electronic documents: Legal documents recognize the legal value of invoices and accounting documents in the form of electronic documents when meet specific standards to support enterprises in performing tax and accounting operations when implementing cross-border online purchase and sale of goods; Legal documents that recognize the legal

value of documents, applications and certifications in the form of electronic documents when they meet specific standards to support the implementation of part or the whole of the business registration process. business, investment registration, bidding and procurement via electronic means.

Second, simplifying customs procedures, customs and tax professional processes for cross-border e-commerce

Customs authorities should coordinate with relevant government agencies in establish a standardized framework for advance electronic data exchange between cross-border e-commerce stakeholders and Customs and other relevant government agencies to facilitate transacted shipments facilitate customs clearance. Establish a common set of terms and reliable mechanisms to accurately measure and analyze cross-border e-commerce on the basis of close cooperation with international organizations such as WTO, UNSD, OECD, UNCTAD, UPU, ICAO, WEF, World Bank Group, as well as with national statistical organizations and e-commerce stakeholders.

Third, training and developing human resources for customs management for cross-border e-commerce

Professional training and retraining for staff should be strictly regulated, and at the same time, the inspection, examination and testing of qualifications should ensure the correctness and rigor to avoid formal diseases or other standards. in the issue of training and fostering staff, leading to ineffective management.

Fourth, modernizing facilities and apply customs management IT to cross-border e-commerce

Modernize machinery and equipment for customs inspection, supervision and control; connecting the IT system with the use of modern equipment and machines, applying online technology, minimizing the intervention of civil servants in the inspection and supervision stages; invest, equip modern facilities to meet the application of customs management on the basis of technology application of the Fourth Industrial Revolution.

Fifth, promoting cooperation between customs authorities and other domestic and international agencies in cross-border e-commerce management.

should be established for advance electronic data exchange between cross-border e-commerce stakeholders and Customs and other relevant government agencies in order to facilitate the delivery of shipments. Customs procedures are carried out smoothly. Establish a common set of terms and reliable mechanisms to accurately measure and analyze cross-border e-commerce on the basis of close cooperation with international organizations such as WTO, UNSD, OECD, UNCTAD , UPU, ICAO, WEF, World Bank Group, as well as with national statistical organizations and e-commerce stakeholders.

7. CONCLUSION

This topic has focused on comprehensively solving both the theoretical basis, the world practice and the practice of Vietnam as a basis for proposing solutions to strengthen the state management of customs for trade activities. cross-border e-commerce. Specifically, the study has achieved the following main results:

First, in order to systematize and clarify the theoretical bases of cross-border e-commerce such as: Concepts, transaction forms, and the roles of actors involved in cross-border e-commerce.

Second, the topic has focused on understanding and clarifying the basic principles and standards of customs management for cross-border e-commerce. Analysis of factors affecting the management of customs authorities for cross-border e-commerce.

Third, the topic has synthesized the management experience of customs authorities for cross-border e-commerce of some typical countries in the world from which to draw some lessons for Vietnam.

Fourth, the topic has analyzed the context of e-commerce development in Vietnam and the current situation of cross-border e-commerce transactions in Vietnam in recent times. On that basis, specifying the legal basis and management method of Vietnamese customs for cross-border e-commerce transactions in Vietnam. From there, evaluate the achieved points, limitations and causes as a basis for proposing appropriate solutions.

Fifth, on the basis of analyzing and assessing the current situation of customs management for cross-border e-commerce in Vietnam in the period of 2018-2022, the topic has proposed solutions to strengthen the state management of the agency. customs for cross-border e-commerce.

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THE INFLUENCE OF PART-TIME JOBS ON FFL STUDENTS' LEARNING ABILITY

Author: Nguyen Linh Chi¹

Mentor: MA. Dao Thi Oanh¹

ABSTRACT: *This study explores the influence of part-time job on a group of first- and third-year students of Faculty of Foreign Languages, Academy of Finance. The article aims to find out the number of students who are studying at FFL and doing part-time jobs at the same time. More importantly, it suggests some recommendations for FFL undergraduates who want to take advantages and overcome their disadvantages if they want to apply for good positions in the future and ensure current study plan. To achieve this goal, the authors used a variety of data collection instruments (such as questionnaires, telephone interviews) and different methods like data analysis, and information synthesis to assess whether their opportunities are high or not. Based on the findings, the study argues that FFLers are students with effective learning and work-balancing approaches.*

Keywords: *learning ability, part-time jobs, learning, influence of part-time job.*

1. INTRODUCTION

In the context that the industrial revolution 4.0 is gradually becoming popular and developing strongly in most countries around the world, Vietnam is not an exception to that development with increasingly strict requirements for team quality. Students need to make great efforts to constantly accumulate knowledge and experience in order to get a suitable job after graduation so that they can compete in the increasingly open labor market. Therefore, to become a promising generation for the country, students must be fostered in parallel between knowledge in the classroom and skills and experiences from practice. One of the ways that most students think they can gain the most experience is from doing part-time jobs outside of school hours. This is a way for students to earn extra money to meet their basic needs, reduce financial stress on families, and provide opportunities for students to gain more work and real-world experience. For the above reasons, the author would like to conduct research titled: ***“The influence of part-time jobs on FFL students’ learning ability.”***

The research aims at: First, investigating the academic ability of FFL students of the Academy of Finance as well as the current situation of taking part-time job among FFL students. Secondly, finding out the influence of part-time jobs on students’ learning ability. Finally, giving some recommendations to the problems that students encounter. The study was conducted at the Academy of Finance with 104 students in particular. In which, 100 students, including 40 first-year students and 60 third-year students, participated in the survey to answer questionnaire. The rest 4 students, including 2 freshmen and 2 third year students, participated in the interview. The survey was conducted from December 13 to December 25. The study was conducted from December 13, 2022 to January 13, 2023.

2. THEORETICAL FRAMEWORK

2.1. Part-time jobs from the perspective of social organizations and communities

2.1.1 Definition of part-time jobs

According to Market Business New (MBN), the term part-time job describes workers who work fewer hours in a day or week than full-time worker. The term can apply to work and jobs, as in “I work part-time” or “I have a part-time job”.

¹ Academy of Finance.

Besides, Woodhouse (2017) states that a part-time job simply involves working fewer hours in a week than a full-time job. Often, part-time jobs involve working in shifts. These shifts are usually rotational with other part-time workers. The same as Woodhouse, Culver (2022) also defines the term part-time job is working in a fewer hours than full-time worker but more detailed. Culver (2022) states that: Part-time jobs typically require no more than 35 hours per week, and may be as few as 5-10 hours. Unlike full-time employees, part-time employees are not guaranteed the same number of hours or shifts each week.

However, the number of hours in a full-time job varies among countries and also from employer to employer within countries. Because of this, there is no universal definition of how many hours make up part-time work, except in relation to full-time. The government of the United Kingdom, for instance, define a part-time worker simply as “someone who works fewer hours than a full-time worker.” The International Labour Organization (ILO) also defines the term in relation to full-time. According to the ILO, part-time workers are those “whose normal hours of work are less than those of comparable full-time workers.” Besides, part-time job is described in Article 32 of Vietnam Labour Law 2019, in which the employee and the employer agree on working hours that are less than normal working hours in days, weeks, or months.

In addition, for students, “part-time job” is working while still attending school in firms, organizations, units, and families that are not prohibited by law and do not have a significant impact on learning... to earn more money or to improve soft skills for the process of living and working, as well as to get experience closer to real life. Part-time jobs have become popular because, for students, especially in today’s competitive environment, social awareness and practical knowledge have a significant impact on their capacity to work, think, and work after graduation.

So, in this study, “part-time job” refers to an informal, irregular job in addition to another secure job; for students, the official job is to attend school. Part-time jobs, internships, and other social activities are examples of informal jobs.

2.1.2. Kinds of part-time jobs

For part-time jobs that require high quotas, which means a lot of work, it will lead to overload on both the health and the ability to receive knowledge of students. Students will no longer be in the best state to study and of course, their academic results will be reduced. Muluk’s research (2017) has identified the “type of part-time job” that has a certain impact on the learning outcomes of learners. The question is, if students choose a job related to their field of study, which gives them skills and experience, offsets and helps students’ learning at school, will “the part-time job” has a positive effect on student learning outcomes? Paolo and Matano (2016) concluded that a part-time job unrelated to the field of study will have a negative effect on academic performance, on the contrary, a part-time job related to the field of study will bring about positive impact on student achievement. Part-time work is comparable to full-time work. Part-time jobs for college students are classified into the following five groups:

(i) On-campus positions

Working on-campus allows students to collaborate with their peers while also developing professional ties and networks for your future job. With an on-campus job, students will have more flexibility in changing their working hours because they will be determined only by their class calendar.

Students can participate in a variety of school activities connected to the knowledge they have gained with this type of study. As a result, students have several opportunities to form relationships with teachers and gain new knowledge faster with classmates. Participating in this employment, however, means that students cannot participate in off-campus jobs to gain other skills.

(ii) Retail and marketing positions

Local boutiques, e-commerce, and social media are all examples of retail occupations. Working in a physical store can give students with vital human and workplace skills that students can apply later in your professional career. Similarly, working in an online position can provide students with technical skills such as business analysis, which will help students stand out from the crowd when applying for jobs in their desired industry. Numerous brands rely on social media to gain business and notoriety and are hiring online candidates to do so. Apply for part-time social media management positions if you have social media talents such as content creation on YouTube or Instagram.

This is a specific form of office employment in which students can polish their intellectual talents while also gaining experience in the field of marketing. Unfortunately, because this form of work is only part-time, the amount of labor and expected compensation are frequently not fulfilled by the students.

(iii) Food-service jobs

Students can earn tips in addition to hourly income if they work in the food-service industry, which includes restaurants, cafeterias, and catering companies, among other businesses. This is especially useful during peak hours and holidays, when their earnings may be larger than usual.

Food service jobs are typically manual labor occupations, so students will obtain the necessary soft skills when talking with clients. Professional and academic credentials, on the other hand, are frequently overlooked in this employment field.

(iv) Paid internships

Make the most of students' part-time college job by taking advantage of a paid internship that can help them enhance their resume with relevant experience. Most paid internships are completed during the summer, so they can supplement their normal part-time job and help them survive the rest of the academic year. A paid internship may provide them with the following benefits: quality references for students' resume, potential future full-time employment prospects, a higher-paying position after graduation, and a new skill set to take with students into your career. Paid internships also demonstrate initiative and ambition, which many employers respect.

(v) Freelancing

As a college student looking for part-time job, the present "gig economy," as some refer to it, works to students' favor. It's quite convenient if students want to work during their own, flexible hours, from babysitting to opening their own online shop on sites like Shoppe, Tiki or Lazada. If students have babysitting, cleaning, or pet-sitting experience, turn it into money by starting their own small business.

Doing a part-time job while attending college demonstrates that students are a hard worker. It will assist students in developing a skill set that students will bring to their profession and beyond. These abilities include, among other things, time management, communication, and problem-solving. Take use of this opportunity to explore their interests, properly prepare for their profession, and broaden their portfolio and character while taking control of their finances.

2.1.3. Law on part-time labor in Vietnam

Part-time labor or part-time job is defined as such in labor law, specifically in Article 32 of the Labor Law 2019, which states: "Employees work without full-time means an employee whose working time is shorter than the normal working time in days, weeks, or months as prescribed in the labor law, collective bargaining agreement, or internal labor regulations." When the labor contract is signed, the employee and the employer will agree to work part-time. Part-time employees are entitled to salaries, same rights and obligations with full-time employees, equal opportunity, non-discrimination, and occupational safety and hygiene.

(i) Social insurance for part-time workers.

Part-time employees will be entitled to social insurance contributions if they enter into one of the legally required contracts for social insurance participation. Article 2 of the Law on Social Insurance 2014 specifies the following provisions:

“1. Vietnamese citizens who are qualified to participate in mandatory social insurance include:

a. employees under indefinite-term labor contracts, fixed-term labor contracts, seasonal labor contracts, or for a specific job with a term of 3 full months to less than 12 months, counting the entire labor contract signed in accordance with labor law between the employer and the legal representative of the person under the age of 15;

b. Those employed under labor contracts lasting from one full month to less than three months.”

(ii) Social insurance contributions for part-time workers.

Insurance rates for part-time employees are comparable to those for full-time employees. The level of social insurance rate payment will be equal to the employee closure rate multiplied by the wage used as the foundation for social insurance payment.

According to the Social Insurance Law of 2014, the payment rate for employees who participate in social insurance is as follows: Workers who fall under the scope of Section 1, Article 2 of the Social Security Law of 2014 must pay 8% of their monthly earnings on a monthly basis.

(iii) Sanctioning for businesses who do not engage in employee health insurance

Regulations on sanctioning of violations are regulated by Decree 28/2020 on penalties for administrative violations in the field of labor, social insurance, sending Vietnamese workers to work abroad under contracts and regulations. determined as follows:

1. Employees who bargain with employees who do not engage in compulsory social insurance will face a fine ranging from VND 500,000 to VND 1,000,000.

2. Employers that fail to provide correct, full, and timely information and papers connected to the payment and enjoyment of compulsory social insurance may face fines ranging from VND 5,000,000 to VND 10,000,000. Obligatory according to the requirements of competent state agencies and social insurance agencies.

3. Employers who have failed to pay required social insurance and unemployment insurance but have not yet been prosecuted will face a fine of between VND 50,000,000 and VND 75,000,000.

2.2. Current limitations of students when taking part-time jobs.

Several students confirm, based on their personal experiences, that a part-time job has an enormous purpose as well as important long-term rewards. Many other subjects, on the other hand, consider that working part-time has numerous risks, including disastrous outcomes for young people. Here are some of the most typical limitations that students experience when working part-time:

2.2.1. Indifference, careless attitude

Some students prefer to work part-time in order to obtain more experience in the area, while others do so in order to make ends meet. Because the employment is just part-time, most students have little focus and spend their time in part-time occupations. As a result, many students are disinterested and unprofessional when participating in extracurricular activities. Although their internship report outcomes in terms of attitude are highly welcomed, it can be noticed that they need to further cultivate that attitude when going to work.

2.2.2. Lack of practical experience

While a lack of work experience hurts a student’s job preparation, there are numerous things students may do to prosper, such as learning and collaborating remotely. The pandemic has instilled in young people

resilience, communication, and adaptability, all of which will be useful in the workplace. Employers should not expect to see traditional elements on a student's CV, such as work experience. The evaluation of students' practical skills is separated into two parts. To begin, pupils with a lot of experience will be evaluated as having a good social engagement history; yet, some firms will grade these employees as "soon hot, soon cold" people. Second, someone with no work experience is less likely to be prioritized for CV screening and interviewing. Case two will be met frequently when students look for part-time jobs. As a result, students' lack of practical experience is viewed as a hindrance while searching for jobs.

2.2.3. Limits on professional knowledge and foreign language

Foreign language fluency is required when applying for a job. Knowing at least one foreign language will help candidates stand out and quickly acquire a job that matches their skill, level, and information search in the midst of the trend of the "multi-nationalization" of firms. Several desirable opportunities will be filled through recruitment. Learning a foreign language must serve its intended purpose of promoting the healthy study, work, communication, and entertainment.

As a result, internships are an excellent way for students to get through difficult recruitment rounds and were not startled when they started working. Because the internship is the greatest time for students to get experience in the sector of their choice, the internship process is similar to that of a new employee in the company.

19% of employers value the background information that students acquire during their university training, from agencies and organizations they have attended, certificates and degrees they have acquired,... and, of course, they must be relevant to the post for which the candidate is applying. As a result, professional knowledge and foreign languages must be developed so that they do not negative impact students' job applications after graduation.

2.3. Overview of learning ability

2.3.1. Definitions of learning ability

According to the English Dictionary, "learning ability" is the ability to comprehend. While learning anything generic, this is a typical concept to clarify learning ability. According to Billett (2012), workplace learning typically refers to the processes of learning through and for paid employment: on-the-job learning or learning via work. Learning ability at workplace, as a concept, highlights that specific contributions to individuals' learning are offered and secured by participation in work activities and interactions inside workplaces or work practices.

However, Velickovic (2019) states that there are other interpretations and definitions of learning ability at workplace that imply some kind of vocational training for high school students, university students, and unemployed people, or definitions that do not indicate the "learner's" working status, i.e. do not emphasize this element as crucial to the definition of the term: "A period of time in which a student works for a company to obtain information and experience."

Thus, there is no comprehensive definition of "learning ability" on which everyone can agree. "In the workplace, information or skills are acquired through formal or informal means... It incorporates both official and informal on-the-job training "according to the ILO (2009). Therefore, the first definition sees learning ability as activities of acquiring knowledge and skills that are organized and clearly defined as such, while the second definition, besides formal, also includes informal learning activities.

2.3.2. Possibility of hands-on learning through part-time jobs.

Many students find actual work through part-time occupations, according to Mr. Pam Caplin (a former vice president of human resources in the United States). "If they have the talent and integrity, they will

perform well in whatever job.” Mr. Pam also stated that students who have many part-time jobs will benefit greatly from “beautifying” their formal employment application.

When you decide to take a full-time job, remember to factor your part-time work experience into your application. These are the important factors that will make your application “stand out” from the crowd. According to Ms. Marry Gibbs (HR recruiter with 12 years of experience), “When assessing job applications, I always pay special attention to applications containing a s since they help your application “stand out” from the crowd. Why am I so concerned? We need practical experiences, not theoretical sentences “ripped” from books”. As a result, in order for students to master self-study and reach particular goals, they must be familiar with the following skills:

(i) Good communication ability

Whatever career you pursue, the ability to communicate with coworkers, exchange and cooperate in work, and report to superiors is an essential talent. This is one of the most critical talents to have if you work in customer service. The secret to developing loyal consumers and boosting the business’s reputation is to treat clients with respect and politeness.

(ii) Ability to Use Technology

Most industries value the ability to use modern technological goods efficiently. Acquiring technical skills while working part-time will provide you with valuable real-world experience that you can utilize in the workplace. In your CV, don’t forget to mention the software system or equipment you’ve used, such as the POS system at retail outlets or office equipment like printers and fax machines...

(iii) Responsibility

Working responsibly and dependably is a significant skill that you should highlight in your CV. It also demonstrates that you are prompt, flexible, complete tasks on time, and are eager to improve your performance.

2.4. Previous studies on the influence of part-time jobs on students’ learning ability

Budget (1987) said that “Many of the students work a second, part-time employment. And why is it vital to have a part-time job?” Because a part-time job allows you to gain valuable work experience, enhance a variety of skills, and supplement your income while you are still in school. Ali (2017) said that “Part time job could bring extra income and help university students to gain working experience. But students may feel sleepy and reduce the time from the study, thus it is a real challenge to balance between a part-time job and study.”

The part-time job has two sides to it. First of all, the students will have many problems related to their studies. They no longer spend a lot of time going to school and studying, instead skipping classes just to work part-time. This has a very serious impact on your results. Friedas (1951) said that “Most of their reports on the disadvantages were joined with advantages which frequently outweighed the unsatisfactory aspects of having part-time employees. Had this not been true, these experienced employers would probably have abandoned part-time arrangements long before the survey was made.”

So part-time jobs are not necessarily the first priority, it is just time for you to experience different types of jobs before graduating from school and going to work officially. Not a single employer will accept your transcripts below good. It is not that you need to have a lot of experience, but you need knowledge related to the position that the company they are looking for.

According to research by Fineshriber (1980), the analysis of the influence of part-time work on students’ learning is surveyed through three main factors: Gender, difficulties in accessing part-time jobs

and finally is the benefits and reasons of looking to part-time jobs. Fineshriber stated that there were two factors of students who were able to achieve a good performance. Those were the intelligence capabilities of students and the type of students' work in which the job which was relevant to students' majors and could improve the students' academic achievement. Based on some research which has been explained above, shows that taking a part-time job may have a benefit in learning. The researcher finally chose the research about the influence of taking a part-time job on the student's learning ability because the researchers that interested there is some influence of taking a part-time job which is relevant to the students' major in this case, is either it would be the positive or negative influence towards the students' learning motivation.

Vietnam's economy has been changing, leading to a change in the labor market. It is forecast that the labor market in the coming time will change and greatly increase job opportunities for trained workers. Industries that use a lot of labor and have low skills will gradually lose their competitive advantage. Part of the low-skilled workforce will be eliminated and replaced by people with skills and good working attitudes. Therefore, in order to enter the extremely harsh labor market, to pass the entrance exams, students need to actively equip themselves with professional knowledge, professional skills, and the right professional attitude.

3. RESEARCH METHOD

The study has employed some research methods as main means for fulfillment. The first one is the literature research to clarify some definitions that refer to part-time jobs, learning abilities and some solutions to solve. The writer also uses quantitative and qualitative methods to analyse and summerise the documents. In addition, the participants includes 100 FFL students for questionaries and 4 students answering interview questions.

3.1. Questionnaire for students

Self-completion questionnaires were useful way of collecting data. This method could bring some benefits, such as: they are cheaper to administer especially when the sample is widely dispersed then one uses postal service; they are quicker to administer since many people can filling them at the same time; Respondents have some autonomy to respond the questions which avoids biases the come in when you have to talk to particular individually.

There are three major sections of the questionnaire. The first section of questions 1–3 is a handwritten question containing personal information about the participants. The information in this part assists the author in categorizing and analyzing the results. The second step is to check the box to see if the subjects have worked part-time or not. Questions 1 and 2 are two questions that inquire about the income of target groups. Question three is a subjective inquiry used to determine whether or not the person has worked part-time. The third section is a question section for the target groups that have checked the "YES" box. Questions 1–3 are mostly concerned with income and the sort of work performed by the target population. This information is especially crucial since it will allow the study to better understand the development of group behaviors later on. Question 4, 5, and 6 were regarding the influence of part-time job on students, which is also necessary to assist the author in conducting research and providing particular statistics. Question 7 is a one-of-a-kind inquiry about the advantages of part-time work for students. Subjects must answer this question by hand in order to express their personal opinions. Question 8 reverts to the check-in kind of response regarding the necessity of part-time work for students. The information in this question assists the author in providing further ideas for a more in-depth discussion.

3.2. Interview

According to et al (habib 2014) Harish et al. (1999): “*Interview is the verbal conversation between two people with the objective of collecting relevant information for the purpose of research.*” Researcher collects research data from both the primary and secondary methods. Researcher collects the primary data by taking direct interviews with different institutions students. In this interview, researcher ask questions to the participate students about the research topic.

The interview method of data collection also saves money; nevertheless, the researcher must analyze the record and ask suitable questions for each case. The interview question segment is divided into two sections: an introduction (name, age) and the main part (a question related to the topic). Two freshman and two third-year students were chosen to participate in the interview question for the introductory question. We also requested income information from three other third-year students. The research for the second question is focused on three primary questions. The first question sought information on whether or not students had worked part-time. The second question was about what to do in the survey if the student has a job; what is the job’s name? The third question will be about the purpose of employment and how part-time job affects pupils.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Current situation of FFL students’ part-time jobs

Currently, students’ part-time jobs are a common problem in society and there are many domestic and foreign studies investigating the positive and negative effects of this activity as either a living (Manthei & Gilmore, 2005), while these two aspects interact with each other. Up to now, not many studies have been found to fully explore the effects of part-time work on both academic and student activities (Wang et al., 2010).

Students working part-time at the Academy of Finance in general, and the Faculty of Foreign Languages in particular, are now a typical occurrence. According to studies and queries, the majority of students have worked part-time since they were freshmen. Furthermore, students working part-time are no longer an uncommon source of concern in this day and age. More importantly, whether or not students have part-time occupations that impair their academic performance is a major worry. Students are regarded as a healthy workforce, regardless of their knowledge or health, and can pursue any relevant job. Currently, many students are looking for part-time work for a variety of reasons, indicating that the demand for part-time jobs for students is extremely high.

Additionally, the Academy of Finance has implemented a training program in accordance with credit requirements, allowing students to be more engaged in their studies. There is less time to attend to class than previously, and with society’s increasing demands, students must be more active in equipping themselves with knowledge and abilities that they cannot gain in the classroom. Part-time work, on the other hand, will almost surely have an impact on students’ learning, because no matter what job they do, it will eat up a substantial part of their schooling time spent studying.

It can be seen that there are numerous types of part-time work, such as part-time work, and the recruitment procedure varies based on the position, so students at FFL may be certain of finding a job that meets their needs. Students work part-time and earn a consistent monthly income that helps them to fund living expenses, education, and other necessities. Jobs that are “not in the correct major” are typical among FFL students in especially. The great majority of students are involved in English-related jobs for

the goal of applying for jobs and earning extra money. Teaching assistantships and tutoring are two jobs in which many FLL students participate. These two careers are in high demand because the nature of the work necessitates the use of English, and English is a strong suit for FFL students. Joining two professions related to education, on the other hand, is not exactly consistent with the major of “English for Accounting” that FFL students learn. “In fact, students who graduate from the Academy of Finance have jobs for up to 98.39% of them after one year of graduation,” according to the findings of an Academy of Finance graduate survey. Main. In addition, “the Faculty of Foreign Languages is the only unit within the Academy of Finance that obtains 100% of the student employment rate after one year of graduation if measured based on the entire number of students responding to the graduation survey,” according to the FFL. To attain this rate, the vast majority of students in the Faculty of Foreign Languages have a strong command of the English language and have been working on it since their freshman year. Consequently, the fact that FFL students work part-time is widely accepted and valued during their studies at the Academy of Finance. But, this is also a reason for the article, which will look into the academic progress and impacts of part-time work on foreign language students at the Academy of Finance.

The survey results on the current situation of part-time employment

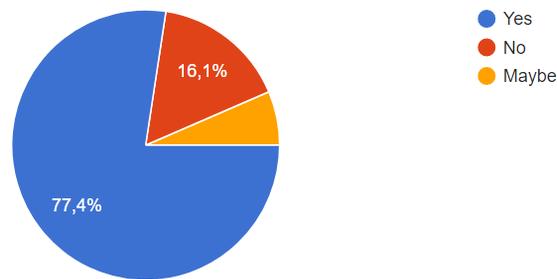


Figure 4.1. The current situation of part-time employment

(Source: Questionnaires result)

Figure 4.1. depicts data on the student group that is related to the current status of students’ part-time work. Based on the graph above, we can see that the total number of students working part-time accounts for 77.4% of the total. This figure demonstrates that surveying and evaluating students with a high number of part-time jobs is appropriate. 16.1% of students have never worked part-time before or had previously worked part-time but are currently unemployed. In general, the graph above plainly illustrates that students working part-time account for the vast majority of the total.

Students’ kinds of part-time jobs

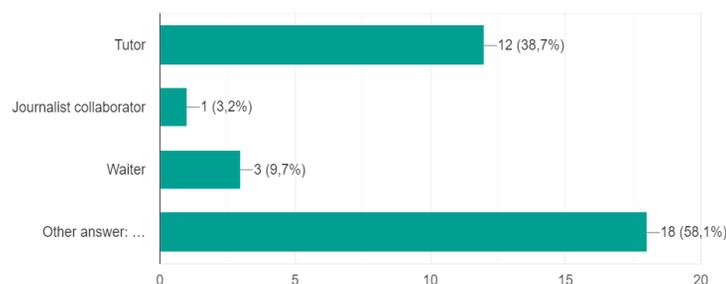


Figure 4.2. Students’ kinds of part-time jobs

(Source: Questionnaire result)

Figure 4.2 depicts the content of “part-time student work,” which includes three major job types: tutor, journalist collaborator, and waiter/waitress. The percentage of students working part-time as tutors is 38.7%, indicating that part-time students mostly employ English abilities for the purpose of this job. Yet, 9.7% of FFL students chose a waiter or waitress employment, indicating that the vast majority of FFL students focus on English-related knowledge and skills rather than participating in other occupations other than manual labor. Students working in various vocations such as teaching assistants, English teachers, and so on account for 58.1% of the total. In general, picking a vocation for part-time work is something that FFL students should think about in order to complement their strengths and, more significantly, link to the industry they are studying.

In terms of when students began working part-time, the majority of students in the poll began working part-time in their first and third years. According to the findings, part-time job is one of the most popular activities in the lives of freshman. Part-time work may be one of the variables for freshman to struggle with learning.

The amount of time spent on part-time job by students

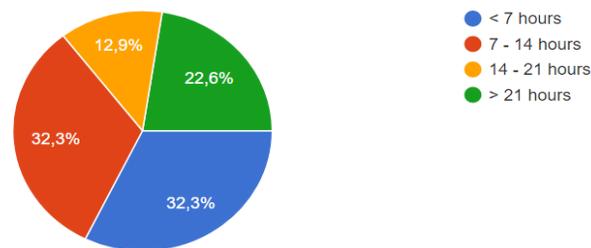


Figure 4.3. The amount of time spent on part-time job by students

(Source: Questionnaire result)

Figure 4.3 depicts the amount of hours students spend working part-time in a week. Overtime work of 7 to 14 hours and less than 7 hours is clearly shown in Figure 3. This means that students must devote at least 3-4 hours each week to part-time work. This quantity of time does not equal the time allotted for the complete work week. Nonetheless, students who worked more than 21 hours accounted for 22.6% of the total. This demonstrates that students labor for more than 20 hours each day, and more particularly, 4-5 hours every session. As a result, students can nearly always work around their academic schedules. The remaining students, or 12.9%, work between 14 and 21 hours every day. This demonstrates that the number of students working during this period is fixed, ensuring that good goals for study and work plans are met. In general, we can observe from the table above that students work part-time for nearly half a day per day, or 4-5 sessions per week. This working time almost has an effect on the cause and purpose of the student’s part-time job.

4.1.2. Reasons that students take part-time jobs

The majority of students choose to work part-time to earn more money to spend (51.6%); it is not specified what the expenditure is here. This finding indicates that students work part-time to supplement their income and assist their parents while attending the Academy of Finance. The students in the survey are of adult age (19-22), so they want to assert themselves by earning an income; additionally, most university students must live far away from their families and must rent dormitories or boarding houses, so spending on daily living expenses is necessary; specifically, most students use part-time wages to spend on personal activities.

Reasons for students to work part-time

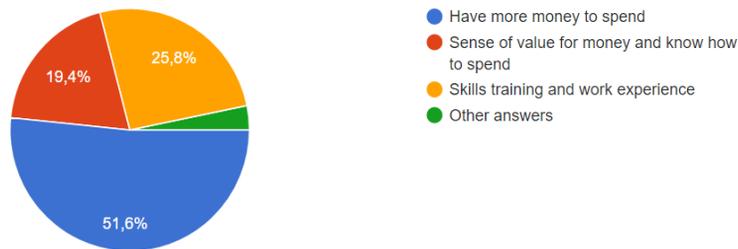


Figure 4.4. Reasons for students to work part-time

(Source: Questionnaire result)

The second reason is to carefully study the value of money in order to use it. By the experiences gained by students, this is regarded a once-in-a-lifetime opportunity. According to the findings, 19.4% of students select this path, partly for financial reasons, but primarily to gain experience for their future lives. Meanwhile, 25.8% of students worked part-time jobs to get more experience, as well as experience itself. It can be seen that this rationale is not appealing to freshmen owing to the age of pupils who have just started school and want to learn new things. The majority of students that choose this reason are third-year students who want to improve their Resumes and future job objectives.

But so far, the reason students go to work is also related to their choice of a part-time employment (Figure 4.2). The majority of students who choose to work in other businesses do so to earn extra money to spend. The rest of the profession’s occupations, such as teaching assistants, tutors, and teachers, all emphasize the necessity to get more experience for future objectives. The results of students’ part-time jobs show that the jobs that students choose to work part-time are very diverse; one reason could be that the student’s place of residence, study, and work is located right in the city center of Hanoi, where there is a high demand for food, entertainment, and learning services, and these part-time jobs do not require a high level of expertise. According to the results of information sources used to find part-time jobs, the two primary sources of information utilized by students to hunt for part-time jobs are introductions from friends and family and internet information sites. This is what relevant units must focus on in order to strengthen student support activities.

4.1.3. Attitudes of students’ family toward part-time jobs

One of the issues that parents have when their children reach their adolescence is whether to send their children to work. Aside from the obvious advantages, many parents see part-time work as posing several threats to their children’s education. Youngsters desire to work part-time not only to earn extra money, but also because they are enthusiastic and curious about life beyond the home and want to try new tasks that have never been done before.

Sending children to work at a young age, according to Dr. Bui Hong Quan, Scientific Advisor and Senior Professor at the Viet Idea Spiritual Care and Training Center, will help teach positive values. “Allowing youngsters to work will help them learn the importance of labor, resulting in an appreciation for labor and a positive attitude toward work. They will have a strong drive to work from a young age.”

Furthermore, the examination of the preceding graphs reveals that kids who work part-time are encouraged to work by their parents in order to have a better understanding of and appreciation for the value of money. Furthermore, students in their first and third years are no longer under the jurisdiction of their

parents, giving them the chance to experience student life while working at their favorite jobs. As a result, whether or not parents send their children to work appears to be more of a psychological issue. In general, the fact that students work part-time for valid reasons makes their parents entirely supportive of the idea.

4.1.4. The influence of part-time jobs on students’ learning ability

4.1.4.1. Advantages

Positive effects of part-time work on students’ learning activities

Students’ part-time occupations have a good impact on their learning activities. Part-time employment for students have a good impact, according to the facts below, because students can learn a lot in the workplace (69%), jobs relevant to the profession that students are studying, such as English listening and speaking abilities. Furthermore, when students were asked to choose one of the most essential perks in the job, soft skills accounted for 22% of the total.

Response sheet for interviewing students about the advantages of working part-time while studying.

I realize, working part-time helps students.....
have money to go to school
more reasonable study time management
to practice the knowledge learned in school
have money to pay tuition fees
get higher scores when working overtime in reasonable time
get better GPA in relevant subjects

Table 4.1. Advantages of working part-time while studying.

(Source: Interview result)

According to the preceding data, the majority of students profit from part-time jobs at enterprises. It is worth emphasizing, in particular, that the forms of professional work help students improve study skills more successfully. GPA summaries illustrate that curriculum-related subjects are applicable in both school and the workplace. The fact that students report that their school grades remain similar while working part-time accounts for the majority of the data in the table below:

Effect of part-time jobs on students’ GPA

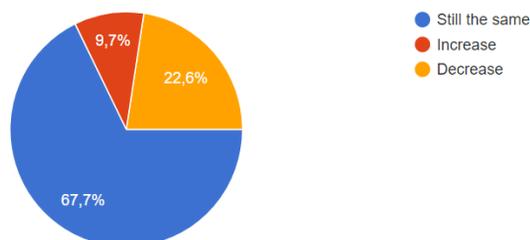


Figure 4.5. Effect of part-time jobs on students’ GPA

(Source: Questionnaire result)

Figure 4.5 illustrates that the impact of part-time work on students’ GPA is still beneficial. The score remains constant, accounting for 67.7% of the total, indicating that the student’s part-time work has little impact on the academic performance. Those who worked improved their grades, and academic performance accounted for 9.7% of the total. In general, the proportion of students who work part-time has a beneficial effect on student learning. It follows that the students’ academic performance remains typical even when they work part-time. This outcome is comparable to Muluk (2017) in that students’ scores remain above

average despite working part-time, however with part-time job ranging from 20 to 30 hours per week, students’ graduation time is extended.

Positive effects of part-time jobs on students’ daily activities

Table 4.2 illustrates that part-time job improves students’ personal, family, and social lives. The strongest positive impact on personal activities, in particular Part-time work, in particular, allows students to save money for personal needs (dining, playing, entertaining, etc.) while also making effective use of their leisure time. This study’s favorable effects on students’ personal life support the findings of Long (2009) and Wang et al (2010). Part-time employment has a somewhat favorable impact on the student’s family life. This result is comparable to Long’s (2009) because working part-time allows students to support their families while also receiving greater attention from them.

Part-time job has numerous positive benefits on students’ social activities, with manifestations such as a student becoming more confident in speaking with others, improving communication and behavior with others in daily life, and making more new friends. As previously stated, Long (2009) and Wang et al. (2010) investigated these positive impacts. Students, on the other hand, receive minimal attention from coworkers, peers, and teachers when working part-time. Part-time work has numerous good benefits on students’ job chances after graduation, especially in helping students gather skills, knowledge, and experience in many different disciplines, in addition to the favorable effects on personal, family, and social activities. This study’s findings are consistent with prior research (Long, 2009; Wang et al., 2010) on the association between part-time occupations and students’ career options.

Positive effects of part-time work on students’ daily activities in Table 4.2.

I realize, working part-time helps students.....
have money for personal expenses (eating, playing, entertainment)
make good use of spare time.
have money to support the family
become more confident in communicating with people
improve communication, how to deal with others in daily life
have more new friends
get more attention from colleagues, friends and teachers

Table 4.2. Positive effects of part-time work on students’ daily activities

(Source: Interview result)

Part-time jobs for students have a good impact on their daily activities in general. Incidentally, the typical student income nowadays is higher. Many students with an average wage of more than 1,500,000 VND have a rate of 61.3% due to the nature of the employment as well as outstanding professional abilities (Figure 4.6):

Student’s salary in 1 month

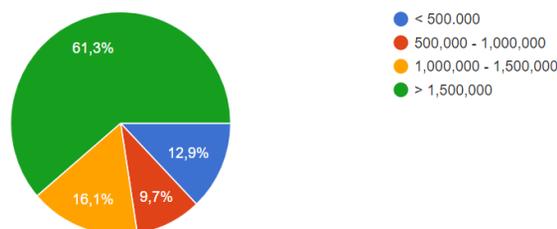


Figure 4.6. Student’s salary in 1 month

(Source: Questionnaire result)

Figure 4.6 displays the release of monthly earnings information for students. According to the above figures, 61.3% of students have an income of more than VND 1,500,000 each year. This demonstrates that students may adequately cover their ordinary living expenses while studying. 9.7% of students had salaries ranging between VND 500,000 and 1,000,000. This equates to an average student earning more than VND 500,000. This sum is sufficient to pay living expenses for students. Part-time work allow students to nearly completely offset their parents’ expenses.

Positive effect of part-time job on job opportunities of students after graduation

Part-time jobs assist many students in achieving particular accomplishments and aspirations after graduation. When students add part-time work experience on their Resume, employers will undoubtedly take notice, especially if students are competing against a large number of other candidates.

I realize, working part-time helps students.
accumulate experience in many different fields.
get future career orientation
have a “beautiful” resume from which to increase job opportunities after graduation.
accumulate professional knowledge to prepare for future careers.

Table 4.3. Positive effect of part-time job on job opportunities of students after graduation

(Source: Interview result)

The aforementioned data clearly illustrate that 88% of students who take part-time work after graduation advance in their careers (according to subjective assessment). Working part-time not only generates revenue, but it also allows students, particularly freshmen, to accumulate and cultivate more life experiences as they attend university. Since working a part-time job allows students to gain knowledge about their field of study. Furthermore, if the work students complete is connected to their subject of study, it is highly convenient, providing students with a very solid base when looking for jobs later on.

In summary, part-time occupations have a wide range of good effects on students’ daily activities, including (1) personal activities, (2) social activities, (3) family activities, and (4) job chances after graduation. Based on the positive benefits discovered, students’ part-time employment is one of the activities that should be encouraged under the condition of working part-time with suitable time constraints. Part-time job has a good effect on students’ learning and living activities, but the positive influence in living activities is stronger than in academic activities.

4.1.4.2. Disadvantages

Negative effects on health and learning

Part-time job is detrimental to students’ health and learning. When students are overly focused on getting money, students will become weary and anxious, which can lead to more serious problems. And, of course, with an unclear health condition, their study will almost certainly fall short of expectations. Too much part-time work, especially for first-year students who are unfamiliar with the pace and approach to knowledge in the university lecture hall, can easily leave them “shocked” with knowledge and make it tough to keep up with another friend.

The effects of working and attending school at the same time on health are shown in Figure 4.7

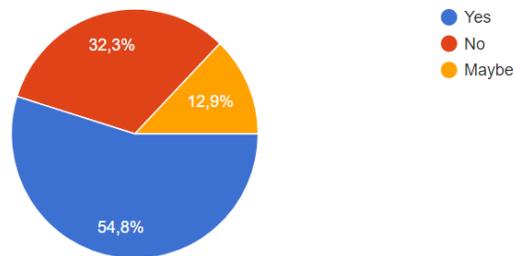


Figure 4.7. The effects of working and attending school at the same time on health

(Source: Questionnaire result)

According to the figure above, students who work part-time and study at the same time have specific negative impacts on their health. The percentage of students that agreed with the preceding circumstance stood for 54.8% of all students. Furthermore, 32.3% of the remaining students disagreed, and 12.9% were unsure regarding the aforesaid issue. Part-time jobs have a relatively unfavorable impact on students’ social activities, manifesting as follows: absence from extracurricular activities; absence from student groups, unions, and associations; absence from voluntary activities. Students in this poll discovered that even when they work part-time, they still have time to socialize with their peers. Because people use school learning facilities while working, the findings of this study contradict those of Wang et al. (2010). In this study, students’ learning activities are less negatively affected than their living activities since the majority of students work part-time with suitable time constraints, and the majority of students pick part-time employment that are connected to their speciality.

Furthermore, the part-time employment has a significant impact on the student’s daily routine. Table 4.4 demonstrates that part-time employment has a moderately detrimental impact on students’ personal lives. Students working part-time, in particular, do not get adequate sleep (7 to 8 hours per day), do not take a lunch break, and do not eat correctly. Students’ sports, recreation, and entertainment activities are less significantly impacted when working part-time than personal activities. This finding supports Anh et al(2013) .’s study on the harmful health impacts of part-time job, particularly when students work long hours.

Negative effects of part-time work on students’ daily activities

I realize that when working part-time, students.
do not have time to sleep enough 7-8 hours per day
do not participate in sports, entertainment or recreational activities.
do not participate in extracurricular activities
do not participate in student organizations, unions, associations
do not participate in volunteer activities
do not have time to hang out with friends

Table 4.4. Negative effects of part-time work on students’ daily activities

(Source: Interview result)

Furthermore, the attitude and morals of students who suffer as a result of working part-time are a source of concern. In this study, a tiny percentage of students (0.7%) believe that earning money will provide a sense of fulfillment, because students prefer to work rather than go to school and squander money, and they have the attitude of avoiding other occupations in order to accomplish more. It demonstrates that the students in this study are in their youth, therefore the majority of them do not pay attention to preserving their health, despite being aware of the negative influence and exercising their health. participation in sports, recreation,

and entertainment activities, however the findings demonstrate that students' attitudes toward the statement "while working part-time, students do not participate in sports, recreation, and entertainment" are almost neutral. Furthermore, according to Vietnamese culture, most students rely on their family from childhood, therefore even when studying away from home, they always make time to visit their homes. Probably for the reasons stated above, the students in this study are not significantly impacted by recreational and family activities, despite working part-time; their health is not adversely affected. Students require more focus.

Influencing future plans

The fact that students are only concerned with obtaining money to satisfy their hobbies will have an impact not just on their health and education but also on their initial plans. According to statistics, the majority of part-time FFLers do not wish to pursue their chosen major. Also, students are more likely to stay with their existing employer following graduation. Several students believe that their part-time work has had a direct impact on their ambitions to study English at the Academy of Finance.

The effect of part-time work on the original intention



Figure 4.8. The effect of part-time work on the original intention

(Source: Questionnaire result)

The graphic above explains how part-time employment affect students' academics, specifically their future plans when working part-time outside of school hours. The majority of the answers were unaffected, accounting for 41.9%; the number of students who agreed was 32.3%; and the remaining students who were unclear accounted for 32.3%. Part-time occupations, in general, have an impact on students' learning processes. Despite the fact that the quantity is not large, students must focus more on their studies.

"Multi-Level" Scam Problem

Scams are growing more complex as the demand for part-time jobs among students in industrialized cities grows. Many bogus work centers have enticed human resources with flying advertisements and dream-earning jobs... and then swindled wages, exploited labor, and failed to pay correctly... As a result, the fact that students work part-time offers numerous concerns. Students, in particular, are hesitant to recommend some reliable information sources to apply for jobs when asked about them. Furthermore, because of their inexperience and lack of a clear reason for working, freshmen are vulnerable to fraud.

4.2. Discussion

According to research findings, students working part-time while still in school is relatively prevalent, and part-time job has an impact on students' living and studying activities. (1) Part-time occupations have a greater favorable impact on everyday life activities than study activities. Students who have money for personal costs and make good use of their leisure time, have extra money, are more rational in their study time

management, and practice what they have learned in school are common symptoms. (2) Part-time jobs have a significantly detrimental impact on learning and living activities, with manifestations such as students not receiving enough sleep (7 to 8 hours per day), not having time for a lunch break, and not eating adequately. (3) At the same time, working overtime for 2 hours or more every day has a bigger detrimental influence. Students' popular solutions for limiting the negative effects of part-time work on learning and living activities include paying attention to diet and getting enough sleep (7 to 8 hours per day), avoiding difficult part-time jobs, choosing part-time jobs related to majors, and planning to study and work part-time every week.

With contemporary students discussing the issue of part-time job and its benefits and drawbacks, the appeal of part-time work is strong, but the risks are not minor. That is not to say that we should waste our opportunities by worrying about what might happen. It is evident that part-time employment benefits students greatly, not just in their social lives but also in learning their good and poor points. Part-time work is excellent, but the hazards are not minor. That is not to say that we should waste our opportunities by worrying about what might happen. It is evident that part-time job benefits students greatly, not only in social situations but also in understanding their strengths and weaknesses. Evidently, mixing employment, education, and leisure enriches students' lives, making them more diverse and valuable in the eyes of employers. However, before electing to work part-time, students should be contacted, as well as spending a significant amount of time researching the job and job brokerage address. Simultaneously, ensure that you will not be sidetracked when studying or working.

Part-time jobs have become increasingly common among students in recent years, with numerous HUFU students engaging in business activities while still enrolled in classes. However, for students, the primary job is to study, and part-time work often has two-way consequences, providing benefits but also posing numerous disadvantages. Working part-time allows students to gain new skills, study, practice, and hone their communication skills, foreign languages, informatics, trust in front of audiences, and other skills that can be applied in practice. This is one of the benefits of part-time employment for students. Apart from that, HUFU students face a variety of challenges, including: With the characteristics of certain part-time jobs, there will be many possible hazards and uncertainty for students, such as being late at work, or taking the risk of having to pay for money in sales and service jobs; or motorbike taxi jobs, where students are vulnerable to unsafely or traffic accidents; Finally, if there isn't a reasonable balance between studying and part-time jobs, academic result will deteriorate.

5. CONCLUSION

Based on the findings and discussion that had been explained, it could answer the research question, what is the influence of part-time job on FFL students' learning ability. Through questionnaire results the researcher concluded that the influence of a part-time job on FFL students' learning motivation was very strong, especially in improving the students' learning ability.

Based on the results, the author gave some recommendations to help students increase their will to attain their study results. Students should focus on research, overcome time challenges, and strive to find solutions. They also should look for employment that are related to their major. At the same time, students must plan a reasonable learning strategy, participate in study group, fully complete the exercises and create a time lock that is really doable for study and a part-time job.

6. APPENDIX

We are students at the Faculty of Foreign Language – AOF. We are carrying out scientific research named “**THE INFLUENCE OF PART-TIME JOBS ON FFL STUDENTS' LEARNING ABILITY**” by conducting a survey on FFL students' occupations. This questionnaire is a part of our research and all

those ideas including personal information will be kept secure and will be used for this research only. We hope you answer the questions honestly, accurately, and accordingly. Thank you for your cooperation!

Part 1. General Information

1.Name:

2.Sex:

4.Class

3.Email:

Part 2. Information questionnaire section

1. How much pocket money are you given in a month?

- a. < 500.000
- b. 500.000 - 1.000.000
- c. 1.000.000 - 1.500.000
- d. > 1.500.000

2. How much pocket money are you given in a month?

- a. < 500.000
- b. 500.000 - 1.000.000
- c. 1.000.000 - 1.500.000
- d. > 1.500.000

3. How much pocket money are you given in a month?

- a. < 500.000
- b. 500.000 - 1.000.000
- c. 1.000.000 - 1.500.000
- d. > 1.500.000

4. Is that amount enough for you to spend for 1 month?

- a.Yes
- b.No

5. Do you have a part time job?

- a.Yes
- b.No

Part 3. In-deep questionnaires section

1. What part-time job did you do?

- a. Tutor
- b. Journalist collaborator
- c. Waiter
- d. Other answer: ...

2. How long do you go to work in a week?

- a. < 7 hours

- b. 7 - 14 hours
- c. 14 - 21 hours
- d. > 21 hours

3. Salary you receive in 1 month?

- a. < 500,000
- b. 500,000 - 1,000,000
- c. 1,000,000 - 1,500,000
- d. > 1,500,000

4. Going to school and working at the same time, how has your study results changed?

- a. Still the same
- b. Increase
- c. Decrease

5. Does going to school and working at the same time affect your health?

- a. Yes
- b. No

6. Does the part-time job affect the study goals you set at the beginning?

- a. Yes
- b. No
- c. Maybe
- d. Others

7. What part-time jobs have helped you (Skills, experience, thinking, personality, ...)

.....

.....

8. The most important reason for you to work part-time?

- a. Have more money to spend
- b. Sense of value for money and know how to spend
- c. Skills training and work experience
- d. Other answers

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A STUDY ON SCIENTIFIC RESEARCH OF STUDENTS AT THE ACADEMY OF FINANCE IN HANOI, VIETNAM

**Performed by: Hoang Thanh Hue, Duong Thi Lan Huong,
Nguyen Thi Thuy Trang, Tran Vu Huong Giang
Instructor: Dr. Tran Thi Thu Nhung**

ABSTRACT: Nowadays, scientific research is a practical and vital in the development trend of higher education training all over the country in general and at the Academy of Finance in particular. However, scientific research for students still has limitations, such as a lack of knowledge and skills, a shortage of financial support, etc. Scientific research analyzes the factors affecting students' scientific research activities. The study results show that although the number of students participating in scientific research is increasing, the quality of scientific research papers could be better. Therefore, the authors have studied ways to optimize solutions to improve the quality and effectiveness of training and teaching. In addition, to achieve the research objectives, the authors have surveyed the Academy of Finance students, thereby seeing the limitations and shortcomings and suggesting solutions for encouraging students to engage in scientific research.

INTRODUCTION

Scientific research is a cognitive activity systematically organized by humans, aiming to discover new knowledge about the nature and laws of the objective world proven by practice and plays a role in improving practice.

In response to the requirements of socio-cultural development and training of human resources to serve the industrialization and modernization of the country, the fourth meeting of the 7th Central Committee of the Communist Party of Vietnam was held, assigning the education sector the following mission: “Redefining goals, redesigning programs, plans, contents, educational methods, training and innovating teaching methods at all educational levels”.

With fundamental responsibility, universities have reaffirmed their goal of providing professionals for society with a high level of scientific knowledge and being capable of creative and logical thinking. In order to achieve that goal, universities are constantly looking for ways to improve the quality of training and teaching to enable students to participate in scientific research actively. Scientific research is a specific form of university teaching that helps students actively study, master new knowledge, and practice applying new cognitive methods. However, students still face many difficulties and obstacles in scientific research activities.

Vietnam integrates increasingly intensively with the world economy, participating in and signing many free trade agreements, constantly changing socio-economic conditions, and developing two scientific and technological revolutions. In order to keep up with the development trend, it requires that students improve their ability to do scientific research and apply new methods in their scientific research activities.

Recognizing the importance of scientific research activities in current practice, the Academy of Finance has constantly introduced policies and guidelines to encourage students to participate in scientific research activities. Therefore, the topic “*A study on scientific research of students at the Academy of Finance in Hanoi, Vietnam*” was chosen as the authors’ scientific research topic to participate in the “Vietnam Young Scientific Talent Award.”

1. THEORETICAL BASIS

1.1. Basic issues of scientific research activities of students

1.1.1. Scientific concepts

The term “science” is a highly complex concept at different levels of the active process of perceiving objective reality and abstract thinking.

According to Vu Cao Dam, science is also understood as a social activity aimed at exploring, discovering the laws of things and phenomena, and applying those laws to create principles of solutions to influence things or phenomena in order to change their state.

Thus, science is the research process to discover new knowledge, new theories, etc., about the natural and social aspects. This new knowledge or theory is superior and can gradually replace the old ones no longer relevant. For example, the concept of plants as non-sensual objects can be replaced by plants with sensations.

1.1.2. Concept of scientific research

Nguyen Van Tuan (2011) suggested that scientific research is “a human activity to expand knowledge through scientific methods” This can be understood that scientific research is an activity of searching, examining, investigating, or testing. Through scientific research, we can prove, discover and create new natures of things, methods, and new knowledge of higher value that contribute to the development of society. Doing good scientific research requires professional knowledge about the research field and passion, and the ability to work independently, self-reliantly, and methodically since you are a university student.

1.1.3. Concepts of scientific research subjects

A scientific research subject is one or more scientific problems that are partly or entirely undiscovered but have a premise and knowable ability to answer the problems posed in the science or practice.

The scientific research topic arises due to the requirements of theory or actual practices, conveying two issues: The problem contains a conflict between the known and the unknown; there is a possibility of resolving that conflict.

A scientific research subject arises when the researcher is faced with a contradiction between existing scientific knowledge’s limitations and the requirement to develop that knowledge at a higher level.

1.2. Factors affecting students’ scientific research activities

Scientific research activities of students at universities have been given more and more concern recently. Depending on each school, this activity can be carried out in many different forms, such as writing essays, internship reports, graduation thesis, or conducting scientific research at the faculty or university level. However, scientific research still needs to be improved for university students in our country, even though it is an essential criterion for Vietnam to achieve the goal of having many schools meeting international standards.

According to the research of Duc Son, H., & Thi Nhu Mai, N. (2021), there are 04 factors affecting students’ participation in scientific research: Research environment, motivation, and research capability of students and Incentives provided by universities. Which research environment has the most impact on students’ participation in scientific research

1.2.1 Research environment

Creating a conducive environment to promote students’ research activities is a current trend in most universities in Vietnam. This involves establishing a university education orientation that enhances students’

proactive research capabilities, fostering a research culture among students, building a system of traditional and electronic libraries with rich resources, and providing convenient access. It also involves developing a solid team of scientific researchers (lecturers) who can guide and support students in their research activities.

Although most universities in Vietnam emphasize the principle of “placing the learner at the center” or “enhancing students’ proactive research,” the reality is that there is still a high level of passivity in learning at universities. Students rely heavily on textbooks and lectures from their professors. Assessments of students’ knowledge and understanding of subjects are often based on memorization tests. The use of essay exams or large assignments is not immune to the issue of students engaging in “copy-pasting.” To address this situation, should universities promote student involvement in research, establish mechanisms to convert students’ research results into grades for courses, or recognize them as part of students’ research and academic achievements?

1.2.2. Research motivation

Research activities aim to acquire scientific knowledge, skills, techniques, attitudes, and corresponding personal development. In his doctoral dissertation, Nguyen Duc Nha identified the motivations behind the research, which manifest in the form of knowledge, skills, techniques, attitudes, and personal development that research activities bring. Researchers have identified two overarching motivations that dominate research activities: the motivation to acquire knowledge and the motivation for social relationships.

1.2.3. Research capacity

The current trend in education is closely linked to the development of research competence for faculty members and students. Research activities for students are an essential requirement in universities’ training process. It is also a necessary foundation for innovation in content, teaching, and learning methods and contributes to improving teaching and learning quality.

In her article, Le Thi Van Anh analyzes that in recent years, university students’ participation in research has been limited in the quantity and quality of research topics. Objectively speaking, the number of students interested in research still needs to be bigger, and the quality of research topics is often not high and lacks practical application. Research activities among students are often seen as a movement. Many students participate in research groups with their friends and engage in research for achievements...

1.2.4. Institutional support and encouragement

Regarding encouraging student participation in research, Dr. Nguyen Truc Le, vice-principal in charge of research activities at the National Economics University, stated: “At the beginning of each academic year, we organize research workshops specifically for students. These workshops introduce the benefits of research activities, encourage students to actively participate, and provide guidance on research directions and project implementation. Based on the student’s registration topics, the university, and departments will assign competent instructors to provide active support throughout the research process.

2. CURRENT STATUS OF RESEARCH ACTIVITIES BY STUDENTS AT THE ACADEMY OF FINANCE

2.1. Mission, Vision, and Quality Policies of the Academy of Finance regarding research

Facing the trends of globalization and the Fourth Industrial Revolution, Academy of Finance has adopted the following fundamental directions for development:

Firstly, the focus is on enhancing the quality of education and research. This involves exploring and maximizing the core potential in high-quality education, ensuring the adaptability and responsiveness to the demands of the knowledge-based economy and the Fourth Industrial Revolution.

Secondly, there is a diversification of training programs and innovative approaches to organizational management. Emphasis is placed on enhancing professional practical skills internationally, promoting self-learning through innovative research and experiential learning.

Thirdly, there is a strong emphasis on improving research capabilities and achievements. This involves harmoniously combining fundamental research, applied research, and implementation-oriented research.

Fourthly, proactive international integration is pursued in all activities of the Academy, with a particular focus on regular undergraduate education, staff development, and research.

Fifthly, university administration is innovated with a focus on autonomy and social accountability, creating an academic environment that is open, innovative, and international. Efforts are made to attract outstanding young individuals and scholars to undertake internships and research at the Academy of Finance.

2.2. Current status of research activities by students at the Academy of Finance.

2.2.1. Research environment at the Academy of Finance.

The research activities at the Academy of Finance are closely related to its training and human resource development activities. In order to enhance scientific and technological capabilities, the Academy of Finance has made efforts to establish a systematic and professional research environment to maximize the inherent potential of its students. The research environment for students can be analyzed based on factors such as state policies and regulations regarding research activities, societal development, social capital and financial resources, and infrastructure.

The regulations for student research in universities and colleges are outlined in Decision No. 08/2000/QĐ by the Ministry of Education and Training on March 30, 2000. It states: “Every year, the heads of institutions decide on an appropriate budget to support students’ research activities. This budget is allocated from the following sources: state budget allocated for scientific and technological activities; regular training budget of the institution; funding from organizations, associations, and individuals both domestically and internationally.” However, addressing the financial challenges in a financially autonomous university environment is relatively tricky. To overcome this difficulty, the Financial Academy has actively innovated its financial management for students’ research activities and increased funding for students to fulfill their tasks, primarily through budget sources. Additionally, the Student Union and Youth Union have proactively established fundraising models for research, motivating and encouraging widespread student participation. Notably, the institution has implemented mechanisms to enhance and expand cooperation with research institutions and businesses to secure financial support for students’ research activities, particularly for projects with high practical applicability.

A good research environment requires adequate equipment, laboratories, classrooms, and libraries with sufficient capacity for appropriate scientific materials. Basic equipment such as computers, printers, projectors, and measuring devices also need to be arranged and regularly maintained. The institute has been actively involved in directing and managing the initial tasks related to infrastructure, technical equipment, and utilizing various resources to upgrade and develop towards standardization and modernization. The institute prioritizes infrastructure and equipment investments that are directly linked to the functions and tasks of scientific research, aiming to maximize efficiency and utilization of resources while avoiding waste. A modern and highly equipped library has been constructed, along with an information center, to provide maximum opportunities for teachers and students to update their knowledge and improve the effectiveness of searching for reference materials, conducting experiments, and applying the acquired knowledge. Additionally, the Institute of Finance gradually promotes the transparency of research programs at all levels,

providing opportunities for students to access research topics within these programs, select and participate in research, and improve the selection process for organizing and implementing scientific and technological projects at various levels based on competitiveness and fairness to attract enthusiastic students to engage in scientific research activities.

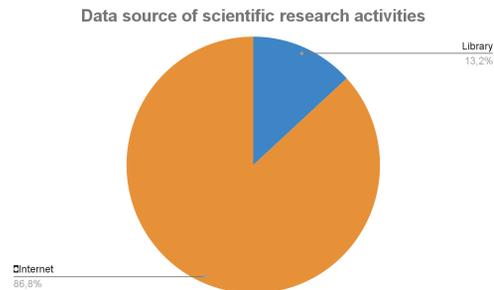


Chart 1: Data source of scientific activities

The results from the chart above indicate that students predominantly rely on the internet as the primary source of data for their research activities, accounting for 87%. On the other hand, research data from the library only accounts for 13%. Therefore, in the near future, the institute needs to improve, establish, and enhance the infrastructure system of the library. This will enable students to access reliable data sources provided by the institution and fully utilize the existing knowledge base.

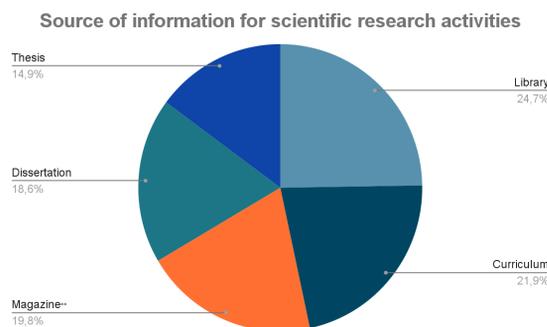


Chart 2: Sources of information for scientific research activities

The analysis from chart 2 reveals that students tend to choose information sources from various library materials, with fairly equal proportions. The highest percentage of students, accounting for 55.1% (223 out of 405 surveyed students), choose reference books from the library. The use of textbooks is reported by 48.8% (198 students). Furthermore, 179 students (44.2%) utilize journals for their research projects. A smaller proportion of students, 41.5% and 33.1%, refer to theses and dissertations, respectively. These findings demonstrate that students at HVTC effectively utilize the available resources provided by the institute.

The research environment should provide students with practical research activities, such as independent research projects, internships, campaigns, and practical programs. Continuous initiatives are organized to highlight the role of innovation and creativity in the era of globalization. To promote research activities, the “Student Research Journal” is particularly appealing. This journal ensures regular publication, with one issue per month, allowing students to access valuable information and learn from their lecturers and peers. Each issue typically contains 19-21 carefully curated articles covering various scientific topics in economics, finance, accounting, auditing, and social issues. This forum serves as a valuable platform for students to gain research experience gradually. The concise length of each article, no more than 5 pages, enables quick and focused reading, facilitating targeted discussions and prompt problem-solving approaches.

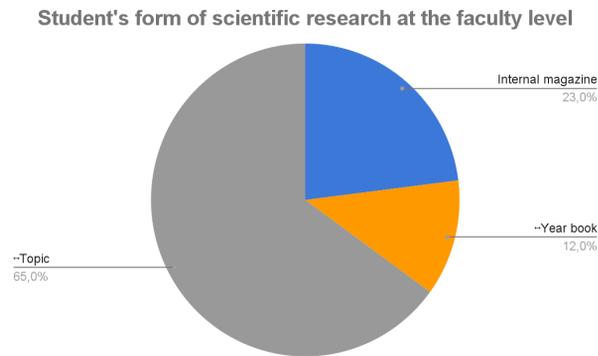


Chart 3: Student's form of scientific research at the faculty level

The descriptive statistical analysis of Chart 3 reveals that students' choices for research projects show that the highest proportion, 65%, opt to write research papers at the department level. Students who choose to write for the Student Research Journal account for 23%. The remaining 12% of students choose to write for conference proceedings.

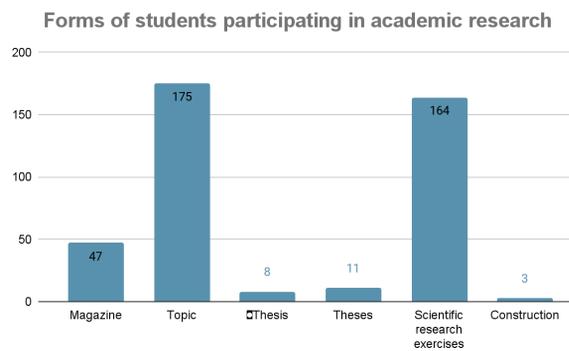


Chart 4: Forms of students participating in academic research

According to the data from Chart 4, among the forms of participation in Academy-level research, the most chosen forms by students are Research Exercises and Research Projects, accounting for 40.2% and 36.5% respectively. Students opting for Report Writing account for 11.6%. The remaining forms, including Thesis, Dissertation, and Research Works, make up a negligible proportion.

From Charts 3 and 4, it is evident that research activities at the Academy of Finance are highly active. The Academy has closely directed various activities to promote diversity in research endeavors, enriching the research environment. This enables students to unleash their creativity and passion for research.

Recognizing the role and significance of research activities in the educational process, the Academy organizes various research-related events such as specialized festivals, Economic Olympics, Marketing Kings, Banking Exploration, Future Chief Accountant, Future Finance Director, English Festival, and Logistics competition at the school level. These competitions, spanning diverse fields, provide valuable knowledge and ignite motivation and enthusiasm among students. In the current digital transformation era, organizing competitions with deep expertise helps students not only practice and apply knowledge to address specific topics but also develop scientific thinking, information exploration skills, presentation and debating skills, and teamwork abilities. The understanding gained from participating in these competitions extends beyond the specific subjects, presenting opportunities for students to apply their knowledge to real-

world projects. These activities also help students hone their teamwork and research skills while expanding their specialized knowledge.

Currently, scientific research activities are widely spreading among students at the Academy of Finance. Scientific research, for students, is a beneficial playground and a nurturing ground for young individuals passionate about research and science. Engaging in scientific research, students acquaint themselves with the process of exploration, understanding, and choosing topics that resonate with their interests. They delve deep into critical thinking and problem-solving approaches. Moreover, the process of conducting and defending their research findings helps students refine their skills in communication, presentation, and confident demeanor before academic committees. This valuable and exciting experiential journey should be embraced by university students during their academic years.

Students at the Academy of Finance possess the vigor of the new era. They are not deterred by challenges or hardships, instead, they are proactive in seeking new knowledge, unafraid to express their ideas. These characteristics are highly essential for research activities. Creativity and practical connections open up new avenues of research and new research problems. The dynamic nature of research enables researchers to actively explore, learn, think, and take action. The confidence, coupled with the valuable knowledge from instructors, helps students stand firm in their academic positions. These qualities are inherent in every student at the Academy of Finance.

2.2.2 Motivations driving students' research activities

Scientific research promotes social development, improves human life, and addresses challenging issues. In an era of rapid scientific and technological advancement, the motivations driving students' research activities have become incredibly important and diverse.

Students are encouraged to acquire specialized knowledge in their fields of study and engage in research activities to develop skills and explore new aspects of their areas of interest. This helps them enhance problem-solving abilities, foster creative thinking, and develop teamwork skills, increasing their competitiveness and creating career opportunities.

Scientific research is closely tied to enhancing the quality of learning and unleashing students' potential and creativity, enabling them to generate valuable research products and works. With this understanding, the Financial Academy has implemented policy mechanisms and incentives to create motivation and encourage students to participate in research activities.

2.2.3 Research capabilities of students at the Academy of Finance.

Higher education is shifting its training goals towards research-oriented and applied universities, focusing on technology transfer. This orientation and transformation require institutions, including the Financial Academy, to pay more attention to students' research capabilities.

Research helps students accumulate knowledge, expand their understanding, gain experience, develop their skills, and foster a proper research attitude. The research results can be effectively applied to their learning process and real-life situations. Therefore, it is necessary to consider both the process and the research outcomes to fully evaluate students' research capabilities at the Academy of Finance.

The attitude of students at the Academy of Finance when engaging in research activities is an essential factor influencing the success of research projects. Scientific research is often a lengthy and complex process, so students must have patience and perseverance to overcome challenges and difficulties. Additionally, students should possess critical thinking and creativity to develop ideas and solutions for

research issues. They need to approach experiments and data collection with caution and accuracy to ensure the reliability of research results. Due to the increased awareness and recognition of the importance and benefits of scientific research, the attention and focus of Academy of Finance students have been elevated, yielding remarkable results.

To produce high-quality works, the necessary skills for student involvement in research must be mentioned. Students at Academy of Finance need to be able to search for and analyze relevant literature on their research topics. This skill includes reading and comprehending specialized materials, assessing the reliability of sources, and collecting necessary information. Students should also be able to analyze and evaluate data collected from experiments or various sources. This skill involves using data analysis software and tools and assessing and explaining the results of data analysis.

Moreover, students need to be able to argue and write reports on research findings. This skill includes identifying research objectives, analyzing data, and presenting research results clearly and logically. Communication skills to effectively present ideas and research findings, both in writing and in oral presentations, are essential skills that students should practice regularly. These skills include writing emails, presenting to a panel of examiners, and introducing research at scientific conferences.

To successfully carry out a research project, students need to have the ability to use research methods correctly. Currently, there are various research methods in the field of scientific research. However, based on data collected from a survey conducted with over 400 students at the Academy of Finance, the chart below illustrates the percentage of the most commonly applied research methods:

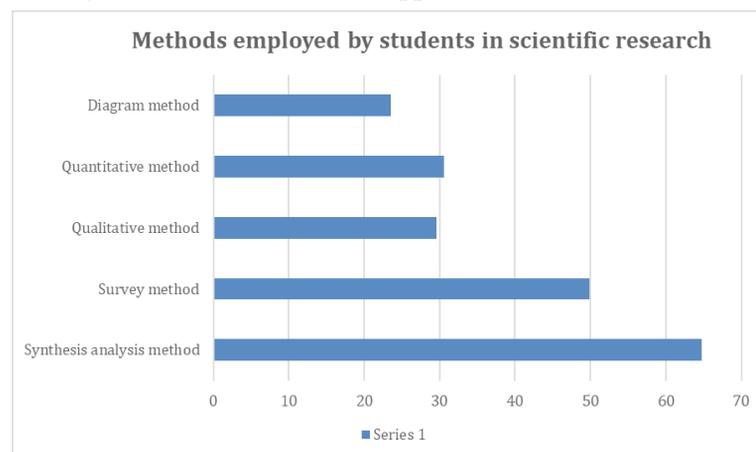


Chart 5: Methods employed by students in scientific research

The chart reveals that the most commonly used research method in scientific research activities is the synthesis analysis method, accounting for 64.7%. The survey also indicates that the survey method is used by 49.9% of students, while qualitative and quantitative methods are employed by 29.6% and 30.6% respectively. Finally, the least utilized method is the diagram method, representing only 23.5% of the total.

Although research activities have received attention, students often pay more attention to the final product and research outcomes. As a result, some students may have concerns and fear that they will not achieve the desired results, which may discourage their participation in research. The participation rate of Academy of Finance students in research activities over the past three years shows that only about 20% of students actively engage in research initiatives, with a focus on third and fourth-year students. Among them, the proportion of final-year students participating in research is highest, ranging from 50% to 60%, while third-year students account for 12.8%. The majority of participants are fourth-year students, as they

have completed a significant portion of the curriculum. However, it is crucial to develop research initiatives for first and second-year students as well, to nurture the passion and interest in scientific research.

Based on the survey data collected from over 400 students at the Academy of Finance, the number of research projects being conducted is still relatively low, and the publication rate of research papers is not high. The survey results reveal that a significant percentage of research projects are categorized as “not achieved,” accounting for 76.5%. Additionally, 12.3% of projects are classified as “average,” only 8.9% reach the “good” level, and a merely 2.2% are rated as “excellent.” These findings suggest that the quality of research projects by students still requires attention and improvement. Consequently, the institution needs to implement appropriate measures and policies to encourage student participation in research activities, aiming not only to increase the quantity of research projects but also to prioritize their quality, thereby contributing to valuable research outcomes.

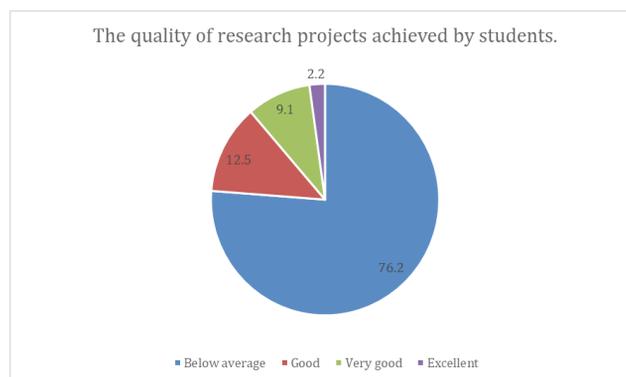


Chart 6: The quality of research projects achieved by students

2.2.4. Encouragement and support for student research at the Academy of Finance.

- *From the Academy’s Perspective:*

The Academy creates research movements for students by organizing competitions and intellectual playgrounds to attract and foster students’ learning experiences and knowledge sharing. The Academy regularly organizes department-level and Academy-level competitions to promote active participation in research activities to provide beneficial platforms for students passionate about scientific research. Additionally, the Academy frequently organizes seminars and contests to facilitate knowledge exchange between institutions, such as the “Olympic Economics and Application: Enhancing the Quality of Scientific Research” competition (2020). Furthermore, intending to continuously enhance the quality of education and scientific research, the Financial Academy values maintaining and expanding international collaborations. In addition to existing traditional partnerships, the Academy has explored and expanded cooperation with numerous universities, institutions, training centers, and reputable research institutes worldwide, including the University of Greenwich, the Association of Chartered Certified Accountants (ACCA), the Institute of Chartered Accountants in England and Wales (ICAEW), the World Institute of Business and International Studies (WIBI) in Singapore, the University of Toulon, the St. Petersburg National Research University of Economics and Finance, and the Central University of Finance and Economics in China. The Academy emphasizes the innovation of program content and teaching methods, considering scientific research as a vital approach to enhancing the quality of education. To effectively implement this solution, the Academy has refined the training objectives for each of the 54 specialized majors, serving as the foundation for developing research program systems aligned with specific disciplines. The improved training objectives are based on surveys of practical needs and evaluations of training quality, aiming to “provide high-quality

financial and accounting training and scientific research products to society.” Adequate funding is allocated to research activities to encourage and motivate students’ active participation in research. According to Decision No. 496/QĐ-HVTC issued on October 3, 2013, by the Ministry of Finance, the funding sources for student research include the state budget allocated for scientific and technological activities, supplementary funds from the Academy’s revenue, and other legal funding sources.

- *From the perspective of student Union and Departments:*

The Student Union and departments play a crucial role as a “bridge” between students and the Academy, effectively disseminating information about scientific research to students. This activity aims to deepen students’ awareness of the importance of scientific research and demonstrate that research is not a distant endeavor but highly relevant for all students. The Student Union and departments ensure close official communication channels between various departments within the institution to provide timely support for students during the research process. They organize competitions and platforms to attract student participation, facilitate knowledge sharing, and foster learning experiences. For instance, on March 7, 2023, the Foreign Language Department’s Student Union successfully organized the “Student Scientific Research Symposium 2023” with the participation of experienced faculty members and 57 student mentors who achieved outstanding results in their research projects. This symposium introduced valuable methods for students to engage in scientific research and helped establish appropriate attitudes and goals for academic and research pursuits. Interacting with experienced students who have achieved high accolades in scientific research boosted the confidence of other students, making it easier for them to select research topics, carry out and refine their projects, and publish increasingly high-quality research works. This contributes to developing the research movement within the Foreign Language Department.

- *From the perspective of faculty members:*

Faculty members guide student research: They regularly stimulate students’ creativity, critical thinking, and ability to analyze and critique various issues scientifically. Faculty members also provide motivation and inspiration, nurturing students’ passion for research. Faculty members’ research publications serve as clear evidence for students to emulate. Additionally, faculty members at the Academy actively listen, understand, and identify the strengths, difficulties, and challenges that students encounter during the research process. Moreover, faculty members assist students in selecting research topics, planning, searching for literature, conducting surveys, and processing and analyzing data, among other tasks.

In summary, within the context of globalization and deepening international integration, considering the significant role of scientific knowledge, promoting research activities at universities is of utmost importance. Student research activities at the Academy have tremendous significance, transforming the learning process into a self-directed learning journey. This foundation is essential for the Academy to enhance the content and teaching methods and contribute to improving the quality of education, meeting the demand for fostering and developing knowledgeable financial and accounting professionals to support the industrialization and modernization of the country. Effectively managing and motivating student participation in research is a pressing task for the Academy. The strength and effectiveness of managing student research activities can only be achieved through coherently integrating these approaches. Neglecting or implementing isolated measures diminishes the effectiveness of managing student research activities in today’s universities.

3.1. Solutions to enhance the effectiveness of student research activities at the Academy of Finance

3.1.1. Directions for research activities at the Academy from 2022-2023 to 2025

Assoc. Prof. Pham Van Lien: To improve the quality of research activities in the coming years, the Academy will focus on several directions. Specifically, it will emphasize the significance of research as one of the essential criteria used to evaluate the ranking of universities and the assessment of faculty members in

universities and academies. Alongside this, the Academy will strengthen and enhance the quality of activities conducted by specialized research groups in various departments and research clubs for young researchers within the institution. It will also promote the organization and implementation of research projects with high practical applications, especially projects funded by the state and ministry and those serving practical management at the local level. The Academy will ensure the proper selection and timely assignment of research topics to individual units, aligning with the research directions established by the institution.

Furthermore, the Academy will enhance the socialization of research activities by exploring and expanding financial resources outside the budget to support research projects. It will also strive to establish stronger connections between research outcomes and the practical application of financial resources.

3. SOLUTIONS TO IMPROVE THE EFFICIENCY OF SCIENTIFIC RESEARCH ACTIVITIES OF STUDENTS AT THE ACADEMY OF FINANCE IN THE COMING TIME

Solution 1: Organize and develop a plan to systematically and effectively implement scientific research policy for students.

Objective: To organize and implement scientific research activities for students systematically and methodically, to promote their dynamism, creativity, and independent research capacity, to form self-learning ability for students, and to create opportunities for students to access and apply scientific research methods effectively and standardly. To develop a specific and clear plan to make the policy implementation more effective.

Requirements: The plan must be implemented specifically for the participants. Universities must base their capacity and ability to pursue their roadmap. The plan must clearly state the tasks of each unit and department in implementing the policy, avoiding overlap affecting the policy's effectiveness. Human, financial, and material resources must be ensured from the state budget or socialization.

Description: The plan must be concretized according to each stage in a specific, clear, and appropriate way. The plan must have a schedule according to the academic year, training roadmap, or according to the requirements of the organization. Based on that, balance the resources involved according to the appropriate schedule. The content of the plan must be accurate and fully implemented. To ensure policy implementation, each piece of content must clearly state the time, resources, requirements, etc...

Tools: To implement this solution, universities must deploy the following tools: Issuing documents such as plans and decisions for implementing scientific research policy. Universities must ensure that the number of researchers, lecturers, and experts is sufficient to implement the plan. Finance is an essential factor determining the success of the policy. Therefore, to effectively implement this policy, universities in Vietnam need to ensure this financial source.

Solution 2:

It is strengthening the dissemination and communication of research policies for students.

They are encouraging research support centers.

They are providing support for entrepreneurship and innovation among students at universities.

Objectives: Firstly, to help students recognize the importance of research in enhancing their academic proficiency within the educational institution. Simultaneously, it allows researchers, faculty members, and experts to realize that effectively implementing research policies for students contributes to improving the effectiveness of research work and enhancing the position of students within the institution's academic environment. Secondly, the dissemination efforts will give students a more specific understanding of

the policies, enhancing their awareness of the correct implementation and encouraging their roles and responsibilities in the policy execution process.

Requirements: First, closely monitor the guidelines and directives from the Ministry of Education and Training, documents from the School Council, and the Management Board of educational institutions to obtain the most effective and up-to-date information for dissemination. Secondly, the dissemination activities should be closely linked to the content of the policies so that the stakeholders involved in policy implementation can clearly understand the value that the policies bring, thereby enhancing the effectiveness of policies.

Description: Higher education institutions assign the task of disseminating and promoting research policies for students to the Student Affairs Department for coordination and implementation. Subordinate organizations must ensure that the content of the policies is effectively communicated to each enrolled student in timely identification of difficulties in students' research activities to propose plans for higher-level management agencies to address. Additionally, the policies should be disseminated and communicated on the university's website and integrated into weekly and quarterly activities related to civic education and legal advocacy for students.

Tools: The following tools should be utilized: Higher education institutions in Vietnam should issue clear and specific guidelines; appoint a team of experienced and dedicated researchers, faculty members, and experts to ensure practical communication efforts.

Solution 3: Improving the allocation and coordination of research policy implementation for students in current higher education institutions.

Objectives: The policy's success heavily relies on allocating and coordinating resources within the current higher education institutions. Therefore, enhancing the allocation and coordination mechanisms for effective policy implementation is crucial. This solution aims to establish a suitable agency where the responsibilities and authority of the stakeholders involved in policy implementation are clearly defined, avoiding the shifting of responsibilities during the process.

Requirements: Firstly, the allocation and coordination should ensure accurate functions and tasks assigned to the stakeholders involved in policy implementation. The allocation should be based on their expertise, experience, and relevant skills. They were accumulating policy implementation experience during work. Secondly, the coordination should be determined based on the organization's shared responsibilities, obligations, and collective benefits to promote policy effectiveness. Each individual and organization involved in the policy implementation process should take action to identify their tasks and responsibilities in policy implementation.

Description: Higher education institutions need to concentrate on structuring their organizational framework and human resources to achieve effective policy implementation. The allocation agency should focus on the quality and efficiency of policy implementation, avoiding the utilization of inadequately skilled personnel. Effective coordination should be based on the functions and tasks of lower-level units and the capacity of human resources, establishing a cohesive coordination mechanism. Specifically, the Research and International Cooperation Department of the University should develop plans and activities for research according to the requirements, ensuring freshness to create enthusiasm among students. Departments, divisions, and units within the university should collaborate with relevant units to evaluate research content, monitor and assess students' research results, and propose commendation methods per the university's regulations. The Finance and Accounting Departments of universities should balance and ensure financial resources for policy implementation, develop contingency plans during the implementation process and submit them to the university's leadership to secure financial resources for policy implementation. The

leaders of university units should organize discussions and provide specific and transparent measures to implement policies most effectively. Additionally, the Science Department and related units should coordinate to implement policy content properly, avoiding shifting, evading, or blaming responsibilities.

Tools: To implement this solution, supportive tools such as guidelines, instructions, and assignments should be provided to departments, divisions, and units within the university, as well as to researchers, faculty members, and experts.

Solution 4: Monitoring, evaluating, and promoting the implementation of research policies for students requires regular and unexpected assessments to utilize resources in current universities efficiently.

Objective: Monitoring and promoting policy implementation are crucial steps in determining the policy's success. The assessment helps identify policy issues and serves as a basis for the execution process. The objective of monitoring policy implementation is to evaluate the performance of departments, divisions, and units within the university regarding their assigned functions, tasks, and delegated authorities. It aims to identify gaps and weaknesses in management mechanisms and policies to propose necessary improvements. Additionally, it aims to prevent, detect, and address any legal violations. For individuals involved in policy implementation, monitoring, evaluating, and promoting policy performance help promptly identify any violations and overcome difficulties and barriers that may hinder the implementation process. This allows the university's leadership to react timely and practical for efficient policy implementation.

Requirements: Monitoring, evaluating, and promoting implementation must be carried out regularly and promptly to ensure timely resolution plans, thus ensuring the effectiveness of policy implementation.

Descriptions: Strengthening the monitoring and supervision of departments, divisions, units, and individuals involved in policy implementation is essential. This is a vital and significant aspect determining the quality and effectiveness of the policy. Leaders of departments, divisions, and units within the university must quickly establish and improve work regulations and assign tasks during policy implementation. The university's Council and Management Board should pay attention to and guide the implementation of research policies for students. The Science and Technology Department and the International Cooperation Department should oversee and guide departments, divisions, units within the university, and stakeholders involved in policy implementation.

Tools: To implement this solution, supporting tools such as guiding documents, instructions, and assessment programs should be provided. Additionally, the human resources involved must ensure the implementation process. In conclusion, research policies for students in higher education institutions are crucial in defining the quality of education in universities today. In Vietnam, higher education institutions increasingly focus on research policies for students as a critical factor in establishing their position. Each year, these institutions allocate budgets to implement research policies for students. This article aims to comprehensively evaluate the research activities of students in Vietnamese higher education institutions and propose solutions to enhance effectiveness. The success of this policy relies on its proper implementation, making the implementation process vital and coherent in research activities.

CONCLUSION

Scientific research plays a crucial role in general education and universities. For current universities in our country, scientific research is considered one of the critical factors in improving the quality of education and producing skilled graduates to meet the increasing demands of society.

Scientific research among students is an immensely significant activity that enhances the quality of higher education. In recent years, the emphasis on improving the quality of student research activities

has been particularly prominent at the Financial Academy. However, there are still many limitations and challenges in this area, such as students needing to fully recognize the importance of research or facing difficulties in conducting research. This study analyzes the current status of student research activities at the Financial Academy to enhance the effectiveness and quality of teaching and learning at the institution.

“The study on the current status of student participation in scientific research at the Financial Academy” has identified the positive aspects and limitations of the institution’s current state of student research activities.

The overall evaluation of the quality of research activities at the Academy reveals that the university’s leadership and departments have implemented various measures to promote student research. Both teachers and students have recognized the significant role of research activities. Based on this awareness, students have shown enthusiasm and passion for research. However, there are still several limitations, such as students needing more opportunities to engage in research, only participating in low-level research activities, and needing more resources for high-level research and inadequate research facilities. Additionally, students have limited time dedicated to research activities. Therefore, universities need to innovate and establish a comprehensive and systematic research management system to meet the quality standards of research activities.

In conclusion, universities should strive to renew the management of research activities coherently and systematically to ensure compliance with quality evaluation standards for research activities.

APPENDIX

Chart 1: Data source of scientific activities

Chart 2: Sources of information for scientific research activities

Chart 3: Student’s form of scientific research at the faculty level

Chart 4: Forms of students participating in academic research

Chart 5: Methods employed by students in scientific research

Chart 6: The quality of research projects achieved by students

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EXAMINING DETERMINANTS OF CAREER COMMITMENT OF BANKERS

Author: Pham Thi Nhu Y¹,

Mentor: Đang Hung Vu¹

ABSTRACT: *This study examines the factors affecting career commitment of banking employees. The suggested research model includes seven factors influencing career commitment, i.e. bank support, job fit, need for achievement, family involvement, job satisfaction, and organizational commitment. Data was collected from an online survey with 300 banking employees on Google form. SPSS 20 was used for data analysis. Results show that career commitment of banking employees is influenced by need for achievement, job satisfaction and organizational commitment. Several managerial implications to enhance the career commitment of bankers are suggested.*

Keywords: *banking, career commitment, job satisfaction, need for achievement, organizational commitment*

1. INTRODUCTION

Human resources play an increasingly important role in businesses. Whether or not a company has a separate human resource management department, all managers are involved in human resource decisions in their field. Workforce is needed for success of business in the digital era [1]. Employees play an important role in the success or failure of an organization, so it is necessary to have a strong human resource management department to promote the effectiveness of human resource management activities [2].

It is said on public media that banking career is always one of the best careers. Bankers work in different departments, i.e. consumer and corporate banking, international banking, credit and so on. Bankers may have a good working environment with higher pay and more favorable promotion opportunities than other careers. However, bankers also said to face a competitive and challenging work environment. It is because bankers are required various skills and expertise. Bankers are challenged with difficulties of reaching KPIs, being adapted with changing, innovative and expanding working process, new technology, and enthusiastic young employees.

Considering the pros and cons of banking career, it is good to know that what are the determinants of career commitment of banking employees. Understanding of the determinants, and the career commitment of bankers would benefits banking managers in terms of developing baking workforces, and enhancing working effectiveness. Given that banking is an attractive industry, studying the career commitment of bankers in Vietnam is necessary and significant.

The purpose of the study is three fold. First, it investigates the factors affecting career commitment of banking employees. Second, it analyzes these factors and the career commitment of banking employees. Finally, it is followed with managerial implications for banking organizations. This paper will be followed with theoretical background, research methods, results and implications.

2. THEORETICAL BACKGROUND

2.1. Career commitment and related concepts

Trang [3] clarifies how career is different from other terms. Career is a job or a series of jobs one does during his/her working life, especially when he/she continue to do better work and earn more. A work is an

¹ An Giang University, VNU-HCM.

activity that a person uses his/her physical or mental effort to perform, usually for money. A job is what one does and receives money on a regular basis, usually referring to an occupation, a specific job or a certain position, e.g. chefs, teachers. One does a job to earn money, e.g. working for a company. Profession is a type of work that requires special training or skills, especially one that requires a high level of education. A professional career is a job in a high position that requires education and training, especially in law and medicine. Occupation usually refers to the profession associated with each person's life, used in official forms and documents, talking about the type of work such as teacher, lawyer, driver.

Commitment is a state in which an individual is bound by his or her actions and through these actions in the belief of maintaining his or her own activities and participation. Commitment is what makes us like what we do and keep doing it, even when the rewards are not obvious [4]. Commitment has been defined as an individual's degree of commitment or commitment to a set of behaviors and motivates a person to act [5]. Commitment is a key concept in the psychology of an organization. It refers to the amount of resources and effort that an individual is willing to invest in his or her job role.

First defined in 1971, professional commitment is the strength of one's motivation to work to maintain a chosen career role [6]. Career commitment is defined as an employee's psychological connection to their career [7]. Professional commitment is defined as a person's attitude towards his or her profession [8]. Professional commitment can be conceptualized as the degree to which someone identifies and values his or her profession [8]. Professional commitment is the strength of a person being motivated to work in a chosen career role [8]. Professional commitment can be considered as one's attitude towards one's profession or profession wherein career commitment involves developing personal career goals, identifying and engaging in such goals that a person is willing to work to support their cause is consistent with its values [9].

The concept of career commitment is underpinned by the notion that a career is a predictable sequence of related jobs that are hierarchically arranged within a particular occupation, thus providing opportunities for advancement. careers for career aspirants [10]. Career commitment includes: occupational commitment and professional commitment, the terms can be used interchangeably [9]. Professional commitment is the belief and acceptance of the goals and values of a profession, a willingness to work for its sake, and a desire to maintain membership in the profession [11]. Occupational commitment is conceptualized as an affective commitment to a profession [12].

One's occupational commitment is conceptualized as a psychological link between a person and his or her profession based on an emotional response to that occupation. A person with a strong professional relationship will identify more strongly and experience more positive feelings about a career than someone with a weak career commitment [7].

Professional commitment can be measured by an individual's reluctance to leave his or her professional role, an individual's willingness to maintain his or her career if encouraged to change, or a desire to want to continue their career after evaluating possible alternatives. Professional commitment can also be described as an individual's commitment to a broader class of work activities than a particular job or organization [13].

Career commitment is characterized by an unwillingness to change careers, personal involvement in a job role, dedication to the profession, pride in the profession, and stimulation from professional activities [14].

Women see career as personal growth, self-fulfillment, satisfaction, contributing to others and doing what one wants to do. Men see a career as a sequence or progression of jobs that leads to recognition and reward. Men relate the work they do to their career advancement, while women disregard their current job and view a career as a personal goal [14].

There is a significant difference between a career and a job in terms of time commitment and investment. The job is short-term and can last for only a few months to half a year, while pursuing a career can take decades of hard work [15]. Career commitment can be individualized, long-term and future-oriented, so it is not expected to tie current job performance as strongly as organizational and job commitments [16].

According to Blau [8], career commitment is an intention to build a meaningful career and pursue and operate for a long time, he considers career commitment as an individual's attitude towards a career or professional profession.

Professional commitment has three components, namely: emotional commitment, ongoing commitment, and normative commitment. An emotional commitment is a personal emotional attachment to one's career. Ongoing commitment is an assessment of the cost of losing a sunk investment in a career, and normative commitment is an obligation to maintain a career [7].

In spite of various concepts relating to career commitment, career commitment is the strength of a person being motivated to work in a chosen career role [8].

2.2. Research model and hypotheses

London [17] documented that job challenge as a determinant of career motivation, a significant positive relationship between jobs and three dimensions of career motivation. In addition to facilitating one's psychological development to keep up with work, challenging jobs can stimulate career resilience through the opportunity for autonomy in completing capital tasks. have in one's professional role. When the level of challenge is high, bankers tend to switch and commit less to the profession [17]. Therefore, the following hypothesis is proposed:

H1: Job challenge has a negative effect on career commitment.

Bank support or opportunities for growth conceptually similar to organizational career management have been shown to be significantly and positively related to career performance [18]. London (1983) hypothesized job challenge as a determinant of career motivation. Facilitating one's psychological development to keep up with work, challenging jobs can stimulate career resilience through the opportunity for autonomy in completing inherent tasks. in one's professional role. Organizational opportunity for growth is hypothesized to indirectly affect career commitment through job satisfaction and organizational commitment. Organizational opportunities for growth can enhance one's career development or the adjustment of competencies related to one's professional role [6]. Since career growth can constitute one's career goals, the realization of this goal will lead to career satisfaction. Commitment to a career requires focused energy. To the extent that one's mental and physical energies are diverted to other matters, it is difficult to develop and maintain a commitment to the cause" [19]. The longer this persists in a person's career, the less committed they will be to their career. Role ambiguity occurs when a person is uncertain about what tasks they should perform. personal development, the support of the organization's superiors is a motivation to help individuals commit to their careers. When the organization supports employees, employees feel comfortable and satisfied than with the job, the level of professional commitment increases higher. Therefore, the hypothesis is proposed:

H2: Bank support has a positive effect on career commitment.

The literature on job fit revolves around the idea that every organization and individual has distinct personality traits. The more similar the characteristics between the individual and the company, the higher the employee's work productivity and job satisfaction. The right personality for the job will also reduce stress, job dissatisfaction, frequent absenteeism and even turnover [20]. Edwards (1991) introduced two

basic concepts of compatibility between people and work. The first is needs-and-ability matching, in which the knowledge, skills, and abilities of workers are commensurate with the actions, desires, or preferences that are fulfilled by jobs that they perform. The second form, which occurs when workers' needs are commensurate with what the job requires, is the type of compatibility often associated with supply-demand or demand-value matching, emphasized in different adjustment theories [21]. Job fit is seen as the relationship between the person's personal characteristics and the job characteristics. This compatibility occurs when a person has the opportunity to handle multiple tasks at the same time in a way that they like.

Employees whose jobs are compatible with their career aspirations are more satisfied with the work environment and demonstrate greater career commitment. There are few studies on the relationship between job fit and career commitment. However, based on logical arguments, when employees have jobs that are compatible with their career aspirations, they will be more committed to their careers [22]

H3: Job fit has a positive effect on career commitment.

An analysis of contemporary research on the premise of career commitment found seven factors more relevant to organizations. These seven factors provide the impetus for organizational leaders to promote labor- and industry-oriented career commitment. Through establishing a work environment that supports strong teamwork, job satisfaction, feedback and support, workers are more likely to develop a strong connection with their current workplace, at their home and with their profession. In addition, workers who have internal control, and who have accumulated many years in their profession, are also more likely to develop a strong career commitment. Finally, compensation and role status will also affect career commitment.

Compensation has a direct effect on both career and organizational commitment. Role status has a negative impact on career commitment, as people who are career committed require a large degree of stability and continuity in their current job. Thus enhancing career commitment, committed workers means careful management of these factors in relation to role statuses. Since career-engaged workers are often much more flexible than organizational-attached workers, due to a greater focus on internal motivating factors for achieving satisfaction than on organizational factors, motivated by the organization. It is therefore important for management practitioners to understand the value and pervasiveness of professional commitment, and to know how to stimulate and retain professionally committed workers [9]

For many individuals, sooner or later, achievement also needs external confirmation (recognition) if it is to be maintained in the long term. Thus, success generates a cascade of externally validated rewards, all of which have the effect of increasing the individual's self-esteem, where failure leads to a decreased sense of self-esteem. The need for achievement has also been identified by London [17] as being interrelated and determining career commitment. The need for achievement has been used to describe the "personal striving of individuals to achieve goals in their social environment" [23]. London [17] also identified goal achievement as indispensable for the individual to "need achievement".

High salary and attractive benefits have a positive effect on commitment, when high-achieving individuals, such as bankers, high-achievers achieve good KPIs, individuals enjoy salary and benefits, higher. Benefits are especially important to career-oriented people out of respect, as these people are said to value themselves. For individuals, promotion is not only related to recognition of achievement, it can also be related to increasing financial rewards and status, salary cannot be considered purely as a factor. It is also closely related to status and recognition; The more a person is financially rewarded, the greater the recognition for services within an organization. Money can play a very important role in people's lives, both material and spiritual joy, money as an incentive for each person because it affects the respect others have for individuals.

It is therefore not surprising that financial reward can sometimes be measured as a factor in job satisfaction. Praise has the effect of boosting an individual's self-esteem and also gives feedback on how the employee is making progress. Of course, performance feedback is necessary if the individual is given the opportunity to modify his or her behavior based on past performance. There is little doubt that employers who want to improve their employee satisfaction must pay attention to both the feedback aspect of accreditation and the issues of recognition through formal procedures, such as promotion. Therefore, it is likely that an employee who is very focused on needs and goals will have a long-term direction and plan and be committed to his or her career. Therefore, the following hypothesis is proposed:

H4: The need for achievement has a positive effect on career commitment.

Family involvement is thought to influence career commitment both directly and indirectly through job satisfaction and organizational commitment. Steffy and Jones [24] also reported a significantly positive relationship between career commitment and dual career planning support, a term that is conceptually similar to spouse support. As a form of emotional support, spousal support can help ease the effects of career disappointments and thus enhance career resilience and therefore commitment.

Considering the assumed indirect effect of Family involvement on career commitment through job satisfaction and organizational commitment, Rosin and Korabik [25] reported that spouse support has a positive effect on husband's job satisfaction. Aryee and Tan [10] documented that spouse support was a significant positive predictor of organizational commitment in a sample of women in frequently mobile jobs [10]. Therefore, the following hypothesis is proposed:

H5: Family involvement has a positive relationship with career commitment

According to [17], job satisfaction, was incorporated into the subdomain "job engagement", as a major determinant of career commitment. Job satisfaction can be defined as the degree to which employees love their jobs [26] or employees' positive feelings towards their jobs [27].

Stemming from the Roethlisberger & Dickson study, commonly known as the Western Electrical study, job satisfaction was initially thought to increase productivity. Much of the current concern with job satisfaction concerns its impact on engagement, absenteeism, and turnover [26] A satisfied employee is expected to enjoy his or her job and the organization and is most likely to be favorably inclined and committed to his or her career. However, once again it should be noted that career commitment, job engagement and job satisfaction are different concepts [8] There is a small empirical study on the job satisfaction-career commitment relationship.

Reasons for being satisfied or dissatisfied with their tasks, satisfied people gave the main reason as 'feeling of progress' themselves while those who were not satisfied with the task gave reasons such as 'bored' depressed', not interested in the current job to be able to commit to a career. They tend to switch careers [28]. Thus, the excellent completion of the task causes a feeling of satisfaction. Therefore, the following hypothesis is proposed:

H6: Job satisfaction has a positive effect on career commitment.

Porter conceptualized organizational commitment as a strength of personal identity that is associated with a particular organization. In addition, organizational commitment has been interpreted in different ways and suggests that organizational commitment can be summarized as an individual's attachment to his or her organization. Organizational commitment can be most broadly characterized by at least three factors: first, a strong belief, acceptance of the organization's goals and values; second is the willingness to use considerable effort on behalf of the organization; the third is a clear desire to maintain membership of

the organization [29]. Mowday, Steers [30] asserted that organizational commitment represents something beyond loyalty to the organization; Organizational commitment refers to a proactive relationship with the organization, individuals are willing to give something of themselves to contribute to the commitment to the organization such as the doctrine related to such relationships, psychological connection by which an individual can connect with other individuals or with an organization.

Organizational commitment can be expected to have a positive relationship with professional commitment. Organizational commitment has been referred to as a behavioral pattern, a set of behavioral intentions, a motivator, or an attitude. Organizational commitment from this perspective is seen as an attitude related to the nature of the relationship between employees and the organization [30]. Such an attitude well enhances career commitment and success; Therefore, it is expected that professional commitment and organizational commitment will be positively correlated. [17] noted that organizational commitment should be an important individual variable explaining career commitment. Obviously, professional commitment is different from organizational commitment. Professional commitment and organizational commitment are two different aspects of human opinion and opinion, which are strongly related to increasing organizational productivity and efficiency.

For example, a person might be committed to his or her career and not to the organization, and vice versa. That is, a person committed to his or her career can move on to other organizations if it helps to advance his career. On the other hand, another person who is committed to the organization can change careers within the organization and remain loyal. Therefore, the following hypothesis is proposed:

H7: Organizational commitment has a positive relationship with career commitment.

The research model has combined outstanding elements of 3 models by London [17], Carson and Carson [31] and Goulet and Singh [28].

3. METHOD

3.1. Sampling

The respondents are employees of joint stock commercial bank in Vietnam, including senior managers. The questionnaire was distributed to respondents via google form sent via Zalo and/or Facebook in April 2023. There are 313 answered questionnaires, of which 300 were valid and 13 were rejected. Convenient sampling was applied, therefore most of respondents are in the South of Vietnam.

3.2. Instruments

The questionnaire was adopted from Goulet and Singh [28] and Aryee and Tan [10]. Some modifications and/or wordings have been made to the questionnaire thanks to face-to-face interviews with banking staff, e.g. working process and working time at the bank. Measurement variables are listed in Appendix 1.

3.3 Data analysis

Data was analyzed with SPSS 20 software. Exploratory factor analysis (EFA) was conducted to extract factors and to examine its internal reliability. Cronbach's Alpha analysis was applied to assess reliability of measurement items. According to Nguyễn [32], Cronbach's Alpha value not smaller than 0.60 is acceptable in terms of reliability.

Pearson correlation was run to test the close linear correlation between the dependent variable and the independent variables. It is to early identify the problem of multicollinearity when the independent variables are also strongly correlated with each other. When there was no multicollinearity found, regression analysis was done. Finally, managerial implications for banking employees were proposed.

4. RESULTS AND DISCUSSION

4.1. Results

EFA for the independent variables were done twice. First, 6 measurement variables were removed. Second, two other observed variables were removed because they do not converge. As a result, two factors were removed, i.e. job challenge and job fit. This research failed to test H1 and H3.

Five factors were finally used for regression, shown in Table 1. The research model was adjusted with five determinants of banking career commitment, i.e. bank support (H2), need for achievement (H4), family involvement(H5), job satisfaction (H6) and organizational commitment (H7).

Table 1: EFA analysis of independent variables

Variable	Factors				
	OC	JS	FI	NA	BS
OC1	.775	.127	.080	.092	.124
OC2	.718	.110	.226	.145	.077
OC3	.680	.333	.095	.093	.209
OC4	.646	.132	.207	.205	.128
OC5	.641	.139	.250	.087	.076
OC6	.635	.268	.188	.052	.305
OC7	.604	.201	.238	.213	-.074
JS8	.245	.726	.033	.233	.109
JS9	.218	.666	.145	.123	.204
JS10	.072	.657	.214	.143	.013
JS11	.214	.648	.062	.043	.296
JS12	.273	.647	.256	.108	.099
FI13	.164	.059	.743	.124	.163
FI14	.201	.041	.727	.019	.186
FI15	.180	.289	.700	.154	.068
FI16	.219	.098	.665	.198	.074
FI17	.142	.104	.654	.118	.023
FI18	.040	.463	.548	.180	-.018
NA19	.144	.049	.228	.719	.230
NA20	.205	.269	.097	.688	.155
NA21	.189	.091	.299	.674	.153
NA22	.054	.426	.006	.560	-.072
BS23	.121	.059	.129	.109	.783
BS24	.218	.277	.057	.248	.632
BS25	.178	.257	.288	.181	.575
Extraction Sums of Squared Loadings		62.255%			
Cronbach's Alpha	0.875	0.828	0.835	0.702	0.692

Regression results was shown in Figure 1. Three hypotheses were supported. First, banking employees who commit to their organization also commit to banking career (H7). The need for achievement is recognized by bankers as important to career commitment (H4). The bankers who are satisfied with their work, i.e. pay, benefits, working policy, working time have positive commitment to banking career (H6). The two hypotheses H2 (bank support) and H5 (family involvement) were not supported.

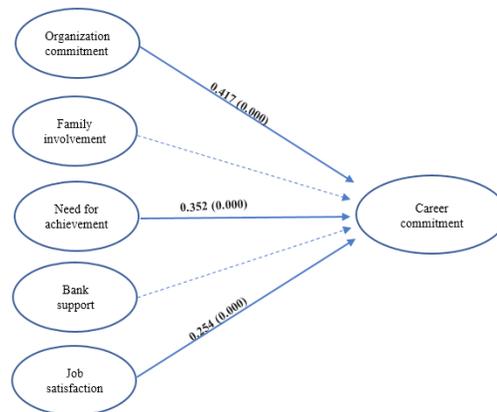


Figure 1: Determinants of banking career commitment

4.2. Discussion

The positive effect of organizational commitment, need for achievement, and job satisfaction on banking career commitment is confirmed in this study. This result is in line with previous study by Aranya, Pollock [11], which documented that job satisfaction positively affects organizational commitment. Bankers with greater need for achievement are also more committed to their banking careers, which was confirmed by Goulet and Singh [28]. In line with Arogundade Ayodeji [29], Mowday, Steers [30], Carson and Carson [31], and London [17], this study also reported the positive relationship between organizational commitment and career commitment.

This quantitative results did not support the effect of bank support and family involvement on career commitment, although the literature on career commitment supports these effects. The liner positive effects of the two factors were not confirmed. However, it is necessary to conduct further investigation on the effect of job fit and family involvement. Qualitative research would have been done to explore how job fit and family involvement.

5. CONCLUSION AND MANAGERIAL IMPLICATION

Although this research was unable to test the effect of job challenge and job fit, it confirmed the positive effect of organizational commitment, need for achievement, and job satisfaction on banking career commitment. In addition, the liner positive effects of bank support and family involvement were not supported in this quantitative research. This calls for future research about the effect of bank support and family involvement. Also, future research would invest more on the use of measurement of job challenge and job fit.

The research results carry several managerial implications. For greater job satisfaction of bankers, it is good for banks to define goals and expectations from employees. By setting clear goals and expectations at work, banks ensure that employees understand their duties and mission. Staff training and development are necessary to provide training and development programs to enhance professional skills and understanding of the banking profession. This helps employees feel that they are invested and have the opportunity to grow at work. In addition, banks should bring exciting promotion opportunities for employees. It is necessary to provide employees with equal opportunities to develop their careers. This helps employees have clear goals and commitment to the long-term development of the banking profession. Employees' achievements must be recognized. Recognition of the achievements and efforts of employees would increase employees' dedication to their profession.

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APPENDIX 1: MEASUREMENT ITEMS

Organizational Commitment		
OC1	I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.	[10]
OC2	I am proud to tell others that I am part of my organization."	
OC3	I talk up this organization to my friends as a great organization to work for	
OC4	I want to continue working at this bank for a long time	
OC5	I am proud to work at this bank	
OC6	I am really interested in the future development of the bank	
Job Satisfaction		
JS8	Leadership from superiors	[28]
JS9	Working time at the bank	Developed
JS10	My colleagues	[28]
JS11	Advancement in ministry	[10]
JS12	Working process at the bank	Developed
Family Involvement		
FI13	It's an indispensable part of life	[22]
FI14	An ideal center to live and strive to work	
FI15	Always interested in me	
FI16	Is the orientation for the goal I strive for	
FI17	More important than anything in life	
FI18	Always given me a lot of time	
Need for Achievement		
NA19	Accept difficult jobs to promote your ability	[28]
NA20	Willing to take on any additional responsibility beyond my own	
NA21	Try hard to do better than your colleagues	
NA22	Take risks when working to achieve expected results	
Bank Support		
BS23	Reward employees who work hard to keep up with the development of the bank	[10]
BS24	Care about employees' lives	[22]
BS25	Create opportunities for employees to improve their professional skills	[22]
Career Commitment		
CC1	The decision to choose a career in banking was the right decision for me	[11]
CC2	Being part of the banking profession really inspires me to do my best work	

CC3	I have a plan for my growth in the banking profession	[31]
CC4	Banking career means a lot to me personally	
CC5	Banking is an important part of who I am	
CC6	I have a strategy to achieve my goals in banking	
CC7	I have specific goals for my growth in the banking profession	
CC8	Banking is the best job I've ever had	[11]
CC9	I'm glad I chose banking out of the other careers I considered at the time I joined	
CC10	I am proud that I am part of the banking profession	
CC11	Sticking to a banking career indefinitely is not a reckless thing to do	
CC12	I work harder than usual to be successful in banking	
CC13	If I don't need to work and still make a living, I still choose to be a banker	
CC14	I am very loyal to the banking profession	
CC15	The value of the banking profession is the same as mine	
CC16	I accept most of the jobs assigned to continue working in banking related fields	
CC17	If there is a job other than banking that pays the same, I will choose another profession	
CC18	I can adapt to another profession, as long as the type of organization is similar to a bank	

FACTORS AFFECTING INDIVIDUAL CUSTOMERS' DECISION TO PURCHASE LIFE INSURANCE IN HANOI

Author: Vuong Minh Ngoc¹, Pham Bao Ngoc¹

Mentor: PhD. Ho Thi Hoai Thu¹

ABSTRACT: *Based on the theoretical framework of theory of planned behavior, this study examines the process from the intention to acquire life insurance among persons in Hanoi City, Vietnam. The research is being carried out in Hanoi via an online survey of 400 respondents. The study employed Cronbach's alpha, exploratory factor analysis, KMO and Bartlett's test, and regression analysis with SPSS software based on the data acquired. Customers in Hanoi city decision to purchase Life Insurance based mainly on 5 factors: Motivates for purchasing life insurance, Life events, Barriers in purchasing Life insurance, Company brand, Opinions of relatives.*

Keyword: *life insurance, purchase intention, Hanoi city,...*

1. INTRODUCTION

Life insurance provides several economic and social benefits. Aside from that, life insurance firms employ many people and assist them better their quality of life. Customers who participate in life insurance will be financially covered with the amount pledged from the first ban when there is a risk such as illness, accident, or death, using modest amounts of money they save to pay yearly premiums. This money will assist their family in alleviating their monetary challenges as well as the emotional anguish they are experiencing. Furthermore, the corporation will contribute to the future of their children's education, assisting them in realizing their aspirations, even if they are unable to continue to support their family if they engage in education insurance for their children. Alternatively, the money clients get after they die will allow them to live a happy retirement life free of children.

Vietnamese people currently tend to preserve money owing to tight familial ties; also, the society's welfare system cannot cover the demands of the majority of the population, causing additional challenges. the need to save for their children's future, driving the growth of life insurance. consumers, however, examine numerous variables when determining whether or not to purchase life insurance products, such as insurance business, insurance goods, customer service... These elements are entwined in the process of consumers researching and deciding to purchase insurance.

People are powerless against unanticipated threats and risks, while living in an advanced-civilized civilization with great technology. Life insurance operations were created to address community-sized hazards and promptly recoup losses. The expansion of the country's life insurance business in the market has contributed to the country's overall economic development. The insurance industry has recruited many employees, generated numerous employment, assisted in increasing household income, and enhanced the contemporary lives of all sectors of society.

The rise of life insurance has contributed to the country's economic progress in general. The insurance business has attracted various activities, generating jobs for many people, assisting in increasing family incomes and improving the present lives of all sectors of society. Annual insurance money has also

¹ Academy of Finance

contributed to the GDP of the country. Life insurance climbed by 20% on average in the first quarter of 2017 compared to the same time previous year, when life insurance premium revenue increased by 29% and non-life insurance premiums increased by 15%. Total market premium revenue was estimated to be at 77,000 billion VND at the end of November 2016, representing a 23.4% rise over the same period last year. Particularly for life insurance, revenue as of the end of the month 11/2016 reached 44,000 billion VND, an increase of more than 30%.

Life insurance in Vietnam has been developed for more than 20 years, but it is still in the process of exploiting new markets. With a population of over 90 million people, only 8% of the population engages in life insurance, while the rest do not. The majority of life insurance clients are from large cities in neighboring provinces, and exploitation is still restricted. When compared to demand and market potential, this figure remains quite low. This outcome demonstrates that the Vietnamese life insurance industry still has a lot of promise and has not yet produced the expected results.

For life insurance firms to gain a better understanding of Vietnamese clients, satisfy their needs, contribute to company development, and enhance sales by analyzing variables influencing customers' propensity to acquire life insurance products. This is why I picked the topic "**FACTORS AFFECTING INDIVIDUAL CUSTOMERS' DECISION TO PURCHASE LIFE INSURANCE IN HANOI**".

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Theoretical framework

2.1.1. Consumer behavior and purchasing decisions.

- **Consumer behavior**

Consumers are defined as individuals who buy for and consume goods and services to meet their own needs. They were the last to use the manufacturing process's goods.

Consumer behavior is understood as a series of decisions about what, when, how, where, how much, and how often that each individual and group of consumers must make decisions over time about choosing to use products, services, ideas or activities. (Wayne D. Hoyer, 2008)

Consumer behavior is the interaction between factors that influence perception, behavior, and the environment by which people change their lives. (Schiffman, et al., 2005)

According to Kotler (2004), in marketing, marketers study consumer behavior with the aim of identifying their needs, preferences, habits, namely what consumers want to buy, why they buy that product or service, why they buy that brand, how they buy, Where to buy, when to buy and how to buy to build a marketing strategy to motivate consumers to buy their products and services.

According to Bennett P. D (1988), consumer behavior is the behavior they exhibit in finding, purchasing, using, and evaluating products and services that they expect will satisfy their individual needs. Referring to the decision to buy a certain product, or buying behavior, there is a theoretical model mentioned as the Theory of Planned Behavior (TPB). Purchase intention reflects future behavioral predictions or plans, or beliefs, and will translate into purchasing decisions. Although Mittal (2001) argues that purchase intention can not accurately predict, however, according to Conner (1998) intention represents a person's motivation to make an effort to perform the behavior.

Thus, customer behavior is the progression and consideration of customers from the moment they recognize a need for particular goods or services until they opt to purchase and utilize these goods or services. Customer behavior refers to the thoughts and sentiments of customers during the buying and consuming process, which includes behaviors such as purchasing, utilizing, and handling items and services.

- **Purchasing decisions**

The psychological process of customers from identifying requirements to generating options and finally selecting particular items and brands is referred to as purchasing decisions. Some costs are little, such as purchasing body wash, while others are significant, such as purchasing a villa. The greater the importance of the purchase, the more time and effort that goes into it.

2.1.2. Definition of Life insurance

Life insurance is a product of insurance firms that protects people from health, body, and life hazards. Simply put, the participant accepts and enters an insurance contract with the insurance business to pay the necessary fees on a regular basis into the insurance company's financial reserve fund in order to be paid a particular amount when regrettably at risk or at maturity.

According to Clause 1 - Article 12 - Law on Insurance Business, an insurance contract is an agreement between an insurance buyer and an insurance enterprise in which the insurance buyer must pay a premium and the insurance enterprise must pay the insurance money to the beneficiary or compensate the insured upon the occurrence of the insured event.

The essence of life insurance is a secure technique of providing future financial security with the goal of replacing income sources when the member faces unforeseen hazards (life insurance benefits). As a result, life insurance is extremely important in people's lives since it not only helps to stabilize life when unforeseen risks arise, but it also serves as a mechanism to share risks in the community by taking the majority to offset the few.

2.2. Literature review

- **Model of factors affecting the decision to buy life insurance by Vo Thi Thanh Loan (2005)**

According to this study, only three supporting aspects of family, psychology of spending and saving (risk and benefits), and gender had a beneficial impact on the choice to purchase 1-year term life insurance. Gender has the greatest influence, followed by supporting influences from family and spending and saving psychology. The author does a regression analysis using the choice to buy each type of life insurance and adds the gender element to the study to elucidate the influencing variables on the buying decision for each type of insurance. As a result, insurers can make better selections when counseling consumers.

Furthermore, the issue has the problem because the author provides 12 components with 60 observed variables, which is excessive for interviewers. The quality of the survey sample suffers as a result of the excessive amount of questions, since the client is unable to focus on accurately answering all of them. As a result, the research findings will not be as predicted.

- **Research on factors affecting the trend of buying life insurance in Tra Vinh province by Nguyen Thi Bup (2012)**

The topic "Factors Affecting the Decision to Buy Life Insurance in Tra Vinh Province" is based on Nguyen Thi Anh Xuan's topic and develops additional elements impacting the choice to buy life insurance such as: Details about the insurance firm. According to research findings, seven variables impact the choice to purchase life insurance: investment advantages, savings benefits, convenience of access, financial benefits, influence of family, health protection benefits, and benefits trump dangers. The author gives various ideas, including: promoting trade promotion activities, improving the professional qualifications of the company's employees, improving service quality, improving and developing products, opening a wide network, and improving agents' professional ethics.

However, one weakness of this study is that the author did not thoroughly investigate which of these criteria has the most influence on the choice to purchase life insurance and whether it has a positive or negative impact on the decision to purchase life insurance. Furthermore, when surveying the questionnaire for research, the author surveyed both those who had purchased life insurance and those who had not purchased life insurance, but the author has not thoroughly studied the factors influencing the decision to purchase life insurance for customers with this potential to have effective approaches to this audience.

In conclusion, the above studies demonstrate that the authors developed varied and unique scales, but the authors have proved that the groupings of elements on corporate brand, purchasing motive, consultant, and perceived value impact the choice to buy life insurance.

2.3. Hypothesis and research model

The author proposes suitable factors into the research model “Factors of life insurance” based on the theory of life insurance, the consumer behavior model of Phillip Ko-tler (Kotler P., Philip Kotler’s contributions to marketing theory and practice, 2011) and the inheritance from the model (Thanh, 2005) variables influencing individual customers’ decisions to purchase life insurance in Hanoi.

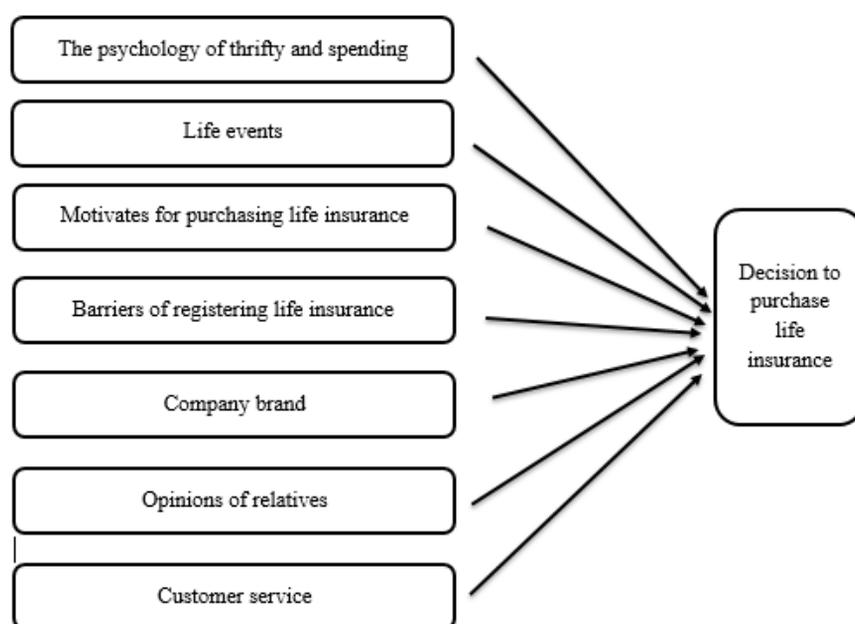


Figure : Proposed research model

Research hypothesis

Hypothesis	Content
H1	The psychology of thrifty and spending has positive impact on the decision to participate in life insurance
H2	Life events has positive impact with the decision to join life insurance
H3	Motivates for purchasing life insurance has positive impact on the decision to participate in life insurance
H4	Barriers in purchasing life insurance has positive impact on the decision to participate in life insurance
H5	Company brand has positive with the decision to join life insurance
H6	Opinions of relatives have positive impact on the decision to participate in life insurance
H7	Customer service has positive impact on the decision to participate in life insurance

After doing study on the variables influencing the intention to purchase insurance products by (Jagdish N. Sheth, 2001), (Nguyen X. A., 2004), (Nguyen B. T., 2012), and (Thanh, 2005). The studies were discovered to be based on the models of Jagdish N. Sheth, Banwari Mittal, and Bruce I. Newman. This covers a set of personal qualities as well as a set of elements that impact the intent to purchase a product. As a result, I picked the research model based on the work of Jagdish N. Sheth, Banwari Mittal, and Bruce I. Newman since it is a research model on the elements that impact the desire to purchase insurance products that has been chosen and developed by many authors from across the world.

3. RESEARCH METHOD

3.1. Scale and questionnaire

Here are the scales and questions related to factors that affect the decision to purchase life insurance:

Variables	Encrypted	Observation variables
The psychology of thrifty spending (TS)	TS1	I save first and spend later
	TS2	I am very interested in future savings
	TS3	I consider the price before buying something
Life events (LE)	LE1	I buy insurance when I witness the risks of people around
	LE2	I bought insurance when I got married
	LE3	I buy insurance when my health is not good
Motivates for purchasing life insurance. (MP)	MP1	I want to financially protect my family
	MP2	I want to save for retirement
	MP3	I see the benefits of life insurance from others
Barriers of registering life insurance (BR)	BR1	The insurance products are complicated and make me confused
	BR2	I am not satisfied with the insurance services
	BR3	I don't believe insurance referrals
	BR4	I have unstable income
Company brand (CB)	CB1	I buy insurance at a company that has a reputation and reputation in the market
	CB2	I buy insurance at a company that has a variety of packages to suit my needs
	CB3	I buy insurance at a company that has good customer service
Opinions of relatives (OR)	OR1	My parents were supportive of me buying insurance
	OR2	My friends supported me to buy insurance
	OR3	My brother/ sister supported me to buy insurance
	OR4	My spouse agrees to me to buy insurance
Customer service (CS)	CS1	Prompt assistance for clients as required
	CS2	Staff members are well-versed in advising and answering clients' inquiries.
	CS3	The procedure is resolved quickly
Decisions to purchase Life Insurance (DB)	DP1	I bought life insurance through a consultant
	DP2	I think buying life insurance is worth my money
	DP3	I think buying life insurance is the right decision

The scale is constructed based on the theoretical foundation of the scale as well as the customer's decision to acquire life insurance products. In this article, we use the Likert scale, which has been adjusted and supplemented so that respondents are asked to rate their level of agreement or disagreement with the research content in Hanoi City based on a research questionnaire on the need for customers in Hanoi to purchase life insurance.

- **Questionnaire:**

The questionnaire consists of 2 main parts:

Part one consists of 4 questions aimed at gathering general information, in-cluding:

- + Personal information: Age, Gender, Income
- + Information about the occupation: Retail, Business owner, Homemaker, Skilled labor.
- + Time information about life insurance
- + Information about the purpose of life insurance

Part two includes questions that affect customer satisfaction on what influences buying decisions. In particular, the 5-point Likert bar is used to measure customer satisfaction with the factors that influence the decision to purchase life insurance after it has been used, specifically:

- 1 = Very low
- 2 = Low
- 3 = Average
- 4 = High
- 5 = Very high

3.2. Sample and data collection

Because the number of clients to be polled is rather high (400), the author will conduct the survey straight outside the Hanoi circle. Customers come to the life insurance firm for activities such as signing contracts, paying fees, borrowing money, earning interest, receiving compensation... and samples are randomly picked from potential customers to learn, advise...

The author gathers data by giving out response sheets directly to consumers who have purchased life insurance and those around them, whereas the author collects data online by sending surveys to individuals via social media platforms.

The information for this study was gathered via self-response questionnaires. Kumar (2005) claims that using questionnaires to obtain research data offers the following advantages: Save money, time, and human resources while maintaining complete anonymity.

Furthermore, it is clear that the study questionnaire instrument allows us to obtain the essential information from a large number of respondents swiftly and efficiently.

Questionnaire: deliver the questionnaire directly to the respondents, with the answers stored in the database, and request a time to collect it once done. To preserve the respondents' anonymity, the questionnaire included a promise to exclusively utilize information for the topic's research purposes, as well as a pledge to keep the respondents' information secret. Furthermore, in order to maintain neutrality, the respondent's last name is not displayed in the questionnaire.

The deadline for sending out surveys and receiving responses is January 1, 2023, and it expires on May 30, 2023. After the questionnaires were collected, the data was checked, and inappropriate replies were disqualified before being forwarded for processing and analysis.

Data collected is saved to a file, and statistical software SPSS 20.0 is used to handle and evaluate the data. Data analysis features in SPSS software include descriptive statistics, scale reliability testing, exploratory factor analysis, regression analysis, ANOVA in-depth analysis, and the Pearson test.

4. RESULTS

4.1. Description of the samples

After receiving 437 questionnaires, the authors discarded 37 questionnaires with inappropriate answers. Final results obtained 400 questionnaires with satisfactory answer information used for analysis.

All validity questionnaires will be processed using SPSS 20.0 software to conduct confidence assessment, factor analysis, correlation analysis, regression analysis and hypothesis testing.

Table: Sample characteristics

		Frequency (people)	Percent (%)
Age	20-35	213	53.25
	35-45	98	24.5
	45-55	89	22.25
Income	<5million	34	8.5
	5-15 million	123	30.75
	15-25 million	122	30.5
	>25 million	121	30.25
Gender	Male	174	43.5
	Female	190	47.5
	Other	36	9
Education	Graduated from high school	234	58.5
	University Graduate	102	25.5
	Masters - PhD	67	16.75
Occupation	retail	89	22.25
	business owner	102	25.5
	homemaker	97	24.25
	skilled labor	112	28
Sum		400	400

According to the above aggregate data, clients participating in life insurance are quite wealthy, with a very diverse distribution throughout several businesses and spheres of activity, and at various ages. Following the Covid-19 epidemic, insurance services in general, namely life insurance, have grown in popularity among clients because people are concerned about health issues and the unavoidable hazards of life. And, as of now, life insurance has progressively become a trend, as shown in Hanoi City, where the majority of persons aged 22 utilize life insurance services because of the benefits it provides.

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4.2. Reliability and validity of the scales

4.2.1. Reliability Test with Cronbach's Alpha

	Observed variables	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
The psychology of thrifty spending				
1	TS1	0,626	0,645	0,762
2	TS2	0,529	0,754	
3	TS3	0,628	0,640	
	Life events			

4	LE1	0,461	0,683	0,698
5	LE2	0,634	0,459	
6	LE3	0,464	0,667	
Motivates for purchasing life insurance				
7	MP1	0,381	0,579	0,617
8	MP2	0,498	0,413	
9	MP3	0,402	0,553	
Barriers of registering life insurance				
10	BR1	0,438	0,629	0,676
11	BR2	0,565	0,536	
12	BR3	0,487	0,59	
13	BR4	0,359	0,668	
Company brand				
14	CB1	0,573	0,687	0,755
15	CB2	0,583	0,675	
16	CB3	0,606	0,657	
Opinions of relatives				
17	OR1	0,475	0,647	0,703
18	OR2	0,561	0,592	
19	OR3	0,485	0,641	
20	OR4	0,432	0,672	
Customer service				
21	CS1	0,563	0,695	0,754
22	CS2	0,495	0,773	
23	CS3	0,704	0,529	
Decisions to purchase Life Insurance				
24	DP1	0,743	0,847	0,878
25	DP2	0,783	0,811	
26	DP3	0,768	0,824	

SPSS 20.0 was used in this study to examine the reliability and validity of model elements influencing Vietnamese youth's propensity to use chatbots in online purchasing. A variable is deemed dependable if its Cronbach's alpha is greater than 0.60. We had all of the model's variables scaled so that Cronbach's Alpha was between 0.6 and $0.8 > 0.6$, which satisfied the criteria. There were no variables with a corrected item-total correlation less than 0.3. As a result, these variables may be completely utilized in the next study.

4.2.2. Exploratory Factor Analysis (EFA) result

- **With independent variables.**

Before doing a factor analysis, it is required to determine whether this approach is acceptable for application. KMO (Kaiser-Meyer-Olkin of Sampling Adequacy) and Bartlett's Test are used to carry out the test.

For hypothesis testing, use Bartlett's Test. H_0 are variables in the population that are not associated with each other, the general correlation matrix is a unit matrix, and the KMO coefficient is used to determine if the sample size is consistent with factor analysis. According to Hoang Trong (2007), a Sig. value of less than 0.05 enables refutation of the hypothesis H_0 , while a value of 0.5KMO1 indicates proper factor analysis.

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.678

Bartlett's Test of Sphericity	Approx. Chi-Square	2402.397
	df	253
	Sig.	.000

The coefficient KMO = 0.678 > 0.5 and the Bartlett's coefficient of significance (Sig) of 0.000 indicated that these 23 variables are associated, and that the component analysis method used in the study is adequate.

Rotated Component Matrix^a

	Component						
	1	2	3	4	5	6	7
LE3	.916						
TS3	.916						
TS2	.693	.529					
LE2	.693	.529					
TS1		.941					
LE1		.941					
CB3			.834				
CB2			.801				
CB1			.753				
OR3				.764			
OR4				.719			
OR2				.718			
OR1				.600			
BR2					.790		
BR3					.723		
BR1					.699		
BR4					.605		
CS3						.884	
CS1						.819	
CS2						.728	
MP2							.778
MP3							.718
MP1							.645

The rotation factor matrix findings shown in the table reveal that the observed variables all have factor load factors larger than 0.5 and upload only one factor. As a result, independent variable scales assure convergence and differentiation.

There are no changes in the model's components after doing exploratory factor analysis. As a result, the study model is not altered and stays unchanged with the presented hypothesis.

- **With dependent variable.**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.741
Bartlett's Test of Sphericity	Approx. Chi-Square	627.888
	df	3
	Sig.	.000

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.413	80.423	80.423	2.413	80.423	80.423
2	.324	10.813	91.235			
3	.263	8.765	100.000			

The EFA analysis is suitable, as indicated by the KMO coefficient = 0.742 > 0.5 and the Bartlett test with Sig.=0.000 0.05.

Eigenvalue of 2.411 > 1. Total variance value = 80.358% > 50%, this number implies that this set of factors explains 80.358% of the variation in the customer choice scale’s observed variables.

4.2.3. Correlation analysis

The authors employed Pearson correlation analysis to examine the connection between the dependent and independent variables. It indicates that the two variables are positively linked, which means that the greater the value of one variable, the greater the value of the second variable.

Correlations

	F_TS	F_LE	F_MP	F_BR	F_CB	F_OR	F_CS	Y
F_TS Pearson Correlation	1	.052	.020	.050	.111*	.247**	-.046	.052
F_TS Sig. (2-tailed)		.304	.686	.316	.027	.000	.364	.304
F_TS N	400	400	400	400	400	400	400	400
F_LE Pearson Correlation	.052	1	.291**	.051	.132**	-.050	.072	.605**
F_LE Sig. (2-tailed)	.304		.000	.309	.008	.322	.149	.000
F_LE N	400	400	400	400	400	400	400	400
F_MP Pearson Correlation	.020	.291**	1	.117*	.236**	.085	.125*	.528**
F_MP Sig. (2-tailed)	.686	.000		.019	.000	.089	.012	.000
F_MP N	400	400	400	400	400	400	400	400
F_BR Pearson Correlation	.050	.051	.117*	1	.078	.052	.041	.185**
F_BR Sig. (2-tailed)	.316	.309	.019		.120	.303	.410	.000
F_BR N	400	400	400	400	400	400	400	400
F_CB Pearson Correlation	.111*	.132**	.236**	.078	1	.352**	-.086	.467**
F_CB Sig. (2-tailed)	.027	.008	.000	.120		.000	.087	.000
F_CB N	400	400	400	400	400	400	400	400
F_OR Pearson Correlation	.247**	-.050	.085	.052	.352**	1	-.111*	.207**
F_OR Sig. (2-tailed)	.000	.322	.089	.303	.000		.026	.000
F_OR N	400	400	400	400	400	400	400	400
F_CS Pearson Correlation	-.046	.072	.125*	.041	-.086	-.111*	1	.044
F_CS Sig. (2-tailed)	.364	.149	.012	.410	.087	.026		.377
F_CS N	400	400	400	400	400	400	400	400
Y Pearson Correlation	.052	.605**	.528**	.185**	.467**	.207**	.044	1
Y Sig. (2-tailed)	.304	.000	.000	.000	.000	.000	.377	
Y N	400	400	400	400	400	400	400	400

The Sig. (2-tailed) of independent variables F_TS (The psychology of thrifty spending) and F_CS (Customer service) with dependent variable Y (Decisions to purchase Life Insurance) both have value more than 0,05. The Pearson correlation test results are shown that F_TS and F_CS must be excluded for further regression analysis.

The 5 meaning factors (F_LE, F_MP, F_BR, F_CB, F_OR) are preserved and can be continued to further regression analysis.

4.3. Regression Analysis

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.789 ^a	.623	.618	.394	1.832

a. Predictors: (Constant), F_OR, F_LE, F_BR, F_MP, F_CB
b. Dependent Variable: Y

A Durbin-Watson value of 1.832 is within the acceptable range of $1 < D < 3$. This allows the model to conclude there is no correlation between the residuals.

Model		Coefficients						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.605	.202		-2.989	.003		
	F_LE	.414	.028	.479	14.695	.000	.900	1.111
	F_MP	.281	.031	.300	9.027	.000	.867	1.153
	F_BR	.104	.033	.098	3.130	.002	.983	1.018
	F_CB	.232	.027	.291	8.520	.000	.823	1.214
	F_OR	.091	.031	.098	2.951	.003	.865	1.156

a. Dependent Variable: Y

According to the regression analysis, statistical results show that the normalized regression coefficients of the regression equation are all different from 0 and sig. < 0.05 proves that there are 5 independent variables involved in influencing the “purchasing decision” of the customer with the insurance item, which are (F_LE), (F_MP), (F_BR), (F_CB), (F_OR).

The regression equation according to β the normalization system is rewritten as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + e_i$$

$$Y = -6,05 + 0,479F_LE + 0,3F_MP + 0,098F_BR + 0,291F_CB + 0,098F_OR$$

Rewrite:

Decisions to purchase Life Insurance = -0,65 + 0,479 Life events + 0,3 Motivates for purchasing life insurance + 0,098 Barriers of registering life insurance + 0,291F_ Company brand + 0,098 Opinions of relatives

4.4. Hypothesis testing results

Hypothesis	Content	Actual result
H1	The psychology of thrifty and spending has positive impact on the decision to participate in life insurance	Reject
H2	Life events has positive impact with the decision to join life insurance	Accept
H3	Motivates for purchasing life insurance has positive impact on the decision to participate in life insurance	Accept
H4	Barriers of registering life insurance has positive impact on the decision to participate in life insurance	Accept
H5	Company brand has positive with the decision to join life insurance	Accept
H6	Opinions of relatives have positive impact on the decision to participate in life insurance	Accept
H7	Customer service has positive impact on the decision to participate in life insurance	Reject

5. DISCUSSION AND RECOMMENDATION

5.1. Discussion

Based on theory included to build a research model, along with the steps, the author makes the conclusions:

According to the Hypothesis tested result, there are 5 factors affecting the decision to purchase life insurance in Hanoi city is: Life events, Motivates for purchasing Life insurance, Barriers of registering Life insurance, Company brand, Opinions of relatives.

This model explains 61,8% of the change in the Decision to Purchase Life Insurance variable of

consumers in Hanoi city to 5 independent factors in the model, while external variables explain the remaining 38,2% of the variance in the dependent variable. All of the variables have a positive beta coefficient, indicating that they have the same effect as the choice to purchase life insurance, which means that the higher (raised) the insurer satisfies these conditions, the higher the decision to purchase life insurance. A comparison of the Beta column's normalization coefficient value reveals:

The strongest impact was the “Life events” factor, ($\beta=0.479$ and $\text{sig.}=0.000$). With a normalization factor of $\beta=0.479$, “Life events” increased by 1 unit, “Decision to purchase Life insurance” increased by 0.479 units. This outcome is warranted, as people are frequently touched by near life occurrences. Many people in modern society are aware of and choose insurance products. When people have a steady income, they frequently consider spending on things that benefit them and their family. In affluent circumstances, each family member can enroll in an insurance plan that meets their requirements. Furthermore, while getting married, customers seek a secure existence, as well as a strong educational future for their children and financial stability. Customers frequently seek insurance to secure financial security for their family and themselves when their own health is not in excellent shape. The breadwinner will relieve your financial load if you have prepared a financial protection plan with the appropriate insurance package. Feel confident enough to work, care for, and provide value to the family from there.

The second level of impact was the “Motivates for purchasing life insurance” factor ($\beta=0.3$ and $\text{sig.}=0.000$). With a normalization factor of $\beta=0.3$, “Motivates for purchasing life insurance” increases by 1 unit, “Decision to purchase Life insurance” will increase by 0.3 units. Hanoians, in particular, and Northerners in general, are cautious with their spending; they recognize the importance of saving and frequently spend to financially guarantee their family and themselves in retirement. Furthermore, because life insurance is a service sector, it is difficult for clients to see the benefits of insurance, other than collecting money at maturity or assuming risks and being compensated by the insurance firm. As a result, witnessing others receive reimbursement from the insurance business will encourage people to purchase life insurance.

The third level of impact is “Company brand”. The regression analysis results show that this factor also has a positive impact on customers' decision to purchase life insurance ($\beta=0,291$ and $\text{sig.}=0,000$). If the normalization factor $\beta=0,291$ means that “Company brand” increases by 1 unit, the measurement value “Decision to purchase Life insurance” increases by 0,291 units. This is comprehensible since the more individuals elect to join in insurance because the insurance firm has a significant respectable brand in the market. The brand is represented not just in financial strength, but also in numerous areas such as products, services, community activity, and brand marketing. Because life insurance products are long-term contracts, the brand is critical in allowing clients to “choose to deposit gold” and transmit complete faith. In addition, while deciding whether to buy a product, buyers constantly weigh the cost vs the benefits it provides. However, the impression of the advantages that the product provides, as well as the cost that customers are prepared to pay, varies from person to person, because each customer has unique personal characteristics and purchasing motives.

Customers that value cheap cost are more likely to agree to low-cost life insurance products to suit needs, such as a modest periodic insurance policy to avoid financial losses if they die. Customers that prioritize both financial security and savings will assess the advantages more than the expenses, claiming more benefits in an insurance policy. Customer service, on the other hand, has a substantial impact on the purchase decision. Because life insurance plans generally have big denominations and lengthy durations, most customers prefer to be treated by insurance agents who will look after their policies until maturity.

“Opinions of relatives” (=0,098 and sig.=0,03) and “Barriers to registering life insurance” (=0,098

and sig.=0,02) were the fourth and fifth degrees of influence, respectively. These two criteria have the least influence on customers' decisions to purchase life insurance in Hanoi. Customers' purchases of life insurance are influenced by their parents, family members, siblings, and spouses. Because each member of the family often earns income, the opinions of close relatives do not have a large impact on the choice to get life insurance, but they do have an impact. Aside from the fact that the interviewee is supported by friends and acquaintances, the percentage of families who are aware of insurance is a potential segment, and insurance companies, in addition to informing customers about insurance benefits, must pay attention to customers' family members (parents, wife, husband, children, etc.). For spouses, especially insurance collectors, it is necessary to know whether the object they collect is supported by the spouse or not; if so, the employee can be flexible and easily accessible; if not, the employee must patiently listen to the thoughts, aspirations, and problems of customers. With a coefficient of $\beta=0,098$, "Opinions of relatives" will increase by 1 unit, "Decision to purchase Life insurance" will increase by 0,098 units.

Furthermore, with the "Barriers of registering Life insurance" factor, customers frequently do not learn carefully or do not have enough information about insurance and in-surance contracts, which leaves customers ambiguous about the benefits they receive when participating in insurance as well as hesitating about the company's existence and long-term development. They do not trust the firm or the consultant because they are afraid of being duped. In fact, customers frequently choose to purchase life insurance from businesses that are entirely based in the United States. They are also concerned that if foreign enterprises fail and are forced to return home, they would be unable to retrieve their rights. Furthermore, there are numerous occasions when clients trust insurance firms but are skeptical of insurance brokers; there have been many cases where consultants defraud customers and then flee, causing widespread concern. Furthermore, some customers believe that the premium payment is excessive and that insurance is unnecessary. The average salary in Hanoi is fairly high, but the average expenditure in daily living is not low, so they must fulfill their urgent demands as well as take care of their family's daily activities. They are aware of the benefits of life insurance, but due to financial constraints, they are unable to participate. As a result, income is always a major consideration in people's actions. People who have financial conditions but have not yet participated in insurance because they want to invest in areas with more attractive profits, on the other hand, are usually qualified people, knowledgeable about many fields, and they accept high risks in order to have high profits, so insurance is not a particularly appealing form of investment. There are other consumers who believe that risks occur seldom in life and that purchasing insurance is unnecessary. This might be a client who is focused on satisfying current requirements and is unaware of unanticipated hazards, thus they believe that purchasing insurance is wasteful and unnecessary.

With the study and regression equations developed, all scales match the reliability standards, and the test demonstrates that the model is appropriate for the whole. The findings confirm that five factors influence customers' decisions to purchase life insurance in Hanoi, listed in descending order as follows: "Life events", "Motivates for purchasing Life insurance", "Company brand", "Opinions of relatives", and finally "Barriers to registering Life insurance". These characteristics all have a beneficial influence on consumers' purchasing decisions, thus insurers must optimize these elements at the same time in order to raise the quantity of insurance utilized.

According to the author's research, the factors influencing customers' decisions to purchase life insurance in Hanoi city were listed with high to low impact levels as "Life events," "Company brand," "Motivates for purchasing Life insurance," "Opinions of relatives," and finally "Barriers to registering Life insurance." This differs from Anh's (2017) Master's Thesis in Economics. The author shown in this study

that the component that had the most influence on the choice to purchase insurance was Service, followed by Barriers, Benefits and Reputation, and lastly Family Opinion. This is also in contrast to Hang (2016). The author argues that there are seven factors that customers say have the most effect on their choice to purchase life insurance: Perceptions of risk and profitability, Motivations for purchasing life insurance, Product value perception, Company brand, Consultant, Customer service and Previous life insurance product experience.

It is clear from all three research that the opinions of family and relatives do not play a significant role in influencing customers' decisions to purchase insurance. Customers' incentives for purchasing life insurance, on the other hand, have a significant role in influencing the choice to purchase insurance. This is reasonable because in Vietnamese families, the person who decides to purchase life insurance is often the breadwinner; they understand and grasp the benefits of insurance, as well as the necessity of insurance for themselves and their own families, ensuring both financial and health for the family.

However, it can be shown that, while variables in everyday life and brand image of insurance firms make for a substantial portion of customers' choice to acquire insurance in Hanoi, this is only moderately important and similar to Hue in Rach Gia. This occurs owing to geographical variances and people's varying perspectives on life. Previous research were done prior to the development of Covid-19; however, with the emergence of Covid-19, individuals began to be concerned about saving and hoarding more for life. People are increasingly paying more attention to health and life, living "slowly" to love themselves, therefore issues in everyday life also play an essential part in large decisions in Hanoi, the capital.

5.2. Recommendation

With Life events, to establish circumstances for clients to participate in insurance, the firm must advertise several insurance packages with reasonable premiums, have a large number of financial assistance programs, or offer insurance packages in a short period of time.

The consultant must explain to the consumer the difference in interest rates between the insured and the bank customer. Customers are being advised to increase the extra price while maintaining the basic fee. This allows clients to earn significantly at the conclusion of the premium payment period. Keeping the basic cost constant will not result in increased protection advantages.

With Motivates for purchasing Life insurance, raising public awareness of the advantages of life insurance. Life insurance companies should invest more in communication and propaganda about the value and benefits of life insurance, assisting clients in understanding that purchasing life insurance is for more than simply insurance. Protection when hazards arise, but also peace of mind because you are saving for your future and helping the country's socioeconomic growth.

With Barriers of registering Life insurance, insurance companies must take steps to carefully advise customers from the start about the benefits after signing the contract; consultants must improve their expertise, professional knowledge of insurance, and organize regular seminars, training classes, and market surveys to convey information and update customer inquiries. Open a customer care center 24 hours a day, 7 days a week to listen to and answer customers' questions. They must also simplify the method, or the consultant must grasp the customer's psychology, be adaptable, and settle the contract proactively rather than following the conventional way.

With Company brand, insurance businesses must improve their reputation in the insurance industry by making charity donations, participating in community activities, thoroughly answering client queries, and providing compensation. satisfactory. Do not let the company's image be harmed by its reputation. The most crucial component in the firm must be the service factor. Take note of all services. Organize

an employee evaluation of the best service provider of the month/quarter/year...in order to motivate and motivate staff to execute their responsibilities properly. It is critical to focus on developing a strong brand that is both the company's and the product's brand. Brand is reflected not only in financial strength, but also in various phases of the total, such as: service flooring, marketing, brand promotion, customer service...

With Opinions of relatives, insurance firms must pay attention to clients' family members (parents, spouses, children, etc.) in addition to telling them about insurance advantages. For spouses, especially insurance collectors, it is critical to understand whether the item they collect is supported by the husband; if so, the staff may be flexible and approachable. If the family does not support the object, the staff must carefully listen to their views and goals and respond to the customers' concerns. Cashiers in the family opinion segment are crucial since they have direct touch with this target demographic. As a result, they must be taught in vital abilities such as listening, communication, information reception, and persuasion. This individual must be well-versed in insurance in addition to doing the primary duty successfully. When consumers want advice, we are always ready to provide it.

6. CONCLUSIONS

In terms of theoretical contributions, there is a dearth of study for understanding predictors of life insurance purchase decisions in the HN city setting, despite the fact that several studies have noted this. This happens might due to the fact that un-foreseen dangers and risks in life is only recently becoming more and more con-cerned in Vietnam, so this research can serve as an example and a noticeable message for life problems. Moreover, the theory of consumer behavior is used in many different ways in pre-vious research for investigating different consumption behaviors and intention, so this study will contribute as an example of a valid model for further research with the same concern and provide a further look into different components of the theory.

Because the issue is limited, the research only looks at those who have purchased insurance. As a result, the following research must conduct a thorough survey and evaluation of both of these groups of individuals in order to ensure the topic's objectivity. More similar studies on a greater size and on a larger scale are required for a wider and more inclusive view. Furthermore, owing to time and resource constraints, this study constructs a model of factors influencing insurance purchase intent without intermediate/process variables, indicating a potential research topic.

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Part 3

Economics

ASSESSMENT OF THE IMPACT OF EXCHANGE RATE ON VIETNAM - EUROPE BALANCE OF TRADE

**Author: Phan Tran Mai Ngan¹, Do Dang Khoa¹, Tran Ngo Yen Nha¹,
Dang Thi Thanh Hang¹, Cu Van Nghi¹
Mentor: Mai Thi Cam Tu¹**

ABSTRACT: The balance of trade (TB) plays a very important role in the global economy because it allows countries to measure their level of development in the international economic arena. Which, the issue of exchange rate fluctuations affecting TB is one of the basic and focused issues in the macroeconomic policy of all countries in the world. Because of that, many authors have embarked on research to find out the factors that affect this object. This study assesses the impact of the exchange rate on the Vietnam-Europe trade settlement in the period 1994-2022, using Autoregressive Distributed Lag (ARDL) and Non-Linear Autoregressive Distributed Lag (NARDL). The results indicate that: The real exchange rate variable has a positive impact on trade equity in both the short and long run, similar to the variable of Vietnam's domestic value. In contrast, the European domestic value and the EVFTA Agreement dummy have a negative impact on the trade equity of both countries.

Keywords: Trade balance, Vietnam - Europe, Exchange rate, NARDL, GDPEU, GDPVN, EVFTA.

1. INTRODUCTION

Trade Balance (TB) plays an important role in the economy. A long-term trade deficit can affect a country's economy, leading to problems such as high unemployment and reduced incomes of businesses and individuals,... The importance of the Trade Balance has attracted the attention of many economic researchers. These studies provide governments and businesses with important information to make optimal and effective economic and trade policy decisions.

The exchange rate is also an important factor associated with the development and growth of the economy of all countries, including Vietnam. Therefore, many scientific works are studied to supplement the necessary scientific arguments to better see the overall picture of the impact of the exchange rate on the Trade Balance.

In addition, after reviewing several research papers, the authors make the following evaluations: Firstly, most research papers only have a single view of a particular subject or some related industry groups. Secondly, most research papers use familiar ECM, ARDL, and OLS models. Thirdly, the above studies are only general; few studies put these relationships in a specific context. Finally, the studies on the impact of exchange rates on the trade balance are inconsistent in terms of the sign, and for Vietnam-Europe, there are still many open questions.

Facing the above arguments, with the desire to make theoretical contributions on the theoretical basis of the Trade Balance between Vietnam and Europe as well as make suggestions in an optimal and effective way, the research team conduct a study on the topic "ASSESSMENT OF IMPACTS OF EXCHANGE RATES ON VIETNAM TRADE BALANCE BETWEEN VIETNAM AND EUROPE" as an urgent topic and contribute to filling these gaps.

The main objective of this article is to assess the impact of the exchange rate on the Trade Balance of Vietnam-Europe and propose a number of recommendations to improve the Trade Balance in the context of the current EVFTA agreement.

1 University of Economics and Law, Vietnam National University Ho Chi Minh City.

Consequently, the current paper seeks to contribute to the existing literature. Firstly, the study has added the necessary scientific arguments on the impact of the exchange rate on the trade balance between Vietnam and Europe and confirmed the important role of the exchange rate in the economic trade activities of a country by using updated data from 1994-2022. Secondly, to our knowledge, this is the first paper to use linear and nonlinear autoregression to analyze the impact of exchange rates on the trade balance between Vietnam and Europe in the context of the EVFTA agreement. Thirdly, the study provides necessary information and is a useful reference for policymakers, contributes significantly to the treasure of scientific research articles, and is also a valuable reference for future research related to the balance of trade. Finally, this study is also a prerequisite and necessary reference for the signing of other agreements in the future.

The next section of this study is organized as follows: section 2 presents the theoretical basis and proposes a research model; section 3 briefly explains the methods and data; section 4 analyzes the results and discussions; and section 5 includes conclusions and recommendations.

2. THEORETICAL FRAMEWORK

2.1. Theories

The relationship between Exchange Rates and Trade Balance has always been a primary concern for researchers. In this context, Trade Balance (also known as international trade) is the concept used to denote the total value of goods and services exported and imported by a country during a specific period, typically one year.

One of the significant theories regarding the relationship between exchange rates and Trade Balance is the theory of the elastic approach to Trade Balance studied in the BRM model. According to this theory, when inflation increases in a country, its currency depreciates compared to the currencies of other countries, which leads to an increase in the domestic value of goods and a decrease in the value of exported goods, resulting in enhanced imports and reduced exports, affecting the country's cash flow and Trade Balance. Additionally, when exchange rates fluctuate, such as a devaluation of the local currency, it makes the domestic currency cheaper, thus encouraging exports. Conversely, depreciation makes imported goods more expensive and restricts imports. The impact of currency depreciation on the Trade Balance is known as the Marshall-Lerner condition (ML). However, the ML condition does not explain why the Trade Balance remains in deficit after currency depreciation. After a certain period, the Trade Balance starts to improve. This phenomenon was discovered by Magee (1973) while studying the relationship between the exchange rate and the US Trade Balance. Magee (1973) identified the J-curve, which was later explained by Akbostanci (2004).

In the study of A. Rose and J. L. Yellen (1989), the authors have successfully built a two-country trade model in Economics. This paper has demonstrated a model to assess the dependence of demand for imported goods in the host country (foreign) on the real income of that country (foreign) and the relative price of imported and exported goods; TB depends on the real exchange rate; the real income of the host country; and real foreign income.

2.2. Literature review

The exchange rate is a crucial factor closely linked to the development and growth of an economy. Exchange rate fluctuations impact TB and are among the fundamental issues in the macroeconomic policies of every country worldwide, including Vietnam. Numerous researchers have studied the relationship between exchange rates and TB. During the literature review, the authors of this study categorized these previous research into three main groups, as follows:

Group one consists of studies that indicate that the exchange rate has no impact or only secondary effects on the Trade Balance. This group includes research conducted by Matiur Rahman et al (2010) in the Philippines using ADF-test, Nguyen Nhat Mai (2014) in Vietnam using the VAR method, Lan Huong Hoang (2016) in Vietnam with VECM & SVAR method, Essa Alhanom (2016) in Yemen using ARDL method, and Nguyen Hong Nga et al (2021) in Vietnam using ARDL and NARDL method.

Group two includes studies that demonstrate a negative impact of exchange rates on the Trade Balance. Some notable studies in this group are conducted by Thanh Hoan Phan and Ji Young Jeong (2015) in Vietnam using ARDL method, Tunaer Vural, B. M. (2016) in Türkiye using ECM, Muhammad Shahbaz et al (2014) in China using ADRL method, Eke et al (2015) using ADF-test and ECM method, Nguyen Quang My et al (2017) in Vietnam using ARDL and ADF-test method, Pham Thi Nga (2017) in Vietnam using Marshall-Lerner condition, Do Thi My Huong and Dang Thi Xuan Thom (2018) in Vietnam using ARDL, ECM and IRFs method, Cheng, K. M. (2019) in USA using ARDL, ADF & KPSS method, and My Linh et al (2020) in Vietnam using VAR & GARCH method.

Group three consists of studies that indicate a positive long-term impact of exchange rates on the Trade Balance. This group includes research conducted by Pham Thanh Hoan and Nguyen Dang Hao (2007) in Vietnam using Cointegration and ECM method, Swarnjit Arora et al (2010) in the USA using the ADRL method, Yusoff & Mohammed B (2010) in Malaysia using Cointegration and VECM method, Nguyễn Cẩm Nhung et al (2018) in Vietnam using VAR & IRF method, and Tran Thi Ha (2019) in Vietnam using ARDL and NARDL method.

2.3. An overview of previous studies and research hypotheses

The bilateral real exchange rate is calculated based on the nominal bilateral exchange rate under price adjustment between the two countries: $RER = \frac{eP^*}{P}$ (where e is the nominal bilateral exchange rate, P^* is the European Consumer Price Index, P is the Vietnam Consumer Price Index). According to the theory mentioned in equation (1), RER is known to have negative or positive effects on TB. In addition, according to the elastic approach to the Marshall-Lerner condition, the devaluation of the local currency will improve TB in the long run. If the approach of the J-curve is followed, the devaluation of the domestic currency will make the trade deficit in the short term and improve in the long term.

Besides, based on the collected studies, the authors found that there is no uniformity in the sign, specifically, some articles indicate that the exchange rate has a negative impact on TB such as: My Linh et al (2020), some other studies show a positive impact of exchange rate on trade finance: Pham Thanh Hoan and Nguyen Dang Hao (2007), Swarnjit Arora et al (2010), Yusoff & Mohammed B (2010), Nguyen Cam Nhung et al (2018), Tran Thi Ha (2019). Therefore, the authors come to the conclusion:

Hypothesis H1: The two-way real exchange rate (RER) is expected to have a multidirectional impact on the Trade Balance, which can be negative or positive.

$GDPVN_t$ not only represents the real domestic value of Vietnam's GDP over time but also represents the income of Vietnamese residents. According to the theory from equation (1), $GDPVN$ has a negative impact on the Trade Balance, more specifically, the trade balance of goods depends on the income of domestic and foreign residents.

When domestic residents' earnings tend to increase, the volume of imported goods also increases. Similarly, an increase in the income of foreign residents leads to a growth in the export of commodities, which negatively affects domestic TB. Swarnjit Arora et al (2010), Essa Alhanom (2016), Pham Thi Nga (2017), Tran Thi Ha (2019), and Nga Nguyen Hong et al (2021) also agree with this viewpoint. However, alongside these findings, some studies yield contrary results, such as Yusoff & Mohammed B (2010), Eke et al (2015), Nguyen Quang My et al (2017), Nguyen Cam Nhung et al (2018), and Nguyen Thanh Trung (2018).

$GDPEU_i$ represents the real domestic value of European GDP, representing the income of European residents over time. According to the theory from equation (1), an increase in the earnings of foreign residents will improve the TB. Some studies, such as Yusoff & Mohammed B (2010), Thanh Hoan Phan and Ji Young Jeong (2015), and Essa Alhanom (2016), also agree with this viewpoint. Therefore, the authors expect $GDPEU$ to have a positive impact on TB. However, other studies yield contrary results, including Eke et al (2015), Pham Thi Nga (2017), and Nguyen Thanh Trung (2018).

The theoretical expectation is that exports and imports increase when the real income of trading partners and domestic income correspondingly increase, and vice versa. In that case, the research group may expect $GDPVN < 0$ and $GDPEU > 0$. However, imports can decrease when income increases if the increase in real income increases the production of substitute goods, thereby reducing imports. In this case, the research group would expect $GDPVN > 0$ and $GDPEU < 0$.

Therefore, the authors expect that $GDPVN$ and $GDPEU$ have a multidirectional impact on TB, which can be positive or negative (H2&H3):

Hypothesis H2: The real gross domestic product of Vietnam (GDPVN) has a multidirectional impact on Trade Balance, which can be positive or negative.

Hypothesis H3: The real gross domestic product of Europe (GDPEU) has a multidirectional impact on Trade Balance, which can be positive or negative.

D_i is a dummy variable where $D = 1$ represents the state when the EVFTA agreement takes effect (2020-2022), and $D = 0$ illustrates the normal state (1994-2019). It captures the average difference in the dependent variable $\ln(X/M)$ during these two periods.

Hypothesis H4: The dummy variable D is expected to have an impact on Trade Balance.

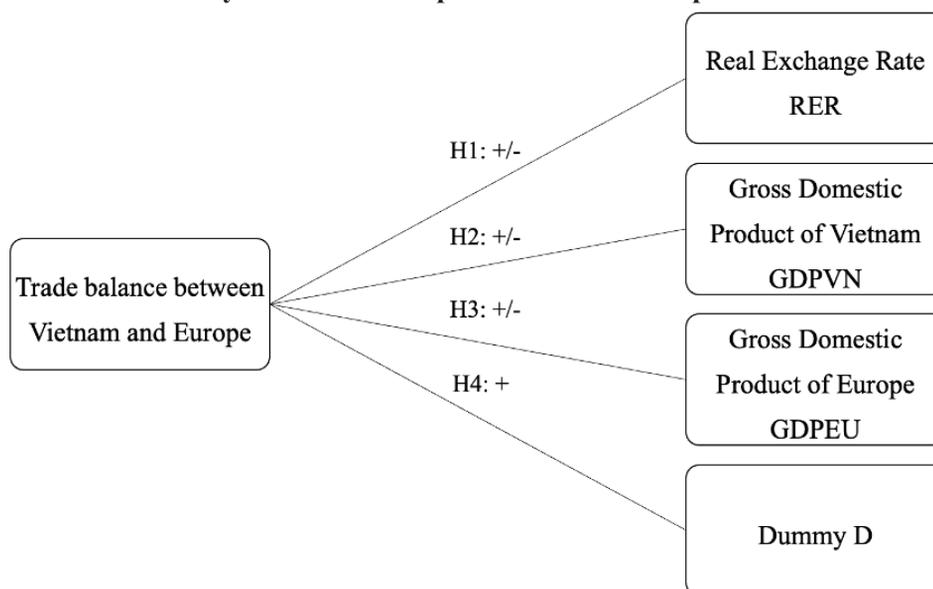


Figure 2.1. Factors affecting the Vietnam-Europe trade agreement

(Source: Author's compilation)

3. RESEARCH METHOD

3.1. Research model

Based on the two-country trade model in the study of A. Rose and J. L. Yellen (1989) and the author's construction, we get:

$$TB = TB (RER, Y, Y^*) \tag{1}$$

From equation (1), we see the Trade Balance depends on the real exchange rate (RER); the actual income of the domestic country (Y); and the actual foreign income (Y*). The change in the real income of the host country will have a negative impact on the Trade Balance. Changes in the actual foreign income will positively impact the Trade Balance, and changes in the real exchange rate could have a negative or positive impact on the Trade Balance.

Starting from the original study by A. Rose and J. L. Yellen (1989) and referencing the model used in Bahmani-Oskooee and Baek (2016), which is based on the original work, the authors propose a research model on the impact of exchange rates on the Trade Balance between Vietnam and the EU as follows:

$$\ln\left(\frac{X}{M}\right) = \alpha_0 + \alpha_1 \ln(RER)_t + \alpha_2 \ln(Y_t^{VN}) + \alpha_3 \ln(Y_t^{EU}) + \epsilon_t \tag{2}$$

Where M_t represents the number of imports into Vietnam from the EU, X_t represents the volume of exports from Vietnam to the EU. Y_t^{VN} (Y_t^{EU}) is the actual income of Vietnam (the EU), RER_t is the bilateral real exchange rate.

As mentioned above, the authors focus on the exchange rate, the EVFTA agreement, or both; therefore, the authors proceed to add a dummy variable D into equation (2). We have:

$$\ln\left(\frac{X}{M}\right) = \alpha_0 + \alpha_1 \ln(RER)_t + \alpha_2 \ln(Y_t^{VN}) + \alpha_3 \ln(Y_t^{EU}) + \epsilon_t + \alpha_4 \ln D \tag{3}$$

Where D is a dummy variable that takes a value of 0 from 1994-2019 and 1 from 2020-2022.

Equation (3) is the long-term equation. Therefore, to evaluate the short-term, especially the short-term impact of the exchange rate (considering the J-curve effect), the research group adds the Autoregressive Distributed Lag (ARDL) method to equation (3). ARDL was developed by Pesaran et al (2001) as in equation (4).

$$\Delta(X/M)_t = \alpha + \sum_{j=1}^n \beta_j \Delta \ln X/M_{t-1} + \sum_{j=0}^n \delta_j \Delta \ln Y^{VN}_{t-1} + \sum_{j=0}^n \pi_j \Delta \ln RER_{t-j} + \sum_{j=0}^n \lambda_j \Delta \ln Y^{EU}_{t-1} + \theta_1 \ln X_{t-1} + \theta_2 \ln Y^{VN}_{t-1} + \theta_3 \ln RER_{t-1} + \theta_4 \ln Y^{EU}_{t-1} + D + \epsilon_t \tag{4}$$

The ARDL model has an advantage over equation (2) as it allows for analysis in both the short and long term. In addition, ARDL can be applied when time series data are cointegrated I(0) or I(1).

The real exchange rate and exports may be asymmetrical when the VND depreciates or appreciates. Therefore, we create two new variables representing the appreciation of the VND as POS and the depreciation of the VND as NEG as follows:

$$POS_t = \sum_{j=1}^t \Delta \ln RER^+_j = \sum_{j=1}^t \max(\Delta \ln RER_j, 0) \tag{5}$$

$$NEG_t = \sum_{j=1}^t \Delta \ln RER^-_j = \sum_{j=1}^t \min(\Delta \ln RER_j, 0) \tag{6}$$

POS is calculated as the sum of the partial appreciation changes of the Vietnamese Dong, and NEG is calculated as the sum of the partial depreciation changes of the Vietnamese Dong. According to Shin et al (2014), the authors replace the RER variable in equation (4) with the POS and NEG variables. We have:

$$\Delta X/M_t = \alpha + \sum_{j=1}^n \beta_j \Delta \ln X/M_{t-1} + \sum_{j=0}^n \delta_j \Delta \ln Y^{VN}_{t-1} + \sum_{j=0}^n \pi^+_j \Delta POS_{t-j} + \sum_{j=0}^n \pi^-_j \Delta NEG_{t-j} + \sum_{j=0}^n \lambda_j \Delta \ln Y^{EU}_{t-1} + \theta_1 \ln X/M_{t-1} + \theta_2 \ln Y^{VN}_{t-1} + \theta^+_3 POS_{t-1} + \theta^-_3 NEG_{t-1} + \theta_4 \ln Y^{EU}_{t-1} + D + \epsilon_t \tag{7}$$

Equation (7) is the nonlinear autoregressive distributed lag model (NARDL). Estimating the coefficients allows for analyzing the impact of exchange rate changes on the short and long-term Trade Balance. NARDL also allows for investigating the asymmetry of the changes in the real exchange rate concerning the export ratio.

3.2. Research Data

Variable names	Explanation	Previous authors	Expectation
Dependent variable			

In(X/M)	Natural logarithm of Vietnam-Europe Trade Balance	Pham Thanh Hoan and Nguyen Dang Hao (2007), Matiur Rahman et al (2010), Swarnjit Arora et al (2010), Yusoff & Mohammed B (2010).	
Independent variables			
InGDPVN	Natural logarithm of Vietnam's gross domestic product (GDPVN)	Nguyen Nhat Mai (2014), Eke et al (2015), Nguyen Quang My et al (2017), Do Thi My Huong and Dang Thi Xuan Thom (2018).	+/-
InGDPEU	Natural logarithm of Euro's gross domestic product (GDPEU)	Nguyen Nhat Mai (2014), Eke et al (2015), Nguyen Quang My et al (2017), Do Thi My Huong and Dang Thi Xuan Thom (2018).	+/-
InRER	Natural logarithm of the real exchange rate (RER)	Do Thi My Huong and Dang Thi Xuan Thom (2018).	+/-
D	Dummy variable representing the impact of the EVFTA Agreement	Group of authors	+

Table 3.1. Variable table*(Source: Author's compilation)*

3.3. Research sample size

Because of the limitation of data, the study used secondary data with a small sample size of $n=29$ from 1994–2022. Data was collected from International Financial Statistics (IFS), which is a reputable and official source of information worldwide.

3.4. Estimation method

The study used the Autoregressive Dispersion Latency (ARDL) model (Pesara et al. (2001)) and the Nonlinear Autoregressive Dispersion Latency (NARDL) model (Shin et al (2014).). This is completely consistent when previous studies also often used these two models to test the long-term cointegration of variables for studies with small sample sizes.

According to Pesaran (1997), ARDL method has many advantages over other cointegration methods. First, in the case of heterogeneous independent variables, ARDL allows heterogeneous independent variables to be used in the model. Second, ARDL can handle linear relationships between variables. Third, ARDL can handle cointegration relationships between variables. In addition, this NARDL has advantages as stated by Arize et al. (2017). First, this method provides an estimator of any number of arguments in the short run and the run time. Second, variables are required to be cointegrated such as $I(0)$ when using the OLS method and $I(1)$ cointegration, while using the VAR, ARDL and NARDL methods are applicable when the merge variable to $I(0)$ and $I(1)$.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Unit Root Test

Variable	ADF		PP		KPSS	
	Level	1st Difference	Level	1st Difference	Level	1st Difference
InRER	-1,072	-3,108	-0,835	-3,047	0,495	0,161
InGDPVN	-1,439	-3,866	-1,255	-3,857	0,867	0,185
InGDPEU	-1,341	-4,185	-1,338	-4,178	0,600	0,153
InX/M	-2,392	-3,915	-2,403	-3,996	0,456	0,394

Table 4.1. Unit Root Test

Because time-series data is used in this model, we first check the stationary of this data. The model's data must stop at level (non-differentiation) or first different for all variables.

Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) test, and Kwiatkowski- Phillips-Schmidt-Shin (KPSS) test are used to check the stationarity at level and first difference for all variables. The results are reported in Table 4.1.

Table 4.1 shows the results of Unit Root Test with variables: lnRER, lnGDPVN, lnGDPEU, and lnX/M. The ADF and PP tests show that most of the variables have unit root or stop at the level or first difference. Additionally, we used the KPSS test for a more persuasive conclusion. The LM-Statistical in KPSS test shows all variables stationary.

Since all variables are non-stationary at lag 2, determining the optimal lag will be the next step for the model before conducting the ARDL and NARDL tests. There are five criteria for determining latency, specifically: Sequential modified LR test statistic (LR); Final prediction error (FPE); Akaike information criterion (AIC); Schwarz information criterion (SC) (Schwarz information criterion); and Hannan-Quinn information criterion (HQ). All five criteria above have the same rating for all variables.

Because no variables are integrated as I(2), determining the optimal lag is the next step before conducting ARDL and NARDL. The LR, FPE, AIC and HQ indicate lag 2, and SC indicate lag 1. Therefore, we used lag 2 as state as Akaike information criterion for conducting the model as in previous papers (Bahmani-Oskooee & Xu, 2012; Olowofeso et al, 2017; Khachatryan & Grigoryan, 2020).

4.1.2. ARDL test

Short-Run Estimates			
Lags	0	1	2
lnX/M		0,273	-0,618*
lnGDPVN	0,414	-2,637	3,506*
lnGDPEU	-1,751*		
lnRER	-1,837	0,827	3,073
D	-0,401	0,022	-0,803*
C	-7,948		

Note: *, **,*** indicate significant at 5%, 10% and 1% levels respectively.

Table 4.2. ARDL Short-Run

4.1.3. ARDL Bound Test Estimates

Test statistic	Value	Signif.	I(0)	I(1)
F-statistic	8,655376	10%	2,2	3,09
k	4	5%	2,56	3,49
		2,5%	2,88	3,87
		1%	3,29	4,37

Table 4.3. F-bound Test ARDL

As can be seen, F-statistic = 8,655376 is greater than the value of the lower limit I(0) and the upper limit I(1) at all four levels of 10%, 5%, 2,5% and 1% and the degree of precision. The estimated delay of the model is (2, 2, 0, 2, 2). This proves that the variables have a relationship in the long run.

4.1.4. Error Correction Model

ECM			
Lags	0	1	2
lnX/M		0,409*	
lnGDPVN	-0,930*	-1,900***	
lnGDPEU			
lnRER_NEG	-2,418*		
D	-0,499***	0,938***	
C			
CointEq		-1,174***	
Long-Run Estimates			
C		-5,908	
lnRER		1,534**	
lnGDPVN		0,954***	
lnGDPEU		-1,301***	
D		-0,878***	

Table 4.4. ECM

After noting the cointegration of the variables through the envelope test, the study estimates the short-term coefficients from the error correction model ECM based on the ARDL(2, 2, 0, 0, 1, 2). From the estimation results, it can be seen that the negative ECM coefficient (CointEq(-1) = -1,174360) with significance level of 1% represents the model adjustment towards long-term equilibrium.

The model results show that, lnGDPVN at lag 1, lnRER and dummy variable D are all statistically significant for short-term TB at 5%. The volatility of lnGDPVN and lnRER_NEG has a negative impact on the trade settlement, specifically when GDP of Vietnam increases by 1%, the Trade Balance decreases by 1,899084%, respectively, after 1 year. In other words, the current volatility of TB depends on the fluctuation of GDPVN one year ago, and when VND increases by 1%, TB will decrease by 2,417956% respectively.

In the short term, TB is improved thanks to dummy variable D at 1% statistical significance at lag 1, meaning that after EVFTA comes into effect, TB will be improved within one year afterwards. This is consistent with trade theory as well as the reality of Vietnam's foreign trade, in particular, Vietnam's main export products are mostly agricultural products. So this is a production lag to the change from the agreement.

Beside, we have: $EC = LNTB - (0,9537*LN\text{GDPVN} - 1,3014*LN\text{GDPEU} + 1,5338*LN\text{REER} - 0,8784*D - 5,9084)$

The long-term estimation results show that, at the 5% significance level, all variables are significant, in which the variable lnGDPVN and the real exchange rate lnRER have a positive impact on trade equity. More specifically, when GDP VN increases by 1%, TB will have a surplus of 0,953692% and when the real exchange rate increases by 1%, TB will have a surplus of 1,533765% respectively. This implies that when VND depreciates 1%, TB will improve by 1,533765%.

Meanwhile, the variable lnGDPEU and the dummy variable D have opposite effects on the trade settlement, when the GDPEU increases by 1%, the trade settlement decreases by 1,301430% respectively and the difference between the trade settlement under the EVFTA Agreement and in normal times is 0,878426 %. In other words, after the EVFTA Agreement is signed, in the long term, TB will deteriorate by 0,878426% compared to when the agreement has not been signed.

4.1.5. NARDL test

Part 1: Short-Run Estimates			
Lags	0	1	2
lnX/M		0,235	-0,409

lnGDPVN	-0,930	0,329	1,900
lnGDPEU	-0,971		
lnRER_POS	1,146		
lnRER_NEG	-2,418	5,051*	
D	-0,499*	0,096	-0,939*
C	5,000		

Table 4.5. Short-run NARDL

(Source: Author's compilation from Eviews 12)

4.1.6. NARDL Bound Test Estimates

Test statistic	Value	Signif.	I(0)	I(1)
F-statistic	7,018799	10%	2,08	3
k	5	5%	2,39	3,38
		2,5%	2,7	3,73
		1%	3,06	4,15

Table 4.6. F-bound Test NARDL

(Source: Author's compilation from Eviews 12)

F-stat = 7,018799, which is greater than the values of lower limit I(0) and upper limit I(1) at all four levels of 10%, 5%, 2,5%, 1%, and model latency the estimated figure is (2, 2, 0, 0, 1, 2). This proves that the variables have a relationship in the long run.

4.1.7. NARDL Long-Run

Part 2: Long-Run Estimates	
C	4,257
lnRER_POS	0,976
lnRER_NEG	2,242
lnGDPVN	1,105*
lnGDPEU	-0,827
D	-1,142*

Table 4.7. Long-run NARDL

(Source: Author's compilation from Eviews 12)

$$EC = LNTB - (1,1048 * LNGDPVN - 0,8272 * LNGDPEU + 0,9758 * LNREER_POS + 2,2422 * LNREER_NEG - 1,1415 * D + 4,2575)$$

In part 2, the long-term estimate shows that when GDP of Vietnam increases by 1%, trade fair will increase by 1,105% respectively and the difference between trade settlement when there is EVFTA Agreement and in normal time is 1,141528%. In other words, after the EVFTA Agreement is signed, in the long term, the TB will deteriorate by 1,141528% compared to when the agreement has not been signed.

Table 4.7 shows that although there is a clear difference between the variables lnRER_POS and lnRER_NEG, these variables are not significant, implying a symmetric exchange rate on the Trade Balance. To answer the above question in a more scientific way, the Wald test is used to detect evidence. In all cases it is hypothesized that H0, POS and NEG are symmetric.

4.1.8. Wald Test

	Test Statistic	Value	df	Probability
Short run of Export/Import	F-statistic	0,316779	(1,14)	0,5825
Long run of Export/Import	F-statistic	0,316779	(1,14)	0,5825

Table 4.8. Wald Test

(Source: Author's compilation from Eviews 12)

Table 4.8 presents the Wald test to check the model's asymmetry. As can be seen, all cases show chi-square probability greater than 1%, thus accepting hypothesis H0, implying a symmetric relationship in both short run and long run of the model.

4.1.9. Diagnostic Check

	RAMSEY Reset	Serial Correlation	Heteroskedasticity	Normality	CUSUM	CUSUMQ
ARDL	+	+	+	+	+	+
NARDL	+	+	+	+	+	+

+: Good; -: Bad.

Table 4.9. Diagnostic Check

(Source: Author's compilation from Eviews 12)

Table 4.9 presents the results of the diagnostic test for the linear and non-linear models of the study. As can be seen, the Breusch-Godfrey Serial Correlation LM test indicates there is no serial correlation; Ramsey Reset test shows that the model does not omit important variables and the model is suitable; The Breusch-Pagan-Godfrey test shows heteroskedasticity did not accompany the model. The normality check indicates the residuals are normally distributed on all of the models.

To test the stability of the model, the authors used the residual test: the cumulative sum of the recursive residuals (CUSUM) and the adjusted cumulative sum of the residuals (CUSUMQ). The results express parameters stability at CUSUM and CUSUMQ.

As a result, this model is still considered being good, meeting most of the test measures. The exchange rate is symmetrical in both the short run and the long run. NARDL supports a small exchange rate impact with Trace balance. Finally, the EVFTA Agreement negatively affects the Trade Balance between Vietnam and Europe.

4.2. Discussion

4.2.1. Impact of real bilateral exchange rate on Vietnam-Europe Trade Balance

The positive impact of exchange rate fluctuations on the Vietnam-Europe Trade Balance has been acknowledged. The research paper recognizes the positive effects of domestic currency depreciation on the Trade Balance in the short and long term. This finding is consistent with several studies conducted by Pham Thanh Hoan and Nguyen Dang Hao (2007), Swarnjit Arora et al (2010), Yusoff and Mohammed B (2010), Nguyen Cam Nhung et al (2018), and Tran Thi Ha (2019).

In fact, over the past nearly 20 years, the official exchange rate adjustments between the Vietnamese Dong (VND) and the US Dollar (USD) have consistently been in the direction of depreciating the VND

to align with the black market exchange rate. As a result, the nominal exchange rate of VND against USD has continuously increased. The State's maintenance of a policy of domestic currency depreciation in recent times aims primarily to improve the Trade Balance. And the result is that the Vietnam-Europe Trade Balance has experienced deficits only in the initial three years and has consistently been in surplus for over 20 subsequent years from 1994 until now.

Based on the theoretical foundations and previous research, as well as comparisons and correlations with empirical data, the authors recognize that the study results are accurate and, in other words, accept hypothesis H1.

4.2.2. Impact of Vietnam's Real Domestic Value GDPVN on Vietnam-Europe Trade Balance

The gross domestic product of Vietnam (GDPVN) represents the income of the domestic population. The research results indicate that the domestic value of Vietnam's GDP (GDPVN) positively impacts the Vietnam-Europe Trade Balance. This viewpoint is also supported by Yusoff & Mohammed B (2010), Eke et al (2015), Nguyen Quang My et al (2017), Nguyen Cam Nhung et al (2018), and Nguyen Thanh Trung (2018). However, the research results contradict the theory in equation (1).

In reality, over the past 20 years, despite the general upward trend in the domestic value of Vietnam's GDP, the Vietnam-Europe Trade Balance has remained consistently in surplus. The main reasons leading to this situation can be explained as follows: as GDPVN increases, people tend to import and consume more foreign goods, posing a trade deficit risk. However, due to the increasingly developed Vietnamese economy, the signing of numerous agreements, and the effective implementation of depreciation policies that have positive effects on the Trade Balance, as well as the relatively slow growth rate of Vietnam's GDP, export turnover has increased more than import turnover, resulting in a trade surplus over the years.

Based on the previous studies and comparisons and correlations with empirical data, despite the results contradicting the theoretical research, the authors still acknowledge that the research findings are accurate. In other words, we accept the hypothesis H2.

4.2.3. Impact of European Real GDPEU on Vietnam-Europe Trade Balance

As analyzed, the gross domestic product of Europe (GDPEU) represents the income of the European population. The research results indicate that the domestic income value of Europe has a significant and negative impact on the Vietnam-Europe Trade Balance. This shows that the increase in Europe's domestic income reduces the demand for Vietnamese goods. The research findings are consistent with certain empirical studies and the initial hypotheses proposed. Eke et al (2015), Pham Thi Nga (2017), and Nguyen Thanh Trung (2018) also agree with these results. However, the research results contradict the theory in equation (1).

These days, the European Union (EU) is a significant region in the trade relationship between Vietnam and Europe. Since 1997, the Vietnam-Europe Trade Balance has consistently been in surplus, with the surplus increasing over time. However, GDPEU showed signs of decline after this period, followed by continuous growth until 2008-2009, with a slight decrease due to the global economic crisis, followed by recovery and strong growth in subsequent periods. GDPEU fluctuates continuously, while the Trade Balance has consistently increased since 1997.

Based on the previous studies and comparisons and correlations with empirical data, despite the results contradicting the theoretical research, the group of authors still acknowledges that the research findings are accurate. In other words, we accept the hypothesis H3.

4.2.4. Impact of EVFTA Agreement dummy variable on Vietnam-Europe Trade Balance

The EVFTA Agreement dummy has a negative impact on Vietnam-Europe TB in both the short and long term. The authors found that from 2020 to 2022 after the agreement came into force, GDPEU and GDPVN both increased sharply. Research results show that GDP positively impacts TB, but the improvement is not enough to compensate for the deficit due to the adverse effects of GDPEU.

5. CONCLUSION

By effectively applying ARDL and NARDL models with annual statistical data from 1994 to 2022, this article has identified and analyzed the degree of impact of factors on Vietnam's overall Trade Balance, namely: gross domestic product of Vietnam; gross domestic product of Europe; bilateral real exchange rate; and the dummy variable D.

Based on the analysis above, the authors propose several policy implications for the government to improve Trade Balance, as follows:

Firstly, continue to implement a flexible exchange rate policy while enhancing the competitiveness of Vietnam's export and import goods.

Secondly, invest in and develop domestic production to enhance the competitiveness of inland goods and substitute imports.

Third, provide financial support policies for small and medium-sized enterprises, and support in the process of transforming into import-export enterprises in order to increase their competitiveness in the international market.

Fourthly, promote cooperation among export-oriented enterprises to strengthen currency exchange contract negotiations and mitigate difficulties arising from the exchange rate volatility.

Finally, promote high-quality products, increasing the competitiveness of Vietnamese exports in the world market.

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THE NATIONAL LOGISTICS COMPETITIVENESS: THE CASE OF ASEM MEMBERS

Authors: Nguyen Dang Phuong Ngan¹, Tran Thi Le Chi¹, Nguyen Thi Quang Cam¹, Tran Tieu My¹

Mentors: Dinh Hoang Tuong Vi¹, Tran Duc Trung¹

ABSTRACT: *In the global business environment, the import and export activities of ASEM member countries play a pivotal role in their respective economies. Despite the emergence of new trends such as green logistics and digital transformation, the efficiency of the logistics industry has fallen short of expectations, as indicated by the lower Logistics Performance Index (LPI) rankings compared to other countries worldwide. The study undertook a comprehensive study employing both qualitative and quantitative methods to analyze secondary panel data for 14 countries from 2007 to 2018. The results revealed that the main factors impacting the logistics competitiveness of ASEM member countries include: (1) infrastructure; (2) labor force; (3) ease of arranging competitively priced international shipments; and (4) ability to track and trace consignments. These findings hold significant policy implications for ASEM members, offering valuable insights to enhance their position and active engagement within ASEM in both the short and long term.*

Key words: Logistics Performance Index, Logistics, Asia - Europe Meeting (ASEM).

1. INTRODUCTION

There are many different interpretations of logistics that approach the subject from various perspectives, leading to different content. Douglas et al. (1998) define logistics as “the process of delivering the right product to the right place, at the right time, under the right conditions, and at the right cost to the consumer”. Vu Thi Kim Hanh (2020) defines logistics as “a tool to link activities in the global value chain such as supply, production, distribution, and market expansion for economic activities”. According to Assoc. Prof. Dr. Doan Thi Hong Van & Pham My Le’s research, logistics is “the process of optimizing location and time to transport and store resources from the first point of the supply chain through the stages of production and distribution to the hands of the final consumer to meet consumer needs at a reasonable cost through a wide range of economic activities”.

In summary, there are many logistics concepts in Vietnam and around the world, and new logistics concepts emerged with the birth of industries, but Vietnamese law has yet to recognize a unified concept of logistics. However, logistics can be understood as the process of bringing products from the place of production to the consumer through different steps to optimize costs.

Le Thi Quynh Nhu (2017) stated that competitive capability is the ability to create a competitive advantage, expressed through internal resources including human resources, tangible assets, and intangible assets, through which core competencies must be created. The elements of logistics must be determined by the resources of the necessary infrastructure, technology, and workforce capacity, which are directly dependent on the institutional aspects (Arvis et al., 2018; Martí et al., 2014; Savvy, 2016). Accordingly, logistic competitiveness is the ability to create an advantage when performing logistics activities based on certain criteria, such as service quality, ability to carry out customs procedures. At the national level, logistics competitiveness is expressed through national resources such as the quality of education, human resources, and other national resources of that country.

Many researchers have used various indicators to assess a country’s level of logistics competition. D. Eggleton (1993) described the criteria to evaluate the effectiveness of logistics activities, which are employee satisfaction, customer satisfaction, and the company’s rate of return. However, the use of the term logistics

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City.

efficiency at the national level refers to the national scope. Accordingly, the World Bank established the logistics efficiency and competitiveness index - LPI in 2007 to determine the efficiency of each country's logistics operations. This index is derived from a survey among freight forwarders, carriers, and carriers operating in the country. Accordingly, logistics factors affect national logistics efficiency (Keng Lin Soh, Wai Peng Wong, Chor Foon Tang, 2021). In addition, according to the connectivity efficiency of economic corridors analyzed through the World Bank's logistics report, the LPI is considered by researchers and practitioners as a unique tool to solve the link between logistics processes and international trade (Arvis et al., 2018).

Therefore, the objectives of the study include: (1) Determining the economic factors affecting the logistics competitiveness of ASEM member countries; (2) Analyzing the degree of influence of these factors on the logistics competitiveness of ASEM members; (3) Proposing solutions to improve the logistics competitiveness of member countries in ASEM based on the results of the analysis of influencing factors.

This study is breaking new ground in its empirical investigation of the connections between LPI and its underlying factors at a global level by utilizing a panel data approach. The research offers two significant contributions. Firstly, it enhances the frontier of knowledge in logistics research by incorporating P.E.S.T. analysis to explain how logistics is linked to national economic and social indicators, which can substantially extend previously published research findings. Secondly, the study's findings are essential for providing guidance to governments on how to foster, enhance, and integrate national social and economic policies to achieve global LPI.

The subsequent sections of this paper are structured as follows: Section 2 offers a review of prior research and discusses the conceptual framework employed in this study. Section 3 presents the empirical model, data, and econometric methods utilized in this research. Section 4 provides a critical assessment of the empirical findings, while the conclusion will be presented in Section 5.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Literature Review

Logistics has become a research area that has received a lot of attention in recent years. However, the number of studies related to logistics performance and competitiveness is still limited.

The study "Factors affecting logistics performance in Asia - Some suggestions for Vietnam" by Tran Nguyen Hop Chau and Trinh Thuy Trang (2022) has shown that 5 out of 9 factors in the research model have a positive impact on the indicator of national logistics efficiency and competitiveness, including political stability, industrial share in GDP, per capita income, technology, and elements bordering the sea.

Besides, according to the study "Discussing Competitiveness of Vietnam Logistics Industry" by Vu Thi Kim Hanh (2020), factors including customs, infrastructure, service quality, inspection and tracking, timeliness, time and international shipments, have a beneficial impact on logistics efficiency.

According to the study "The major determinants of logistics performance in a global perspective: evidence from panel data analysis" by Wai Peng Wong and Chor Foon Tang (2018), factors such as infrastructure, technology, human resources, and education play an important role in improving logistics efficiency because the logistics industry cannot operate without these factors. In addition, the results also show that institutional quality factors, including political stability and corruption perception, also contribute to improving logistics capacity. Specifically, low corruption rates and high political stability will help improve logistics efficiency, thereby enhancing national logistics capacity.

The studies of Birol Erkan (2014), Daniel Y. Lee et al (2017), Burmaoglu Serhat, and Sesen Harun (2021) all have some similarities with the research results of Wong and Tang (2018). All of these studies reveal the importance and influence of infrastructure on logistics competitiveness. However, according to Y. Lee et al (2017), besides infrastructure, the government's priority industrial development policy, information network structure, and the growth of the logistics market also have a significant impact on national logistics performance.

According to Burmaoglu Serhat and Sesen Harun (2021), besides infrastructure (including transport infrastructure and information technology), other factors also positively affect logistics competitiveness, such as customs, inspection and tracking, timeliness, and international shipments. However, infrastructure and customs are the two most important factors to be enhanced to improve the country's logistics competitiveness. Additionally, the research of Ona Graina Rakauskien et al. (2022) shows that institutions are considered a foundation for economic corridors to have a positive impact on national logistics performance and competitiveness.

Lastly, the conclusions of Samet Guner and Erman Coskun's (2012) study also highlighted factors influencing the logistics competitiveness of 26 OECD member nations, including GDP, political risk, human development, and democracy. Political risk is specifically evaluated using factors including political stability, regulation quality, government quality, the weight of the masses' voice, and government accountability.

2.2. The P.E.S.T Analysis

P.E.S.T analysis was introduced by Aguilar in 1967 to assess the influence of factors in the macroenvironment on the development of an industry. The acronym "P.E.S.T" stands for political, economic, socio-cultural, and technological factors that exert both direct and indirect influence on businesses operating in any industry, relating to the macro-environment (Ward & Rivani, 2005; Mohamed et al., 2010). These factors are:

P (Political): Including political and legal factors relevant to the particular industry.

E (Economics): Including economical factors relevant to the study of a particular industry.

S (Sociocultural): Socio-cultural factors impact people's perceptions.

T (Technological): Including technological factors for the business industry.

According to Pulaj and Kume (2013), P.E.S.T analysis is a strategic tool that allows businesses to assess the external environment from a panoramic perspective, offering a comprehensive understanding of the industry. It is a vital instrument for tracking trends and changes occurring in the external context. In other words, P.E.S.T factors encompass uncontrollable elements that can either present opportunities or pose threats to firms and industries.

Peng and Nunes (2007) proposed that P.E.S.T analysis serves two primary functions. The initial function involves examining the status or situation of a specific company or industry, while the second function entails assessing the viability of broad management solutions within a business setting. P.E.S.T analysis is described as a method for recognizing and assessing external opportunities and threats, thereby enabling organizations to establish distinct missions, formulate strategies, attain long-term goals, and devise policies for achieving annual objectives. Various studies have applied P.E.S.T analysis in different sectors. For example, Darkow (2010) used the P.E.S.T method to analyze the logistics industry. Similarly, Lao and Jiang (2009) conducted P.E.S.T analysis on online payment services, and Yingfa and Hong (2010) examined e-government using P.E.S.T analysis.

P.E.S.T analysis has certain limitations. According to Lynch (2012), compiling an exhaustive list of factors would yield insignificant results and demonstrate a lack of serious consideration in the strategic management process. Furthermore, Burt et al. emphasized that the absence of interrelationships among variables poses challenges in comprehending how these factors influence the environment. On the other hand, Gracht and Darkow (2010) found that employing P.E.S.T analysis enables more accurate predictions for unexpected situations and can be considered a valuable foundation for strategy development. This finding aligns with Lynch's (2012) study that, despite its reliance on previous experiences, P.E.S.T analysis can be employed as a forward-looking forecast.

Within the scope of the research, the authors select a group of political, economic, socio cultural and technological factors. In the context of this study, the political element is political stability, while the economic factor is GDP growth and the social factor is the labor force. The ability to track and trace, ease of arranging prices, and infrastructure are technological factors. These factors affect the logistics industry in both short-term and long-term aspects. Hence, businesses should consider these factors when making an investment decision.

2.3. Theoretical Framework

Political Stability (PS)

Political stability is a crucial indicator for evaluating a country's institutional quality (Kaufmann, Kraay, and Mastruzzi, 2010). According to Tran Nguyen Hop Chau and Trinh Thuy Trang (2022), a country's level of political stability reflects the certainty and steadiness of its governmental policies. Additionally, Wong and Tang (2018) state that a stable political environment demonstrates the sustainability and integrity of the current government regime, which in turn promotes economic activities, including logistics.

H₁: Political Stability has a positive impact on the country's logistics performance and competitiveness index LPI.

GDP Growth (GDPG)

The International Monetary Fund (IMF) defines GDP as the total monetary value of final products and services produced in a country during a specific time period. The growth of GDP is a crucial indicator of the economy's health and is considered a criterion for assessing a country's economic development. According to Li et al. (2010), logistics capacity and economic growth are interconnected. Mohammad Reza's research findings (2013) further establish a close relationship between logistics and economic development. Logistics performance and economic growth have a mutually reinforcing relationship (Sipos and Bizoi, 2014). In other words, the growth of the national economy promotes and improves logistics efficiency, and vice versa. Therefore, there is a positive correlation between GDP growth and a country's logistics competitiveness.

H₂: GDP growth has a positive impact on the country's logistics performance and competitiveness index LPI.

Labor Force (LABOR)

The World Economic Forum (2014) defines labor resources as the availability and skill set required for workers to perform their duties effectively. Nguyen Thi Thuy Dung and Ngo Nu Mai Quynh's (2020) research indicates that the labor force factor is the most significant determinant of logistics capacity for businesses and the country as a whole. Moreover, according to Wai Peng Wong and Chor Foon Tang (2018), a well-functioning labor market is crucial for the sustainable development of the national economy.

Sustainable development leads to increased trade, exports, and competitiveness, resulting in an improved logistics efficiency index (LPI) for the country. Therefore, the labor force factor has a synergistic impact on the logistics competitiveness of the country.

H₃: Labor force has a positive impact on the country's logistics performance and competitiveness index LPI.

Ability to track and trace consignments (TRACK)

The World Bank defines the ability to track, trace, and locate international shipments (Track & Trace) as one of the essential factors in analyzing a country's logistics competitiveness through the LPI index. An effective Track & Trace system will improve the management of logistics networks, thus enhancing the country's logistics competitiveness. Studies by Burmaoglu Serhat & Sesen Harun (2021) and Vu Thi Kim Hanh (2020) indicate a strong correlation between the ability to track, trace, and locate international shipments and a country's logistics competitiveness. Thus, the capacity to track, trace, and locate international shipments positively impacts a country's logistics competitiveness.

H₄: Ability to track and trace consignments has a positive impact on the country's logistics performance and competitiveness index LPI.

Ease of arranging competitively priced international shipments (PRICE)

The World Bank defines the ease of arranging competitively priced international shipments as one of the factors used to analyze a country's logistics competitiveness through the LPI index. The ease of arranging competitively priced international shipments enables businesses and the national economy to save costs in the logistics chain by streamlining production and business processes, thereby enhancing the country's logistics competitiveness. Vu Thi Kim Hanh's (2020) research indicates a direct correlation between easier arrangements at competitive prices and a country's logistics competitiveness. Therefore, the ease of arranging competitively priced international shipments has a positive impact on a country's logistics competitiveness.

H₅: Ease of arranging competitively priced international shipments has a positive impact on the country's logistics performance and competitiveness index LPI.

Infrastructure (INF)

According to Daniel Y. Lee (2017), infrastructure is a crucial factor in evaluating logistics performance at the macro level. Furthermore, there is a positive correlation between logistics and infrastructure capacity, including seaports, railways, roads, and information technology (Burmaoglu Serhat, Sesen Harun, 2021). Beysenbaeven (2018) further states that investment in infrastructure has a close relationship with logistics efficiency, contributing to improving a country's logistics competitiveness. Studies by Vu Thi Kim Hanh (2020), Wai Peng Wong and Chor Foon Tang (2018), and Birol Erkan (2014) also show a strong link between LPI and infrastructure. Thus, the infrastructure factor has a positive impact on a country's logistics competitiveness.

H₆: Infrastructure has a positive impact on the country's logistics performance and competitiveness index (LPI).

The above discussion on determinants is closely related to the P.E.S.T. analysis. The P.E.S.T. Analysis explains the macro factors, including political, economic, sociocultural, and technological factors, that would sustain a country's logistics competitive performance.

In the context of this study, the macro variables are infrastructure, labor, and political stability. These are expected to improve logistical competitiveness to benefit the national economy by attracting businesses

and eventually increasing the GDP (Hanouz, Geiger, and Doherty 2014). Based on the P.E.S.T. analysis, we develop a conceptual framework, as presented in Figure 1, to assist and rationalize the specification of our model to understand the behavior of LPI.

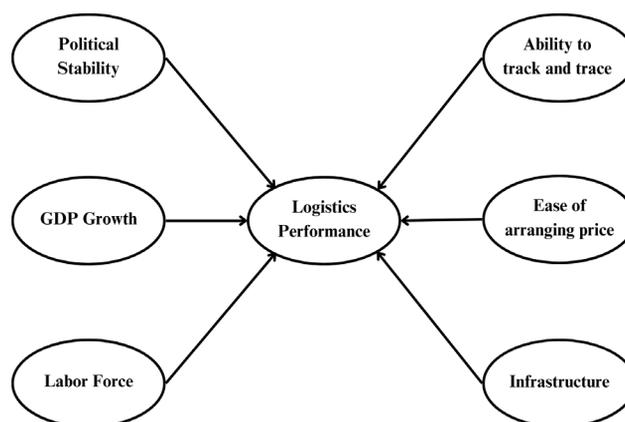


Figure 1. Conceptual framework for logistics performance.

3. DATA AND RESEARCH METHOD

3.1. Data

The data in the research paper belongs to secondary data and was collected from the years 2007, 2010, 2012, 2014, 2016, and 2018. The choice of countries and sample period is mainly determined by the availability of data. The LPI index released by the World Bank is updated every two years, in even years (except 2007) and the last time in 2020, while other indicators such as customs clearance efficiency and border management are updated to 2018. Therefore, after considering, in order to avoid incomplete input data affecting the research results, the research team decided to choose the data set from 2007, 2010, 2012, 2014, 2016, and 2018 so that the research results create consistency and high accuracy. Data on LPI factors, including ability to track and trace consignments, ease of arranging competitively priced international shipments, political stability, labor force, and GDP growth, were obtained from the biennial Logistic Performance Index (LPI) Reports and the World Governance Indicators of the World Bank. The data on the competitiveness index to measure the efficiency and availability of infrastructure was collected from various publications of the Global Competitiveness Reports by the World Economic Forum. All data were transformed into natural logarithms to standardize the measurement and minimize the heteroskedasticity problem. The descriptive statistics of the variables under investigation are displayed in Table 1.

3.2. Research methodology

Regression Model (Pooled OLS)

The Pooled OLS model is the simplest, most rudimentary approach to panel data. Gujarati & Porter (2009) assume that the regression coefficients (intercept and slope) do not change in space and time. Furthermore, the independent variables are strictly exogenous. A variable is said to be strictly exogenous if it does not depend on the past, present, and future values of the random error.

Fixed-effects model (FEM)

The fixed effects regression model, which is an extension of the classical linear regression model, is given by:

$AND_{it} = b_1X_{it1} + b_2X_{it2} + \eta_i + \epsilon_{it}$ where $u_{it} = \eta_i + \epsilon_{it}$. The error of the classical linear regression model is separated into two components, including: (1) the ν component represents unobservable factors that differ between subjects but do not change over time, (2) the ϵ component, which represents unobservable factors that vary between subjects and change over time.

There are two methods used to estimate the parameters of the fixed effects model, including: (1) regression of minimum dummy variables (fixed effects Least-Squares Dummy Variable (LSDV), with each dummy variable representing each subject of the sample, (2) Fixed Effects Estimator

Random effects model (REM)

Considering the economic relationship with the dependent variable Y, the two observable explanatory variables X1 and X2, and one or more unobservable variables Panel data includes N subjects and T time points, (NxT) of observations. The random effects model is written as follows:

$AND_{it} = b_1X_{it1} + b_2X_{it2} + \eta_i + \epsilon_{it}$ ($i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$), where the classical error is divided into two components, including: (1) the ν component represents unobserved factors that differ between subjects but do not change over time. In which $\eta_i = \alpha_0 + \omega_i$ ($i = 1, 2, \dots, N$) includes the uncertainty component α_0 and the random component ω_i . (2) Ingredients represent unobservable factors that vary between subjects and change over time.

Selections of Pooled OLS, FEM and REM model

The selection of a suitable model Pooled OLS, FEM, or REM is verified on the basis of the F-test, the Breusch-Pagan LM test, and the Hausman test.

(1) Selecting the Pooled OLS or FEM model: The FEM fixed effect estimate was verified by Gujarati (2009) by the F-test with the hypothesis:

H0: All coefficients β are zero

H1: Is there at least one non-zero coefficient β

(2) Selecting a Pooled OLS or REM model: The REM random effect estimate was tested by Baltagi (2008) using the Breusch-Pagan Lagrange Multiplier method (Breusch-Pagan LM Test) with the hypothesis:

H0: All coefficients β are zero

H1: Is there at least one non-zero coefficient β

(3) Selection of FEM or REM model: Hausman test (1978) is used to select FEM or REM model (Baltagi, 2008; Gujarati, 2004) with the hypothesis:

H0: The estimates obtained from the two methods are not different.

H1: The estimates obtained from the two methods are distinct.

Generalized Least Squares method

To achieve efficiency for the model, the GLS (Generalized Least Squares) method was applied. According to Nguyen Thi Lien Hoa and Bui Thi Bich Phuong (2014), using the FGLS method helps control phenomena related to autocorrelation and variable variance. The model will be estimated by the GLS method, and the errors from the final result will be used to estimate the variance matrix and covariance of the error. Using this matrix, the results will be converted back to the original variables, allowing for estimation of the parameter values of the model.

4. RESULT AND DISCUSSION

4.1. Result

In this section of our study, we will analyze and discuss the outcomes obtained from our LPI model, after providing an explanation of the model specification, data, and panel data estimation procedures used in our research.

Table 1. Summary of descriptive statistics.

Variables	Mean	Std. Dev.	Min	Max
ln(LPI)	1.267	0.126	0.989	1.441
PS	0.315	0.870	-1.65	1.496
GDPG	4.296	2.944	-1.25	14.52
LABOR	64.683	6.005	50.357	78.563
ln(TRACK)	1.284	0.126	0.975	1.472
ln(PRICE)	1.236	0.096	1.02	1.398
ln(INF)	1.609	0.234	0.992	1.902

Table 2 presents the estimated outcomes for three models: POLS, REM, and FEM. Before critically evaluating the coefficients, we must select an appropriate model. Diagnostic tests in the second part of Table 2 show computed R-squares ranging from 0.9598 to 0.9765, indicating a good fit for the data across all models. This observation is supported further by the overall F-test. The computed R-squares indicate that over 90% of the variation in the behavior of LPI can be explained by the explanatory variables, regardless of the estimation model used. The signs of the estimated coefficients are mostly consistent across all models. These findings demonstrate that our LPI model is appropriately specified and deserves further analysis.

Subsequently, we conducted three significant specification tests to determine the most appropriate model for further analysis. Table 2 shows the results of the specification tests, indicating that the null hypothesis associated with the POLS are rejected by the outcome of the Poolability test, and therefore, at a significance level of 1 percent, the FEM is deemed more appropriate for our study. Additionally, the findings of the Hausman test indicate that the null hypothesis associated with the FEM is more reliable and efficient compared to the REM. Based on these specification test results, it can be concluded that the coefficient estimates obtained from the POLS and REM are inconsistent and biased, rendering the results obtained from these models invalid. Consequently, the results from the FEM should be utilized for analysis. Nevertheless, we identify that the FEM is susceptible to heteroskedasticity issues, which have the potential to encounter bias when drawing statistical inferences. In order to tackle this concern, we have taken steps to re-estimate the model utilizing the Generalized Least Squares (GLS) method. The outcomes of this re-estimation can be observed in the final column of Table 2.

Table 2. The results of the logistic performance panel regression model.

Variables	POLS	FEM	REM	GLS
PS	0.005 (0.038)	-0.011 (0.012)	0.008* (0.005)	0.003 (0.002)
GDPG	-0.0007 (0.001)	-0.0007 (0.001)	-0.0008 (0.001)	-0.0006 (0.0005)

LABOR	0.0005 (0.0004)	-0.0002 (0.001)	-0.0005 (0.0005)	0.0008** (0.0003)
ln(TRACK)	0.533*** (0.043)	0.398*** (0.041)	0.514*** (0.043)	0.562*** (0.032)
ln(PRICE)	0.365*** (0.047)	0.345*** (0.041)	0.365*** (0.047)	0.353*** (0.033)
ln(INF)	0.106*** (0.020)	0.046** (0.022)	0.098*** (0.021)	0.113*** (0.018)
Constant	-0.0715* (0.042)	-0.275** (0.094)	-0.033 (0.049)	-0.125** (0.042)
Diagnostic tests				
Observations	84	84	84	84
R-squared	0.9765	0.9598	0.9763	
Overall F-test	533.47***	74.32***	2146.95***	4856.11***
P – value	0.0000	0.0000	0.0000	0.0000
Poolability test (POLS and FEM)	5.58*** [0.0000]			
Hausman test (FEM and REM)			61.33*** [0.0000]	
Heteroskedasticity test		384.68*** [0.0000]		

*Note: The symbols ***, ** and * represent the level of significance at 1%, 5% and 10% respectively. The values in parentheses (.) indicate the standard error, while the values in square brackets [.] represent the p-values.*

Consistently as anticipated, the findings align with our initial expectations, indicating that the estimated coefficients positively influence LPI (Logistic Performance Index). Furthermore, these coefficients exhibit statistical significance at conventional levels of significance (i.e., 1%, 5%, and 10%). We observe that LPI is influenced by input factors, specifically the level of infrastructure and the percentage of labor force participation. These factors are crucial for enhancing LPI, as the logistics industry relies on them for efficient operations. A 1% increase in infrastructure and labor force participation would result in approximately a 0.113% and a 0.0008% improvement in LPI, respectively.

In addition to the input factors, two other variables, namely the ease of arranging competitively priced international shipments (PRICE) and the ability to track and trace consignments (TRACK), play significant roles in explaining LPI behavior. The estimated coefficients for TRACK and PRICE are 0.562 and 0.353, respectively. This implies that a 1% increase in TRACK and PRICE, on average, leads to a 0.562% and a 0.353% improvement in LPI, respectively. It is evident that the ease of arranging competitively priced international shipments (PRICE) and the ability to track and trace consignments (TRACK) are important determinants of LPI behavior.

4.2. Discussion

Our findings highlight the importance of input factors such as infrastructure and labor force in supporting the logistics process and enhancing LPI. These results align with the perspective of Guner

and Coskun (2012), who also emphasize the effect of economic inputs on logistics competitiveness. The findings also validate the perspective expressed by Wong and Chor Foon Tang (2018), who argue that an efficient labor market is essential for the long-term growth of the national economy. They have stated that sustainable development leads to enhanced trade, exports, and competitiveness, ultimately resulting in a higher logistics efficiency index (LPI) for the country. However, this is not the complete picture, as our findings reveal that improving the ease of arranging competitively priced international shipments and the ability to track and trace consignments are crucial for enhancing logistical competitiveness. This is because a higher level of ease in arranging competitively priced international shipments and a stronger ability to track and trace consignments can significantly improve efficiency and ensure sustainable LPI. In fact, Vu Thi Kim Hanh (2020) and Burmaoglu Serhat & Sesen Harun (2021) also support this notion, noting that a better ease of arranging competitively priced international shipments and an enhanced ability to track and trace consignments can enhance national logistics competitiveness.

Hence, while infrastructure and labor can positively influence LPI, their impact is contingent upon the local government's and logistic companies' ability to improve the ease of arranging competitively priced international shipments and the ability to track and trace consignments within the national logistics system.

5. CONCLUSION

This study examines the key factors that have an impact on the behavior of LPI using unbalanced panel data from 14 countries. The empirical findings suggest that countries that possess resources such as infrastructure and labor, as well as capabilities such as the ease of arranging competitively priced international shipments and the ability to track and trace consignments, are capable of improving their logistics processes and thereby successfully enhancing their national logistics competitiveness. Nevertheless, it is crucial to acknowledge that although these inputs are essential, they are not adequate on their own to achieve a significant overall improvement in LPI.

The policy implications of the findings suggest that the ease of arranging competitively priced international shipments and the ability to track and trace consignments play a critical role in determining macro-level logistic competitiveness. To enhance the ability to track and trace consignments, it is recommended that ASEM member countries focus on improving the quality of transport and information infrastructure. Measures such as digitization and automation can be implemented to streamline processes, reduce processing time, and enhance efficiency by minimizing errors. Moreover, to improve the ease of arranging competitively priced international shipments, ASEM member countries should utilize electronic data interchange (EDI), which facilitates seamless data connectivity between businesses. By adopting EDI, trade-related data can be efficiently exchanged, leading to smoother logistics operations. Additionally, stakeholders in the logistics industry and governments should ensure the availability and accessibility of all trade-related resources. This includes investing in necessary infrastructure, promoting collaboration between industry players, and implementing supportive policies. These efforts are crucial for enhancing competitiveness and sustaining superior LPI within the ASEM region.

This research makes two important contributions. Firstly, it expands the existing knowledge in logistics research by incorporating P.E.S.T. analysis, which examines the connections between logistics and national economic and social indicators. This integration significantly enhances our understanding of the subject and extends the scope of previously conducted research. Secondly, the findings of this study serve as a valuable basis for assessing and analyzing the logistics competitiveness of a country. They provide economic researchers and strategic planners with valuable insights into the competitiveness of a nation's

logistics sector. These insights are crucial for guiding governments in fostering, enhancing, and integrating national social and economic policies to achieve global logistics competitiveness. In summary, the research findings contribute to the body of knowledge in logistics research and provide important guidance for policymakers aiming to promote and strengthen their country's logistics sector, thereby improving national competitiveness on a global scale.

However, the present study has two limitations that can serve as opportunities for future research on the same topic. Firstly, in terms of data, the study relied on available datasets from various sources, such as the World Bank, the World Economic Forum, and other resources. However, it is important to note that certain specific details may not have been updated during the course of the investigation. Additionally, there may be limitations in the proactive generation of information and incomplete data sources. Moreover, disparities in data collection methods across countries can potentially impact the study's results. Secondly, in relation to the scope of the research, the study encounters challenges in terms of the availability of measurement standards for evaluating logistics competitiveness across ASEM region countries. This lack of standardized measurement may result in the research findings not providing comprehensive coverage of all aspects related to logistics and competition. Furthermore, it is crucial to acknowledge that the study primarily focuses on a select number of ASEM member countries, which implies that the results and recommendations may not be universally applicable to all ASEM members. These limitations indicate potential areas for further investigation, such as addressing data gaps and inconsistencies, developing standardized measurement standards for logistics competitiveness, and broadening the scope of analysis to include a more comprehensive range of ASEM member countries. By addressing these limitations, future research can contribute to a more robust understanding of logistics competitiveness and its implications in a broader context. Further research could expand the analysis by incorporating the dynamics of logistics competitiveness through the utilization of the dynamic panel GMM estimator. Nonetheless, this approach would necessitate the availability of ample and suitable data to facilitate accurate estimation. Despite these limitations, our findings have provided a comprehensive explanation for LPI behavior.

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AN ANALYSIS OF FOREIGN DIRECT INVESTMENT AND SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES FROM 1990 TO 2019

Author: Cao Man Nhi¹

Mentor: MBA Hoang Thi Que Huong¹

ABSTRACT : This research is carried out to investigate the impacts of foreign direct investment (FDI) on three pillars of sustainable development in 32 developing countries. The three pillars include economic growth, income distribution, and environmental quality. The research relies on annual data from developing countries from 1990 to 2019. Throughout researching and testing data process, the panel-corrected standard errors (PCSE) method is executed. Results show that FDI promotes economic growth in developing countries, but creates income inequality and more CO₂ emissions to the environment. Besides the main variables of the research, other variables such as per capita energy consumption (EN) and domestic investment (DI) also affect sustainable development in developing nations. The research also proposes recommendations for developing countries to promote sustainable development paths.

Keywords: Foreign direct investment (FDI), sustainable development, economic growth, income distribution, environmental quality, developing countries.

1. INTRODUCTION

According to the International Monetary Fund (IMF), investments which are to establish enterprises in other economies and to build long-term relationships and returns for the direct investors and host countries, are called Foreign Direct Investment (FDI). FDI has been receiving significant attention worldwide and is considered an important factor of impressive economic growth in a wide range of developing nations (Anwar and Lan, 2010). According to The United Nations Conference on Trade and Development (UNCTAD) (2021), developing countries have received a larger amount of FDI inflows, an increase of 30% in 2021. FDI has played a significant role in providing investment capital and promoting export growth over time. It also has created a more comprehensive range of diversity and competition in the market (Anwar and Lan, 2010). In Africa, foreign investment is considered one of the primary sources of funds; thereby, these countries execute many attractive policies to attract FDI (United Nations, 2005). However, FDI also brings risks for the host countries in the industrialization process. In fact, FDI enterprises may become big players in the host developing nations and push local companies out of the market. Moreover, FDI companies can take advantage of weak regulation and bring capital back to developed countries (Jones, 1996). There are also many FDI corporations taking advantage of the lax environmental law and posing dangerous threats to the natural environment and human life. Notably, multinational corporations are manufacturing companies with large scale of production. This causes serious problems to the environment (Bora, 2002). More importantly, FDI may also worsen the income inequality gap in many countries. Thus, the impacts of FDI on host developing economies are still controversial.

On the other hand, according to the UNCTAD (2014), FDI is considered one of the potential factors to boost sustainable development. Sustainable development means “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (the World Commission on Environment and Development, 1987). Munasunghe (1993) and Elkington (1997) defined

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City.

sustainable development in three main focuses, which are economic, social, and environmental factors. Duran et al. (2014) shared the same view that sustainable development includes three main components of economic, ecological, and human factors. Meanwhile, Lan (2014) and Sauvart and Mann (2017) pointed out sustainable FDI includes five main dimensions, economy, social development, environmental management, institution quality and labor skills. In fact, there are studies on the impacts of FDI on individual aspects of sustainable development worldwide and in developing countries. According to Blomstrom & Kokko (1996), FDI enhances the productivity of economic growth locally. Nga and Huong (2017) conducted research about “green FDI”. They demonstrated that green FDI can promote sustainable economic growth. Ahmad et al. (2019) conducted a study on how FDI inflow can reduce the poverty rate in South Asian and Southeast Asian countries. Meanwhile, Nguyen and Trinh (2008) concluded that the FDI and international integration are the main cause of unequal income distribution in urban and rural areas of Vietnam. By contrast, Kaulihowa and Adjasi (2017) and Ucal et al. (2015) revealed an opposite finding on FDI and income inequality with Nguyen and Trinh (2018). The study showed that FDI can contribute to decrease the income inequality in Turkey and Africa. Meanwhile, Ngoc, Le, and Duy (2019) showed that FDI and human capital contribute to positive impacts on labor productivity in Vietnam, which implies that the labour force is encouraged to enrich their knowledge and skills and the government should plan in detailed to boost human capital. Furthermore, Bakhsh et al. (2017) and Sargunesi (2018) showed FDI could worsen CO2 emissions in Pakistan and Turkey respectively.

In terms of studies on the total point of view for all sustainable development factors and FDI, there are just few studies. Ridzuan et al. (2017) researched FDI and sustainable development in Singapore. The research showed that economic growth and environmental quality will be improved by FDI, but FDI worsens the income equality in this country. Robi and Shunsuke (2018) studied the relationship of economic growth and sustainable development in Indonesia. Tien et al. (2020) figured out that FDI and economic growth have a positive relationship in the middle of Vietnam. However, FDI corporations tend not to abide strictly to environmental law in this region. Overall, studies so far in developing countries have not been profoundly conducted in terms of combined pillars or dimensions of sustainable development and FDI. Specifically, the impacts of FDI on sustainable development of all social, environmental, and economic factors of a large number of developing nations have not been pointed out clearly and altogether. Moreover, most of studies are conducted in a single location or region. There has been little research of FDI and three pillars of sustainable development in many developing countries. Thus, this research is executed to fill these research gaps with an aim to figure out the relationship and impact of FDI on three main pillars of sustainable development in 32 developing countries and give recommendations to promote sustainable development in developing nations.

2. THEORETICAL FRAMEWORK

2.1. Foreign direct investment and economic growth

Dunning & Lundan (2008) showed that FDI contributes to economic development by building new companies, recruiting more workers, and reducing unemployment. Pegkas (2015) used two regression models of Full Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) to investigate the impacts of FDI on economic growth of European countries from 2002 to 2012. The research also proposed a positive relationship between FDI and economic growth in these countries. Sunde (2016) researched how export and FDI inflows affect Africa’s economic growth from 1990 to 2014. By utilizing the Bound estimation, the author found out that FDI and export contribute to positive economic growth in

African countries. Ridzuan et al. (2017) showed that FDI contributes positively to the economic growth of Singapore through the autoregressive distributed lag estimation technique. Tien et al. (2020) conducted research on how FDI affects economic growth in terms of sustainable development in the middle of Vietnam. There are five main impacts examined, including economics, society, environment, institutions, and labour from surveying 194 FDI companies in the middle of Vietnam and using a Likert scale with 5 levels and the descriptive statistics method to analyze. The study shows FDI has positive impacts on economic growth. Overall, most of the existing studies of the relationship between FDI and economic growth are positive. Researchers showed that FDI contributes to the economic development for host nations.

2.2. Foreign direct investment and income distribution

Ridzuan et al. (2017) show that FDI brings negative effects on income equality in Singapore. There is also a research of Hyungsun and Miguel (2017) on the relationship of FDI and income distribution in 7 countries in Southeast Asian (Laos, Cambodia, Indonesia, Thailand, Philippines, Malaysia, and Vietnam). The authors used a sample period between 1990 to 2013. The result showed income equality decreases if FDI inflows increase. Anwar & Lan (2010) also pointed out that big cities in Vietnam tend to attract more FDI, thus creating unequal distribution of FDI among Vietnam through examining the two-way linkages of economic growth and FDI among provinces in Vietnam from 1996 to 2005. On the other hand, there are studies showing that FDI can reduce income inequality in the long run. Specifically, Figini and Gorg (2011) demonstrated that although increases in FDI would cause rises in income inequality, this effect can reduce if FDI continues to increase in developing nations. Ucal et al. (2015) also showed FDI can reduce the income inequality in Turkey with ARDL estimation technique. Kaulihowa and Adjasi (2017) also showed the same finding that FDI decreases income inequality in 16 African countries in the long run with higher economic growth. In addition, Quoc et al. (2021) conducted a study to clarify the impacts of FDI and income inequality in Vietnam using the Generalised Method of Moment model from 2012 to 2018. The research shows that FDI has a negative impact on income inequality. The expansion of FDI can increase income inequality and income inequality increases as the Vietnam economy develops. However, when human resources develop and economic governance improves, income inequality will improve. Overall, in terms of FDI and income distribution, there have been both positive and negative relationship.

2.3. Foreign direct investment and environmental quality

Mihaela (2014) studied the relationship between FDI and sustainable development in terms of the environment in 6 countries in Europe (Sweden, Slovakia, Poland, France, Spain, and Greece). The research showed that the hypothesis of pollution haven does not work and if FDI focuses on environmental sectors, it will have positive impacts on sustainable development. Huiming et al. (2016) figured out that FDI and CO₂ emissions have a negative relationship. It means that economic growth contributes to less CO₂ emissions in ASEAN-5. Similarly, Wu and Li (2011) revealed that increases in FDI do not mean that the level of pollution will rise in China. The authors claimed that FDI enterprises will bring advanced technologies and encourage transfers within the country towards better technologies, which in turn boosts production efficiency and reduces pollution. By contrast, Tien et al. (2020) stated that FDI harms the environment as FDI enterprises tend to bring old technology to the host countries and are careless about protecting the environment. Trinh and Quoc (2017) relied on the Leontief and Ghosh systems to calculate the greenhouses gas emissions when economic growth increases in Vietnam. The study showed the higher economic growth, the higher level of CO₂ emission. Overall, previous studies have showed both positive and negative impacts of FDI on CO₂ emissions in many countries worldwide.

3. RESEARCH METHOD

From previous research and analysis, the research relies on three main dependent variables with three main research models based on the research of FDI and three main pillars of sustainable development of Ridzuan et al. (2017) in Singapore. First is the model of economic growth with the dependent variable being real gross domestic product per capita (GDP) and other independent variables are foreign direct investment (FDI), the total labour force (LAB), gross fixed capital formation (DI), and trade openness (TO). Second, is the model of income distribution with Gini coefficient (GINI) as a dependent variable. GINI is the index to measure income distribution in the population invented by Corrado Gini. It can be measured by ranges from 0 to 1 or percentage. A higher number means a higher income distribution gap. Other independent variables are GDP, DI, FDI, and TO. Third, is the model of environmental quality. CO₂ is the main dependent variable and GDP, FDI, per capita energy consumption, kg of oil equivalent (EN), and TO are independent variables. All variables will be used under log-linear form (LN).

3.1. Model of economic growth

The production function framework of Cobb-Douglas is applied with three variables of capital, labour, and FDI as follow:

$$Y_t = f(K, L, FDI) \quad (1)$$

In which:

Y: real output

K: capital

L: labour

FDI: foreign direct investment inflows

This standard function then was extended further by Lucas (1988), Romer (1986), and Rebelo (1991) by adding the model of endogenous growth. This theory confirmed that both the amount of investment and the efficient use of investment affect the development of a country in the long run. Thus, this research is based on the equation of Ridzuan et al. (2017) to build a suitable equation from equation (1) and this equation is also logged as follow:

$$\text{LNGDP}_t = \beta_0 + \beta_1 \text{LNLAB}_t + \beta_2 \text{LNDI}_t + \beta_3 \text{LNFDI}_t + \beta_4 \text{LNTO}_t + \varepsilon_t \quad (2)$$

In which:

GDP: real gross domestic product per capita

LAB: total labour force

DI: gross fixed capital formation (domestic investment)

FDI: foreign direct investment inflows as a percentage of GDP

TO: the sum of export and import amount over GDP

According to Sahoo and Mathiyazhagan (2003) and Ridzuan et al. (2017), because FDI has a positive relationship with economic growth, it is added to the equation. Similarly, through previous research on the relationship between FDI and GDP, two variables also show a positive relationship (Dunnung and Lundan, 2008; Tien et al., 2020; Anwar & Lan, 2010; Pegkas, 2015; Sunde, 2017; and Vy, 2021). The control variable of LAB is also added to control GDP and avoid variable biases (Ridzuan, et al., 2017). In terms of DI which means domestic investment, it was invented by Barro in 1999 and had positive impacts on economic growth. Moreover, TO is a criterion to evaluate the trade openness for the economic growth of an economy. TO is considered to have a positive relationship with economic growth (Balasubramanyam et al., 1996).

3.2. Model of income distribution

The standard income distribution model was developed by Mah (2003):

$$GINI_t = f(Y_t, Y_t^2, FDI_t, TO_t) \quad (3)$$

In which:

GINI: Gini coefficient

Y & Y²: per capita income and per capita income square

Based on the research of Ridzuan et al. (2017), Y² will be removed not to violate the Kuznets Curve in the following equation:

$$LNGINI_t = \alpha_0 + \alpha_1 LNGDP_t + \alpha_2 LNDI_t + \alpha_3 LNFDI_t + \alpha_4 LNTO_t + \varepsilon_t \quad (4)$$

In which:

GINI: Gini coefficient

GDP is projected to have either negative or positive effects on income distribution (Ridzuan et al., 2017). Other variables also have both negative and positive effects on GINI. DI is considered as a positive effect on GINI (Mah, 2003). However, according to supporters of the neoclassical theory, GINI and DI have the opposite effect (Ridzuan et al., 2017). Moreover, on one hand, GINI and FDI are considered to have a negative relationship (Ridzuan et al., 2017; Anwar & Lan, 2010; Hyungsun and Miguel, 2017; Nguyen et al., 2020). On the other hand, Figini and Gorg (2011) and Quoc et al. (2021) expect positive impacts of FDI on GINI. In terms of TO, TO is predicted to have a positive relationship with GINI (Dependency Theory).

3.3. Model of environmental quality

The model of environmental quality is relied on the model by Shahbaz et al. (2013):

$$CO_{2t} = f(Y_t, F_t, E_t, TR_t) \quad (5)$$

In which:

CO₂: emissions metric ton per capita

Y_t: real GDP per capita

F_t: financial development

E_t: energy consumption per capita

TR_t: trade openness per capita

Based on the research of Ridzuan et al. (2017) of sustainable development in terms of environment and FDI in Singapore, the equation is adjusted in log as follow:

$$LNCO_{2t} = \varphi_0 + \varphi_1 LNGDP_t + \varphi_2 LNFDI_t + \varphi_3 LNE_t + \varphi_4 LNTO_t + \varepsilon_t \quad (6)$$

In which:

EN: per capita energy consumption, kg of oil equivalent

CO₂ emissions are considered a serious factor contributing to the greenhouse effect when more than 60% of greenhouse gas is from CO₂ emissions (Ozturk and Acaravci 2010). Moreover, according to Ridzuan et al. (2017), there have been hot debates surrounding the topic of CO₂ emissions and their impacts on the environment, global warming, sustainable energy and orientations toward sustainable development. Therefore, CO₂ emission is chosen to discuss and give a further evaluation to the research world. Overall, it is expected that CO₂ emissions and GDP have a positive relationship. FDI, on the one hand, has both negative and positive effects. If FDI enterprises bring green and modern technology to the host countries or focus on environmental factors, FDI and CO₂ will have negative relationship (Mihaela, 2014 and Ridzuan et al. 2017). By contrast, FDI and CO₂ will have positive effects if FDI companies do not focus on

environmentally friendly factors (Marian et al., 2016 and Tien et al., 2020). TO is also added to the equation as it may bring negative impacts on the environment (Antweiler et al., 2001). Finally, EN is also discussed in the equation to define its effects on environmental quality. It is forecasted to have a positive relationship with CO₂ (Ang, 2007; Hailiciouglu, 2009; Ridzual et al., 2017).

3.4. Research hypothesis

Based on previous research on the relationship among variables, there are hypothesis drawn for each model as follow:

- Economic growth model:

H1: Foreign direct investment is expected to have impacts on economic growth in developing countries.

- Income distribution model:

H2: Foreign direct investment is expected to have impacts on Gini coefficient in developing countries.

- Environmental quality model:

H3: Foreign direct investment is expected to have impacts on CO₂ emissions in developing countries.

3.5. Research data

There are 32 developing countries investigated in this research (Argentina, Bangladesh, Belarus, Brazil, Bulgaria, Chile, China, Colombia, Ecuador, Egypt, India, Indonesia, Iran, Jordan, Malaysia, Mexico, Morocco, Nepal, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Romania, Russia, South Africa, Sri Lanka, Thailand, Uruguay, Vietnam, and Zimbabwe). They are on the list of 152 developing countries provided by World Data based on the definition of IMF. The reasons why these developing countries are chosen are due to the availability and sufficiency of data sources. The time series is based from 1990 to 2019 to have a large panel enough for analysis. Data is extracted from the World Bank (2023), The World Development Indicator (2023), Vietnam General Statistics Office (2023), and the Global Consumption Income Project (2015).

4. RESULTS AND DISCUSSION

4.1. Results

Firstly, Stata 16.0 software is executed to describe basic information of all researched variables. **Table 4.1.1** below demonstrates mean, standard deviation, minimum, and maximum of variables. The lowest mean is detected from LNCO₂ variable of 0.7534 and the standard deviation is 1.0920, whereas the highest value of mean is LNDI, at 23.9405 with a standard deviation of 1.6425. Overall, the standard deviation among variables ranges from 0.1379 to 2.3761. Ranges are not big, even smaller than means. This means that there is not much difference in researched variables of all countries.

Table 4.1.1: Overall descriptive analysis of researched variables.

Variable	Mean	Standard. Deviation	Minimum	Maximum	Observations
LNGDP	7.8457	1.0896	4.5718	10.1155	960
LNCO ₂	0.7534	1.0920	-3.0382	2.8406	960
LNGINI	3.8209	0.1379	3.2268	4.0308	960
LNLAB	16.7089	1.4700	13.2390	20.4757	960
LNFDI	21.1397	2.3761	9.2103	26.3963	960
LNTO	4.0258	0.5216	2.6213	5.3955	960
LNEN	6.9505	0.8128	4.7443	8.8341	960
LNDI	23.9405	1.6425	18.5616	29.4418	960

Source: Stata 16.0 analysis

Secondly, five statistics tests to choose suitable regression models will be conducted. The first test is cross-sectional dependence which is made to choose a suitable test for stationarity. If the panel data is cross-sectional dependent, second-generation unit root test (CIPS) will be executed to test for stationarity. By contrast, if the panel data does not have cross-sectional dependence, stationarity tests such as Levin-Lin-Chu, Breitung, IPS or Fisher will be performed. For this section, cross-sectional dependence Pesaran test is executed. The null hypothesis is “There is no cross-sectional dependence”. All p-value of three models is less than 1% (see **Table 4.1.2** below). Thus, H0 is rejected. This mean that there is cross-sectional dependent test.

Table 4.1.2: Results of cross-sectional dependent test.

Cross-sectional dependence test		
H0: There is no cross-sectional dependence		
Models	p-value	Conclusion
Economic growth model	0.0000	cross-sectional dependence
Income distribution model	0.0058	cross-sectional dependence
Environmental quality model	0.0000	cross-sectional dependence

Source: Stata 16.0 analysis

Because there is cross-sectional dependence, the second test of CIPS for stationarity will be performed (see **Table 4.1.3** below). The null hypothesis for this test is “There is non-stationarity. The results show that variables stop at both I(0) and I(1). I(0) means at the level, while I(1) means at first difference. LNFDI, LNTO, and LNGINI stop at I(0), whereas LNGDP, LNLAB, LNDI, LNC02, and LNEN stop at I(1).

Table 4.1.3: Results of stationarity test.

CIPS stationarity test							
H0: There is non-stationarity.							
Models	Variables	Levels	Result	Variance	Levels	Results	Final results
Economic growth model	LNGDP	-1.494	NS	d.LNGDP	-4.570	S	I(1)
	LNLAB	-1.234	NS	d.LNLAB	-3.370	S	I(1)
	LNDI	-1.688	NS	d.LNDI	-4.284	S	I(1)
	LNFDI	-2.847	S				I(0)
	LNTO	-1.700	S				I(0)
Income distribution model	LNGINI	-2.010	S				I(0)
	LNGDP	-1.494	NS	d.LNGDP	-4.570	S	I(1)
	LNFDI	-2.847	S				I(0)
	LNDI	-1.688	NS	d.LNDI	-4.284	S	I(1)
	LNTO	-1.700	S				I(0)
Environmental quality model	LNC02	-1.216	NS	d.LNC02	-4.470	S	I(1)
	LNGDP	-1.494	NS	d.LNGDP	-4.570	S	I(1)
	LNFDI	-2.847	S				I(0)
	LNTO	-1.700	S				I(0)
	LNEN	-1.281	NS	d.LNEN	-4.460	S	I(1)
Critical values	(-1.46) - (-1.69)						
NS: Non-stationarity							
S: Stationarity							

Source: Stata 16.0 analysis

If independent variables are correlated, estimation might be biased. Thus, the third test for multicollinearity of variables is carried out. The regression models are run, then test correlation and VIF are also conducted. **Table 4.1.4**, **Table 4.1.5**, and **Table 4.1.6** show the correlation of variables in economic growth, income distribution, and environmental quality model.

Table 4.1.4: Correlation of variable in economic growth model.

Variables	LNGDP	LNLAB	LNDI	LNFDI	LNT0
LNGDP	1				
LNLAB	-0.2067	1			
LNDI	0.4234	0.7726	1		
LNFDI	0.5137	0.5331	0.8011	1	
LNT0	0.1794	-0.4157	-0.231	-0.0189	1

Source: Stata 16.0 analysis.

Table 4.1.5: Correlation of variables in income distribution model.

Variables	LNGINI	LNGDP	LNDI	LNFDI	LNT0
LNGINI	1				
LNGDP	-0.0984	1			
LNDI	-0.0207	0.4234	1		
LNFDI	0.0244	0.5137	0.8011	1	
LNT0	-0.3251	0.1794	-0.231	-0.0189	1

Source: Stata 16.0 analysis.

Table 4.1.6: Correlation of variables in environmental quality model.

Variables	LNC02	LNGDP	LNFDI	LNEN	LNT0
LNC02	1				
LNGDP	0.7326	1			
LNFDI	0.3819	0.5137	1		
LNEN	0.9326	0.7155	0.2857	1	
LNT0	0.354	0.1794	-0.019	0.3365	1

Source: Stata 16.0 analysis.

Overall, there is a high correlation among variables, such as LNFDI and LNDI at 80.11%, LNGDP and LNCO2 at 73.26% or LNEN and LNCO2 at 93.26%. Therefore, it is important to check multicollinearity (see **Table 4.1.7** below). Mean VIF of the three models is from 1.86 to 3.15. These numbers are not large enough to cause multicollinearity. Thus, there is no multicollinearity.

Table 4.1.7: Mean VIF of economic growth, income distribution, and environmental quality model.

Variable	VIF	1/VIF	Variable	VIF	1/VIF	Variable	VIF	1/VIF
LNDI	5.24	0.191	LNDI	3.25	0.307	LNGDP	2.61	0.383
LNFDI	3.09	0.323	LNFDI	3.25	0.308	LNEN	2.28	0.439
LNLAB	2.96	0.338	LNGDP	1.45	0.691	LNFDI	1.4	0.716
LNT0	1.3	0.768	LNT0	1.22	0.817	LNT0	1.15	0.871
Mean VIF	3.15		Mean VIF	2.29		Mean VIF	1.86	

Source: Stata 16.0 analysis.

The fourth test for autocorrelation of variables will be proceeded. The null hypothesis is “There is no first-order autocorrelation”. P-value of the three models is less than 1%, thus, H0 is rejected. Therefore, there is autocorrelation among variables (see **Table 4.1.8** below).

Table 4.1.8: Results of Wooldridge test for autocorrelation.

Wooldridge test for autocorrelation		
H0: There is no first order autocorrelation		
Models	p-value	Conclusion
Economic growth model	0.0004	autocorrelation
Income distribution model	0.0000	autocorrelation
Environmental quality model	0.0000	autocorrelation

Source: Stata 16.0 analysis.

Final test is Heteroscedasticity with the null hypothesis of “There is no heteroscedasticity”. P-value off three models is less than 1%, thus, there is heteroscedasticity (see **Table 4.1.9** below for the results).

Table 4.1.9: Results of heteroscedasticity test.

Likelihood-ratio test		
H0: There is no heteroscedasticity		
Models	p-value	Conclusion
Economic growth model	0.0000	heteroscedasticity
Income distribution model	0.0000	heteroscedasticity
Environmental quality model	0.0000	heteroscedasticity

Source: Stata 16.0 analysis.

After testing, the panel data has almost disturbances. Therefore, according to Daniel (2007), Generalized Least Squares (GLS) regression and Panel-Correlated Standard Error (PCSE) regression are the most suitable. GLS is used if observation variables are less than time series ($N < T$). And PCSE will be executed with a larger panel scale. In this research, there are 32 countries and 30 years investigated ($N > T$). Thus, PCSE is more suitable.

Based on the results (see **Table 4.1.10** below), in the economic growth model, all four variables of LNLAB, LNDI, LDFDI, and LNT0 are statistically significant as p-values are less than 5%. In terms of income distribution model, there is only LNDI variable not having statistical significance. In the model of environmental quality model, all variables are statistically significant as p-values are less than 5%. R-squares of three model are high. For the economic growth model, LNLAB, LNFEDI, LNDI, and LNT0 can explain 93.59% of the variation for LNGDP. The model showed that both LNFEDI and LNDI have positive relationship with LNGDP. By contrast, LNT0 shows the opposite impact on LNGDP. However, this is not the main variable, thus, it is not significant. Therefore, in this model, the main independent is LNFEDI and it has positive effects on economic growth. This aligns with the research’s hypothesis. In the model of income distribution, LNT0 and LNGDP have a negative relationship with LNGINI. By contrast, LNFEDI shows a positive relationship with LNGINI. This result is up to author’ expectation. Moreover, R-squares of this model is 0.9773. This means that independent variables of LNGDP, LNFEDI, and LNT0 can explain 97.73% of variation for LNGINI. In the model of environmental quality, all variables have a positive relationship with LNCO2. In which LNE0 has the strongest impact on LNCO2. Increases in LNFEDI and LNGDP also make LNCO2 increase. These results align with the research hypothesis. Furthermore, LNT0 affects LNCO2 positively, which is logical with the result of LNCO2 and LNFEDI. When FDI increases, it means TO also increases.

Table 4.1.10: Results of PCSE regression.

Economic growth model						
LNGDP	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
LNLAB	-0.7776	0.0261	-29.7700	0.0000	-0.8288	-0.7264
LNFDI	0.0211	0.0043	4.9400	0.0000	0.0127	0.0295
LNDI	0.6934	0.0262	26.4900	0.0000	0.6421	0.7447
LNT0	-0.0905	0.0316	-2.8700	0.0040	-0.1523	-0.0286
_cons	4.1570	0.4295	9.6800	0.0000	3.3152	4.9988
R-squared	0.93590					

Income distribution model						
LNGINI	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
LNGDP	-0.0215	0.0067	-3.2200	0.0010	-0.0346	-0.0084
LNFDI	0.0038	0.0012	3.1200	0.0020	0.0014	0.0061
LNDI	-0.0069	0.0046	-1.5100	0.1320	-0.0159	0.0021
LNT0	-0.0210	0.0104	-2.0300	0.0430	-0.0414	-0.0007
_cons	4.1514	0.1088	38.1700	0.0000	3.9382	4.3645
R-squared	0.9773					

Environmental quality model						
LNC02	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
LNGDP	0.0729	0.0156	4.6700	0.0000	0.0423	0.1034
LNFDI	0.0503	0.0067	7.5300	0.0000	0.0372	0.0633
LNEN	1.1119	0.0233	47.7700	0.0000	1.0663	1.1576
LNT0	0.1351	0.0227	5.9600	0.0000	0.0907	0.1795
_cons	-9.1532	0.1961	-46.6700	0.0000	-9.5376	-8.7688
R-squared	0.8897					

Source: Stata 16.0 analysis.

5. DISCUSSION

From the research's result in the economic growth model, foreign direct investment (FDI) has positive impacts on GDP in developing countries. When the amount of FDI inflows increases, GDP per capita also increases. Specifically, if there is 1% increase in FDI inflows, GDP per capita will rise by 2.1%. This means that FDI will rise GDP per capita of developing countries. The result is suitable with previous research of Dunnung & Lundan (2008); Anwar & Lan (2010), Pegkas (2015); Sunde (2017); Ridzuan (2017); and Tien et al. (2020). In this model, however, LNFDI contributes a small proportion to economic growth in developing countries, whereas LNDI shows a considerable positive impact on LNGDP. As when domestic infrastructure is improved, it will create effectiveness and efficiency in production, transportation and distribution. It is implied that to promote economic growth, foreign investment one of contributors, but the main factor needs to come from the country itself to make more domestic investment to improve the infrastructure and facilities. As for LNT0 and LNLAB, they are considered to have negative relationship with LNGDP. Moreover, LNLAB has negative impacts on LNGDP. This can be explained that when the total labour increases, but there are no sufficient jobs in the economy for employees, the labour force market will become more competitive and there are more unemployed people. This affects the real gross domestic

products per capita. However, this not the main variable of this research, thus, further studies need to be carried out to have deeper insights.

In the income distribution model, LNFDI has shown the positive relationship with LNGINI. When LNFDI increases by 1%, LNGINI then increases by 0.38%. This result aligns with Ridzuan (2017), Anwar & Lan (2010), Hyungsun and Miguel (2017), and Nguyen et al. (2020). This means that when a developing country receive more FDI, the income inequality will rise at the same time. According to Lee and Vivarelli (2006), FDI enterprises or multinational corporations tend to seek high-skilled and quality labor force, thus boosting the income gaps among levels of labour. Moreover, Nguyen at el. (2020) explained that FDI tends to focus on big cities in urban areas instead of rural areas, thus, creating the income gap within a nation. However, Quoc et al. (2021) revealed if there are policies to develop human resources and distribute FDI reasonably, FDI will help to reduce income inequality. By contrast, LNGDP shows negative impacts on LNGINI. The higher GDP per capita, the lower Gini coefficient. In fact, incentives or increases in salary will create more motivation for the labour force to work harder, which increases GDP per capita and therefore, reducing the income inequality.

In the environmental quality model, all the independent variables are statistically significant and have positive relationship with LNCO2. These results similar with previous research of Antweiler et al., (2001); Ang, (2007); Hailiciouglu, (2009); Wu and Li (2011); Mihaela (2014); Huiming et al. (2016); Bakhsh et al. (2017); Ridzual et al., (2017); and Sargunesi, (2018). In which LNEN has the highest correlation values with LNGINI. This means that 1% increase in LNEN will create 111.19% increase in LNCO2. According to Ang, (2007) and Hailiciouglu, (2009), when the economy is growing, the energy consumption will also increase, thus adding more CO2 emissions. FDI and TO also worsen CO2 emissions when LNFDI and LNTO increase by 1%, LNCO2 will rise by 5.03% and 13.51% respectively. This means when a developing country is more open to imports and exports and FDI will increase, which causes increases in CO2 emissions. As many of FDI enterprises or multinational corporations invest in production or heavy industries in developing countries. Or they may bring old and out-of-date machines, equipment and technology and take advantage of legal gaps or lax regulations.

Overall, when combining all three pillars of sustainable development (economic growth, income distribution, and environmental quality) in 32 researched developing countries, it can be said that FDI promotes economic growth in these countries. However, there are also needs for other improvements such as domestic investment to attract more FDI and sustain a long-term growth. On the other hand, FDI causes increases in Gini coefficient and higher CO2 emissions in these developing countries. Therefore, from 1990 to 2019, FDI in 32 researched countries has not contributed to the comprehensive sustainable development due to its negative impacts on income distribution and the environment.

Table 4.1.11: Conclusions of research hypothesis.

Hypothesis	Conclusion
H1: Foreign direct investment is expected to have impacts on economic growth in developing countries.	Positive
H2: Foreign direct investment is expected to have impacts on Gini coefficient in developing countries	Positive
H3: Foreign direct investment is expected to have impacts on CO2 emissions in developing countries	Positive

There are needs to take action towards sustainable development in these countries. Firstly, in terms of economic growth, developing countries should continue to focus on attracting more FDI inflows through open economic policies and create favourable conditions to FDI projects. Moreover, it is vital to have strict policies on taxes and control well financial statement of these FDI enterprises to ensure long-term economic growth. Furthermore, domestic investment should be focused on to enhance the infrastructure and facility

capability for the development to have competitive advantage in attracting FDI. This can be developments of road structure, bridges, subways, distribution warehouses, and industrial zone scales. Secondly, in terms of income distribution, the government should have policies to distribute FDI capital evenly across all the regions. This creates more equal job opportunities for all employees to approach and work for multinational companies. Moreover, educational programs should be executed to enhance the workforce capability and productivity. In addition, if the governments tend to promote economic development in remote areas, it is necessary to promote education and technology skills in these regions for the local. This does not only help to distribute foreign investment widely and to narrow the income gap, but this also promotes economic growth at the same time. Thirdly, in terms of environmental quality, the governments should investigate and evaluate the effectiveness of exiting FDI enterprises. The authorities should check operating processes, industrial disposal treatment, and business products of these enterprises carefully to make sure that all of them are safe and meet up with the standard requirements. Moreover, it is also important to fix and adjust stricter rules regarding industrial wastes and policies to protect the environment. Strict measures should be applied for those who violate the rules. Furthermore, for new FDI projects, the governments should prioritize and make favourable conditions for green FDI such as investments in advanced and modern technology, equipment and infrastructure which are environmentally friendly. It is also necessary to put limitation on mining or heavy industries which cause serious effects on the environment. Moreover, raising people's awareness about environmental problems is also urgent. When they are aware of problems such as climate changes, plastic waste, CO₂ emissions, greenhouse effects, they will consume wisely and choose sustainable-material products.

Besides positive contributions to the topic of FDI and sustainable development, this research still poses some limitations. Firstly, the paper uses secondary data from website which are publicised by individual countries. Thus, author could not fill in missing data blanks. Secondly, this research ignores the impact of recent events which have caused serious consequences in terms of economic, environmental, and social factors. The time series is from 1990 to 2019, which remove 2020, 2021, and 2022. These three years witnessed significant changes and serious damages of Covid-19 pandemic, Ukraine-Russia war, Suez channel blocking. Thus, the reseach fails to analyse and provide deeper insights of how these disruptions affect FDI and sustainable development. This will be a recommendation for further research to investigate in these factors.

6. CONCLUSION

Impacts of FDI and three pillars of sustainable development (economic growth, income distribution, and environmental quality) are examined in this research through data collected from 32 developing countries from 1990 to 2019. The results demonstrate that FDI inflows contribute to economic growth of developing countries. However, it is FDI inflows which cause environmental and social problems. They are increasing in income distribution gaps and CO₂ emissions disposed. Thus, it can be concluded that FDI inflows do not promote sustainable development in developing countries on the total point of view. Besides FDI inflows, the findings also show that not only FDI can contribute sustainable development path of developing country, but also domestic investments on infrastructure and facilities bring positive impacts on economic growth. Moreover, energy consumption per capita is considered a culprit of CO₂ emission rises. Therefore, it is imperative for governments in developing countries to execute policies which help to promote sustainable development. One of them is investing in domestic structure, combined with improving educational levels among their citizens, and launching campaigns to raise people's awareness of environmental problems. When domestic infrastructure is improved and education levels are upgraded for

most of citizens, countries can attract more FDI inflows and have equal income distribution. Furthermore, when people are well-educated in general levels and in terms of environment as well, they become more aware and have smart choice of consumption. For example, they might opt for green and sustainable products. Thus, this encourages both domestic and FDI enterprises change products to adapt to customers' demands. All of these, in the end, will lead to comprehensive sustainable development.

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IMPACTS OF ECONOMIC GROWTH, FOREIGN DIRECT INVESTMENT AND RENEWAL ENERGY ON AIR POLLUTION: EMPIRICAL STUDIES IN SOME EAST ASIAN COUNTRIES

Authors: Trinh Trong Quyen¹, Nguyen Nhu Quynh¹, Le Thi Bang Nhan¹

Mentor: Dr. Ngo Ngan Ha¹

ABSTRACT: *This study uses FE (fixed effect method) and RE (random effect method) methods and applies panel data to analyze the impact of economic growth, foreign direct investment, and renewable energy on air pollution in East Asia in the period 2000 - 2021. In order to choose the best estimation method for the gravity model (expanding the study of Hausman & Taylor, 1981), the authors also inherit and use the Hausman-Taylor test to analyze and evaluate the results of the research model. Empirical research results show that economic growth and renewable energy have an impact on increasing air pollution. Meanwhile, foreign direct investment has the effect of reducing CO2 emissions in these countries. Based on the research results, the study proposes some policy implications to reduce air pollution in East Asian countries.*

Keywords: *Economic growth, foreign direct investment, renewable energy, environmental pollution, East Asia*

1. INTRODUCTION

Air pollution is one of the most challenging environmental problems facing countries. Air pollution levels remain dangerously high in many parts of the world. New data from the World Health Organization (WHO) shows that nearly the entire world population (99%) breathes air containing high levels of pollutants. According to the World Health Organization (WHO), there are 7 million premature deaths from exposure to air pollution globally each year.

East Asia is one of the regions with high economic growth and has become the most dynamic and innovative development region in the world. However, the downside of rapid economic growth is that these countries are facing air pollution problems. Facing this situation, along with many countries in the world, East Asian countries have joined the Glasgow Climate Agreement (COP26) with a commitment to reduce CO2 emissions by 45% by 2030 compared to 2010 levels and to zero by 2050. To achieve the above goal, countries in East Asia have developed action plans to realize the goals of COP26. However, on the way to that goal, countries in East Asia face the paradox that economic growth in most of these countries is based on fossil energy, causing air pollution. As well as attracting foreign direct investment capital has contributed greatly to economic growth and development, but in some countries, this region is putting pressure on the air environment. Experts have recognized that it is necessary to exploit renewable energy sources to reduce pressure on the atmosphere. Understanding the relationship between economic growth, foreign direct investment, renewable energy, and air pollution will help countries in East Asia develop the most appropriate policies to accomplish their target of COP26. Stemming from the above meaning, the study of the topic: “Impact of economic growth, foreign direct investment and renewable energy on air pollution: Empirical studies in some East Asian countries” is necessary.

1 Thuongmai University

2. THEORETICAL FRAMEWORK

2.1. Overview of air pollution

2.1.1. The concept of air pollution

Environmental pollution is a concept defined by many scientific disciplines. From a biological perspective, this concept refers to the state of the environment in which its chemical and physical parameters are changed for the worse. From an economic perspective, environmental pollution is an unfavorable change to the living environment in terms of physical, chemical, and biological properties that can cause immediate or long-term harm to the health of humans, animals, plants, and other living conditions.

In Vietnam, from a legal perspective: “Environmental pollution is the change of environmental components that do not conform to environmental technical regulations and environmental standards, causing adverse effects on humans and living organisms” (Clause 8, Article 3 of the Law on Environmental Protection 2014).

It can be seen that the most common of the above definitions of environmental pollution is the change of environmental components in a bad direction, which is detrimental to humans and organisms.

The atmosphere is the collection of all the gases that surround us. Air is responsible for providing life for all living things on earth, including humans. That is very important for the survival and development of all living things on Earth. Air pollution is a large change in the composition of the air due to the presence of foreign substances leading to unclean air or causing unpleasant odors, and reduced vision when looking at a distance. The state of air pollution is a topical issue of most concern worldwide.

2.1.2. Causes of air pollution

UNEP (2022) has pointed out some causes of air pollution as follows:

- *Natural causes*

- Air pollution from volcanic eruptions: Volcanic eruptions bring a large amount of nutrients to the soil. However, large amounts of methane, chlorine, and sulfur gas generated during volcanic eruptions cause serious air pollution.

- Wildfires: These fires will produce a huge amount of Nitrogen Oxide. Moreover, forest fires also release a large amount of smoke and ash into the air.

- Wind is an indirect cause of pollution: Not a direct cause, but the wind is also an indirect cause of air pollution. The wind is the vehicle that carries dust, and harmful gases from factories, natural disasters, etc. far and wide. This causes the pollution to spread rapidly.

- Air pollution from storms: Storms will produce large amounts of CO_x and fine dust, which increases the pollution in the air.

In addition to the above causes, the decomposition of animal carcasses, ocean waves, or natural radiation are also causes of air pollution.

- *Caused by human activities*

Humans are the victims of environmental pollution, but humans are also the main agents of environmental pollution. Many daily human activities contribute to air pollution.

- Industrial and agricultural production activities

This is the main cause, causing pain for the community and the state, not only in Vietnam but also in many developing countries. Smoke and dust from the exhaust pipes of factories and factories in industrial

zones darkened the sky. They emit CO₂, CO, SO₂, Nox, and some other organic substances, with extremely high concentrations. These industrial zones not only pollute the air environment but also pollute the water environment, causing “cancer villages” to be formed. Acid rain is also the result of industrial production activities that do not treat waste properly. The abuse of pesticides, fertilizers, or activities of burning straw, stubble, burning forests for farming are also causes of air pollution.

- Transportation

This is the biggest cause of air pollution today. With a huge number of vehicles constantly moving, the emissions from these vehicles are also terrible. Especially, for old cars, and poor mechanical systems, the higher the emissions. Vehicles release toxic substances into the air such as CO, VOC, NO₂, SO₂,... with extremely high and continuous concentrations. This cause is second only to industrial activities when the amount of emissions from vehicles discharged into the environment is very large.

- Infrastructure construction activities

Construction activities of high-rise buildings, high-rise apartments, or bridges always bring heavy air pollution. When transporting materials, even if carefully covered, dust will be scattered into the environment and cause pollution. Not to mention, in cases where it is not covered, materials will be dropped onto the road, causing danger and producing a huge amount of smoke and dust that can hinder vehicles traveling together on the road.

Besides, there are many reasons such as garbage collection, daily activities of people, defense activities, etc.

2.1.3. Effects of air pollution

Air pollution causes great harm to the natural world, the economy and to people. UNEP (2022) pointed out the following basic harms:

- Effects of air pollution on animals and plants

Air pollution causes great harm to animals and plants. Hazardous compounds (SO₂, NO₂, CO, H₂S, lead, etc.) can cause airway obstruction in animals. Accordingly, it reduces the immune system as well as the metabolism. Fruit trees are often very sensitive to changes in the environment. Fruit trees exposed to HF compounds can cause mass defoliation.

Hazardous chemicals present in polluted air can cause acid rain. Acid rain has the ability to kill beneficial microorganisms in the soil and destroy crops. Acid rain also changes the quality of water in rivers, streams, and lakes. Chemical compounds are also capable of combining with water present in the air. At the same time, following the rain, these compounds also seep into the ground, causing irreversible harm. This can cause mass death of animals and plants. Toxic chemicals also have the ability to seep into the food chain causing poisoning, polluting the water environment, and harming aquatic organisms.

- Harm to humans

Effects on human health are the most serious consequences of air pollution. It makes the rate of people suffering from respiratory diseases, cancer, and infertility, ... increasing. With the current era of industrialization, rapid development makes the need to use means and tools to simplify people's lives more and more. This has been causing an increase in the rate of smog in the air. Every day, people have to inhale a huge amount of dust pollution. Causes negative effects on the lungs, respiratory tract, and eye diseases. It also causes skin diseases, hair loss, baldness, etc.

- Consequences of air pollution on the economy and society

Air pollution causes many negative economic and social impacts. The physical and chemical factors of the environment are changed. The economy also suffers more damage when it comes to spending capital

to improve the living environment for people. In addition, when the environment is polluted, it will also have a direct impact on human tourism and shopping activities.

2.2. The relationship between economic growth, foreign direct investment, renewable energy, and air pollution

• The relationship between economic growth and air pollution

Most of the studies on the relationship between economic growth and environmental pollution in general and air pollution in particular aim to test the appropriateness of the environmental Kuznets Curve (EKC). The EKC hypothesis posits that the relationship between economic growth and environmental degradation is characterized by an inverted U-shaped curve. Accordingly, economic growth is not a threat, but a means to improve the environment in the future. Specifically, environmental pollution increases in the early stages of economic development, but after a certain income milestone, environmental quality improves and the level of waste decreases. In the process of development, economic growth spurs an increase in demand for a clean environment to achieve a higher standard of living. At this stage, the processes of clean production, clean consumption, and the use of environmentally friendly products are given priority.

The impact of economic growth on air pollution is studied through the impact of economic growth on CO₂ emissions. The empirical study of Ahmed, K., Rehman, M., & Ilgan, O. (2017). shows that urbanization increases CO₂ emissions but to a certain extent, then this increase will reduce emissions in Indonesia during 1971 - 2014. Qichang, X., Junxian, L. (2019) found that the nonlinear effect of economic growth on CO₂ emissions follows an inverted U-shaped pattern, CO₂ emissions tend to increase in the early stages of economic expansion and then decrease as China's economy grows. An empirical study by Tran, T.M., et al (2022) using the VAR model and variance decomposition to test the impact between CO₂ emissions, foreign direct investment, and economic growth in Vietnam shows a positive relationship between CO₂ emissions and economic growth with an impact rate of 17.4%. However, this study only tests the one-way causal relationship from GHG emissions to economic growth. The empirical study of Soytaş, U., Sari, R., & Ewing, B. T. (2007) suggests that in the long run, growth increases pollution in the United States from 1960 - 2004. At the same time, the empirical finding of Salahuddin et al (2015) shows that growth stimulates CO₂ emissions in the member countries of the Gulf Cooperation Council during the period 1980 - 2012. Meanwhile, Ahmed et al. (2017) concluded that income has a negative impact on environmental degradation in five South Asian countries for the period 1971 - 2013.

• The relationship between foreign direct investment and air pollution

Theoretically, the impact of FDI on the environment can be positive or negative. According to the argument of the “pollution hiding place” hypothesis raised and developed by Brian, C., & Taylor, S (1994), negative effects occur when FDI inflows increase emissions to the environment. Similarly, Golub et al. (2011) argue that liberalization without policies and measures to protect the environment will gradually become a competitive tool among developed countries to attract FDI. Many empirical studies also provide evidence that FDI enterprises significantly increase CO₂ and SO₂ emissions in China (Cole et al., 2011), Turkey (Kihcarslan and Dumrul, 2017); a 1% increase in FDI inflows increases pollution by 0.04% in Latin American countries (Sapkota and Bastola, 2017); in both the short and long term, an increase in FDI has the effect of increasing CO₂ emissions, and conversely, an increase in CO₂ also has an effect of increasing FDI wages (Tran, T.M, 2022).

In contrast, some scholars support the “pollution halo hypothesis”, the impact of FDI on the environment can also be positive. FDI enterprises are usually developed corporations in the world, production processes, application of advanced technologies, new, cleaner, and energy-saving technologies. Therefore, the harmful

environmental impact of FDI enterprises does not last forever (Asghari, M., 2013). The empirical study of Ngonadi et al. (2020) also shows that FDI inflows reduce CO₂ emissions in sub-Saharan Africa in the period 2004 - 2015 by means of generalized moment regression. Research by Tang and Tan (2015) also supports this hypothesis by showing that increased FDI contributes to a decrease in CO₂ emissions.

- *The relationship between renewable energy and air pollution*

Energy is considered the lifeblood of the economy, and the most important tool for the socioeconomic development of a country (Sahir, H., & Qureshi, H., 2007). Energy can be classified into fossil energy and renewable energy. In particular, some energy sources such as fossil fuels and coal pollute the environment while renewable energy helps clean the environment (Bennett and Zaleski, 2001). Agreeing with Leonard, B., & Pierre, Z., (2001), Bekun et al. (2019) also argue that renewable energy consumption can help improve environmental quality, and fossil fuels can lead to the decline of a country's environmental portfolio. However, Bilgili et al. (2016) with panel data of 17 OECD countries for the period 1977-2010, through the FMOLS, DOLS method, concluded that renewable energy consumption has a negative impact on CO₂ emissions. Thus, the research literature on the relationship between renewable energy and CO₂ emissions shows rather conflicting results.

3. RESEARCH METHODS

3.1. Research methods and models

In order to understand the impact of economic growth, foreign direct investment, and renewable energy on air pollution in some East Asian countries, it is possible to apply the pooled estimation method – the POOLED method, the fixed effect method (FE) and the random effect method (Random Effect – RE). The POOLED method helps to increase the number of observations but ignores the differences between the research subjects. In practice, this has certain limitations when applied to analyzing the effects of economic growth, foreign direct investment, renewable energy, and environmental pollution in some East Asian countries by countries in the region. These countries have differences in per capita income, foreign direct investment attracts, etc. To overcome this drawback, the authors use FE and RE methods. In order to choose the best estimation method for the gravity model (expanding the study of Hausman & Taylor, 1981), the Hausman-Taylor test method has been developed, which is the most suitable method to compare and choose between FE and RE methods (Egger, 2005). In this study, the authors also inherit and use the Hausman-Taylor test to analyze and evaluate the results of the research model.

To analyze the impact of economic growth, foreign direct investment, and renewable energy on air pollution in some East Asian countries, with the help of STATA 15, the proposed regression model for the study is as follows:

$$CO2_{it} = \beta_0 + \beta_1 \cdot GDP_{it} + \beta_2 \cdot FDI_{it} + \beta_3 \cdot RENEW_{it} + \epsilon_{it}$$

Where “i” is representative of the countries studied in the panel data, $i = 1 \dots 9$; t is the study period, $t=2000 \dots 2021$. At the same time, to “smooth” the research data, the variables GDP, FDI, and RENEW are taken logarithmically. From the results of the above model estimation, to evaluate the received model, the study uses the following tests: Wooldridge autocorrelation test, and Wald test of variable variance.

3.2. Research data

The data used in the study were compiled from the databases of the websites: The World Bank Development Indicators Database (<https://data.worldbank.org/>) and Our World in Data (<https://ourworldindata.org/>) on factors affecting air pollution in some countries in East Asia in the period 2000 - 2021.

Table 1. Variables used in the research model

Variables	Describe	Source
CO2	CO2 emissions per capita	Our World in Data
GDP	Gross domestic product per capita	The World Bank Development Indicators Database
FDI	Foreign direct investment capital	The World Bank Development Indicators Database
RENEW	Renewable energy (% primary energy)	Our World in Data

Source: Authors' synthesis

4. RESULTS AND DISCUSSION

4.1. Situation of air pollution in East Asia

There are different views when considering the concept of East Asia. According to common understanding, from a geographical or ethnic perspective, East Asia (or Greater East Asia, Far East) is a concept to refer to a sub-region located in the East of Asia. In this geographical and geopolitical perspective, the region includes the countries and territories of China, Japan, Korea, Hong Kong, Macau, Mongolia, North Korea, and Taiwan.

The concept of East Asia including Southeast Asia and Northeast Asia is a widely used understanding today. East Asia is seen as a product of regional integration, an extension of the concept of East Asia in the usual sense but plus Southeast Asia. This interpretation comes from an initiative of Malaysian Prime Minister Mahathir Mohamad. He was the first person to officially promote the concept of East Asia including the member countries of ASEAN and Northeast Asia. The Chiang Mai Initiative (1997) was the result of a currency swap agreement by 13 countries to prevent further crises in the future. On that premise, economic relations have been increasingly consolidated through a series of Ministerial Meetings, Summits... With these developments, ASEAN+3 cooperation has been called East Asia more often and clustered. from East Asia is also understood in a broader sense

ASEAN+3 is considered one of the most important and fast-growing, dynamic economic regions in the world, but at the same time, it is also assessed by experts and scientists as an area with an alarming level of air pollution. China is now one of the world's largest CO2 emitters, accounting for 27% of all greenhouse gas emissions worldwide.

Table 2. CO2 emissions per capita of some countries in East Asia in the period 2015 – 2021

Unit: tons

Country	2015	2016	2017	2018	2019	2020	2021
Northeast Asia							
China	7.079569	6.965584	7.0986867	7.306542	7.5541654	7.6889496	8.04574
Japan	9.615686	9.479893	9.382093	9.056306	8.792438	8.321498	8.56574
Korea	12.436215	12.432552	12.70659	12.968438	12.472093	11.527396	11.886425
Southeast Asia							
Indonesia	2.0809183	2.1105638	2.14464	2.260322	2.4461334	2.2430317	2.2621746
Malaysia	7.5864425	7.995221	7.762195	8.2436075	8.20496	7.8157063	7.626435
Philippines	1.0914071	1.1686072	1.2661793	1.3063054	1.3157338	1.2092029	1.2668023
Singapore	9.99393	6.242084	6.4457793	7.91461	5.0996385	5.060936	5.4715614
Thailand	4.117252	4.08616	4.133732	3.966176	4.070233	3.8805997	3.889545
Vietnam	2.3617034	2.4278777	2.4782856	2.8891642	3.560416	3.403044	3.344827

Source: Our World in Data

Air pollution has had serious consequences in East Asian countries. In Indonesia, it is recorded that every year in this country, 123,753 people die from air pollution, about 60,040 people die from water

pollution, and 32,850 people die from exposure to emissions. This is due to many different reasons, but one of them is the deforestation rate of 40% in the past 50 years. In China, with the largest population in the world, along with many business and manufacturing activities, the country has to live in a state of extremely toxic fine dust, with extremely high CO2 content.

In the face of alarms about CO2 emissions and disasters caused by extreme weather, countries in East Asia have all made efforts to reduce CO2 emissions, but the results are different from country to country. The past years, although still at a high level, have seen encouraging progress in the direction and speed of CO2 reduction in China, Korea, Malaysia, and Thailand. Some of the economies that have not experienced consistent performance and lag in carbon emissions reductions over the past decade are Indonesia and Japan. Meanwhile, some economies such as the Philippines and Vietnam are coal-dependent developed countries and are still far from the destination of reducing CO2 emissions.

Recognizing the alarming levels of serious air pollution, countries in East Asia have joined the Glasgow Climate Treaty (COP26). COP26 has resulted in rapid and significant reductions in CO2 emissions, including a 45% reduction in CO2 emissions by 2030 from 2010 levels and to zero by mid-century, “taking into account different national circumstances.” However, what factors need to be adjusted to achieve the above goal requires careful study by countries.

4.2. Results of empirical research on the impact of economic growth, foreign direct investment, renewable energy, and environmental pollution in some countries in East Asia

4.2.1. Descriptive statistics

Table 3. Descriptive statistics of quantitative variables

Variable	Obs	Mean	Std. dev.	Min	Max
CO2	198	5.727131	3.813936	.6658252	12.96844
LOGGDP	198	3.835885	.5806941	2.596139	4.862096
LOGFDI	198	.7632582	.26796	-.6151807	1.514421
LOGRENEW	198	.595302	.5660603	-.7531611	1.383965

Source: Analytical results of the author's team

Table 3 presents statistical results describing the mean, standard deviation, minimum and maximum values of the variables used in the study. From the results of descriptive statistics, it is shown that the variables in the estimated model all collect enough data with 198 observations. The highest CO2 emissions were in Korea (in 2018) and the lowest in Vietnam (in 2000). Meanwhile, gross domestic product per capita GDP is highest in Singapore (in 2021) and lowest in Vietnam (in 2000). For foreign direct investment, FDI was highest in Singapore (in 2019) and lowest in Indonesia (in 2000). Finally, renewable energy consumption is the highest in Vietnam (in 2017) and the lowest in Singapore (in 2000).

4.2.2. Determine correlation coefficient and test for multicollinearity

The study conducted correlation analysis by making a matrix of correlation coefficients of the variables, presented in Table 4, showing that the Pearson correlation coefficient between pairs of variables ranges from 0.0627 to 0.8617. Which, the variables LOGGDP and LOGFDI have a positive effect on CO2 and LOGRENEW has a negative effect on CO2. Besides, the low correlation coefficient between the pairs of independent variables also contributes to further confirming the fit when multicollinearity will be less likely in the research model. Thus, the results of the above correlation analysis are consistent with most previous studies in the world and in line with the author's expectations during this research period.

Table 4. Correlation coefficients between variables

	CO2	LOGGDP	LOGFDI	LOGRENEW
CO2	1.0000			
LOGGDP	0.8617	1.0000		
LOGFDI	0.0627	0.2093	1.0000	
LOGRENEW	-0.5856	-0.6050	-0.4633	1.0000

Source: Analytical results of the author's team

Table 5. Multicollinearity Test

Variable	VIF	1/VIF
LOGRENEW	1.94	0.515422
LOGGDP	1.59	0.627507
LOGFDI	1.29	0.777446
Mean VIF	1.61	

Source: Analytical results of the author's team

Multicollinearity is a phenomenon in which the independent variables in the model are linearly correlated with each other. The study was conducted to test the hypothesis that there is no multicollinearity phenomenon by using the VIF criterion with the results presented in Table 5 showing that the VIF of all independent variables is less than 2, so the model does not have multicollinearity.

4.2.3. Analysis of regression results

Table 6. Model estimation results

CO2	FEM (1)	REM (2)
LOGGDP	1.962001*** (5.432152)	2.589748*** (7.628461)
LOGFDI	-1.795683*** (-3.205220)	-1.978631*** (-3.480478)
LOGRENEW	0.971858* (1.968775)	0.076333 (0.169535)
_Cons	-1.007 (-0.80)	-2.742** (-1.99)
Hausman Test	Chi2 (3) = 18.31 Prob > chi2 = 0.0004	
Modified Wald test	Chi2 (9) = 4043.61 Prob > chi2 = 0.0000	
Wooldridge Test	F(1, 8) = 0.085 Prob > F = 0.7787	

Note: *, **, *** show statistical significance at 10%, 5%, and 1%, respectively, and t statistics in parentheses

Source: Analytical results of the author's team

Next, the study applies regression methods on panel data, including the Fixed effects model (FEM) and Random effects model (REM). The results show that the Fixed effects model (FEM) regression method is more suitable due to the Hausman test with $\text{Prob} > \text{chi}^2 = 0.0004 < 0.05$. Wald test on the phenomenon of variance in the model shows that $\text{Prob} > \text{chi}^2 = 0.0000 < 0.05$, so we conclude that the model does not have variable variance. Wooldridge test shows that the model also does not have autocorrelation because $\text{Prob} > F = 0.7787 > 0.05$. After estimating the model by the FEM method and verifying that the model has no defects, we obtain the results of the research model:

$$\text{CO2} = -1.007 + 1.962 * \text{LOGGDP} - 1.796 * \text{LOGFDI} + 0.972 * \text{LOGRENEW}$$

With the dependent variable being CO2 emissions, after using the FEM method, we obtain the following research results:

First, economic growth has a positive impact on CO2 emissions. The results show that, in the absence of other factors, increased economic growth will increase CO2 emissions into the environment. This result is consistent with the study of Soytaş, U., Sari, R., & Ewing, B. T. (2007) and Salahuddin, M., Gow, J., & Ilgan, O. (2015). This is explained by the fact that in the past time, in order to achieve the goal of rapid economic growth in a short time, countries in the East Asia region have used outdated technologies in production as well as used a lot of fossil energy in the production process and caused air pollution.

Second, foreign direct investment has a negative impact on CO2 emissions. The results show that holding other factors constant, increasing foreign direct investment will reduce CO2 emissions into the environment. This is consistent with the empirical research of Asghari (2013), Ngonadi et al (2020), and Tang, C., Tan, B. (2015). In recent years, the Governments of East Asian countries have made adjustments in policies to attract foreign direct investment. These countries have switched from attracting width to attracting in-depth, prioritizing FDI flows with high science and technology content. That has contributed to improving the production process of enterprises and reducing CO2 in the environment.

Third, renewable energy has a positive impact on CO2 emissions. The results show that holding all other factors constant, an increase in renewable energy consumption will increase CO2 emissions into the environment. This result is consistent with the study of Bilgili et al (2016). In fact, in recent times, East Asian countries have developed renewable energy and used renewable energy in production. However, the development of renewable energy also affects the air environment. Building and assembling wind turbines, for example, requires hundreds of tons of materials – steel, concrete, fiberglass, copper, as well as neodymium and dysprosium used in permanent magnets. All of this activity releases carbon emissions.

4.4. Policy implications

From the above research results, the study proposes a number of policy implications to reduce environmental pollution as follows:

First, efforts to implement green growth goals. Economic growth has a great impact on environmental pollution. To reduce environmental pollution, green growth is a solution that many countries around the world are aiming for. East Asian countries need to move towards green growth through greening industrial production, developing a circular economy in agriculture; implement green consumption and green lifestyle. In which, the government completed the financial policy framework for green growth. Develop a policy framework for national budget allocation and management for the implementation of the Green Growth Strategy. In addition, completing the financial policy framework (including: Taxes, fees, subsidies, funds, sanctions, green criteria, sustainable development for listed companies on the stock exchange) promote the implementation of the Green Growth Strategy; Develop a mechanism to support the private sector in the preparation and implementation of green growth projects.

Second, continue to attract green FDI. East Asian countries need to continue to maintain the policy of attracting FDI in-depth. In particular, implementing preferential policies for investors using advanced production technologies to minimize environmental pollution in the production process. At the same time, to ensure the reduction of environmental pollution in industrial parks and export processing zones, the Government should strengthen the inspection and supervision of waste treatment in these areas. In particular,

the Government needs to develop and promulgate criteria, standards and regulations on exploitation and use of natural resources and environmental protection in attracting and using FDI. Environmental requirements and environmental impact assessments should be given top priority. Upgrading environmental standards to serve as a basis for not accepting projects that do not encourage investment (such as textile dyeing using old technology...). Always ensure the principle of not attracting FDI at all costs; not attract projects that have the risk of destroying natural resources and the environment

Third, develop renewable energy rationally. The important role of renewable energy development to replace fossil energy in production cannot be denied because renewable energy is effective in reducing environmental pollution. However, in the process of developing renewable energy, it is necessary to ensure that the construction and implementation of renewable energy projects and works do not affect CO₂ emissions into the environment. To develop renewable energy, Vietnam needs to apply appropriate mechanisms and policies such as: (i) Apply economic and financial incentives and support policies to promote the development and use renewable energy to solve the problem of shortage of primary energy sources and supply energy to rural areas; (ii) Establish a mechanism and use market measures to attract capital from all economic sectors to develop renewable energy, and at the same time contribute to improving the technical level of renewable energy technology, promote the development of the renewable energy equipment manufacturing industry, constantly improve competitiveness, move towards the renewable energy industry, under the support through government policies, soon achieve large scale for development.

5. CONCLUSION

Air pollution is a top concern of countries in the world in general and countries in East Asia in particular because of the harm it brings to the biological world, people, and economic development in countries. Therefore, understanding the factors affecting air pollution in East Asian countries to propose appropriate solutions for these countries. The research quantifies the impact of economic growth, foreign direct investment, and renewable energy on air pollution. Research results show that economic growth and renewable energy have a positive impact on air pollution; foreign direct investment has a negative impact on air pollution. From the above results, the study has proposed three groups of solutions. However, in order to implement the above solutions, efforts of the Government, businesses, and people are required.

Although the study has achieved certain results, the scope only considers the factors of economic growth, foreign direct investment, and renewable energy affecting air pollution, not other factors such as urbanization level, institutional environment, etc. Besides, another limitation of the study is the number of observations of the model. It can be seen that, for panel data, the number of observations of 09 countries is not an ideal number of observations. Therefore, the next development direction is to analyze more factors affecting air pollution and add the number of research countries.

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ANALYZING THE IMPACT OF CLIMATE CHANGE FACTORS ON VIETNAM FRESH FRUIT EXPORT

Authors: Tran Hanh Quyen¹, Vu Thi Hoa Mai¹, Tran Thanh Thao¹, Pham Thi Lan Anh¹

Mentor: Doan Nguyen Minh¹

Abstract: Despite being highly important, fresh fruit export in Vietnam is exceptionally sensitive to climate related changes and can be negatively influenced by altered environmental factors. This study analyzes the impact of climate changes on Vietnam's fresh fruit export using Auto-regression distributed lag (ARDL) estimator. The results support a negative relationship between elevated temperature and fresh fruit export in both long and short run, while higher CO₂ and precipitation level is associated with larger export volume in the short-run, but show no significant influence in the long run. A set of recommendations is also drawn out based on the regression results

Keywords: Climate change, Fresh fruit export, ARDL estimation, Vietnam

1. INTRODUCTION

Fresh fruit production and export is a vital sector for Vietnam's agriculture industry, with diverse fruits grown in all regions thanks to favorable natural conditions. Vietnam currently exports fruits to over 40 markets, with China being the largest partner, followed by the US, EU, and South Korea. The export of key fruits, including mango, rambutan, coconut, dragon fruit, and pomelo, is showing strong growth, and Vietnam is expanding its export market to countries in Asia, Europe, America, and Africa. (Journal of Science and Technology in Forestry and Agriculture, October 2017).

Natural conditions such as soil, climate, rainfall, and water sources greatly affect the growth and development of crops, impacting productivity, quality, and export supply. Favorable conditions lead to high yields, while unfavorable conditions have negative effects. (Journal of Science and Technology in Forestry and Agriculture, October 2017).

The relationship between climate and trade has long been considered based on the relationship of trade activities that influence the increase or decrease of greenhouse gas emissions as well as the impact of increasing/reducing greenhouse gases on trade activities. Vietnam ranks high in vulnerability to the impacts of climate change and has been selected by the United Nations as a country to conduct typical research on climate change and human development (Vu Huy Hung, 2021).

The impact of climate change on Vietnam's trade will be most evident in sectors such as agricultural exports in general or fresh fruit exports in particular which are highly sensitive to climate change. Export turnover of these industries is at risk of decline due to decreased production volume and tightening regulations on emission standards. (Vu Huy Hung, 2021)

Research dedicated to evaluating the impact of climate change on fresh fruit export in specific country contexts is abundant. However, the differences in estimation methods and data collection often lead to results' heterogeneity. The main objective of this study is to utilize a holistic estimation method based on the ARDL model to assess the relationship between climate change and fresh fruit exports in Vietnam in both the short term and long term. The estimation results then act as a basis for recommendations aiming at harmonizing the relationship between climate change and fresh fruit exports in Vietnam.

¹ Thuongmai University.

2. LITERATURE REVIEW

Environmental pollution and the effects of climate change have caused quite a bit of concern in recent decades, and a lot of research has been conducted to identify the influencing factors and evaluate them. their potential consequences. However, in this study, we limit the research overview to the effects of climate change on agriculture, and especially the effects related to fresh fruits.

Agriculture is one of the most vulnerable sectors to climate change. There has been quite a lot of research done to evaluate impacts of climate change on agricultural production. Based on the time series data from 1984 to 2017, (*Shakeel Ahmad et al., 2020*) highlighted the situation of the agriculture sector of Pakistan and empirically analyzed the short-run and long-run impact of Chinese foreign direct investment, climate change, and CO₂ emissions on agricultural productivity and causality among the variables. The ARDL model and Granger Causality test were employed to find out the long-run, short-run, and causal relationships among the variables of interest. The result showed that climate change and CO₂ emissions have a negative impact on the agricultural growth of Pakistan both in the short-run and long-run. Using the same research method, (*Yasemin Dumrul, Zerrin Kilicarslan, 2017*), (*Mohammed Shuaibu et al., 2020*) also showed different effects of temperature and rainfall on agriculture in Turkey and Nigeria in short and long term.

In addition to the overview studies on agricultural production, many specific agricultural commodities have also been studied on the direct effects of climate change, such as: (*Pervez Zamurrad Janjua, Ghulam Samad, Nazakatullah Khan, 2013*), (*Abbas Ali Chandio, Ilhan Ozturk, Habibullah Magsi, 2019*), (*Abbas Ali Chandio, Korhan K, Gokmenoglu, Fayyaz Ahmad, 2021*), (*Muhammad Nasrullah et al., 2021*), (*Inayatullah Jan, Muhammad Ashfaq, Abbas Ali Chandio, 2021*), (*Abbas Ali Chandio et al., 2022*),...

(*Pervez Zamurrad Janjua, Ghulam Samad, Nazakatullah Khan, 2013*) used the ARDL model and annual data from 1960 to 2009 to evaluate the impact of global climate change on the production of wheat in Pakistan. The results of estimation reveal that global climate change doesn't influence the wheat production in Pakistan. Also studying the effects of climate change on wheat production, (*Abbas Ali Chandio, Korhan K, Gokmenoglu, Fayyaz Ahmad, 2021*) reported that CO₂ emissions and temperature have a negative impact on wheat production in both the long and short term. In contrast, rainfall had a positive effect on wheat production in both cases.

(*Abbas Ali Chandio, Ilhan Ozturk, Habibullah Magsi, 2019*) explored the linkage between CO₂ emissions, average temperature, cultivated area, consumption of fertilizer, and rice production in Pakistan. The annual time series data from 1968 to 2014 were used to enhance the validity of the empirical outcomes. The ARDL bounds testing approach is applied to explore the effects of climate change on rice production. The main fruitful outcomes of this study are that rice production in Pakistan is positively affected by the CO₂ emissions in both long-run and short-run.

(*Inayatullah Jan, Muhammad Ashfaq, Abbas Ali Chandio, 2021*) study investigates the impacts of climate change on yield of selected cereal crops (wheat and maize) in the northern climatic region of Khyber Pakhtunkhwa province of Pakistan for the period 1986–2015. The empirical findings reveal that average precipitation has a significantly positive impact on yield of both crops in long- as well as short-run. The results further reveal that the effect of average minimum temperature on both crops is insignificant in long-run. However, the short-run effect of average minimum temperature is significantly positive on yield of maize crop but insignificant on yield of wheat crop. In long-run, an increase in average maximum temperature negatively affects crop yield. In short-run, however, it positively affects the yield of wheat and maize crops.

In Vietnam, there have been quite a few studies on the effects of climate change on agricultural production. (*Thai Minh Tin, Vu Van Long, Tran Hong Diep and Vo Quang Minh, 2018*) conducted research on the application of multi-criteria analysis in assessing the effects of climate change on agricultural production in the coastal provinces of the Mekong Delta, Vietnam. In the study of the impact of climate change on the productivity of some key agricultural products in the Red River Delta, (*Nguyen Dang Khoa, Nguyen Dinh Bau, 2022*) with OLS estimation with empirical model based on data for the period 2005 - 2020 has examined the impact of temperature and rainfall on the yield of key agricultural products including rice, maize and sweet potato. The results showed that the average annual temperature increase will have a negative effect on maize and sweet potato production, but it won't affect rice yield. Rice production may yield lower yields if the weather is higher than normal when cultivated in the cold months (Winter-Spring crop). On the other hand, the warming of the winter months is beneficial for sweet potato production. The experimental results also show that an increase in average monthly rainfall has a negative effect on rice yield; however, increased rainfall in less rainy months (dry season) is beneficial for maize production.

Besides, there have also been a number of studies on the impact of climate change on agricultural trade. Studying on the effects of climate change on agricultural trade in Central Asia, (*Xiaohua Yu, Hengrong Luo, Hanjie Wang & Jan-Henning Feil, 2020*) used Kazakhstan as an example to empirically analyze the effects of climate change on the grain trade by including them as determinants in the gravity model. The results of the study suggested that climate changes in Kazakhstan, measured by rainfall and temperature, could increase wheat, rice and maize imports, while decreasing wheat exports.

In general, studies in Vietnam and around the world have just only studied the effects of climate change on agricultural products and mainly on agricultural production. Many studies on the export of agricultural products have been published, but very few studies have shown the impact of climate change on this activity, and especially there have been no studies involved in this topic on fresh fruit. Therefore, the research team decided to carry out the study “Research on the effects of climate change on fresh fruit exports in Vietnam” on the basis of inheriting the achievements of previous studies and new findings on this issue in Vietnam.

3. CURRENT SITUATION OF VIETNAM FRESH FRUIT EXPORT TURNOVER AND WEATHER CONDITION

3.1. Current situation of fruit exports in Vietnam

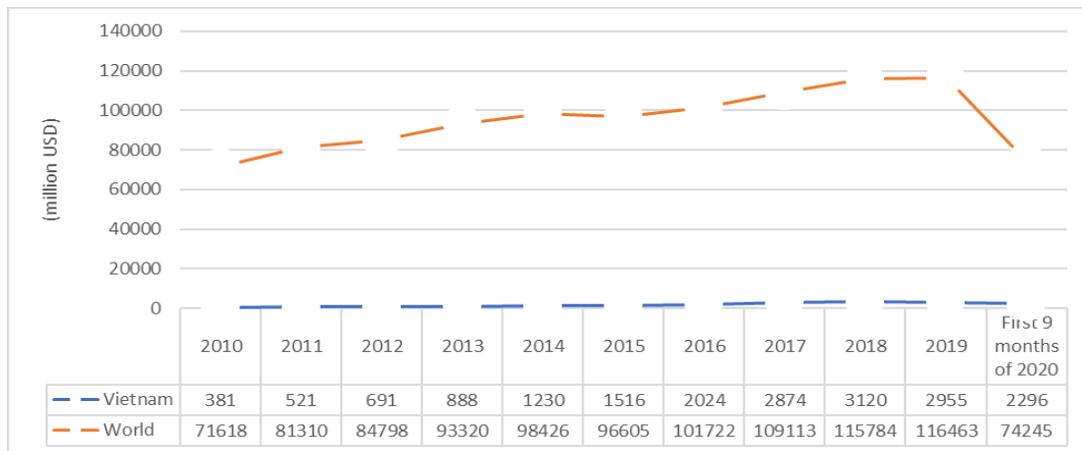
Table 3.1: Vietnam's and world's fruit export turnover.

Year	World (million USD)	Vietnam (million USD)	Proportion of Vietnamese fruit (%)
2010	97.399,5	405,5	0,42
2011	113.349,1	560,7	0,49
2012	117.208,0	746,1	0,64
2013	127.109,8	965,7	0,76
2014	131.777,8	1.340,1	1,02
2015	129.087,9	1.655,1	1,28
2016	134.441,3	2.214,9	1,65
2017	143.785,2	3.151,8	2,19
2018	151.822,7	3.437,1	2,26
2019	150.338,0	3.397,0	2,26
First 9 months of 2020	96.602,7	2.529,0	2,62

Source: Ministry of Agriculture and Rural Development

From 2010 to 2019, the global fruit trade experienced an average annual growth of 5.3%, with Vietnam’s fruit exports accounting for 80% of the total USD 3.26 billion of fruit and vegetable exports in 2020 despite the Covid-19 pandemic’s impact. However, Vietnam’s market share in the world is still small. Fresh fruits have a significantly higher market share than processed fruits in the global fruit export turnover, and Vietnam’s export turnover for fresh fruits is USD 2.3 billion, accounting for 90.8% while processed fruits accounted for USD 0.2 billion, equivalent to 9.2%. (Table 3.2).

Table 3.2: Export turnover of fresh fruits of Vietnam compared to the world



Source: Ministry of Agriculture and Rural Development

Vietnam’s fresh fruit exports exceed the world average at 90.8%. However, their export faces challenges due to Vietnam’s relatively low capacity for preservation and processing and underdeveloped logistics. Fruit exports in Vietnam have potential and prospects, but face difficulties such as product quality management, unstable weather, competition, and insufficient research and development investment. With proper policies, management, and technology, Vietnam’s fruit production can grow strongly, sustainably, and expand further into international markets.

3.2. Current situation of Vietnam’s weather condition

The current situation of temperature change due to climate change in Vietnam

Vietnam has a high average temperature, ranging from 24-25°C. Climate change is causing an increasing trend in the average temperature.



Figure 3.1: Average temperature of Vietnam in the period of 2000-2021

Unit: °C - Source: Trading Economics

The average temperature of Vietnam has fluctuated but shows an increasing trend, with an average temperature of 24.79°C, 0.29°C higher than the temperature standard of 1970-2000, and gradually increasing over the decades

The average temperature across the country is increasing, resulting in prolonged droughts and heatwaves throughout the country. Droughts reduce crop yields, cause water shortages for irrigation, and even pose a risk of desertification, reducing the area available for cultivation and thus reducing the export of fresh fruits.

The current situation of precipitation change due to climate change in Vietnam

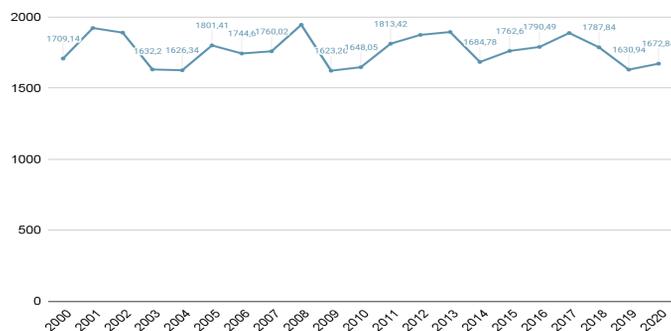


Figure 3.2: Average rainfall in Vietnam in the period of 2000-2021

Unit: mm - Source: WB

The average rainfall in Vietnam has slightly increased over the decades, with irregular fluctuations, averaging 1766.89mm in the period of 2000-2021. However, extreme weather phenomena are becoming increasingly complex, with signs of increasing frequency and scope of impact, as reported in the National Environmental Status Report for 2016-2020. By the end of the 21st century, annual rainfall may increase by about 5% compared to the 1980-1999 average, and sea levels may rise by an additional 75cm, according to the Ministry of Natural Resources and Environment.

Floods and rising sea levels will cause loss of arable land in agriculture. According to the Climate Change Scenarios released in 2020 by the Ministry of Natural Resources and Environment, the average sea level rise for the entire East Sea region by 2050 is projected to be 24 to 28 cm, leading to saltwater intrusion in coastal areas and a reduction in agricultural land area, thereby decreasing the export of fresh fruits from Vietnam.

The current situation of CO2 emission change due to climate change in Vietnam

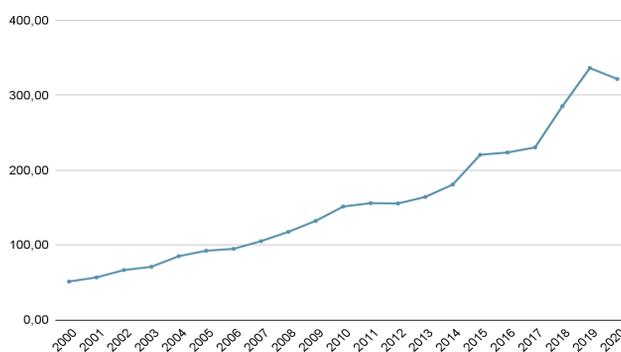


Figure 3.3: Total CO2 emissions of Vietnam in the period of 2000-2020

Unit: million tons - Source: WB

CO₂ emissions in Vietnam have rapidly increased over the years, rising 6.5 times from 51.21 million tons in 2000 to a high of 336.49 million tons in 2019. In the period of 2010-2020, the increase in CO₂ emissions was twice as high as the previous decade. In 2020, the energy sector (including transport activities) accounted for the highest percentage of CO₂ emissions at 62%, followed by the agricultural sector at 18%, the industrial process and product use at 14%, and waste at 5%. (MPI, UNDP, USAID 2022) (Department of Social and Environmental Issues - Ministry of Planning and Investment, 2022).

4. DATA AND ESTIMATION MODEL

4.1. Model

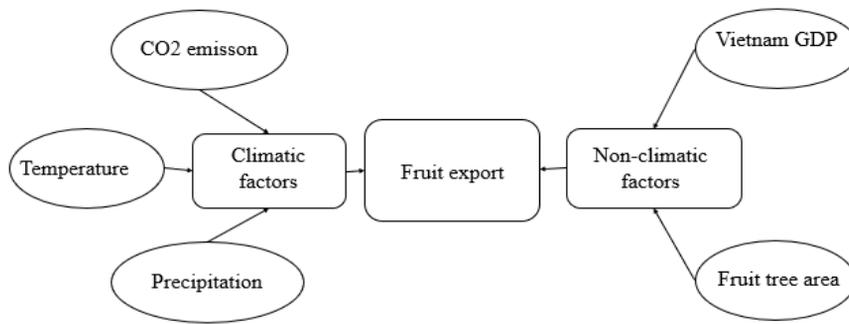
To determine the impact of climate change on fresh fruit export activities in Vietnam, the research team will observe and analyze three weather variables, including CO₂ emissions, temperature, and rainfall, as well as two non-weather variables, Vietnam's GDP and the area of fruit trees in the country. The division of variables into weather-related and non-weather-related ones is inspired by the study "Addressing the Long and Short-Term Impacts of Climate Change on Major Food Crop Production in Turkey" (Abbas Ali Chandio, Korhan K, Gokmenoglu, Fayyaz Ahmad, 2021). This division helps us identify the direct (weather-related) and indirect (non-weather-related) impacts of climate change, thereby providing the most accurate and objective analysis of the effects of climate change on fresh fruit export activities in Vietnam.

Regarding the selection of variables, the research team found that temperature, rainfall, and CO₂ emissions are the factors that directly affect fruit production yields. These variables are fundamental factors for assessing climate change and have been widely used in previous studies. However, the results of these studies have been inconsistent, with the same factor producing different positive and negative outcomes. For example, while a study on the impact of climate change and other factors on rice production in Korea by Muhammad Nasrullah and colleagues (2021) based on variables such as CO₂ emissions, average temperature, and rainfall showed that an increase in CO₂ emissions in Korea could significantly increase rice yields, a 1% increase in average temperature could increase rice yields by 1.16%, and a 1% increase in rainfall could reduce rice yields by 0.13%. In contrast, a study by Abbas Ali Chandio, Korhan K, Gokmenoglu, Fayyaz Ahmad (2021) on the long- and short-term impacts of climate change on major food crop production in Turkey showed that CO₂ emissions had a negative impact on wheat production in both the short and long terms, increased temperatures in Turkey had adverse effects on wheat production, and rainfall had a positive effect on wheat production. Therefore, the research team decided to choose these three variables to analyze and accurately evaluate the impact of climate change on fruit trees in Vietnam.

For non-weather-related variables, the area of fruit trees reflects the degree of environmental response and government policies to fruit production and demonstrates the production yield and export capacity of Vietnam. Vietnam's GDP helps evaluate some aspects of the country's fresh fruit export activities. When a country has a high GDP, it indicates a large production capacity, resulting in more exports. Therefore, selecting Vietnam's GDP is expected to have a positive impact on fresh fruit export activities in the country.

Factors such as drought and saline intrusion were not considered in this study because comprehensive data on these factors have not been collected and analyzed across the country. In addition, the measurement and evaluation methods for these factors are not yet standardized, making it difficult to analyze using the research model chosen by the authors.

This model shows the factors affecting the amount of fruits exports of Vietnam



To find the relationship between the dependent variable and the independent variable, the model is built based on the model of Pervez Zamurrad Janjua, Ghulam Samad, Nazakatullah Khan, (2013) Abbas Ali Chandio, Ilhan Ozturk, Habibullah Magsi, (2019) Shakeel Ahmad et al., (2020), Inayatullah Jan, Muhammad Ashfaq, Abbas Ali Chandio, (2021), Abbas Ali Chandio et al., (2022) as follows:

$$\ln XK_t = \alpha_0 + \beta_1 \ln Ttb_t + \beta_2 \ln Rtb_t + \beta_3 \ln KT_t + \beta_4 \ln DT_t + \beta_5 \ln GDP_t + \vartheta_t \quad (1)$$

In Eq. (1): XK denotes the fresh fruits export, Ttb represents the average annual temperature, Rtb is the average annual precipitation, KT is the total CO₂ emissions, DT is the fruit trees area, GDP stands for the total GDP of Vietnam, α_0 is the constant, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ represent for regression coefficients, t is time ($t = 2000, 2001, \dots, 2021$), and $\vartheta_t \vartheta_t$ is normal white noise.

4.2. Data

The study used yearly time-series data covering the period of 2000 to 2021. This includes data on average annual temperature, average annual rainfall, total CO₂ emissions, Vietnam's total GDP, which are collected from the World Bank organization (World Bank - WB), and the fruit tree area of Vietnam is collected from the General Statistics Office of Vietnam. The export value of fresh fruit products is gathered from Food and Agriculture Organization of the United Nations (FAOSTAT)..

4.3. Estimation method

This study uses Autoregressive Distributed Lag (ARDL) model to estimate the influence of the factors of average annual temperature (Ttb), average annual precipitation (Rtb), total CO₂ emissions (KT), fruit trees area (DT), total real GDP of Vietnam (GDP) to fresh fruit exports (XK) and find out the relationship between them.

The ARDL method proposed by Pesaran & Pesaran (1997) has several advantages. In cases where the sample size is small, this approach is more statistically meaningful than the Johansen cointegration technique for testing for cointegration. It is also suitable for achieving both short- and long-run elasticity in a small sample size and follows the least squares estimation (OLS). Additionally, if the authors cannot ensure the stationarity or non-stationarity properties of the data system, the I(0), I(1), or mutually cointegrated models are suitable for the ARDL procedure in experimental studies. However, it fails when I(2) is present in any variable.

The ARDL cointegration process consists of two steps:

Step 1: Bound test determines cointegration between variables. If the test results show that a merge exists, we move on to step 2. Otherwise, if there is no merge, the process is terminated and the ARDL model cannot be applied.

Step 2: Estimate long-run coefficients and short-run coefficients of ARDL and Error Correction Models (ECM).

For long-term numerical system estimation, we will use the OLS (Least Squares) method to compute the ARDL model on the database that was identified as merged in Step 1. Then, we estimate the system to shorten the time through error correction configuration (ECM). The ECM model helps to measure the rate at which the dependent variables adjust back to long-term equilibrium after each adjustment from the time deviation.

The end result is computational estimation and error correction modeling (ECM) systems, which enable cointegration analysis between variables and measure time and limit effects between them.

After finding out the relationship exists between the variables, the study uses Error Correction Model (ECM) to find the short-term dynamics and built under the following equation:

$$\Delta \ln XK_t = \alpha_0 + \beta_1 \ln Ttb_{t-1} + \beta_2 \ln Rtb_{t-1} + \beta_3 \ln KT_{t-1} + \beta_4 \ln DT_{t-1} + \beta_5 \ln GDP_{t-1} + \sum_{i=1}^p \gamma_i \Delta \ln XK_{t-i} + \sum_{j=0}^q \delta_j \Delta \ln Ttb_{t-i} + \sum_{j=0}^q \theta_j \Delta \ln Rtb_{t-i} + \sum_{j=0}^q \rho_j \Delta \ln KT_{t-i} + \sum_{j=0}^q \mu_j \Delta \ln DT_{t-i} + \sum_{j=0}^q \vartheta_j \Delta \ln GDP_{t-i} + \tau ECM_{t-1} + \varepsilon_t \quad (2)$$

Where: Δ represents the difference, τ is coefficient of ECM_{t-1} , representing the adjustment speed of the parameter, ECM is rate of adjustment to long-run equilibrium after a short-run shock.

5. RESULTS AND DISCUSSION

5.1. Research results

5.1.1. Unit root test

Table 5.1: Results of Augmented Dickey-Fuller

Variable	ADF
ln(XK)	0,8993
ln(XK)	0,0001***
ln(KT)	0,7666
ln(KT)	0.0010***
ln(Ttb)	0,0153
ln(Ttb)	0,0000***
ln(rtb)	0,0024
ln(rtb)	0,0000***
ln(GDP)	0,5886
ln(GDP)	0.0113**
ln(DT)	0,9099
ln(DT)	0.0184**

Source: Author's calculation

Note: This table shows the results of the Dickey Fuller test, the number showing the p-value of the test without the propensity parameter. ***, **, * represent significance at 1%, 5%, and 10%, respectively.

The test results of the enhanced Dickey-Fuller model (ADF) presented in Table 5.1 show that the variables ln(Ttb) and ln(Rtb) remain constant at the data level (I (0)) at significance level 1%. On the other hand, there is no fixed level of output data with factors such as ln(XK), ln(KT), ln(GDP) and ln(DT). However, when testing the stationarity of the data series in the form ln for the variables XK, KT, GDP and DT at the first difference at 5% significance level, the data series are stationary. Therefore, the data series of the variables are suitable for use in this study.

5.1.2. ARDL bound test

Table 5.2: Constraint F test results

Statistics F (Dependent variable: XK)	Level of significance	Important binding value (Pesaran et al., 2001)	
		I(0)	I(1)
20.675***			
	1%	4.29	5.61
	5%	3.23	4.35
	10%	2.72	3.77

Source: Author's calculation

Note: The numbers in parentheses are p-values: ***, **, * represent significance at 1%, 5%, and 10%, respectively.

The presence of cointegration between variables is tested using the binding test method. Accordingly, the results presented in Table 5.2 show that the estimated F-statistic value (20,675) is larger than the critical values of 1%, 5% and 10% respectively. Therefore, the results of the bound F test supported the rejection of the null hypothesis H0 of no co-integration, and at the same time indicated the existence of a long-term relationship between the variables. This implies that there is a cointegration between Vietnam's fresh fruit exports and other key determinants of the model. The existence of cointegration supports the analysis of short-term and long-term relationships of factors affecting fresh fruit exports in Vietnam.

5.1.3. Estimation of long-run and short-run coefficients of related ARDL (Long-run & Short-run)

Table 5.3: Estimated long-term outcomes using the ARDL model

Variable	ln(XK)	P-value	Standard error	t-Statistics
ln(KT)	-7.336**	0.177	4.475	-1.64
ln(Ttb)	-8.740*	0.067	39.543	2.50
ln(GDP)	5.695*	0.098	2.650	2.15
ln(Rtb)	37.380	0.395	41.843	0.89
ln(DT)	21.528	0.244	17.259	1.25
R ²	0.957			
R ² adjust	0.820			

Note: The P-values of the coefficients are reported in parentheses. The numbers in parentheses are p-values: ***, **, * represent significance at 1%, 5%, and 10%, respectively.

The results show that: the variable ln(KT) has a P-value of 0.177 greater than the 0.1 significance level, so the variable ln(KT) has no long-term impact on the variable ln(XK) means that the average emissions has no significant long-term impact on Vietnam's fresh fruit exports. Meanwhile, the other two variables ln(Ttb) and ln(GDP) have P-values of 0.067 and 0.098 respectively, less than 0.1 significance level; and has a positive elasticity coefficient, so the two variables mean annual temperature and total real GDP have a positive impact on fresh fruit exports in the long run with a confidence level of 10%. Surprisingly, variable proxied for rainfall level (Rtb) shows no significant relationship with the dependent variable

The variable ln(Ttb) has a P-value of 0.067 and a positive long-term elasticity coefficient of 98.740 with a confidence level of 10%, meaning that annual mean temperature is positive with the ability to export fruit, that is if the average annual temperature increases by 1%, the ability to export fruit will also increase by

98%. This can be explained that, in the long term, to adapt to changing temperatures, farmers are interested in switching to new production models and application of new varieties that are less affected by the weather. Moreover, when the temperature of the region increases, the demand for fruits to cool down will also increase, leading to an increase in exports in the long term, especially during the peak hot months of summer.

The variable $\ln(\text{GDP})$ has a P-value of 0.098, a long-run elasticity of 5.695 with a significance level of 10%, which means that the average real GDP has a positive effect on the amount of fruit exported, which means that on average, if Vietnam’s total real GDP increases by 1%, the amount of fruit exports will also increase by 5% in the long run. This can be explained by the fact that sustainable economic growth leads to the expansion of overall export capacity. As GDP increases, investments in infrastructure, transportation, and agricultural technology are improved, enhancing the productivity and efficiency of the agricultural sector. This can improve the quality and shelf life of fruits, enabling them to have a higher competitive advantage in the international market, thereby increasing fruit production and exports. Furthermore, over time, as the domestic market expands and stabilizes, exporters can seek opportunities in the international market to generate additional revenue. Exporters can target new markets and establish trade relationships with other countries by negotiating trade agreements with international partners. These trade agreements can help reduce trade barriers and create more favorable conditions for fruit exports. Accessing new markets and strengthening trade relations can expand the volume of fruit exports in the long term.

The variable $\ln(\text{KT})$ has a P-value = 0.177 greater than the 0.1 significance level, so the variable $\ln(\text{KT})$ has no long-term impact on the variable $\ln(\text{XK})$ meaning that the average emissions have no impact in the long run to Vietnam’s fruit exports. Recognizing that CO2 emissions are the main cause of climate change, many countries, including Vietnam, are increasingly aware and better prepared to deal with climate change-related issues. In the long term, Vietnamese businesses can adapt to climate change by adopting modern technologies and changing production methods to reduce environmental impact and enhance sustainability in the industry. For example, the use of automated irrigation systems and soil moisture sensors helps save water and ensure efficient water usage. Wastewater treatment technology can also be applied to treat and reuse wastewater from the fruit production process. The proper use of organic fertilizers, appropriate land and water management practices, and reducing the use of prohibited substances in the production process are other examples of measures that can be taken...

Table 5.4: Short-term results

Variable	Coefficient	P-value	Standard error	t-Statistics
$\ln(\text{KT})$	3.959**	0.013	.930	4.26
$\ln(\text{Ttb})$	-4.921**	0.003	6.747	-6.36
$\ln(\text{GDP})$	-1.954**	0.020	.521	-3.75
$\ln(\text{Rtb})$	2.860*	0.066	1.370	2.09
$\ln(\text{DT})$	1.856	0.191	1.313	1.41

Source: Author’s calculation

*Note: The P-values of the coefficients are reported in parentheses. The numbers in parentheses are p-values: ***, **, * represent significance at 1%, 5%, and 10%, respectively.*

All three variables $\ln(\text{KT})$, $\ln(\text{Ttb})$, $\ln(\text{GDP})$ are significant in the short run because they have a P-value of 0.013; 0.003; 0.020 respectively, which is less than 0.05 significance level. These results can be explained in detail as follows:

Although CO2 emissions are not significant in the long run, for the short-term model it still has a negligible impact. The short-run coefficient of CO2 emissions of 3.959 shows that a 1% increase in emissions on average results in a 3% increase in fruit exports. As international demand for fruits increases,

the production and export of fruits also increase. Strengthening fruit production activities to meet the demand can result in increased use of transportation and industrial processes, leading to increased CO₂ emissions. Therefore, in the short term, CO₂ emissions reflect the growth potential of the industry, and they are synchronized with export turnover.

Although mean annual temperature has a positive effect in the long term (Table 5.3), it has a negative effect on fruit exports in the short term with a short-term coefficient of -42.921. This shows that a 1% increase in the average annual temperature of Vietnam results in a 42% decrease in fruit exports in the short term. In fact, the increased temperature and prolonged heat have a significant effect on the flowering and fruiting of many crops, which not only reduces crop yield but also lowers fruit quality. The quality and design of the fruit do not meet export standards, thereby affecting the source of raw materials for processing and exporting. Moreover, in the short term, producers, especially farmers, have not adapted and responded in time, leading to a decrease in production, leading to a decrease in fruit exports. On the contrary, in the long term, producers research and apply varieties and models that can withstand heat, so the export volume also increases over time.

Similar to the variable $\ln(Ttb)$, the annual average GDP has the same effect in the long run but opposite in the short run with the short-run coefficient of -1.954. This suggests that if average annual GDP increases by 1%, exports fall by 1% in the short run. This can be explained by the fact that in the short term, when GDP increases, it affects the domestic economic conditions and the supply and demand in the domestic market. If the average per capita income is higher, it leads to increased consumer spending, thereby increasing domestic demand. As a result, meeting domestic demand becomes a priority, and the quantity of fruits for export may decrease in the short term. In another sense, short-term GDP growth can lead to an increase in the demand for domestic resources and materials, especially when production needs increase. If this demand cannot be met through domestic production, the country will have to import resources or products from other countries. This can lead to increased production costs and product prices, making the country's products more expensive in the international market and reducing its competitiveness. Additionally, short-term GDP growth can also create disparities among industries within the country. Some industries may develop faster and attract more investment, causing the country's export products to focus on specific items. This has a two-sided impact on the export of fruits in Vietnam, as rapid growth may lead to increased investment but also a decrease in export volume.

5.2. Discussion and recommendation

In short term:

An increase in temperature negatively affects exports in the short term, highlighting the need for solutions to mitigate the impact of climate change. Vietnam's average temperature increase is part of global warming, which requires collective efforts from all countries to reduce. However, the Vietnamese government can also implement policies as follows to address this issue.

First, encourage the use of clean and renewable energy. This not only helps to mitigate the temperature increase due to climate change but also helps to reduce production costs and mitigate the impact of climate change. The Vietnamese government has policies to prioritize the use of clean energy, but it is still limited in some farming areas due to investment costs and a lack of skilled labor.

Second, efficient energy usage is key for sustainable agriculture and fruit production. Advanced technologies such as drip irrigation, monitoring devices, and automatic control can minimize water usage and increase productivity. The Vietnamese government has set requirements for sustainable agriculture, but it requires closer coordination from businesses and farmers, as well as investment in new technologies to save and use water more effectively.

Third, recycling waste in agricultural and fruit production. Recycling organic waste from fruit production can produce natural fertilizers and energy, as well as other useful products like paper, packaging, and building materials. Although many farmers use this method to reduce waste and use resources sustainably, it is currently small-scale and self-initiated, and has not yet produced significant results. Businesses and governments need to invest in research to standardize and replicate these agricultural waste recycling models on a larger scale.

In long term:

Rising temperatures negatively affect short-term fruit exports due to their impact on crop quality and productivity. However, the results suggest that in the long term, fruit exports may increase due to adaptation, change, and innovation by the government, businesses, and people.

First, research new high-quality crop varieties with good adaptability to harsh natural conditions. In fact, many new crop varieties have been researched and tested in Vietnam. This has resulted in promising economic benefits, but challenges remain, including small-scale and scattered research efforts, inadequate infrastructure and technical services, and a lack of irrigation and cold storage facilities in some areas. Therefore, the government and businesses need to invest more in physical infrastructure during the research and application process, as well as collaborate with more developed countries in this field.

Second, applying scientific and technical advancements to agricultural production in Vietnam can improve productivity and quality. Businesses can learn from techniques used in developed countries but must also adapt them to suit local conditions. Many businesses have successfully implemented VietGAP standard intensive farming processes for various crops and utilized modern equipment and machinery to increase productivity and quality. However, the application of scientific and technological advancements to agricultural production in Vietnam is still primarily small-scale, and few agricultural businesses use high technology in their production. As a result, the quantity and quality of agricultural products produced are insufficient for competing in demanding markets. The government needs to have investment policies and incentives in this field, while businesses must cooperate and exchange experiences to develop sustainably together.

In addition, the results showed that GDP growth leads to long-term export increase. Thus, the government and businesses should enhance production and increase value-added in agriculture to contribute to GDP growth.

First, investment in infrastructure. This includes investment in agricultural infrastructure like irrigation, power systems, internal transport routes, and warehouses, which can transform agricultural production towards intensive cultivation and attract businesses to invest in agriculture. This can enhance transportation and production capabilities, facilitating the export of agricultural products and increasing GDP.

Second, encourage technology, capital, and labor transfer. This measure is crucial for enhancing Vietnam's fruit production and export capacity and strengthening its competitiveness and economic development. However, Vietnam faces challenges in this area, including unfavorable investment policies and administrative procedures that hinder investment and technology transfer, as well as a shortage of skilled labor in agriculture. The government needs to have effective policies to address these issues.

6. CONCLUSION

This study focuses on assessing the relationship between climate change and fresh fruit exports in Vietnam. Research data is time series data for the period 2000 - 2021 collected through the Statistical Yearbook of the General Statistics Office of Vietnam and the World Bank.

Analysis of fresh fruit export status, climate change issues and factors related to climate change affecting fresh fruit export in Vietnam. Studying and quantifying climate change factors affecting Vietnam's fresh fruit exports through the ARDL lagged autoregressive model proposed by Pesaran et al (2001).

The contour tests, ARDL tests and ECM tests show that mean emissions have no significant long-term impact on Vietnam's fresh fruit exports, and mean temperature and real GDP have an impact positive effect on fresh fruit exports in the long run. While CO₂ emissions are not significant in the long run, the short-term model does. Both annual average temperature and average annual GDP have a negative impact on fresh fruit exports in the short term, and a positive impact on the long term.

Finally, on that basis, the thesis offers solutions and recommendations to the Government, business and farmer in short term as well as long term based on the important policy implications of the variables in order to minimize the effects of climate change on fresh fruit exports. Vietnam. This study will continue to develop more extensive follow-up studies by adding to the empirical model other macroeconomic factors such as methane (CH₄), sea level rise and possible industrialization. exists a relationship with Vietnam's fresh fruit exports in both the short and long term.

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RESEARCH THE IMPACT OF FREE TRADE AGREEMENTS (FTAS) ON EXPORT OF VIETNAMESE GOODS

Author: Pham Phuong Anh¹, Bui Thu Trang¹, Le Khanh Thao Chi¹, Pham Hoai Linh¹

Mentor: Doan Nguyễn Minh¹

Abstract: *The theory of international trade suggests that free trade agreements promote trade through the removal of tariff and non-tariff barriers, as well as creating a transparent foundation for trade through regulations on labor, investment, and intellectual property. However, practical studies show that the overlap and complexity of free trade agreements can also nullify the positive effects of these agreements or even bring about contradictory effects. Therefore, this article examines the impact of free trade agreements (FTAs) on the export of Vietnamese goods on the basis of data in the period from 2011 to 2021 based on the use of gravity model and PPML maximum estimation method to have a basis for proposing some solutions to improve Vietnam's export competitiveness. The results of the research show that the disproportionality in the impact of free trade agreements, while the agreements between ASEAN and Japan, Australia, New Zealand as well as the Vietnam Chile Agreement, the Trans-Pacific Progressive Agreement (CPTPP) have a positive impact on Vietnam's exports, the remaining agreements have no impact or negative impact on exports.*

Keywords: *FTAs, Vietnam Export*

1. INTRODUCTION

According to the World Trade Organization (WTO), more than 200 free trade agreements are now in effect, and Vietnam has signed 15 FTAs thus far. Vietnam is also one of the few nations in the Asia-Pacific region to have implemented three new-generation FTAs. It demonstrates that Vietnam is actively interacting more with other economies to present chances to increase competitiveness, foster economic development, and enhance people's lives.

Moreover, the data changes every year and is based on fluctuations in the world, along with the establishment of new FTAs as well as the increasingly complete old FTAs, leading to the impact of FTAs on exports of countries that are always up to date. As a result, ongoing research into the effects of free trade agreements is necessary because it is always changing.

In particular, FTAs are believed to have a positive impact such as according to the articles "Participation in FTAs brings many positive impacts to the Vietnamese economy (Ministry of Industry and Trade of the Socialist Republic of Vietnam 9/2020), New-generation free trade agreements (FTAs) to facilitate the development of production and business activities (Ministry of Industry and Trade of the Socialist Republic of Vietnam 1/2022) or Market expansion from FTA free trade agreements (VTV News 11/2022). However, many researchers think that overlapping FTAs can cause complexity, leading to businesses having difficulties in using or using inefficiently as well as not taking advantage of tariff incentives from FTAs. In addition, Vietnam is still dependent on traditional markets in the short term despite signing FTAs with numerous partners, or for agreements: the EVFTA, CPTPP, RCEP... Vietnamese businesses will focus on doing business primarily with big markets while less interested in the small market. From there, the FTA has the opposite effect or no impact. Therefore, further research is needed to assess the impact of free trade agreements on the economy to promptly propose solutions to promote the advantages brought by FTAs as well as to recognize the negative aspects to take appropriate preventive and remedial measures.

¹ Thuong Mai University.

Stemming from the urgency of the above issue, the research team decided to learn about the topic “Research the impact of free trade agreements on the export of Vietnamese goods”. The article uses statistics and data of the General Statistics Office, Worldbank, Database System of Industry and Trade to analyze and describe the situation of goods exports of Vietnam in recent years under the impact of FTAs. In addition, the research uses gravity models, the maximum PPML estimation method and data related to trade relations between Vietnam and 40 partner countries between 2010 and 2021 from data of the World Bank, Trademap, CEPII - GeoDist, WTO – RTA database... to assess the impact of FTAs on Vietnam’s goods exports. Based on the situation of Vietnam’s goods exports and the results of using the gravity model to assess the impact of free trade agreements, the group will make recommendations to help Vietnam make the most of its opportunities when participating in and signing such free trade agreements in the coming time.

2. OVERVIEW OF RESEARCH ON THE IMPACT OF FTAS

2.1. Relevant foreign studies on the impact of Free Trade Agreements (FTAs) on trade

Given the importance of free trade agreements, a significant number of studies have employed different methods to assess the impact of FTAs on international trade flows. Nguyen Thi Anh’s research (2020) used qualitative analysis to evaluate the impact of FTAs on international trade. By collecting and analyzing data, this research explored the factors and trends related to the impact of FTAs on international trade. Furthermore, there are comprehensive studies that use meta-analysis to synthesize findings from previous studies regarding the impact of FTAs on international trade, such as Smith’s research (2018). Although these studies do not directly address Vietnam’s goods exports in a specific period, they provide an overview of the impact of FTAs on international trade that can be applied to understand the impact of FTAs on Vietnam’s exports. However, these studies only indicate the general trends between FTAs and trade flows without fully estimating the direction and intensity of the impact of FTAs on trade flows.

To address this issue, several studies have applied estimation models to more accurately assess the impact of FTAs on international trade.

Prominently, Anderson and van Wincoop (2003) used the Gravity model to estimate the impact of FTAs on international trade flows and concluded that FTAs have a positive and significant effect. Baier and Bergstrand (2007) also applied the Gravity model and found that FTAs indeed enhance international trade among agreement members. Additionally, Fontagné and Freudenberg (2006) analyzed the vertical and horizontal components of trade in international trade relationships, providing an overview of the impact of FTAs on structural changes and trade flow directions. By combining these results, we can gain a better understanding of the impact of FTAs on exports and international trade. However, these studies only reveal general trends and have not estimated the specific intensity and direction of the impact of FTAs on trade flows.

2.2. Relevant research on the impact of FTAs on Vietnam’s exports

The research conducted by Tran Van Binh (2019) and the research by Le Quang Tien (2019) both focus on the impact of FTAs on Vietnam’s exports. While Tran Van Binh’s research utilizes a case study approach, Le Quang Tien’s research employs the Gravity model. Both studies use export data and economic indicators to measure the impact of FTAs on Vietnam’s export value and market share. The combination of the case study approach and the Gravity model provides a multidimensional view of the impact of FTAs on Vietnam’s exports, from understanding the specific impacts on the export structure to evaluating the overall value and market share of exports.

The studies by Nguyen Minh Quang and Nguyen Thi Hien also focus on the impact of FTAs on Vietnam's exports; however, they concentrate on different aspects of exports. Nguyen Minh Quang's research (2016) focuses on the impact of FTAs on Vietnam's export competitiveness. This research uses linear regression and evaluates the impact of FTAs on important factors such as product quality, technology, price, and delivery time. Additionally, the research provides proposals to enhance Vietnam's export competitiveness. On the other hand, Nguyen Thi Hien's study (2018) focuses on the impact of FTAs on Vietnam's export diversification. Using export data from 2000 to 2016 and employing linear regression, this research measures the impact of FTAs on the diversification of Vietnam's export products and identifies important factors influencing the diversification process.

There does not seem to be any research that comprehensively studies the impact of all FTAs on Vietnam's exports. This creates a research gap that needs to be addressed. Therefore, this article proposes the use of the gravity model to estimate the impact of FTA agreements on Vietnam's export value and provide recommendations for enhancing the competitiveness of Vietnamese businesses. By applying the gravity model, this research can provide detailed information on the impact of FTA agreements on Vietnam's export value. The gravity model allows for analyzing the interactions between economies in a global system, thereby assessing the benefits and impacts of FTAs on Vietnam's export sector. The results of the research will provide valuable information for government and businesses in strategic orientation and development planning regarding FTA information. Additionally, regulatory agencies and relevant organizations can utilize the research findings to construct supportive policies and further develop other FTAs, thereby increasing competitiveness in the domestic export market.

3. THE SITUATION OF GOODS EXPORT OF VIETNAM IN RECENT YEARS UNDER THE IMPACT OF FTAS

3.1. Status of signing and participating in FTAs of Vietnam until the end of 2021

Up to now, Vietnam has officially joined and signed 14 FTAs and currently 2 FTAs are in the process of negotiation. The fact that Vietnam has successfully negotiated and signed many FTAs with bilateral and multilateral trading partners has created many opportunities for economic growth and market diversification. Exporters and importers create jobs and raise incomes for domestic workers. Specifically, there are 3 FTAs bilateral agreement was signed Vietnam - Japan Economic Partnership Agreement (VJEPA - effective 2009), Vietnam - Chile Free Trade Agreement (VCFTA - effective 2014), Vietnam Free Trade Agreement - Korea (VKFTA - 2015); 6 multilateral FTAs include ASEAN Free Trade Area (AFTA - 1993), ASEAN - China Free Trade Agreement (ACFTA - 2003), ASEAN - Korea Free Trade Agreement (AKFTA - 2007), Economic Partnership Agreement the ASEAN - Japan Comprehensive Economic Partnership (AJCEP - 2008), the ASEAN - India Free Trade Agreement (AIFTA - 2010), the ASEAN - Australia and New Zealand Free Trade Agreement (AANZFTA -2010); and 5 FTAs are considered as new generation FTAs including: Free Trade Agreement of Vietnam - Eurasian Economic Union (VN-EAEU FTA -2016), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP - 2019), ASEAN Free Trade Agreement and Hong Kong (China) (AHKFTA - 2019), Vietnam - European Union Free Trade Agreement (EVFTA - 2020), Vietnam - UK Free Trade Agreement (UKVFTA - 2021).

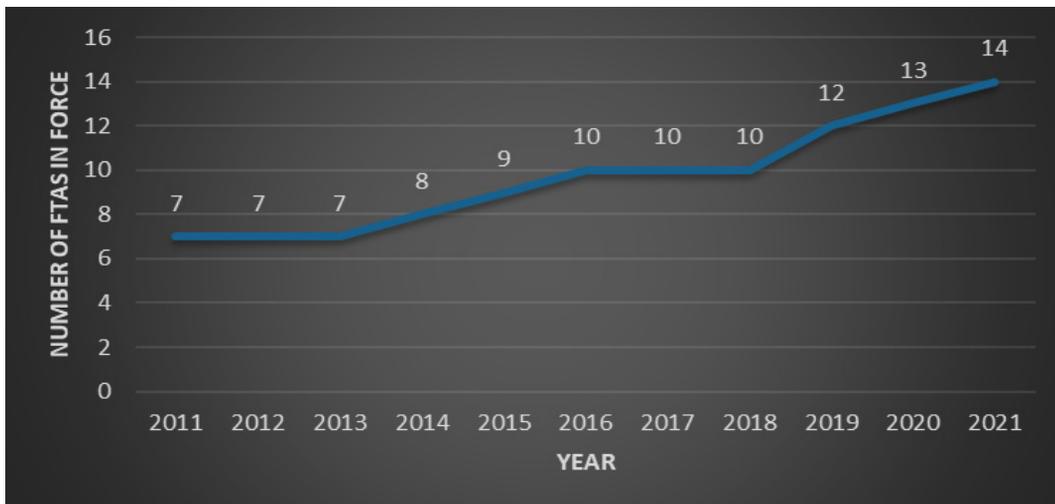


Chart 1. Number of effective FTAs that Vietnam has signed by year period 2011 - 2021

Source: VCCI

- **The FTAs Vietnam is negotiating include:**

The Free Trade Agreement between Vietnam and the EFTA (VN-EFTA FTA) (including 4 countries Switzerland, Norway, Iceland, and Liechtenstein) started negotiating in May 2012. Currently, this FTA is still in the negotiation process.

Free Trade Agreement between Vietnam and Israel (VIFTA): was started to negotiate on December 2, 2015, currently this FTA is still in the negotiation process.

Thus, countries that share many trade agreements with Vietnam can be mentioned as China, Japan, Korea, Chile, Australia, New Zealand, Brunei, Singapore and Malaysia.

3.2. Current status of export turnover of Vietnam

- **Exports**

In the period 2010 - 2021, Vietnam’s export turnover continuously increased. This trend coincides with the trend when participating in the free trade agreements of Vietnam. Statistics show that Vietnam’s total export turnover has increased from 72.24 billion USD in 2010 to 335.79 billion USD in 2021. Accordingly, export turnover is 4.65 times higher after 11 years. On average, during the whole period, Vietnam’s export turnover reached about 187.1 billion USD/year.

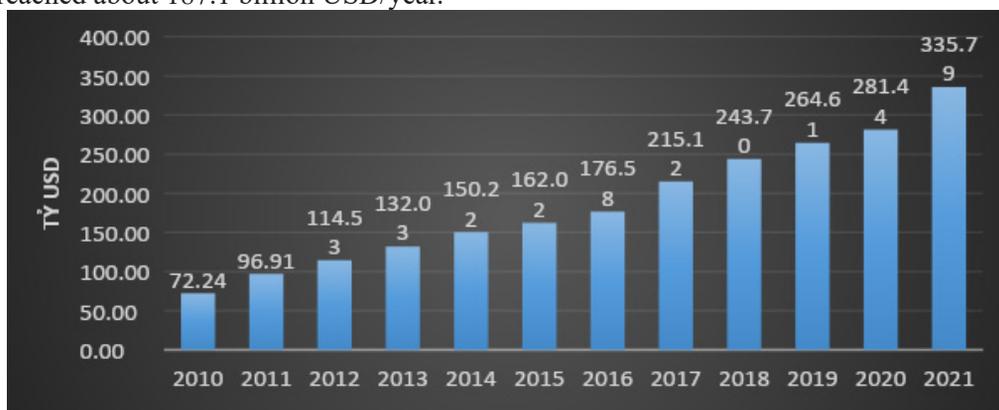


Chart 2. Export turnover of Vietnam over each year in the period 2010 - 2021

Source: Trademap

In terms of growth rate, export growth in the 2010-2021 period averaged 16.2 %/year. In recent years, the export of goods has changed markedly in terms of quality, reflected in the restructuring of export goods. Accordingly, the structure of goods has a positive shift among commodity groups and is directed toward the core of industrialization. Specifically, at present, the industrial goods group accounts for over 80%; followed by the group of agricultural products and aquatic products accounting for over 10% and the group of fuels and minerals accounted for just over 1% of total export turnover.

The proportion of Vietnam's exports through major export markets (US, China, Japan, South Korea) has generally grown markedly with the active participation and signing of bilateral and multilateral agreements. The US remained Vietnam's largest export partner between 2010 and 2021.

In 2010, the ASEAN Trade in Goods Agreement (ATIGA) took effect, bringing intra-regional trade relations to a new stage. In the period 2010 - 2021, exports between Vietnam and ASEAN countries have grown significantly, from 12.35 billion USD in 2010 to 86.33 billion USD in 2021, increasing 7 times. Free trade agreements in ASEAN also play an important role in this achievement. However, this agreement also brings certain difficulties, especially in the issue of competition for "unfair" goods. Specifically, for agricultural products, from 2018 to now, the domestic sugar industry has been under great pressure when Thai businesses have dumped, smuggled and cheated. Facing the above situation, the Ministry of Industry and Trade has imposed an anti-dumping tax on this item. WOMENIn general, the reduction of 1,706 tariff lines to 0% by 2015 of this agreement will affect the increase of import turnover and the trend of increasing import movement from ASEAN countries compared to other partners, while export turnover does not have many opportunities to increase dramatically under the impact of tariff liberalization because ASEAN 6 countries have completely cut tariffs for Vietnam to 0% since 2010.

In the EU market, in the 2010 period, exports to the EU were estimated at 9.73 billion USD, up 17.8% compared to 2009. This number increased gradually over the years and especially showed signs of a slight decrease in the period 2018 - 2020. This is explained because at this stage, Vietnam has to face a yellow card with our country's seafood industry, as well as the impact of the covid 19 pandemic. In 2020, the EVFTA agreement will come into force with many aspects. Vietnam's exports recorded impressive growth in the EU market (such as iron and steel by 73.9%; cameras, camcorders and components by 260%; machinery and equipment by 82.3%...). Some new products also have high growth to the EU market during this period such as rice, bamboo and rattan products, carpet sedge (increased by over 50%); ceramic and porcelain products (increased by over 25%); a group of vegetables and fruits, electrical wires and cables (increased by more than 15%)...

So, after joining new-generation free trade agreements such as CPTPP, AHKFTA, UKVFTA, EVFTA, Vietnam's export turnover has grown significantly, exports have been significantly higher than in previous years in markets where Vietnam has signed FTAs.

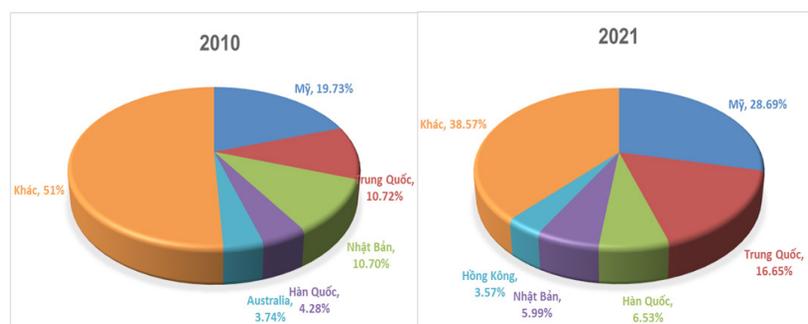


Chart 3. Structure of exporting countries in 2010 and 2021.

Source: Trademap

4. RESEARCH METHOD

4.1. Research model

Introduced in the 1960s, the gravity model has gradually become a useful tool for estimating, explaining and evaluating issues related to international trade. In the course of the history of research, gravity models have been developed both theoretically and practically applying very popular estimation. The traditional gravity model can be expressed by the following equation:

$$X_{ij} = \frac{Y_i E_j}{d_{ij}^2}$$

Where X_{ij} represents the volume of trade or labor flow between i and j , Y_i is the total value of manufactured goods of i , E_j is the total demand of country j for goods or labor, and d_{ij} is the geographical distance between two countries i and j .

The more complete of the above model is the structural gravity model. This model has provided a solution to the problem of multilateral trade barriers, and gradually became a popular tool in the analysis, evaluation and policy of trade in the multinational international trade environment. Therefore, in order to assess the impact in a complete way as well as increase the reliability of the estimation results, the research team will use a structural gravity model to assess the impact of FTAs on Vietnam's commodity exports. Specifically, use a model with a linear log form as follows:

$$\ln PX_{VN,j} = \beta_0 + \beta_1 \ln GDP_{jt} + \beta_2 \ln GDP_{VN,t} + \beta_3 \ln(IMP_{VN,j}) + \beta_4 \ln(DIST_{VN,j}) + \beta_5 \text{Contig}_{VN,j,t} + \beta_6 \text{FTA}_{VN,j,t} + \varepsilon_{VN,j,t}$$

In which $PX_{VN,j}$ is the value of the commodity flow from Vietnam to importing country j ; GDP_{VN} and GDP_j are the nominal gross domestic product of Vietnam and the partner country j represents the trade index, $IMP_{VN,j}$ is the value of the flow of goods exchanged to the country importing Vietnam from the country exporting j ; $DIST_{VN,j}$ is the economic center distance between the two countries of Vietnam and j ; $\text{Contig}_{VN,j}$ is a binary variable value that will be equal to 1 if Vietnam and j share the same border and vice versa is zero. These are all common variables and are often used in modeling.

$\text{FTA}_{VN,j}$ is a vector consisting of a set of dummy variables representing a binary variable value that will be equal to 1 if Vietnam and j share a free agreement and vice versa equal to 0. FTAs (15 fake variables including AFTA, ACFTA, AKFTA, AJCEP, VJEP, AIFTA, AANZFTA, VCFTA, VKFTA, VN-EAEU FTA, CPTPP, AHKFTA, EVFTA, RCEP, UKVFTA) have an impact on Vietnam's exports. This is a mandatory key variable in the model because the research paper focuses on the impact of FTAs on Vietnam's commodity exports; e is the natural logarithmic base; ij is assumed to be the standard distribution error term.

4.2. Maximum Likelihood Poisson Pseudo-Maximum Likelihood (PPML) Estimation Method

PPML model was recommended by Silva, Tereyro (2006) where the dependent variable of the gravity model will be transformed into a phi log function. Specifically, the gravity model equation estimated using PPML takes the form:

$$X_{VN,j,t} = \ln GDP_{jt} + \ln GDP_{VN,t} + (1 - \sigma) \ln t_{VN,j,t} - (1 - \sigma) \ln - (1 - \sigma) \ln + \varepsilon_{VN,j,t}$$

Using PPML to estimate commercial data has the following benefits:

Firstly, PPML provides consistent and efficient results when the model has the appearance of price variables that exhibit fixed effects. The above characteristic is of high importance when gravity models based on the theoretical background of trade often must have the appearance of variables that represent the fixed impact of importers and exporters (Shepherd, 2012).

Secondly PPML automatically considers the points of observation when the trade flow is zero, this feature of PPML allows these data to be considered without having to be removed or replaced as in OLS estimation. Thus, allowing commercial data to be estimated without the problem of selection bias.

Thirdly, PPML estimation allows the result to be estimated in the form of elasticity (percentage change), although the independent variable of the PPML-estimated gravity model will be in the non-log function $X_{VNj,t}$, but the results of the gravity model will still be analyzed in the form of elasticity, making it easier to identify the research results.

Finally, PPML estimation solves the problem of variance changes appearing in commercial data.

4.3. Research data

Data used in the model include Vietnam's export and import turnover to 40 countries collected from the World Integrated Trade Solution data source of the World Bank (World Bank) and Trade map, Data on the gross domestic product (GDP) collected from the World Development Indicator database of the World Bank (World Bank). The distance variable between the two countries, DIST is defined as the physical distance from the capital both VN to country j and the data collected from the GeoDist database is calculated and provided by CEPII. The Contig common border variable also has data collected from the GeoDist database calculated and powered by CEPII. Data on trade relations between Vietnam and partner countries through free trade agreements are obtained from the WTO RTA database.

5. ASSESS THE IMPACT OF FTAS ON VIETNAM'S COMMODITY EXPORTS.

5.1. Research results

Lnexp	Robust	
	Coefficient	P-value
Lndist	-0.129	0.000
Lnimp	0.018	0.044
lrgdp1	0.304	0.000
lrgdp2	0.398	0.000
Contig	0.371	0.000
ACFTA	-0.591	0.000
AKFTA	-0.028	0.303
AJCEP	0.767	0.000
VJEPA	-0.927	0.000
AIFTA	-0.187	0.000
AANZFETA	0.055	0.006
VCFTA	0.262	0.000
VKFTA	0.002	0.872
VNEAEUFTA	-0.169	0.005
CPTPP	0.039	0.047
AHKFTA	-0.032	0.303
EVFTA	0.004	0.881
UKVFTA	-0.038	0.026

Table 1: Evaluate impact of factors on Viet Nam's export turnover.

Observing 18 variables which affect Vietnam's export in the 2010 – 2021 period. The research paper divides variables into 4 main groups. The first group includes control variables, namely: Lndist, Lnimp, lrgdp1, lrgdp2, Contig. The second group consists of bilateral free trade agreements which are VJEPA, VCFTA, VKFTA. The third group comprises multilateral free trade agreements ASEAN+, including: AFTA,

ACFTA, AKFTA, AJCEP, AIFTA, AANZFTA. And the last group involves new generation agreements, namely: VNEAEUFTA, CPTPP, AHKFTA, EVFTA, RCEP, UKVFTA.

The study shows that there are 4 variables which are not statistically significant. They are AKFTA, VKFTA, AHKFTA, EVFTA. There are 6 negative variables, including: Indist, ACFTA, VJEP, AIFTA, VNEAEUFTA, UKVFTA and 8 positive variables, namely: lnimp, lrgdp1, lrgdp2, Contig, AJCEP, AANZFTA, VCFTA, CPTPP.

The ASEAN Free Trade Area – AFTA is eliminated because the multicollinearity happens between AFTA and ASEAN+ FTAs. Moreover, RCEP - Regional Comprehensive Economic Partnership Agreement is also excluded from the study due to its entry into force on January 1, 2022 while the study focuses only on the impact of trade agreements on Vietnam's exports in the period 2010 - 2021.

5.2. Discussion

True to the gravity model theory, the variable distance has an inverse effect on Vietnam's exports, implying that means the longer the distance is, the lower the export turnover achieves. Specifically, the distance between Vietnam and partner markets increases by 1 kilometer, Vietnam's exports to that market decrease by -0.13%. According to World Bank data in 2020, the East Asia and Pacific market includes countries such as China, South Korea, and Japan,... accounting for 44.4% - This is the region with the largest export market share of Vietnam while further afield such as Latin America and the Caribbean accounts for 2.86% or the Middle East and North Africa accounts for only 2.34% of Vietnam's export turnover.

Meanwhile, the growth of import turnover positively affects Vietnam's export turnover. When import turnover increases by 1%, export turnover will increase by 0.018% due to Vietnam's outsourcing export structure. According to the Economic Investigation of the General Statistics Office of Vietnam, the whole country has 1740 enterprises carrying out processing goods activities with foreign countries and the export turnover of goods after processing accounts for more than 18% of the total export turnover of goods.

Additionally, Vietnam's total domestic product and the total domestic product of partner countries bring positive impacts on Vietnam's exports in tandem. In detail, Viet Nam's GDP grows 1% leads to 0.31% growth of its own export turnover while the GDP of partner countries increases by 1% sort to the 0.4% increase of Viet Nam's export turnover. These are happened because the augmentation of partner countries' GDP rises foreign purchasing demand while the growth of Viet Nam's GDP strengthens supply capacity. The demand meets supply ability that motivates the increase of Viet Nam's export. When the huge import demand meets the ability to supply large export goods, it will promote each other and directly affect Vietnam's export turnover.

The geographical border between Viet Nam and partner countries promotes Viet Nam's export to this country 1.88 times more than other geographical non – border countries. This is explained by the fact that Vietnam and neighboring countries mainly exchange goods based on road transport, while road infrastructure between countries are well-invested as well as customs clearance is quite convenient. Moreover, Vietnam's partnerships with bordering countries are based almost exclusively on the goals of peace, stability, cooperation and development. Such as the Association of Southeast Asian Nations - ASEAN and the ASEAN Economic Community - AEC, the friendly cooperation between Vietnam and China, the friendship between Vietnam and Laos,....

Through the VCFTA, Vietnam's exports to Chile increased by 0.22%. Chile is committed to a greater degree of openness to Vietnamese goods. Accordingly, 83.54% of the total tariff lines will be eliminated as soon as the Agreement comes into effect, accounting for 81.8% of Vietnam's export turnover to Chile

in 2007, this commitment determines that by 2029, Chile will eliminate most of the flows from Vietnam, accounting for 99.62% of the tariff and equivalent to 100% of Vietnam's export turnover to Chile in 2007. VCFTA is one of the new, comprehensive FTAs, with a highly broad cooperation framework but also very flexible in cases, facilitating bilateral trade. Beside that, Chile is a potential export market for Vietnam and a hinge to expand Vietnam's product exports to the South American market.

Prior to VJEPA, economic relations between the two countries were implemented on the legal basis of the AJCEP signed in 2008. VJEPA was signed to enhance trade exchanges between the two countries based on VJEPA's tariff-free commitments to diversify items, especially Vietnamese exports. Specifically, in the mentioned commitment, Japan will eliminate tariffs for 96.45% of total tariff lines in the Tariff for Vietnamese goods by the end of the roadmap 2026. However, the VJEPA has a negative impact on Vietnam's exports because the duplication of the same trading partner in the two agreements, making it difficult to choose to apply a suitable one. Moreover, Japan is an extreme strict market, goods exported to this market are strictly controlled, so if Vietnamese goods do not meet the requirements, they will be refused import and circulated in the Japanese commodity market.

Before signing VKFTA, Vietnam and South Korea had trade cooperation through the AKFTA. In order to bring into full play the potential of trade and investment exchanges, Vietnam and Korea continue to sign bilateral free trade agreements and officially implement them from 12/2015. Established after 8 years, VKFTA offers more incentives in both the fields of goods, services and investment. However, according to experts at the "Seminar on the application of the Vietnam – Korea Free Trade Agreement", Vietnamese enterprises have not yet taken advantages of incentives to boost exports to the Korean market. Specifically, the proportion of enterprises using C/O to take incentives from VKFTA is only 15%. In addition, it is also impossible to eliminate external factors such as the Covid epidemic, supply chain disruptions,... Therefore, the impact of VKFTA had no meaning to Vietnam's exports in this study.

The ACFTA between ASEAN and China has a negative impact on Vietnam's exports with a coefficient of -0.59. In essence, ACFTA is an old agreement with low quality, rigid regulations on C/O origin for enterprises. In addition, the market between Vietnam and China has many similarities, so although ACFTA has also made changes to make the agreement more comprehensive, the reduction of trade tariffs, the removal of tariff barriers caused Chinese goods to flood into the ASEAN market or more specifically, the Vietnamese market created trade competition between products of Chinese enterprises and Vietnamese enterprises. Currently, China is the largest trading partner but also the market where Vietnam has the biggest trade deficit.

In term of AIFTA, Vietnam's export turnover to India is -0.19%. According to commitments in the agreement, many advantageous export items of Vietnam are on India's sensitive list, which means there is a slow tariff reduction roadmap, such as textiles and garments, footwear, plastic products, machinery, equipment and spare parts. There are some items such as seafood, vegetables, processed foods, textile products, means of transportation... again in the exclusion category, i.e. India has not committed to reducing taxes. In addition, when we open under the Agreement, because our export structure and India have many similarities, there will be many goods, industries or sectors that have to compete with imports, many businesses have to reduce production or dissolve due to incompeteability.

AANZFTA is the most comprehensive free trade agreement that ASEAN has signed with dialogue partners, expanding deeply with the goal of comprehensive integration of 12 economies, so the increasingly diversified products, the expanded cooperation and investment framework has a direct impact on Vietnam's ability to export goods to the Australian market and New Zealand. The multilateral agreement between

Australia, New Zealand and ASEAN is shown on the statistical table with a favorable impact and boosts Vietnam's export turnover to Oceania 2.56 times more than other countries.

Japan is one of Vietnam's most important and long-standing partners. While the VJEPA variable has a negative impact, AJCEP has a positive impact with coefficient of 0.767 because compared to VJEPA, AJCEP has more favorable rules of origin for Vietnamese enterprises to access to the Japanese market and the application of the agreement will be based on export needs to take advantage of tax incentives or take advantage of preferential origin of Business.

The AKFTA agreement has no impact on Vietnam's exports. The reason is the proportion of enterprises taking advantage of incentives from AKFTAs is still very limited, causing the trade balance with export value to increasingly tilt in favor of Korea. In addition, Korea protects domestic goods, in spite of preferential tariffs, Vietnam's exports, especially agricultural products, are very strictly inspected, so exports are limited while agricultural products are one of Vietnam's main export .

Member countries in the Eurasian Economic Union, but Russia, have a very low import turnover from Vietnam, moreover, Vietnamese enterprises have not taken advantages of opportunities as well as made good use of the incentives of the agreement as well as exploited this open market. Therefore, through the VNEAEUFTA, Vietnam's exports decreased by 0.17%.

Meanwhile, the EVFTA and AHKFTA agreements have no significance in this study. The above agreements came into force for a relatively short time, so they did not show a clear impact while the impact of the agreement often lags behind the implementation, so EVFTA and AHKFTA need more time to record export growth of markets. In addition, in recent years, political instability along with policy changes from Beijing have been changing the economic and social development of this special zone. Especially since June 30, 2020, when China applied the National Security Law to Hong Kong. Because Hong Kong's political sensitivities coincide with the agreement's entry into force, it is unlikely to have a tangible impact on Vietnam's exports.

In contrast, it is also a new agreement, which was just active in May 2021 but the UKVFTA has shown its impact with a coefficient of -0.04. The United Kingdom of Great Britain and Northern Ireland is one of Vietnam's most important economic partners, so the opportunity to grow exports of Vietnam's sectors to this market is huge. The UK officially withdrew from the EU in 2020 caused a backlog of trade demand between Vietnam and the UK. The UKVFTA agreement was born and inherited all the principles of EVFTA is an opportunity to promote exchange, especially the export of Vietnamese goods to this market. The active time of the agreement is very short compared to the time limit of the study, so the impact of the agreement represents an adverse impact on Vietnam's exports.

Similarly, CPTPP is a new generation multilateral agreement, signed and took effect in January 2019. CPTPP countries commit to completely eliminate from 97% to 100% of import tariff lines for goods originating from Vietnam, depending on the commitments of each country. With the active participation of many countries in the agreement, detailed commitments to delve into a number of issues such as non-tariff measures, tariff barrier removal, transparency implementation as well as a wide exchange market, high demand and diversity, although it has a relatively short validity period, the CPTPP agreement has recorded a positive impact on Vietnam exports with a coefficient of 0.04.

6. RECOMMENDATIONS TO PROMOTE VIETNAM'S EXPORTS UNDER THE IMPACT OF FREE TRADE AGREEMENTS

6.1. Recommendations to the Government

Firstly, the negative impact of the distance variables and the positive impact of the border common variable proved that the Vietnamese government should continue to actively promote and invest in the

development of road infrastructure and facilities and promote the convenience of customs clearance to promote relations between countries in the same region or countries sharing borders with Vietnam.

Secondly, the government needs to improve the market forecasting capacity to have a close orientation and direction with the actual situation to create coordination between sectors and levels to help prepare well the basic conditions in the country as well as the strategy, methodical, clear when signing FTAs. Strengthen communication for businesses about Vietnam's commitments and the commitments of partners in FTAs to improve and overcome the problem of businesses not understanding the commitments, and requirements or not taking advantage of FTA incentives such as AKFTA, VKFTA, VJEPA,...

Finally, the adverse impact of AIFTA in the research has also shown that Vietnam should make an offer to the two countries to open the market for vegetables, seafood, processed foods...and sign a bilateral free trade agreement between Vietnam and India to facilitate the import and export of agricultural products between the two countries.

6.2. Recommendations to business

Firstly, the estimated results show that the total domestic output of Vietnam and the importing country has a positive effect on Vietnam's goods exports. Therefore, it can be seen that the development of the production capacity of Vietnamese enterprises, promoting the volume of manufactured goods is very necessary. In addition, businesses also need to actively expand export markets, focusing on markets with large GDP. To do this, businesses need to collect information about the requirements of the potential market, as well as about the needs and tastes of consumers in these markets.

Secondly, bilateral free trade agreements such as VJEPA, VCFTA, and VKFTA have different impacts. For VJEPA, this agreement has the opposite effect. The actual benefits from the tariff reduction of the VJEPA are limited, the level of preferential leverage is lower than in other FTAs. However, this is also a comprehensive agreement on trade in goods, services, investment and economic cooperation, so Vietnamese enterprises should actively promote the export to Japan of goods that Vietnam has advantages and enjoys many incentives in the VJEPA Agreement. For VCFTA, this agreement has a positive impact on Vietnam's exports. In 2021, Vietnam will continue to be ASEAN's top exporter to the Chilean market and Chile's fifth largest trading partner in Asia, after China, Japan, South Korea and India. It can be assessed that this market is very open and Vietnamese enterprises must try to increase exports to this market based on meeting the requirements of Chilean products. Particularly for the VKFTA agreement, the results show that this agreement is not significant in research because the application of incentives is very limited and Vietnamese enterprises have not yet grasped the opportunity to apply the agreement while VKFTA is more expanded in the field of goods and services and investment than the AKFTA agreement established 8 years ago. Enterprises need to be more proactive in understanding information as well as mastering the rules of origin of this agreement.

Thirdly is the ASEAN+ agreements including ACFTA, AKFTA, AJCEP, AIFTA, AANZFTA. Contrary to the negative impact of VJEPA as mentioned above, AJCEP has a positive impact on Vietnam's commodity exports. This shows that Vietnamese enterprises should use more than AJCEP, apply preferential treatment under AJCEP lower than the VJEPA tax rate at the time of export or if using inputs from ASEAN countries to produce exported goods with origin following the AJCEP Agreement. Similarly, AANZFTA also gives positive results. However, these are difficult markets and require very high quality, so businesses need to continue to focus on diversifying goods, proactively sourcing raw materials, improve the quality and competitiveness of products to make the best use of this agreement. Of all the ASEAN+ agreements, only

the AKFTA agreement is not significant in this research. Although this agreement opens a smaller number of items than VKFTA, it has a C/O rule of origin with a higher percentage of VKFTA users and businesses are familiar with the rules in this agreement, but AKFTA is narrower and less expanded than VKFTA. Vietnamese enterprises should know how to use flexibly, choose to meet the criteria to be granted C/O in the form of AK or VK and improve the problem of applying limited incentives to imbalance the trade balance with the export value increasingly tilted towards Korea. In contrast to the above agreements, ACFTA and AIFTA have the opposite impact on Vietnamese exports. Like previous agreements, it is not only necessary for state policies but also for Vietnamese enterprises to grasp and better understand these two markets.

Finally, there are the new generation agreements. For example, China is no longer a pleasant market for agricultural exports and the ACFTA agreement has a negative impact as analyzed above, but with the signing of the Regional Comprehensive Partnership Agreement (RCEP) or the promotion of participation in the CPTPP agreement, it is expected that these agreements will facilitate economic cooperation between the two countries, besides, businesses need to have a clear and complete plan for goods to China, focusing on the types of products that China is in great demand from Vietnam such as tropical agricultural products, seafood... and at the same time carefully learn about changes in the quality regulations of the local market, diversify the main export channel to improve the efficiency of orders. Next, in order to take advantage of opportunities and increase exports, Vietnamese enterprises themselves need to make efforts to innovate themselves, proactively control and improve product quality combined with promoting sustainable economic development, a green economy to create conditions to meet standards, technical regulations or non-tariff barriers from the fastidious market - EU. This is because although the EVFTA is not significant in research due to its short validity period when looking at the scope of commitments (EVFTA not only refers to direct trade, but also to environmental, intellectual property, labor, trade and sustainable development, cooperation and capacity building issues), it can easily be seen that, besides opportunities, EVFTA brings many challenges. And Vietnamese businesses are facing difficulties when there are too many problems along with no experience in implementing the required agreements.

7. CONCLUSION

Based on the gravity model and PPML estimation, the authors calculate and collect relevant data. In order to assess the impact of Free Trade Agreements (FTAs) on Vietnam's exports, the collected dataset includes data related to trade relations between Vietnam and 40 partner countries over a period of time. The period from 2010 to 2021. The research has solved the following issues: System and clarify basic theoretical issues about Free Trade Agreements FTAs as well as factors affecting the export of Vietnam. these Agreements, as well as a theoretical analysis of the model used in this research. Analyzing the current situation of Vietnam's exports by industry and by market in the 2010-2021 period, we see that the export market is expanding, not only increasing in traditional markets but also exploiting new markets. potential and make effective use of FTAs. The findings of the research show that: AANZFTA, VCFTA, and CPTPP are shown on the statistical table with a positive effect, showing a positive impact on Vietnam's export turnover. ACFTA, AIFTA, UKVFTA negative effect on exports. Vietnam, when joining this agreement, exported less to the partner country. Particularly, the free trade agreement between ASEAN - Japan has a positive impact on Vietnam's exports, in contrast to the influence of this agreement, the VJEPA agreement with the participation of Vietnam and Japan has a positive effect on Vietnam's exports. reverse motion. Agreement VNEAEUFTA facilitates exchanges between countries, but in fact, it has a negative impact on Vietnam's export turnover. Agreements such as AKFTA, VKFTA, EVFTA, AHKFTA are not meaningful in this research. Finally, on that basis, the research offers solutions for the Government and businesses based

on the important policy implications of the variables to improve and enhance the effectiveness of free trade agreements. to Vietnamese exports.

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RESEARCH ON FACTORS AFFECTING VIETNAM'S FRUIT AND VEGETABLE EXPORTS TO THE EU MARKET

Author: Nguyen Thi Linh Chi¹, Nguyen Van Du, Le Thi Que, Duong Thi Phuong Thao
Mentor: MSc. Truong Quang Minh

ABSTRACT: This study adopted a mixed-methods-based approach that is qualitative and quantitative research to analyze the factors influencing the export of fruits and vegetables from Vietnam to the EU market and their impact in the period of 5 years from 2017 to 2021. Through in-depth interviews with experts and processing data collected from 157 businesses, the results show that: Vietnam's fruits and vegetables exports to the EU market have been influenced by 5 factors. All 5 factors have a positive impact on export results and are in descending order of impact: (1) Characteristics of the EU market, (2) Export marketing strategy, (3) Characteristics of exporting business, (4) Characteristics of Vietnam's macro-environment and (5) Competitors. Based on these results, the study proposes some recommendations for both the Vietnamese government and exporters to boost the efficiency of the export of Vietnam's fruits and vegetables to the EU market.

Keywords: EU, export of fruit and vegetable, Vietnam.

1. INTRODUCTION

The export of agricultural products in general and the export of fruits and vegetables in particular is an important economic activity that affects many actors in the economy: farmers, vegetable and fruit exporters, intermediaries, and the economy. According to Balassa (1985), the export of agricultural products plays a very important role, such as: making an important contribution to a country's economic growth and development; creating more jobs and increasing incomes for workers; contributing to the improvement of the state's economic policy and management mechanism in accordance with international laws and practices;... Based on the advantages and potentials of geographical location, land, labor, climate and other ecological conditions, Vietnam can develop a sustainable, multi-industry ecological agriculture with a wide range of agricultural products and great export economic value. In particular, fruits and vegetables are one of the important commodities in Vietnam's agricultural industry, which has grown rapidly in export turnover over the years. The export value of Vietnam's vegetables and fruits has increased from 2.86 billion USD to 3.34 billion USD in the period 2012-2022. In the region, Vietnam is the third largest exporter of vegetables and fruits after the Philippines and Thailand, and Vietnam's fruit and vegetable products have been exported to many countries and territories (Agro Processing and Market Development Authority, 2019).

The EU is a very large fruit and vegetable import market, accounting for 45-50% of the fruit and vegetable volume world imports. Currently, the EU is Vietnam's 4th-largest fruit and vegetable export market. Vietnam's fruit and vegetable exports to the EU continuous growth in the period 2017 - 2021, with an average increase of 5% - 22% per year. Especially, the effect of the EU-Vietnam Free Trade Agreement (EVFTA) has brought great opportunities for Vietnam's fruit and vegetable. Accordingly, the EU is committed to opening up very strongly for Vietnamese fruits and vegetables: 94% of the total 547 tax lines on vegetables and fruit and vegetable products will be eliminated as soon as the Agreement comes into effect. The EVFTA also removes a number of trade barriers for Vietnam and helps Vietnam meet

¹ Thuongmai University.

international standards within the legal framework, environmental regulations and investment requirements. These incentives are considered to create a great advantage in prices for Vietnamese fruit and vegetable (especially in the competition for importing into the EU with countries that have strengths in vegetables and fruits that have not yet had an FTA with the EU such as China, Thailand, Malaysia, ...). However, the total value of Vietnamese fruit and vegetable exports to the EU only accounts for 0.15% (2017) and 0.22% (2021) of the total import turnover of vegetables and fruits in this market. This proportion shows that Vietnam's fruit and vegetable export turnover to the EU is low compared to Vietnam's export potential as well as the EU's import demand.

In previous studies, the competitiveness and efficiency of exporting agricultural products were often affected by a number of factors such as: characteristics of the foreign market (Lam Thanh Ha, 2021; Lina Cui, 2010), characteristics of the domestic market (Dinh Cao Khue, 2021), competitors (Pham Ngoc Y, 2019);... At the same time, the research team noted that there are still quite a few specific studies on the export activities of Vietnamese fruit and vegetable exporters to the EU in a systematic way as well as research works on the factors affecting the export of fruits and vegetables from Vietnam to the EU. Moreover, those studies mainly use the gravity model and there are not many studies using the enterprise survey method. This research approach to the direct survey of enterprises not only meets the research objectives but also can prove to be realistic and topical.

Thus, with the development potential of Vietnam's fruit and vegetable export sector, the export prospects when the EU-Vietnam Agreement (EVFTA) comes into effect and the number of relevant studies is not many, these show the urgency of the research problem. In-depth research and sufficient assessment of the factors affecting Vietnam's fruit and vegetable exports to the EU market will contribute to supplementing the research theoretical framework, and the research results can be used as a source of information valuable reference for policymakers, researchers, and Vietnamese fruit and vegetable exporters.

2. THEORETICAL FRAMEWORK

2.1. Literature review

Export performance is defined as the exporting result of a firm, or the extent to which the firm achieves its goals in exporting products to foreign markets (Ngo Thi Ngoc Huyen & Nguyen Viet Bang, 2020). Export performance is influenced by internal and external factors, corresponding to two theoretical approaches that underlie most research on export activity, namely: theoretical Resource Based View - RBV by Grant (1991) and industrial organization theory - IO by Michael Porter (1980).

The research based on the two theories RBV and IO is increasing. However, each research paper only mentions certain factors in each specific case. After an overview of related topics, the authors found that the factors affecting export activities may include: characteristics of the import market (Ngo Thi Ngoc Huyen & Nguyen Viet Bang, 2020); Pham Ngoc Y, 2019; Lam Thanh Ha, 2021; Lina Cui, 2010; Dinh Cao Khue, 2021; Pham Hoang Linh et al., 2019; Cemal Atici and Bulent Guloglu, 2014), characteristics of the domestic market (Ngo Thi Ngoc Huyen & Nguyen Viet Bang, 2020; Nguyen Thi Duong, 2012; Nguyen Quynh Hoa & Dinh Cong Hoang, 2020; Dinh Cao Khue, 2021; Puspitasari et al., 2021), characteristics of the business (Dinh Cao Khue, 2021; Lam Thanh Ha, 2021; Cao Minh Tri & Nguyen Luu Ly Na, 2018), export marketing strategies (Dinh Cao Khue, 2021; Lam Thanh Ha, 2021; Cao Minh Tri & Nguyen Luu Ly Na, 2018; Ghafoor et al., 2010) and characteristics of competitors (Nguyen Thi Duong, 2012; Pham Ngoc Y, 2019).

2.2 Hypothesis and research model

2.2.1. Characteristics of the EU market

The characteristics of the import market are commonly understood to mean threats and opportunities from this market for exporting commodities into it. Most of the studies highly appreciate and recognize that the characteristics of the importing country's market have a great influence on the export of agricultural products. According to Ngo Thi Ngoc Huyen and Nguyen Viet Bang (2020), the importance of foreign market characteristics is confirmed and assessed as having the greatest influence and impact on export activities. Affirming that in the condition that exporting enterprises are mostly small and medium-sized, and their ability to adapt to the global supply chain is still limited, a thorough study of the export market is one of the two urgent issues compared to the export market's remaining problems. When there exists a difference between the domestic environment and the export market, such as cultural, economic, geographical, and political differences, the greater the difference, the lower the export results of enterprises (Pham Ngoc Y, 2019). In this study, consumption market demand, consumer tastes (indigenous resident preferences), EU domestic production capacity, exchange rate, the population of the import market, and Geographical distance are considered to be the characteristics of the import market to where Vietnamese enterprises will export vegetables and fruits. Therefore, hypothesis 1 is built as follows:

H1: The characteristics of the EU market have a positive impact on Vietnam's fruit and vegetable exports to the EU market (+).

2.2.2. Characteristics of Vietnam's macro-environment

A macro-environment refers to the set of conditions that exist in the economy as a whole, which can affect the business's operations. When exporting enterprises have a close relationship with raw material suppliers, the support of the government, export associations, the environment can be favorable for export, the law for export activities Transparency will stimulate an increase in export (Ngo Thi Ngoc Huyen and Nguyen Viet Bang, 2020). National factors include factors on natural conditions for agricultural production, government mechanisms and policies, factors on the development of science and technology to production, preservation and transportation of agricultural products. is a factor affecting the production and export of agricultural products (Nguyen Thi Duong, 2012). Therefore, this study expects the export infrastructure, the cooperation of the management agencies to help businesses access export policies, the potential and advantages of developing fruit and vegetable production in Vietnam, the openness of the economy or the international economic integration and the scale of cultivation according to GlobalGap standards in Vietnam affects the research results. Hypothesis 2 is built as follows:

H2: Characteristics of Vietnam's macro-environment have a positive impact on Vietnam's export results to the EU market (+).

2.2.3. Characteristics of the exporting business

The characteristics of a business can be defined as the state of resources within it. Good resources and capability will provide exporting businesses with numerous opportunities to access and fulfill the demands of the import market (Dinh Cao Khue, 2021). In the context of strong trade liberalization today, businesses that want to maintain and develop export markets for goods in general and agricultural products in particular must have their own export strategy, including clear plans, specifically, which comes with risk tolerance and control ability (Ibeh, 2003). The ability of firms to export can also be expressed in terms of firm size (Beleska, 2014; Akyol & Akehurst, 2003; Constantine, 1996). Many studies have confirmed that

firm characteristics are correlated with export performance (Monteiro et al., 2019). In this study, the size and quality of capital, the size, and quality of labor, the ability to apply science and technology, export experience, image, and reputation of the enterprise are considered as the characteristics of the enterprise export. Hypothesis 3 is built as follows:

H3: Characteristics of the exporting business have a positive impact on Vietnam's export results to the EU market (+).

2.2.4. Export marketing strategy

The formula for how a business will compete, what are the goals and what policies will be needed to realize these goals are known as the marketing strategy. Export marketing strategy refers to the way in which companies respond to import market conditions by carrying out mixed marketing campaigns, including product, price, promotion, and distribution in international marketing field (Ngo Thi Ngoc Huyen & Nguyen Viet Bang, 2020). Export marketing strategy is also one of the factors affecting the export activities of agricultural products of enterprises. Tailoring marketing strategies to the requirements of foreign markets allows companies to satisfy customer requirements in export markets (Haddoud et al., 2018). In addition, studies by several authors show that firms' marketing strategies influence export performance (Cavusgil and Zou, 1994; Chen et al., 2016). In this study, enterprises participating in trade promotion fairs to promote their products, organize price-competitive promotional activities and use many different distribution channels to export or research trends in the market. The market's consumption of vegetables and fruits will be the characteristics of the export marketing strategy of Vietnamese enterprises exporting vegetables and fruits to the EU. Hypothesis 4 is built as follows:

H4: Export marketing strategy has a positive impact on Vietnam's fruit and vegetable exports to the EU market (+).

2.2.5. Competitors

Competitors are also one of the factors affecting the export of goods in general and agricultural products in particular. Competitors in this article are interpreted as countries that export similar or substituted Vietnamese fruit and vegetable products in the EU market. In the export market, exporters face competition not only for the product itself but also for various substitute products from both the domestic market and other exporting countries. The degree of competition in the export market can be expressed through the number and size of suppliers, prices, and non-price factors such as quality, product diversification, advertising, and reposting. In this article, competitor scores such as acceptance of sustainable competitors in products, frequency of competitor-specific new product introductions, sustainability-based competition industry sustainability, competitor supply capacity and price competition against competitor industry sustainable products are believed to have an impact on Vietnam's fruit and vegetable exports to the EU. Hypothesis 5 is built as follows:

H5: Competitors have a favorable impact on Vietnam's fruit and vegetable export results to the EU market (+).

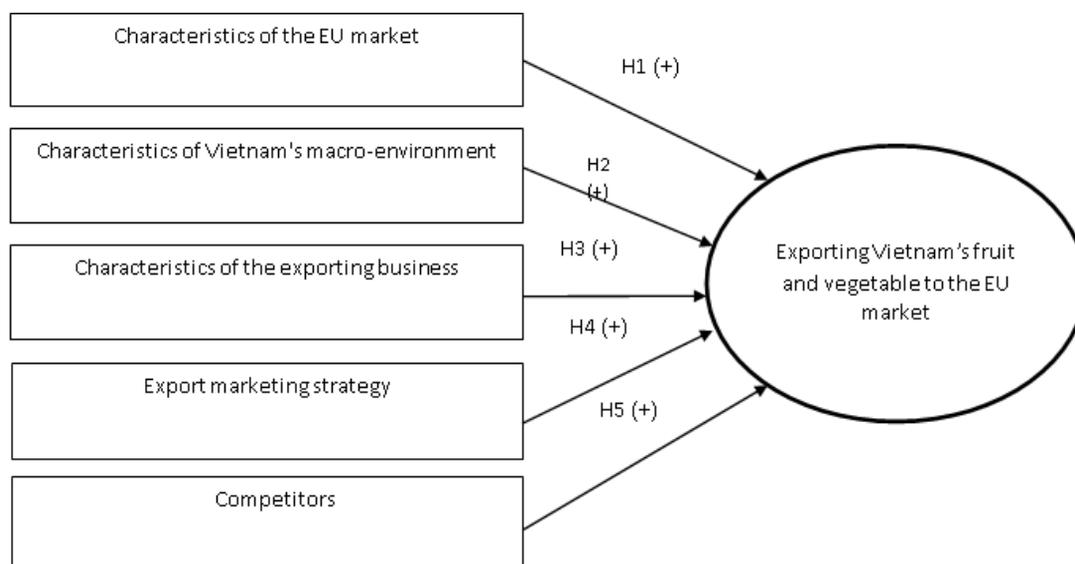


Figure 1. Expected research model

Source: Proposed by the authors

The variables in the research model are measured by the Likert scale with a scale from 1 to 5. The scale used to measure specific variables is as follows:

Table 1. The scale of the research

Factor	Code	Item	Reference
Characteristics of the EU market (F_NN)	NN1	EU consumers prefer tropical fruit and vegetable products	Ngo Thi Ngoc Huyen and Nguyen Viet Bang (2020); Pham Ngoc Y (2019); Lam Thanh Ha (2021); Lina Cui (2010); Dinh Cao Khue (2021)
	NN2	The EU's domestic production capacity of fruit and vegetables has not yet met the EU market demand	
	NN3	The rising exchange rate benefits Vietnam's exports	
	NN4	The large population of the EU creates a large market demand for exports	
	NN5	The geographical distance between Vietnam and the EU is convenient for exporting goods	
Characteristics of Vietnam's macro-environment (F_TN)	TN1	Export infrastructure (roads, factories, processing technology, ...) developed in favor of enterprises' exports	Ngo Thi Ngoc Huyen and Nguyen Viet Bang (2020), Dinh Cao Khue (2021)
	TN2	The effective coordination of management agencies helps businesses to access and understand export policies	
	TN3	Businesses receive more incentives when Vietnam actively integrates into the international economy by signing many bilateral and multilateral trade agreements and participating in international organizations, etc.	
	TN4	The growing scale of cultivation according to GlobalGap standards is a favorable condition for Vietnamese enterprises to export	
	TN5	The potential and advantages of developing fruit and vegetable production in Vietnam create favorable conditions for enterprises to export	
Characteristics of the exporting business (F_DN)	DN1	My business is able to mobilize and manage capital for export activities	Dinh Cao Khue (2021), Lam Thanh Ha (2021), Cao Minh Tri and Nguyen Luu Ly Na (2018)
	DN2	The workforce of my company has knowledge and experience in exporting vegetables and fruits to the EU	
	DN3	My business is equipped with technology for processing and exporting vegetables and fruits	
	DN4	My business has foreign investment capital	
	DN5	The image of my business has a reputation to enhance its position in the fruit and vegetable export market	

Export marketing strategy (F_CL)	CL1	My business regularly participates in trade promotion fairs to promote products and find strategic partners	Dinh Cao Khue (2021), Lam Thanh Ha (2021), Cao Minh Tri and Nguyen Luu Ly Na (2018)
	CL2	My business studies the EU markets fruit and vegetable consumption trends to create the best product adaptation	
	CL3	My business uses many different distribution channels to export the results to the EU market	
	CL4	My business regularly organizes promotional activities and competes on prices for exported vegetables and fruits	
Competitors (F_CT)	CT1	The increased intensity of competition will positively affect the adaptability of businesses and thereby increase their export results	Pham Ngoc Y (2019)
	CT2	The frequency of new product introductions creates motivation for my businesses to improve their products	
	CT3	My business improves the supply ability to compete with competitors' supply	
	CT4	The level that competitors adopt sustainable competition is high, which motivates my business to develop a strategy on Sustainable competition in this field	
	CT5	My business seeks to improve export prices to compete with other competitors' prices	
Exporting Vietnam's fruit and vegetable to the EU market (F_KQ)	KQ1	My business's profit from exporting to the EU has increased steadily	Pham Ngoc Y (2019), Lam Thanh Ha (2021), Cao Minh Tri and Nguyen Luu Ly Na (2018).
	KQ2	My business's export of vegetables and fruits to the EU has grown well	
	KQ3	My business is satisfied with the revenue from exporting vegetables to the EU market	

Source: Compiled by the author from research overview

3. RESEARCH METHOD

3.1 Data processing

The article uses mixed research methods: combining qualitative and quantitative research. The results obtained from the interviews help the research team to build the research model, hypotheses, and at the same time complete the survey form. Specifically, the research team built a semi-structured questionnaire to interview experts about the importance of factors affecting the efficiency of Vietnam's fruit and vegetable exports to the EU market. The interviews were conducted for the purpose of gaining deep insight into the current state of production, processing, logistics, and export of Vietnam's fruit and vegetable industry. The authors used the purposive sampling technique for the identification and selection of experts who would be able to demonstrate a wealth of experiences and profound understanding regarding of the research topic. There were 4 experts representing businesses, the Association of Fruits and Vegetables and the University of Economics participated in the interviews. The decision to select interviewees in this study is based on the research questions and relevant theoretical perspectives that informing our study. The average time of each interviews was two hours and taken place at the interviewee's offices. They provide valuable information about opportunities, challenges, market trends, and consumer preferences in both domestic and international markets. The answers were compared with results from previous studies done by domestic and foreign scholars, thereby helping the research team to more accurately identify the group of factors that are likely to affect the effectiveness of the study of fruit and vegetable export.

Then, the authors used a quantitative method. The results obtained from the previous qualitative interviews were used to build research models and hypotheses, and simultaneously to complete the survey

form. The survey questionnaire was sent on a large scale to Vietnamese enterprises that are exporting fruit and vegetable to the EU market. The list of survey samples was collected from the list of “Reputable exporters” published by the Ministry of Industry and Trade over the years, “Export information to the EU market - vegetables and fruits” by European - American market department (Ministry of Industry and Trade), list of members of Vietnam Fruit and Vegetable Association and from other personal relationships of the author. The number of samples is 157, which satisfies the condition that it is more than 5 times the number of observed variables.

3.2. Data collection

Secondary data is collected from direct sources (books, dissertations, research works stored in the National Library, the Library of the Thuongmai University, and the Library of the Hanoi Law University) and other online sources (websites of the General Statistics Office, General Department of Customs, UN Comtrade, Trademap, Eurostat, ...)

Primary data is collected by surveying enterprises in Vietnam that have export activities to the EU. The questionnaire was created on Google Form and sent to the selected firms from September 2022 to October 2022. The survey by questionnaire collected 157 valid survey sheets. Primary data were processed using SPSS 20 software.

4. RESULTS AND DISCUSSION

4.1. Results

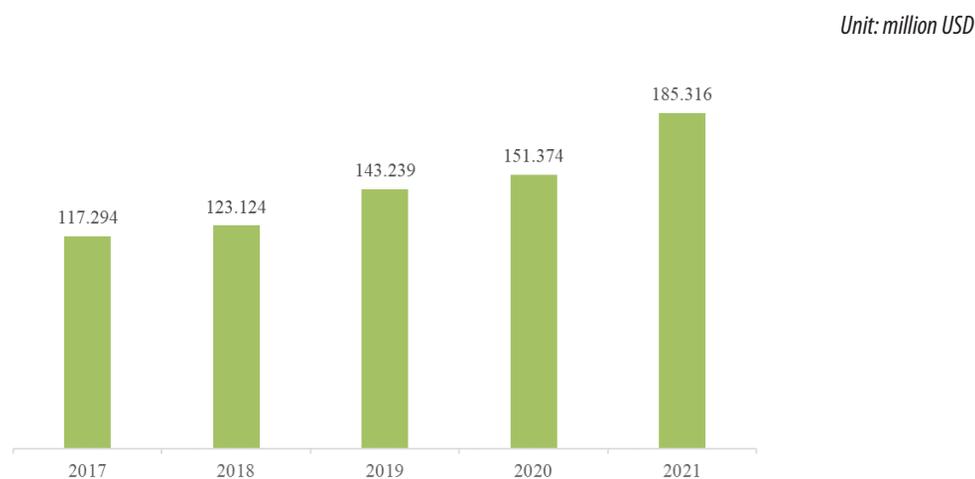
4.1.1. Actual situation of Vietnam’s fruit and vegetable exports to the EU market

4.1.1.1 Export turnover

EU is an extremely large fruit and vegetable import market, accounting for 45% to 50% of the world’s imported fruits and vegetables. Currently, the EU is Vietnam’s fourth largest fruit and vegetable export market. However, Vietnam’s vegetables and fruits exported to the EU are still mainly fresh and preliminarily processed products. The products that have been deeply processed are very few, so the added value is not high.

According to statistics from UN Comtrade, Vietnam’s fruit and vegetable exports to the EU achieved an average growth rate of 12.35% per year in the period 5 years from 2017 to 2021.

Figure 2. Fruit and vegetable export turnover of Vietnam to the EU market

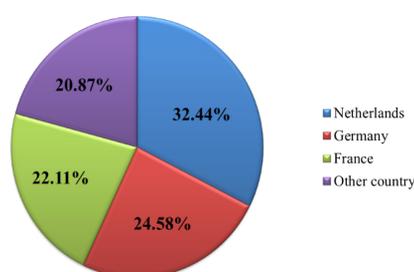


Source: Compiled and analyzed by the author

According to statistics of UN Comtrade, Vietnam's fruit and vegetable exports to the EU increased steadily in the period of five years from 2017 to 2021, averaging 5% to 22%. In 2017, Vietnam's vegetables and fruits exported to the EU reached 117.294 million USD, following by 2021 this figure has peaked at 185.316 million USD.

Vietnam's vegetables and fruits have been present in almost all EU member countries, of which the Netherlands, Germany, and France are the three largest export markets in the bloc, accounting for 32.44%, 24.58% and 22.11% respectively in 2021.

Figure 3. Structure of Vietnam's fruit and vegetable export market in the EU in 2021
(% by value of turnover)



Source: Compiled and analyzed by the author

4.1.1.2 Exported products

Table 2. Structure of vegetables and fruits exported from Vietnam to the EU by HS code

Unit: million USD

HS code	2017	2018	2019	2020	2021
HS 07 (Edible vegetables, certain roots and tubers)	15.041	12.852	15.172	14.700	16.987
HS 08 (Edible fruit and nuts; peel of citrus fruit or melons)	56.126	65.696	71.491	71.769	98.100
HS 20 (Preparations of vegetables, fruit, nuts or other parts of plants)	46.126	44.574	56.574	64.903	70.227

Source: Compiled and analyzed by the author

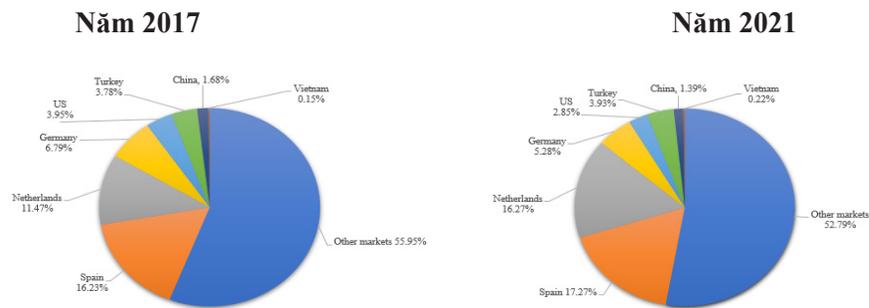
According to UN Comtrade, in 2021, Vietnam's fruit and vegetable exports to the EU market increased for all three groups of fruits and nuts; processed products and vegetables, in which processed products (HS code 20) raised the most by 5.3 million USD compared to 2020.

Export turnover of fruits and nuts from Vietnam to the EU in 2021 reached \$98 million, up 36.82% compared to 2020, accounting for 52.9% of the total export turnover of vegetables and fruits to the EU. In which, Vietnam increased exports of coconut, date, fig, pineapple, avocado, guava, mango and mangosteen products. In contrast, some items in the group of fruits and nuts exported to the EU decreased, such as dried apricots, prunes, apples, peaches, pears, papayas, tamarinds, pears.

For vegetables and fruits, export turnover to the EU in 2021 will reach 16.99 million USD, an increase of 15.58% compared to 2020. Vietnam focuses on exporting to the EU products such as corn, straw mushrooms, lemongrass, sweet potato, taro, chili, ...

4.1.1.3 Export market share

Figure 4. Market share of fruit and vegetable supplies in the EU (% by value)



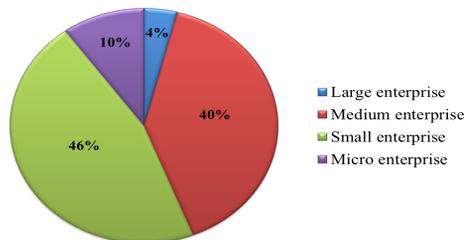
Source: Compiled and analyzed by the author

According to calculations from UN Comtrade data, Vietnam is one of the few markets where the EU recorded a high average growth rate of fruit and vegetable imports in the 2017-2021 period: 13.1%/year, from 117 million USD in 2017 to 185 million USD in 2021. The market share of Vietnam’s fruit and vegetable products in the total import value of the EU accounted for 0.15% in 2017, increasing to 0.22% in 2021. Although the value of EU imports of this item from Vietnam is still much lower than that of many other domestic and foreign markets, the high growth rate of imports shows that the fruit and vegetable industry in Vietnam is gradually meeting the EU’s consumption conditions and tastes.

4.1.2. The results of the analysis of influencing factors / Research results

4.1.2.1 Descriptive statistics

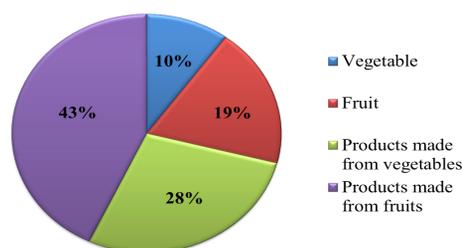
Figure 5. Statistics on the size of enterprises participating in the survey



Source: Data surveyed from enterprises

The results in 157 enterprises exporting fruits and vegetables to the EU market showed that there was a difference in the size of the enterprises: 46% of small enterprises participated in the survey, 40% of medium enterprises, 10% of micro enterprises and only 4% of large enterprises in detail.

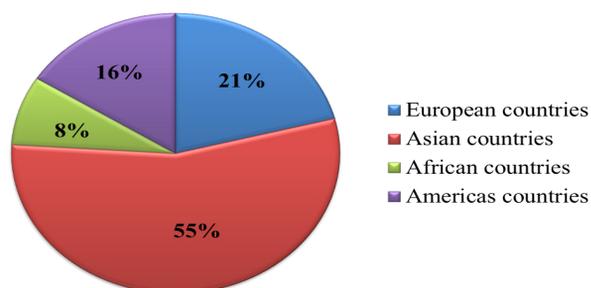
Figure 6. Proportion of the key export fruit and vegetable products to the EU market



Source: Data surveyed from enterprises

The majority of enterprises surveyed export processed fruit products (43%) and processed vegetable products (28%). Meanwhile, unprocessed vegetables and fruits are 10% and 18%, respectively.

Figure 7. Main competitors of Vietnamese fruit and vegetable exporters in the EU market



Source: Data surveyed from enterprises

Asia businesses were considered as the main competitors, accounting for 55%, following by Europe businesses (21%), Americas businesses (16%), and finally Africa businesses (8%).

4.1.2.2. Factors influencing to the export of fruits and vegetables from Vietnam to the EU market

a. Check the reliability of the scale

Table 3. Cronbach's Alpha accreditation results

Factors	Number of observed variables	Cronbach's Alpha	Smallest Correlation coefficient
Characteristics of the EU market (F_NN)	4	0.782	0.528
Characteristics of Vietnam's macro-environment (F_TN)	4	0.818	0.592
Characteristics of the exporting business (F_DN)	4	0.844	0.633
Export marketing strategy (F_CL)	3	0.8	0.618
Competitors (F_CT)	4	0.807	0.535
Exporting Vietnam's fruit and vegetable to the EU market (F_KQ)	3	0.858	0.705

Source: Data analyzed by SPSS 20

b. EFA discovery factor analysis results

Table 4. Rotated Component Matrix

Item	Component				
	1	2	3	4	5
DN2	.825				
DN3	.803				
DN5	.790				
DN1	.749				
TN1		.824			
TN3		.814			
TN2		.807			
TN4		.761			
CT2			.790		
CT1			.786		
CT5			.776		
CT3			.678		
NN1				.846	
NN3				.750	

NN4				.715	
NN2				.655	
CL2					.838
CL3					.827
CL1					.740

Source: Data analyzed by SPSS 20

The above matrix ensures the conditions of convergence value and discriminant value. No variable loads in both factors and no variable has no load factor, most of the load factor is greater than 0.5 so the research model remains the same.

c. Pearson’s correlation analysis

Table 5. Pearson correlation

		Correlations					
		F_NN	F_DN	F_CT	F_CL	F_TN	F_KQ
F_NN	Pearson Correlation	1	.250**	.476**	-.005	.025	.599**
	Sig. (2-tailed)		.002	.000	.947	.756	.000
	N	157	157	157	157	157	157
F_DN	Pearson Correlation	.250**	1	.215**	-.488**	.078	.313**
	Sig. (2-tailed)	.002		.007	.000	.334	.000
	N	157	157	157	157	157	157
F_CT	Pearson Correlation	.476**	.215**	1	.062	.183*	.518**
	Sig. (2-tailed)	.000	.007		.437	.022	.000
	N	157	157	157	157	157	157
F_CL	Pearson Correlation	-.005	-.488**	.062	1	-.007	.185*
	Sig. (2-tailed)	.947	.000	.437		.928	.021
	N	157	157	157	157	157	157
F_TN	Pearson Correlation	.025	.078	.183*	-.007	1	.355**
	Sig. (2-tailed)	.756	.334	.022	.928		.000
	N	157	157	157	157	157	157
F_KQ	Pearson Correlation	.599**	.313**	.518**	.185*	.355**	1
	Sig. (2-tailed)	.000	.000	.000	.021	.000	
	N	157	157	157	157	157	157
		**. Correlation is significant at the 0.01 level (2-tailed).					
		*. Correlation is significant at the 0.05 level (2-tailed).					

Source: Data analyzed by SPSS 20

The linear correlation between the independent variable and the dependent variable: All independent variables have sig. < 0.05 and $0 \leq r \leq 1$. This shows that the independent variables have a linear correlation with the dependent variable F_KQ with the degree of correlation through determination on r.

Linear correlation between independent variables: Most of the research expect sig. correlation between independent variables is greater than 0.05 or if sig is less than 0.05 then r is low. The results of running SPSS of the group found that the above conditions were satisfied. At the same time, no case of sig

was recorded. < 0.05 and Pearson correlation value > 0.7 , so there is little possibility of multicollinearity (Carsten F. Dormann et al., 2013).

d. Multivariable regression analysis

Table 6. Multivariable regression analysis results

Model	Unstandardized Coefficients	Standardized Coefficients	Collinearity Statistics	
	B	Beta	Sig.	VIF
Constant	-2.716		.000	
Characteristics of the EU market (F_NN)	.515	.435	.000	1.345
Characteristics of the exporting business (F_DN)	.354	.304	.000	1.474
Competitors (F_CT)	.196	.172	.005	1.388
Export marketing strategy (F_CL)	.412	.326	.000	1.369
Characteristics of Vietnam's macro-environment (F_TN)	.228	.291	.000	1.043
Sig value. F (Anova)	0.000			
Adjust R Square	59.5%			

Source: Data analyzed by SPSS 20

After analyzing the regression results, the model has an adjusted R² coefficient of 59.5% or the influence of the independent variable explains 59.5% of the variation of the dependent variable in the regression model.

The equation showing the results of Vietnam's fruit and vegetable exports to the EU market according to independent variables is as follows:

$$F_{KQ} = 0.435 * F_{NN} + 0.326 * F_{CL} + 0.304 * F_{DN} + 0.291 * F_{TN} + 0.172 * F_{CT} + e$$

4.2. Discussion

Among the factors affecting the export of fruits and vegetables to the EU market, the independent variable F_NN "Characteristics of the EU market" has the highest impact ($\beta = 0.435$), followed by F_CL "Export marketing strategy" exports" ($\beta = 0.326$), F_DN "Characteristics of the exporting business" ($\beta = 0.304$), F_TN "Characteristics of Vietnam's macro-environment" ($\beta = 0.291$), F_CT "Competitors" ($\beta = 0.172$). Beta coefficients are all positive, so these independent variables all have a positive effect on the dependent variable.

This shows that in the context and conditions in Vietnam, the findings in our study are similar to the research results of Ngo Thi Ngoc Huyen and Nguyen Viet Bang (2020), Lina Cui (2010), Dinh Cao Khue (2021) on characteristics of the foreign market; Ngo Thi Ngoc Huyen and Nguyen Viet Bang (2020), Dinh Cao Khue (2021) on characteristics of the domestic market; Dinh Cao Khue (2021), Lam Thanh Ha (2021), Cao Minh Tri and Nguyen Luu Ly Na (2018) on characteristics of the exporting business; Dinh Cao Khue (2021), Lam Thanh Ha (2021), Cao Minh Tri and Nguyen Luu Ly Na (2018) on export marketing strategy; Pham Ngoc Y (2019) on competitors.

From the analysis above, the author put forward recommendations to boost the efficiency of Vietnam's fruit and vegetable exports to the EU market:

4.2.1. For exporters

- (1) Invest in development and application of technology for production lines

Enterprises need to actively invest and apply production lines, continuously innovate technology to have high quality products to meet import standards into the EU market. In addition, it is necessary to apply closed technology right from the selection of varieties, planting, harvesting, production and to storage and transportation.

(2) Establish a sustainable competitive strategy for enterprises

Before products are imported into the EU, they must be irradiated and processed to ensure quality. All these implementation costs are borne by Vietnamese enterprises, thus increasing export prices, making it difficult to compete with similar exporting countries in the region. Therefore, businesses need to find ways to overcome this situation by building a competitive strategy on sustainable prices. Besides, enterprises need to combine with other strategies such as: applying science and technology to increase the rate and value of exported products; invest in preservation technology to reduce product loss; for export products, it is necessary to increase the proportion of processed products to reduce the cost of technical barriers.

(3) Build brands for products, such as: Actively registering private labels for exported fruits and vegetables; Coordinate with Vietnamese Ambassadors and Trade Offices in EU countries or the Fruit and Vegetable Association to participate in fairs and exhibitions to widely promote products; ...

4.2.2 For authorities

(1) Actively participate in new generation FTAs and effectively implement the commitments in the EVFTA Agreement, harmonize standards and regulations on goods quality, and agreements on goods quality, labor, environment and combating climate change in FTAs and EVFTA Agreements.

(2) Improve the effectiveness of the implementation of strategies to create sustainable export sources, such as: solutions to specialize in the cultivation of key fruit trees in each locality, specific guidance on the implementation of decisions planting area planning.

(3) Promote the development of the structure of export vegetables and fruits in the direction of improving quality and efficiency; building prestige and brand for Vietnamese fruit and vegetable products.

(4) Strengthen trade promotion, timely update information to support exporting enterprises, research products suitable to the specific needs of each consumption market.

5. CONCLUSION

The article has collected data on the situation of Vietnam's fruit and vegetable exports to the EU market in the period 2017-2021, and the results of qualitative and quantitative research show five factors affecting exports of fruits and vegetables from Vietnam to the EU market include: (1) Characteristics of the EU market, (2) Characteristics of Vietnam's macro environment, (3) Characteristics of exporting enterprises, (4) Export marketing strategies and (5) Competitors. All these 5 factors belong to the group of motivating factors, in which Characteristics of the EU market promote the strongest, and Competitors promote the weakest. Simultaneously, the research made recommendations for exporters and state management agencies to boost the efficiency of Vietnam's fruit and vegetable exports to the EU market.

Although the author has made every effort possible in the research process for this study, there are still some limitations that future research can further improve on. Firstly, the number of survey samples collected is modest with 157 answer sheets. Future studies should collect larger samples to improve the accuracy and reliability of the results. Secondly, future studies may add to the research model new factors to be able to further examine factors affecting Vietnam's fruit and vegetable exports to the EU market.

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DIGITAL FINANCE, SHADOW ECONOMY, AND ECONOMIC GROWTH: EVIDENCE FROM SELECTED COUNTRIES

**Author: Ly Ngoc Lam¹, Hoang Thi Phuong Linh¹, Phan Nguyen Anh Quan¹,
Nguyen Ho Xuan Tra¹, Doan Ngoc Vy¹
Mentor: PhD. Tu Thi Kim Thoa¹**

ABSTRACT: This study examines the impacts of digital finance and shadow economy on economic growth in 54 selected countries during the period from 2012 to 2021. Economic growth calculated as GDP per capita is a dependent variable; digital finance calculated as mobile money transaction and shadow economy are independent variables; corruption, trade freedom and foreign direct investment (FDI) are control variables. By using GMM estimator, our research found that while digital finance could exert a positive impact on economic growth, shadow economy negatively influences economic development. Moreover, it is discovered that foreign direct investment also has a positive effect on economic growth, and trade freedom as well as corruption is investigated to be statistically insignificant. These findings are expected to make an outstanding contribution to the development of digital finance in various nations including Vietnam, and recommend several useful policy implications in order to enhance digital finance and mitigate shadow economy that are of great benefits to economic progress.

Key words: Digital finance, shadow economy, economic growth, mobile money transaction.

1. INTRODUCTION

The real economy's development cannot be accomplished without the backing of finance because it is the lifeblood of the real economy. Digital finance is a consequence of integrating traditional finance with digital technology. It is characterized by financial characteristics that are less reliant on traditional finance's physical channels, are more geographically penetrating, and offer lower cost advantages. The conversion of the financial industry to digital is a long-term, risky, and high-commitment process. To achieve sustainability, it needs reliable and ample financial resources. Finance is increasingly integrating with new technologies including big data, cloud computing, and artificial intelligence. According to research by the International Monetary Fund, digital payments, remittances, and financing have increased in emerging and developing nations at an unprecedented rate over the past three years. Digital payment services in emerging and developing nations increased from \$1.2 trillion in 2017 to \$1.5 trillion in 2019. Similarly, to this, mobile payments have grown by 50% in 2019 compared to 2018. In emerging and developing nations, the use of digital and mobile payments has expanded along with their value. For example, the number of mobile payment users climbed from 3.3 billion in 2017 to 4 billion in 2019, accounting for almost 64% of the population.

There has been a lot of discussion on the impact of the shadow economy on economic growth, but there are still several issues that need to be resolved, including how this type of activity can affect the formal economy and what impact it has on economic growth. Several studies have been made, including (Zaman & Goschin, 2015; Borlea et al., 2017; Mandroschenko et al., 2018). While defining the precise dimensions of the "shadow economy," these authors have also revealed the regularities of this phenomenon in order to determine whether this kind of activity could be a source of economic growth or depression, as well as to pinpoint and evaluate the variables influencing economic growth. In developing nations, the

¹ University of Economics Ho Chi Minh city.

shadow economy accounts for more than 30% of the total economy. The shadow economy has been found to have a negative effect on a nation's economic growth, according to a vast body of research. The political climate is predicted to play a significant effect in the growth of the shadow economy in earlier studies. Unstable political conditions encourage unemployment and low productivity, which leads to an increase in the informal economy. Additionally, some emerging nations have worse political stability indices than developed nations.

However, there are still several research gaps from previous studies that ought to be taken into consideration. Firstly, most researchers investigating the relationship between digital finance and economic growth relied on data from one nation or a small group of economies, particularly China (Liu et al, 2022; He et al, et al; Qian et al., 2020). Moreover, there are still many discrepancies and disagreements about the impact of the shadow economy on economic growth, as some writers have shown a negative association while others have shown a positive one.

Therefore, this research aimed to analyze the impact of digital finance and shadow economy on economic growth, using data collected from 54 countries around the world in 10 years during the period from 2012 to 2021. This study is expected to fill the gaps from previous research when utilizing data from many countries to generalize the results. Moreover, this study could contribute to consolidate and provide empirical evidence about the relationship between shadow economy and economic growth.

2. THEORETICAL FRAMEWORK

2.1. Solow growth model

The Solow growth model was developed by Robert Solow in 1956. According to the Slow Growth Model, technology is just as important an input to production as labor and capital, the two other basic components of production. Economic growth must be stimulated by technological advancement in the manufacture of goods, the delivery of services, and corporate operations. According to the concept, technological development increases service production and delivery efficiency, which results in high output productivity.

2.2. Technological spill - over theory

According to the technological spillover theory, digital finance can benefit the finance industry in three different ways. Technical staff are made available, financial disintermediation is accelerated, and financial inclusion is increased through technological spillover. By advancing technology, lowering costs, boosting outreach efforts in the financial industry, and increasing the effectiveness of the financial system, digital finance alters traditional financial institutions through the "spillover effect."

2.3. The effect of digital finance on economic growth

Digital finance is the combination of Internet technology and finance. It is a financial service created by the fusion of financial innovation and digital innovation such as distributed technology, big data, and artificial intelligence (Liu et al, 2022). The term is described as financial services provided via mobile devices, computers, the Internet, or payment cards. In the world, digital finance has become a major factor in modern finance with many innovative applications that can be found in fintech, banking services, and embedded finance.

In China, there are various empirical research investigating the impact of digital finance on economic growth. Liu et al. (2022) pointed out digital finance can, over time, improve the quality of China's economic growth, with the effect being more apparent in less developed areas. The mechanisms showed how improving

and advancing the industrial structure through digital finance might improve the quality of economic growth. Similarly, He et al. (2022), Jiang et al (2021) and Ding, Shi & Hao (2022) used 31 provincial regions in mainland China as their research subject, utilized the digital inclusive finance index to measure the level of digital finance to show that digital finance may foster regional economic development and has a favorable impact on economic development in terms of breadth, depth, and service support. Correspondingly, Zhu (2022) investigated the impact mechanism and impact of digital inclusive finance on high-quality economic development using panel data of 30 provincial regions in China from 2011 to 2019. It is discovered that high-quality economic development is directly and significantly impacted by digital inclusive finance. Another research related to digital inclusive finance (DIF) was conducted by Wang, He & Li (2022), they concluded that there is significant geographical variability in the impact of DIF on economic growth and inventive development, and DIF has a direct positive influence on economic growth and innovative development. In addition, Liu et al (2021) showed the results of the VAR model demonstrating that the development of digital financial inclusion significantly contributes to economic growth and that this impact is significantly mediated by the Internet threshold effect. Lastly, two other authors consisting of Gu & Sun (2022) also consumed China as a sample in order to indicate that investment in digitization is a major concern for the economic development of provinces since it makes a significant contribution to regional economic quality development. At the provincial level, Zou, Zhang, & Fan (2020) presented that the development of digital finance in Sichuan Province can support regional entrepreneurship, stimulate economic development, and reduce the income gap between urban and rural areas. In another country like Kenya, Misati et al (2022) offered a significant positive impact of financial depth on economic growth consistent with the supply-leading finance theory, and Mulee (2019) indicated that every aspect of digital financial innovation benefits Kenya's economy.

At a larger scale, Thaddeus, Ngong & Manasseh (2020) found a high correlation between digital financial inclusion and the advancement and expansion of sub-Saharan economic growth. Meanwhile, Ozturk & Ullah (2022) demonstrated that while digital financial inclusion spurs economic expansion, it also has a negative impact on environmental quality due to higher CO₂ emissions. With 52 developing countries, it is discovered by Khera et al (2021) that the exogenous component of digital financial inclusion is positively associated with growth in GDP per capita between 2011 and 2018. Based on above literature reviews, the hypothesis proposed is:

H1: Digital finance has a positive impact on economic growth

2.4. The effect of shadow economy on economic growth

According to Andrzej (2022), there are many words used to describe the shadow economy such as underground, informal, illegal, gray zone, not registered, off books, night economy, and moonlight, under reporting, or even black or immoral white economy.

On the one hand, shadow economy is indicated to have a positive impact on economic progress since it offers several methods for tackling unemployment and boosts the formal economy's expansion by bringing money generated by illegal transactions into it. Zaman & Goschin (2015) did discover a cointegrating relationship between GDP and the shadow economy through Johansen test, providing empirical support for the claim that the shadow economy was related to Romania's economic growth between 1999 and 2012. Similarly, Goel, Saunoris & Schneider (2019) and Mar'i & Cavusoglu (2021) also studied the negative impact of the underground economy on economic growth in the United States and 156 nations respectively. Correspondingly, Nguyen & Duong (2021) concluded that the BRICS countries' economic growth is positively impacted by the shadow economy and measures to control corruption.

On the other hand, several researchers also pointed out that shadow economy negatively affects economic growth because it hinders GDP growth rate and government revenue. Between 2005 and 2014, empirical research was done by Borlea, Achim & Miron (2017) proved that increased corruption and the shadow economy have a detrimental impact on economic progress. Similarly, Baklouti & Boujelbene (2020) demonstrated that rising levels of corruption and the shadow economy are associated with lower economic development in 34 OECD nations from 1995 to 2014. Results also suggest that the impact of corruption on economic growth is amplified by the shadow economy. In Libya, the credit crunch and the shadow economy had a significant impact on economic growth (Omar & Amlus, 2020). In another country, Ukraine, Kovalenko et al (2022) made a conclusion that shadow economy exerted an adverse impact on corporate business and households in Ukraine. This study also pointed out several root justifications why this nation experienced an informal economy. With a larger sample, 17 Asian countries with emerging and developing economies, Nguyen & Luong (2020) demonstrated that while the shadow economy has a statistically significant negative influence on economic growth, the corruption index has a statistically significant beneficial impact. With 51 countries and developing countries, Mayssa et al (2021) and Younas, Qureshi & Al-Faryan (2022) demonstrated that the size of the shadow economy has a significant negative impact on economic growth. Finally, in ECOWAS countries, Camara (2022) showed that the shadow economy reduces economic growth and CO2 emissions using annual data from 14 countries between 1991 and 2016. Seeing the big gap in academic research on the relationship between the Shadow economy and economic growth, authors decided to solidify the knowledge background by testing our second hypothesis, which is:

H2: Shadow economy has a negative impact on economic growth

From the above literature review, the influence of digital finance and shadow economy on economic growth has received special attention from scholars around the world. However, there are 2 research gaps that authors pointed out and addressed in this research. Firstly, when assessing the influence of digital finance on economic growth, different research results are provided. To be more particular, shadow economy has both positive and negative effect on economic growth. Due to disparities in location, religion, problem-solving approaches, and other factors, scientists may come to different conclusions about how the shadow economy affects economic growth. Therefore, this research was expected to clarify and consolidate the effect of informal economy on economic growth based on our research sample. Moreover, regarding research scope, most of authors conducting a study related to digital finance and economic growth based on data collected from a particular country or just a bloc of economies. Therefore, authors decided to collected data from a larger number of countries in order to diversify data and get better and more general research results.

3. RESEARCH METHODOLOGY

3.1. Data and sample selection

This study aimed to analyze the effect of digital finance and shadow economy on economic growth through collecting data from all countries around the world. Then, authors decided to remove several countries that experienced the inadequacy of data to avoid from missing value problem. Finally, authors got on data gathered from 54 nations worldwide from various continents from trustworthy sources, including the World Bank, International Monetary Fund (IMF), Heritage Foundation, and Medina & Schneider (2019).

3.2. Variable measurement

3.2.1. Dependent variable

Though no unanimously accepted definition has been forgotten by now, economic growth or economic development is a phenomenon that can be statistically quantified using economic indicators like GDP and GNP. It is seen as a well-determined goal for all countries. Therefore, it could be argued that while

development demonstrates how growth affects society by raising the standard of living, economic growth is the process of expanding the sizes of national economies, the macro-economic indicators, especially the GDP per capita, in an ascendant but not necessarily linear direction. The goal of economic progress is unquestionably the multifaceted fulfillment of human potential, increased material and spiritual richness for the populace, and their ascent to higher levels of civilization and culture.

In this study, economic growth (EG) is measured by GDP per capita (constant 2015 US\$) collected from World Development Indicators (WDI) - World Bank (Nguyen & Duong, 2021; Borlea, Achim & Miron, 2017).

3.2.2. Independent variable

Digital finance: is a combination between financial services and digital technologies such as the Internet (including mobile and Internet of Things), big data, distributed technology (such as cloud computing and blockchain), artificial intelligence, and information security (biometrics and encryption). Financial inclusion and financial intermediation are facilitated by digital finance, which also helps to fight poverty and advance sustainable development. Digital finance also significantly influences industrial structure, which has the potential to benefit the economy. Digital finance is becoming important to both developed and developing nations worldwide. The use of and access to affordable financial services and products by the underprivileged, low-income, and disadvantaged portion of the population through M-banking, E-banking, ATMs, etc. is known as digital finance. Digital finance improves the availability of required financial inclusion services including opening a bank account, using credit, and using bank savings services. For the purpose of achieving benefits through financial inclusion, countries are starting to adopt plans to improve people's access to financial digital inclusion (Thaddeus, Ngong & Manasseh, 2020). Mulee (2019) demonstrated that digital finance is of great benefits to economic development in Kenya. Correspondingly, Jiang et al (2021) pointed out that economic progress in China could be enhanced by the development of digital finance.

Digital finance is measured in several ways, however, in our research, digital finance is analyzed through mobile money transaction collected from Financial Access Survey - IMF and number of ATMs per 100,000 adults which is used for robustness test (Syed et al, 2021).

Shadow economy: Shadow economy is defined as mostly the legal economic and productive activities that are deliberately hidden from official authorities and that, if recorded, would contribute to GDP (excluding illegal or criminal activities, and do-it-yourself, charitable or household activities) (Andrzej, 2022).

There are various justifications why informal sectors have a considerable impact on economic growth. On the one hand, shadow relations lessen social conflict and mitigate unfavorable social contrasts between the rich and the destitute. Because of the shadow phenomenon, both the national GDP and the regional GDP are on the rise. The official economy's financial and industrial sectors get investments from the shadow economy as well (Mandroschenko, Malkova & Tkacheva, 2018). However, negative effects of shadow economy are unavoidable. The country's tax system is distorted by the shadow economy, which does not give budgets at all levels enough tax revenue. The state of the public finances is badly impacted by the shadow activity, which also diminishes the state budget and distorts its structure and financial sphere. Also, the country's monetary system is badly impacted by the shadow activities. The reproduction of the work force in the formal economy is negatively impacted by the phenomenon of the shadow economy. Investment procedures are also distorted by the shadow economy's activity (Mandroschenko, Malkova & Tkacheva, 2018).

Shadow economy is measured by the size and development of the informal sector (Medina & Schneider, 2019). There are diverse previous research using this calculation in studying the effect of shadow economy (Nguyen & Luong, 2020; Baklouti & Boujelbene, 2020)

3.2.3. Control variable

Corruption is measured as control of corruption and collected from Worldwide Governance Indicators - World Bank (Spyromitros & Panagiotidis, 2022). **Trade freedom** is measured by the trade freedom index (TF), scored on this index range from 0 to 100. In order to gather information for the Trade Freedom Index, the Heritage Foundation is a trustworthy source (Siddik et al, 2022). **Foreign direct investment** is measured as foreign direct investment, net inflows (% of GDP), collected from World Bank database (Sukar, Ahmed & Hassan, 2007; Susilo, 2018).

3.3. Model specification

Following Syed et al. (2021); Nguyen & Duong (2021); Jiang et al. (2021); Liu et al. (2022), authors strived to analyze the impact of digital finance and the shadow economy on economic growth, as follow:

$$EG_{it} = a_0 + a_1 EG_{it-1} + \beta_1 MO_{it} + \beta_2 SE_{it} + \beta_3 COR_{it} + \beta_4 TF_{it} + \beta_5 FDI_{it} + \varepsilon_{it}$$

Where:

EG_{it} is the dependent variable for economic growth, measured in GDP per capita (constant 2015 US\$), measured in natural logarithm, with indicating the country (i) and time (t), respectively.

a_0 is intercept term.

$a_1, \beta_1, \dots, \beta_7$ are the respective sensitivity coefficients for the six variables.

MO_{it} is an independent variable and an indication of digital finance measured by mobile money transaction (% of GDP), with indicating the country (i) and time (t), respectively.

SE_{it} is an independent variable and measured by size and development of shadow economy as a percentage of real GDP per capita, with indicating the country (i) and time (t), respectively.

COR_{it} is a control variable and represents control of corruption, with indicating the country (i) and time (t), respectively.

TF_{it} is a control variable and indicates the index of trade freedom, with indicating the country (i) and time (t), respectively.

FDI_{it} is a control variable and indicates foreign direct investment, measured by net inflow as a percentage of GDP, with indicating the country (i) and time (t), respectively.

ε_{it} is the error term.

Table 1. Variable description

Source: Authors

Variable	Label	Measurement	Source	Expected sign
Economic growth	EG	GDP per capita (constant 2015 US\$)	World Development Indicators (WDI) – World Bank	N/A
Digital finance	MO	Digital payment proxy mobile money transaction percentage of GDP	Financial Access Survey - IMF	+
Shadow economy	SE	Size and development of the shadow (%)	Medina & Schneider (2019)	-
Corruption	COR	Control of Corruption Index	Worldwide Governance Indicators – World Bank	+
Trade freedom	TF	The index of trade freedom	Heritage Foundation	+
Foreign direct investment	FDI	Net inflow of foreign direct investment (%)	WDI - World Bank	+

3.4. Data analysis

To deal with endogeneity as well as dynamics, many estimation methods have been developed, with the central role being the use of instrumental variables. Among them, GMM is one of the most used estimators, allowing to overcome the difficulty of choosing instrumental variables and solving endogenous

problems. To evaluate the effectiveness of this method, the authors base on the AR (1) and AR (2) correlation tests, and use the Sargan and Hansen tests. Accordingly, test Sargan and Hansen (1998) to determine the appropriateness of instrumental variables in the research model. Arellano - Bond test (1991) to test the first order autocorrelation through AR (1) test, and AR (2) test evaluates the 2nd order series correlation in the model. Additionally, we address the substantial measurement error presence by using a two-step system GMM to estimate dynamic unbalanced panel data (Lee, 2007).

4. RESULTS AND DISCUSSION

4.1. Descriptive statistics

Table 2. Descriptive statistics

Source: Author's synthesized by Stata

Variable	Obs	Mean	Std. Dev.	Min	Max
EG	540	9.9773	5.6062	6.4173	23.2502
SE	324	0.3125	0.0918	0.131	0.582
MO	439	0.5189	0.3803	0.0299	1.0618
COR	540	-0.5169	0.4534	-1.1426	0.2616
TF	530	72.5184	6.9929	62.6	82.5
FDI	540	0.0425	0.0917	-0.4008	1.0902
ATM	519	25.1357	25.1253	0.0906	117.7917

Note: This table reports the results of descriptive statistics. There 7 variables used in this study include: economic growth (EG), shadow economy (SE), mobile money transactions (MO), number of ATMs per 100,000 adults (ATM), corruption (COR), trade freedom (TF), foreign direct investment (FDI).

Accordingly, economic growth of the selected countries measured by GDP per capita has the mean value of 9.98 with the minimum value at 6.42 and the maximum value at 23.25. In addition, the average shadow economy is 31.25%. The average mobile money transactions are about 51.9%. Finally, the control variables, including COR, TF, FDI and ATM have the mean values of the variables at -0.52, 72.52, 4.26%, 25.14 respectively.

4.2. Correlation matrix

Table 3. Correlation matrix

Source: Author's synthesized by Stata

	EG	SE	MO	COR	TF	FDI
EG	1					
SE	-0.9665	1				
MO	0.9455	-0.9237	1			
COR	0.0992	0.0077	0.0482	1		
TF	-0.0981	0.1321	-0.0910	0.3223	1	
FDI	0.0901	-0.0838	0.1231	0.1360	0.0525	1

Note: This table reports the results of correlation matrix. There 6 variables displayed in this table include: economic growth (EG), shadow economy (SE), mobile money transactions (MO), corruption (COR), trade freedom (TF), foreign direct investment (FDI).

In the correlation matrix table, the independent variables in the study are all correlated with the dependent variable. Accordingly, the independent variable digital finance measured by mobile money transactions has a positive correlation with economic growth, with 0.9455, consistent with research expectations. Moreover, shadow economy has a negative correlation with economic growth, with -0.9665, consistent with our

expectations as well. Moreover, digital finance measured by mobile money transactions has a negative correlation with shadow economy, with -0.9237 . The correlation coefficients of the independent variables are all less than 1, so the regression model rarely has multicollinearity.

4.3. Research findings and discussion

Table 4. The effect of shadow economy and digital finance on economic growth – GMM estimator

Source: Author's synthesized by Stata

	L. EG
SE	-.0684*
	-1.93
MO	.0151**
	2.25
COR	-.0005
	-0.69
TF	.00009
	1.26
FDI	.0063***
	3.07
Cons	.0656307
	2.26
AR (2)	0.447
Sargan's test - p-value	0.427
Hansen's test - p-value	0.504

*Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% significance levels, respectively. Where the model is $EG_{it} = a_0 + a_1 EG_{it-1} + \beta_1 SE_{it} + \beta_2 MO_{it} + \beta_3 COR_{it} + \beta_4 TF_{it} + \beta_5 FDI_{it} + \epsilon_{it}$ where EG represents economic growth, SE stands for shadow economy, digital finance measured as mobile money transactions (MO) and the others are control variables: corruption (COR), trade freedom (TF) and foreign direct investment (FDI).*

The table 4 offers insights into the statistics that the estimated model has the p-value of the AR (1) test less than the significance level of 5% and the p-value of the AR (2) test is larger than the significance level 10%. Therefore, the models have first order autocorrelation but no second order residual autocorrelation. At the same time, the Hansen test of the model has p-value greater than the significance level of 10%, which means the instrumental variables used in the model are appropriate. Moreover, the p-value of the Sargan test is also greater than the 10% significance level. The illustrative estimation result has the largest number of tools, which is 32, lower than the number of groups, so the stability is guaranteed. From these results, authors can conclude that the conditions for the model's consistency and rationality are quite satisfied.

As far as table 4 is concerned, digital finance (MO) exerts a positive impact on economic growth (EG). To be more detailed, 1 increase in digital finance will result in an 1.51% increase in economic growth at a 5% significant level. Therefore, hypothesis H1 is accepted. This result is consistent with previous studies

(Liu et al, 2022; Mulee, 2019; Jiang et al, 2021). According to the Slow Growth Model, technology is just as important an input to production as labor and capital, the two other basic components of production. Economic growth must be stimulated by technological advancement in the manufacture of goods, the delivery of services, and corporate operations. According to the concept, technological development increases service production and delivery efficiency, which results in high output productivity. There is a two-way relationship between technological advancement and the financial system, in which the former promotes the latter's expansion. The frequency with which financial systems lend money to economically inventive entrepreneurs increase with the development of financial systems, which in turn contributes to economic growth. The model is important for this study because it emphasizes how the advancement of technology in the financial sector contributes to economic growth. According to the technological spillover theory, digital finance can benefit the finance industry in three different ways. Technical staff are made available, financial disintermediation is accelerated, and financial inclusion is increased through technological spillover. By advancing technology, lowering costs, boosting outreach efforts in the financial industry, and increasing the effectiveness of the financial system, digital finance alters traditional financial institutions through the "squid effect." An explanation for this correlation could be that through scenarios, data, and financial innovation products, digital finance can make up for the drawbacks of traditional financial services, fully exploit the benefits of "cheap cost, rapid speed, and wide coverage," and lower the threshold for financial services and service costs. Thus, the financial challenges faced by businesses are reduced, their R&D costs are assured, technological innovation is facilitated, and eventually, the advancement of their technological competence and total factor productivity is fostered (Sun, 2021). Additionally, according to Fu et al. (2021) and Li et al. (2020), household consumption is stimulated by digital finance, aiding in industry restructuring and enhancing bank efficiency. Moreover, digital finance could enhance industry – an important factor of economic growth. Particularly, digital finance obtains consumer data through utilizing the benefits of digital technology, Internet trading platforms, market applications of information technology, and management innovation (Xu et al., 2021). Digital finance can promote industry fusion and correlation with upstream and downstream industries that can be formed based on the industrial convergence of new industries and new formats, accelerate industry differentiation and reorganization, and ultimately promote the improvement of industrial structure that results in economic development (Zhang, 2018). It might also cut the financing costs and minimal financial service requirements for industrial issues. The availability of financial services is increased thanks to digital finance, which also lowers the requirements for industrial subjects to access financial services, lowers the information cost of financing industrial subjects, and broadens the financing channels (Li & Ran, 2021).

Shadow economy (SE) negatively affects economic growth. To be more detailed, at 10% significance level, 1 increase in the shadow economy will result in a 6.84% decrease in economic growth, which is in line with Nguyen & Luong (2021); Mayssa et al (2021); Borlea, Achim & Miron (2017) and Younas, Qureshi & Al-Faryan (2022). A growing shadow economy causes tax revenues to drop significantly and the delivery of public goods to deteriorate, both of which can hinder economic growth. Government spending and transfers typically reduce as tax revenues fall. The availability of public services for everyone in the economy diminished as the shadow economy grew, which had a negative impact on economic growth (Loayza, 1996). Additionally, the existence of the informal economy reduces the effectiveness of macroeconomic policy, which is largely predicated on the notion that unofficial activities, by fostering unfair competition, adversely affect how the market is allocated. In addition, shadow activity has a negative impact on the status of the public finances, as well as the state budget's size, structure, and financial environment. The shadow activities also have a significant negative impact on the nation's monetary system. The phenomena of the shadow economy have a detrimental effect on the reproduction of the labor force in the traditional economy. The operation of the shadow economy distorts investment procedures as well (Mandroshchenko, Malkova & Tkacheva, 2018).

Foreign direct investment has a positive effect on economic growth due to the impacts of transferring technology and expanding employment opportunities (Mehic et al, 2013). Particularly, at 1% significance level, 1 increase in foreign direct investment will result in a 0.63% increase in economic growth. This result was discovered by various authors (Susilo, 2018). The remaining variables including corruption and trade freedom have no statistically significant effect on economic growth.

4.4. Robustness test

Table 5. Robustness test by using another measurement of digital finance - ATM

Source: Author's synthesized by Stata

	L. EG
SE	-.1411***
	-8.08
ATM	.00005***
	2.67
COR	.0011**
	2.02
TF	.00009*
	3.29
FDI	.0054**
	2.58
Cons	.1367305
	5.77
AR (2)	0.316
Sargan's test - p-value	0.514
Hansen's test - p-value	0.318

*Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% significance levels, respectively. Where the model is $EG_{it} = a_0 + a_1EG_{it-1} + \beta_1SE_{it} + \beta_2ATM_{it} + \beta_3COR_{it} + \beta_4TF_{it} + \beta_5FDI_{it} + \epsilon_{it}$ where EG represents economic growth, SE stands for shadow economy, digital finance measured as number of ATMs per 100,000 adults (ATM) and the others are control variables: corruption (COR), trade freedom (TF) and foreign direct investment (FDI).*

To test the robustness, the authors use another measurement for the digital finance variable instead of mobile money transactions. The variable used is the number of ATMs per 100,000 adults, as suggested by Syed et al (2021). Table 5 shows that it is consistent with the regression results when ATM is used as an independent variable. Particularly, 2 independent variables including digital finance and shadow economy are statistically significant.

5. CONCLUSION AND RECOMMENDATION

The research "Digital finance, shadow economy and economic growth: Evidence from selected countries" was conducted in order to clarify the influence of digital finance and shadow economy on economic growth based on data collected from 54 countries during the period from 2012 to 2021. The

results demonstrated that while digital finance is of great benefits to economic growth, informal economy could pose a threat to economic development, which means that the research method used is stable and appropriate.

Authors found out that Digital Finance positively affects economic growth. The discoveries provide a variety of policy implications for fintech innovation and banking regulation. First and foremost, governments ought to promote a greater digitalization of banking services in developing nations. To compete with developed nations, developing markets need sufficient revenue and resources, which digitalization aids in obtaining through inclusive growth and a decline in the informal sector. Secondly, developing nations should make greater investments in building safe and reliable digital infrastructure since unstable and dangerous digital platforms increase the likelihood of fraud and financial risk. Welfare-focused digital banking services for people, enterprises, and households should be promoted by policymakers. To encourage digital transactions, the government could also give some financial support or subsidies to people and financial institutions. Government should also ensure that there is less regulation for fintech service providers so that they can develop their financial technology and intermediation function while minimizing costs, when possible, to better serve their clients. Policymakers should also consider the cost of providing fintech services to people, enterprises, and households in order to maintain proper budgetary resources. Thirdly, in order to fully leverage digital technology's favorable impact on increasing income distribution, we must take advantage of the symbiotic and mutually reinforcing relationship between the development of digital finance and other economic systems. As stated in the text, the effects of the development of the digital financial industry on the distribution of income within an area are not isolated, and the interaction between the development of the digital financial industry and personal capital - both human and material - will also be seen. Government agencies should therefore disregard the association between digital finance and other development factors when developing policies on the development of digital finance, as well as treating it as an independent variable affecting regional income distribution.

The main goals are to:

- boost local economic growth and raise residents' income levels;
- balance regional spending on education, encourage balanced educational growth, and ensure that all students have equal access to quality education;
- maintain foreign investment attraction and trade structure optimization;
- increase the flow of financial expenditure to local businesses.

Besides, authors also noticed that the Shadow economy has a negative impact on economic growth. Our findings indicate that if long-term economic policy is to reduce the size of the shadow economy, it should prioritize human development, economic and capital market growth, and economic freedom while reducing income inequality, streamlining the tax code, and reducing VAT rates, tariffs, and income taxes to the extent that this is feasible and does not conflict with other economic policy objectives. As a sample, institution quality factors dominate other shadow economy issues. Authors advise policymakers to reduce bureaucracy and over-regulation while also fostering an atmosphere that is more democratic and transparent in order to strengthen institutions. In order to improve the quality of institutions, policymakers must develop policies. Authors will be unable to decrease the extent of the shadow economy without high-quality institutions. The expanding shadow economy can also be combated by reducing inflation through macroeconomic environment reform and bridging the wealth and poverty divide.

Despite our best efforts, our research has a few unexpected limits. First of all, this study was conducted over a 10-year period, which is still regarded as a short time frame. 54 nations have been utilized to study the connection between digital finance, shadow economy and economic growth. As a result, the scope of the research should be considered and expanded in the future. Data for analysis should be gathered over a

longer time span, such as 20 or 30 years, in order to be more in-depth. Following this, it is required to do the research based on a larger number of countries in order to have a thorough and comprehensive study. In addition, digital finance could be analyzed by other measurements including number of registered mobile money accounts per 1,000 adults or number of active mobile money accounts per 1,000 adults.

6. APPENDIX

6.1. Selected countries

1	Albania	28	Madagascar. Rep. of
2	Angola	29	Malawi
3	Armenia	30	Mali
4	Azerbaijan	31	Mauritania. Islamic Rep. of
5	Bangladesh	32	Mauritius
6	Benin	33	Mongolia
7	Bolivia	34	Mozambique. Rep. of
8	Botswana	35	Myanmar
9	Cambodia	36	Namibia
10	Cameroon	37	Niger
11	Chad	38	Nigeria
12	Côte d'Ivoire	39	Pakistan
13	Egypt. Arab Rep. of	40	Paraguay
14	Fiji. Rep. of	41	Philippines
15	Ghana	42	Qatar
16	Guinea	43	Romania
17	Guinea-Bissau	44	Rwanda
18	Guyana	45	Senegal
19	Honduras	46	Solomon Islands
20	Hungary	47	South Africa
21	India	48	Thailand
22	Indonesia	49	Togo
23	Jamaica	50	Türkiye. Rep of
24	Jordan	51	Uganda
25	Kenya	52	Vietnam
26	Lesotho. Kingdom of	53	Zambia
27	Liberia	54	Zimbabwe

6.2. Descriptive statistics

```
. sum EG SE MO COR TF FDI ATM
```

Variable	Obs	Mean	Std. Dev.	Min	Max
EG	540	9.977344	5.606246	6.41736	23.25029
SE	324	.3125401	.0918908	.131	.582
MO	439	.5189686	.3803786	.0299547	1.061887
COR	540	-.5169402	.4534388	-1.142694	.2616838
TF	530	72.51849	6.992929	62.6	82.5
FDI	540	.0425594	.091771	-.400866	1.090253
ATM	519	25.13575	25.12534	.0906518	117.7917

6.3. Correlation matrix

```
. corr EG SE MO COR TF FDI
(obs=324)
```

	EG	SE	MO	COR	TF	FDI
EG	1.0000					
SE	-0.9665	1.0000				
MO	0.9455	-0.9237	1.0000			
COR	0.0992	0.0077	0.0482	1.0000		
TF	-0.0981	0.1321	-0.0910	0.3223	1.0000	
FDI	0.0901	-0.0838	0.1231	0.1360	0.0525	1.0000

6.4. GMM estimator

```
. xtabond2 EG L1.EG SE COR TF MO FDI, gmm(12.EG 12.COR 13.MO, lag(3 3)) iv(13.TF 13.FDI 13.COR) two
> step small
Favoring space over speed. To switch, type or click on mata: mata set matafavor speed, perm.
Warning: Two-step estimated covariance matrix of moments is singular.
Using a generalized inverse to calculate optimal weighting matrix for two-step estimation.
Difference-in-Sargan/Hansen statistics may be negative.
```

Dynamic panel-data estimation, two-step system GMM

Group variable: ID	Number of obs	=	225
Time variable: Year	Number of groups	=	33
Number of instruments = 32	Obs per group: min	=	1
F(6, 32) = 3.99e+08	avg	=	6.82
Prob > F = 0.000	max	=	7

	EG	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
EG						
L1.		.9928995	.0025946	382.68	0.000	.9876145 .9981846
SE		-.0684162	.0355144	-1.93	0.063	-.1407566 .0039242
COR		-.0005409	.0007894	-0.69	0.498	-.0021488 .0010671
TF		.0000958	.0000758	1.26	0.215	-.0000586 .0002502
MO		.0151819	.0067361	2.25	0.031	.0014609 .0289029
FDI		.0063283	.0020642	3.07	0.004	.0021237 .0105329
_cons		.0656307	.0290442	2.26	0.031	.0064696 .1247919

Warning: Uncorrected two-step standard errors are unreliable.

Instruments for first differences equation

Standard

D.(L3.TF L3.FDI L3.COR)

GMM-type (missing=0, separate instruments for each period unless collapsed)

L3.(L2.EG L2.COR L3.MO)

Instruments for levels equation

Standard

L3.TF L3.FDI L3.COR

_cons

GMM-type (missing=0, separate instruments for each period unless collapsed)

DL2.(L2.EG L2.COR L3.MO)

Arellano-Bond test for AR(1) in first differences: z = -2.22 Pr > z = 0.026
 Arellano-Bond test for AR(2) in first differences: z = 0.76 Pr > z = 0.447

Sargan test of overid. restrictions: chi2(25) = 25.64 Prob > chi2 = 0.427
 (Not robust, but not weakened by many instruments.)

Hansen test of overid. restrictions: chi2(25) = 24.28 Prob > chi2 = 0.504
 (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:

GMM instruments for levels

Hansen test excluding group: chi2(11) = 7.79 Prob > chi2 = 0.732

Difference (null H = exogenous): chi2(14) = 16.48 Prob > chi2 = 0.285

iv(L3.TF L3.FDI L3.COR)

Hansen test excluding group: chi2(22) = 21.83 Prob > chi2 = 0.470

Difference (null H = exogenous): chi2(3) = 2.44 Prob > chi2 = 0.485

6.5. Robustness test

```
. xtabond2 EG L1.EG SE COR TF ATM FDI, gmm(12.EG 12.COR 13.ATM, lag(3 3)) iv(13.TF 13.FDI 13.COR) twostep small
Favoring space over speed. To switch, type or click on mata: mata set matafavor speed, perm.
Warning: Two-step estimated covariance matrix of moments is singular.
Using a generalized inverse to calculate optimal weighting matrix for two-step estimation.
Difference-in-Sargan/Hansen statistics may be negative.
```

Dynamic panel-data estimation, two-step system GMM

Group variable: ID	Number of obs	=	220
Time variable: Year	Number of groups	=	33
Number of instruments = 32	Obs per group: min	=	1
F(6, 32) = 1.09e+09	avg	=	6.67
Prob > F = 0.000	max	=	7

	EG	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
EG	L1.	.9867708	.002345	420.80	0.000	.9819942 .9915474
SE		-.1411096	.0174552	-8.08	0.000	-.1766646 -.1055545
COR		.0011035	.0004139	2.67	0.012	.0002604 .0019467
TF		.0000939	.0000465	2.02	0.052	-8.67e-07 .0001886
ATM		.0000568	.0000173	3.29	0.002	.0000216 .0000919
FDI		.0054638	.0021192	2.58	0.015	.001147 .0097805
_cons		.1367305	.0237037	5.77	0.000	.0884476 .1850134

Warning: Uncorrected two-step standard errors are unreliable.

Instruments for first differences equation

Standard

D.(L3.TF L3.FDI L3.COR)

GMM-type (missing=0, separate instruments for each period unless collapsed)

L3.(L2.EG L2.COR L3.ATM)

Instruments for levels equation

Standard

L3.TF L3.FDI L3.COR

_cons

GMM-type (missing=0, separate instruments for each period unless collapsed)

DL2.(L2.EG L2.COR L3.ATM)

Arellano-Bond test for AR(1) in first differences: z = -2.09 Pr > z = 0.036

Arellano-Bond test for AR(2) in first differences: z = 1.00 Pr > z = 0.316

Sargan test of overid. restrictions: chi2(25) = 24.09 Prob > chi2 = 0.514
(Not robust, but not weakened by many instruments.)

Hansen test of overid. restrictions: chi2(25) = 27.77 Prob > chi2 = 0.318
(Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:

GMM instruments for levels

Hansen test excluding group: chi2(11) = 12.93 Prob > chi2 = 0.298

Difference (null H = exogenous): chi2(14) = 14.84 Prob > chi2 = 0.389

iv(L3.TF L3.FDI L3.COR)

Hansen test excluding group: chi2(22) = 25.43 Prob > chi2 = 0.277

Difference (null H = exogenous): chi2(3) = 2.34 Prob > chi2 = 0.504

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ECONOMIC FREEDOM, FINANCIAL DEVELOPMENT, AND FOREIGN DIRECT INVESTMENT: A COMPARATIVE STUDY OF DEVELOPED AND DEVELOPING ECONOMIES

**Author: Le Quynh Anh¹, Nguyen Ha Tuan Khoa¹, Nguyen Phan Thuy Khue¹,
Truong Nguyen Yen Ly¹, Khuc Hai Quynh¹
Mentor: Le Anh Tuan¹**

ABSTRACT: This research investigates the impact of economic freedom on foreign direct investment as well as the moderating role of financial development in this linkage. Employing international data from 161 countries from 1995 to 2020, we find that an improvement in economic freedom can increase foreign direct investment in developing countries. However, there is no significant evidence of a relation between economic freedom and foreign direct investment in developed countries. Our further analysis shows that the positive nexus between economic freedom and foreign direct investment is less pronounced for countries with high financial development. Our findings are robust after addressing endogeneity by using a dynamic approach from a two-stage system GMM estimation. Overall, our study points to the presence of heterogeneity in the effect of economic freedom that addresses its benefits in developing countries, thereby providing implications for policymakers in attracting foreign investors.

Keywords: Economic Freedom, Foreign Direct Investments, Financial Development

1. INTRODUCTION

Despite the economic downturns during the 26-year period, FDI inflows globally still manage to reach its peak at nearly 3.13 billion USD (OECD, 2007), reflecting a growing trend compared to the previous period. Numerous papers have shown the financial benefits of FDI such as aiding the transfer of technology to developing nations (Osano & Koine, 2016), boosting labor force expansion (Hale & Xu, 2016), and encouraging the business environment to be more competitive through the creation of international corporations (MNCs) (OECD, 2002). This led to emerging countries' remarkable economic development and poverty reduction. FDI is necessary for both developed countries and developing countries. Notably, developing countries make use of the FDI flows as an external source of finance for economic development, whereas in the case of developed countries, FDI flows can be used as a reassurance for sustainable economic development. IMF and WTO are the two main organizations that encourage the growth of FDI flows by eliminating the restrictions for capital transfer. In addition, national governments are also adjusting the policies to attract this type of capital source. However, before investing in another nation, foreign investors carefully study the host country's socioeconomic characteristics, with economic freedom being a crucial component that must be examined.

Karabegovic et al. (2003) defined economic freedom as the ability of firms to make decisions about their businesses without facing the restriction from the government or government policies against the free-market behaviors seized by economically powerful groups to limit the economic choices of others. Economic freedom is a manifestation of an open and effective economy, governments that respect and support openness and free markets create a better opportunity for innovation and advancement, eventually leading to greater human flourishing (Torstensson, 1994). Economists have studied the link and impacts of economic freedom on the FDI inflows in several years, in different regions. Quazi (2007) indicates that

¹ University of Economics Ho Chi Minh city.

economic freedom is a key factor that has a significant impact on the FDI, a higher level of economic freedom means a larger domestic market size, higher returns on investment, and also a more competitive business environment. In addition, economic freedom also encourages the promotion of FDI by increasing the likeliness of receiving FDI inflows (Zghidi et al., 2016).

Several studies have explored the impact of economic freedom on FDI in certain regions, such as East Asia (Quazi, 2007), South Asian (Nasir & Hassan, 2011). Nasir & Hassan (2011) indicates that policymakers in South Asian countries should put more effort into enhancing the level of economic freedom as a way to attract more FDI to the countries. Moussa, Çaha, and Karagöz (2016) investigate the economic freedom and its macroeconomic component to attract the FDI inflow at the regional and global levels. Although many papers have investigated the impact of economic freedom on FDI, a comparative study of developed and developing countries is not fully conducted. In this study, we fill this gap in the literature by using a global sample of 161 countries around the world over a 26-year period to compare the impact of economic freedom on FDI. Answering these research questions is crucial because FDI is considered as an important factor that significantly contributes to economic growth of the country.

The main purpose of this study is to analyse the relationship between economic freedom in a given country and the attraction of FDI inflows. We use the Economic freedom index collected from the Heritage organisation website as our main source of data as these data illustrate the correlation of economic freedom to other factors, such as rule of law, government size, regulatory efficiency, and open markets. The index provided us with a closer look into how the Economic freedom index can be a detrimental factor when attracting FDI inflows in both developed and developing countries. In addition, we examine heterogeneity in the relationship between economic freedom and FDI by using cross-sectional analysis that employs financial development as a moderator. In this way, we can explicitly explore the role of country-level financial conditions in attracting investment from foreign investors. Notably, one may argue our results suffer from endogeneity. We use the two-step Generalized Method of Moments (GMM) estimator to allow us to obtain more efficient, unbiased, and consistent estimates and address the potential and endogeneity problems.

Employing a cross-country sample of 161 developing and developed countries over the 1995 – 2020 period, we find a significant positive impact of EF on FDI in developing countries, in line with Quazi (2007). Interestingly, there is no significant linkage between EF and FDI in developed countries.

This study is among the very first studies that examine the relationship and impacts of EF on the FDI inflows in 161 countries globally for the period of 1995-2020. Given that the empirical results from a single country are still unclear, we take advantage of international data to provide robust evidence about the positive impact of EF on FDI, especially in developing countries.

Finally, this study adds to the corpus of literature that is being written about EF and the connection between FDI inflows and economic development. According to our findings, it is critical to take into account regional variations in financial development when analysing how financial development influences how much FDI contributes to growth. It is crucial for decision-makers to comprehend how local economic freedom policies impact the growth-enhancing effects of FDI. For FDI to have a major impact on economic growth, policymakers should concentrate on effectively maximizing the flexibility of the domestic economy.

The remainder of the paper is as follows. Section 2 provides a literature review and hypothesis development. Section 3 describes the methodologies including data selection, variable definitions, and model. Section 4 presents the empirical results and we come to a conclusion in Section 5.

2. THEORETICAL FRAMEWORK

2.1. The causal relationship between the Economic Freedom and Foreign Direct Investment

Scholars have examined the relationship between EF and FDI inflows in various regions over years. According to Quazi (2007), EF is a major element that has meaningful effect on FDI; greater level of EF implies larger domestic market, higher return on investment, and a higher level of competition. EF also promotes FDI by raising the likelihood of FDI inflows (Zghidi et al., 2016). Other scholars have thrown light on the link between EF and FDI spillovers by taking certain geographically grouped economies into account. The outcomes demonstrate that FDI is significantly influenced by EF and macroeconomic variables, along with trade. Imtiaz and Bashir (2017) revealed that EF had a positive and statistically significant impact on FDI. Imtiaz et al. (2017) examined the Economic freedom index and other macroeconomic variables for attracting FDI in South Asia from 1995 to 2014, the outcomes suggest that general EF is a key factor of FDI. Along the way, there were researchers who focused on the conditions of the nations they studied, such as Quazi (2004), who researched whether EF, may determine FDI inflows in developing countries. The research used average data from 1995 to 2000 for a cross-section of 67 developing nations, discovered that EF is a significant and robust element of FDI.

FDI provides nations with quick access to advanced technology, which may help both the company receiving investment and other local companies. FDI can boost exports by creating assembly plants and aiding local businesses in entering overseas markets (Aitken et al., 1997). However, other experts denied the particular benefits of FDI flows. They also stressed the negative social consequences of EF. According to Krugman (2000), international investors can benefit from liquidity-constrained local capitalists' fire sales of property throughout economic downturns. In this case, foreign investors buy domestic firms due to their better cash position instead of having technological supremacy. Razin et al. (1999) asserted that nonnative venture investors' off-balance knowledge superiority may lead to overinvestment. Previous studies have demonstrated that FDI does not arise by chance but depends on the recipient nations' ability to absorb them, which is affected by a range of variables. Blomstrom et al. (1994) observed that FDI has a greater beneficial impact on growth in nations with a larger degree of evolution. Balasubramanyam et al. (1996) examined the effectiveness of FDI due to the commercial policies of the beneficiary nations.

2.2. The relationship between Economic Freedom and Foreign Direct Investment under the effect of Financial Development

Researchers found that FDI has a greater impact on countries with export-oriented policies. However, the development effect of FDI in developing nations with import replacement policies could not be observed. Strategies of import replacement reduce the efficacy of FDI by modifying the yields from both government and personal capital (Balasubramanyam et al., 1996). FDI has a minor direct influence on development, but it contributes favourably to growth in nations where human resources are over a defined limit (Borensztein et al., 1998). This is because FDI is related to a country's labour force's degree of education. Therefore, advanced nations tend to benefit more from FDI than developing nations because of their greater human resources. This is further reinforced by Xu (2000) that US multinational corporations' transmission of technology is attributed to capacity development in developed nations but not in underdeveloped nations.

Alfaro et al. (2004) found that instead of HR, economic territory expansion was more important for FDI spillovers. Financial sector improvement also affects FDI spillovers. Scholars like Hermes and Lensink (2003), Alfaro et al. (2004, 2010), and Durham (2004) recognized the importance of well-functioning financial institutions for successful technological spillovers. Bank and stock market growth were related to

physiological FDI spillovers. A better-developed financial system contributed positively to the transfer of new tech associated with FDI.

Studies have linked EF to development. Financial experts believe it includes the ability to choose and provide materials, competition between companies, free trade, and protected ownership. EF can explain why some countries are more financially successful than others. However, when researchers used the index elements instead of the gross economic freedom standard, they found that the impacts varied among elements (Heckelman & Stroup, 2000; Carlsson & Lundstrom, 2002).

Research on the connection between FDI and development is limited, particularly on the impact of EF on FDI. Although it is logical to assume that nations that support higher EF are more likely to gain from multinational corporations, there is no strong practical proof to back up this claim. Studies show a favourable association between EF and economic growth (De Haan & Sturm, 2000; Olson, 2000; Justesen, 2008). Research also indicates that EF is a significant element that stimulates increases in inward FDI, indicating good business and investment conditions. For example, Bengoa and Sanchez-Robles (2003) recognized a link between EF and inward FDI in Latin America, contending that nations with fewer limitations and stronger institutions will attract more FDI.

The Heritage Foundation countries' EF is calculated by using four categories and 12 factors: property rights, government integrity, judicial effectiveness, government spending, tax burden, fiscal health, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom, and financial freedom. After running the regression tests, we propose the first hypothesis which is established to test the relationship between EF and FDI:

H1: Economic freedom has a positive impact on foreign direct investment.

To test if EF has a different impact on FDI between nations with high and low levels of financial development, we develop the following hypothesis. Financial growth is necessary for attracting FDI since foreign businesses can easily access financial services and outside funding to expand their commercial operations (Ezeoha and Cattaneo 2012; Agbloyor et al. 2013; Suliman and Elia 2014). Moreover, the level of financial sector development promotes FDI (Alfaro et al. 2008; Lee and Chang 2009; Al Nasser and Gomez 2009). Increasing access to external financing and indirect support for overall economic activity resulting from financial growth encourages FDI inflows (Alvarez and Lopez, 2013; Desbordes and Wei, 2014). As financial development improves, more productive firms with foreign ownership function in manufacturing sectors that are more dependent on external financing, and the effect of EF on FDI is less pronounced. However, higher destination nations' financial development could discourage FDI in several ways (Antras et al., 2009; Ju and Wei, 2010; Bilir et al., 2013).

Numerous studies (Hermes and Lensink, 2003; Alfaro et al., 2004, 2009, 2010) have highlighted the significance of a strong financial system for local firms to benefit from foreign technology spillovers. Financial development encourages inbound FDI in both source and destination countries. The financial advantage of foreign companies over domestic firms (Desai et al., 2004b, 2008; Alfaro and Chen, 2012) is linked to their home nations' financial depth, with implications beyond short-term perspectives.

H2: The positive impact of economic freedom on foreign direct investment is less pronounced for high financial development levels countries.

3. RESEARCH METHOD

3.1. Data collection

This study examines the relationships between economic freedom and foreign direct investment and the moderating impact of financial development on this relationship using international data between 1995 and 2020. We firstly collect our country-level data from different sources, then combine and store them as panel data.

After removing some countries that contain missing observations to minimize the error, the final sample throughout the 26-year period from 1995 to 2020 consists of 161 countries, including 34 developed countries, 127 developing countries and one special administrative region of China (Hong Kong) recognized by the United Nations. Our final sample is an unbalanced panel data of 3,634 country-year observations from developed and developing countries.

3.2. Measurement for Foreign direct investment (FDI)

Foreign direct investment (FDI) is the acquisition of stock in a company by a corporation based outside of its home nation. According to the balance of payments, FDI is the total of equity capital, long-term capital, and short-term capital. Economic growth can be supported by FDI in both the investing and receiving nations. Many countries now use FDI as a source of funding to build infrastructure and create jobs for their citizens. However, FDI has a drawback, which is the need for considerable government regulation and control, increasing the risk of political danger.

This variable is used commonly in previous studies as a good measure of direct foreign investment (Lehmann et al., 2004; Wacker, 2013).

3.3. Measurement for Economic freedom (EF)

Following prior studies (DeHann&Sturm, 2000; Heckelman, 2000; Quazi, 2007), we use The Heritage Foundation's Economic freedom index to measure economic freedom, based on 12 factors within 4 categories: Rule of Law (Property rights, Judicial effectiveness, Government integrity); Government Size (Government spending, Fiscal health, Tax burden); Regulatory Efficiency (Business freedom, Monetary freedom, Labor freedom) and Open Markets (Trade freedom, Financial freedom, Investment freedom).

Four categories are graded on a 0 to 100-point scale. The overall score of economic freedom of each country is calculated by averaging those 12 factors equally. We name the Economic freedom index as ECON_FREE, higher values of ECON_FREE denote higher economic freedom in a given country.

3.4. Control variables

We include a rich set of control variables that may influence FDI, taking their data from World Development Indicators, The World Bank. First, Onyeiwu and Shrestha (2004) indicate that inflation (INFLATION) is one important determinant of foreign direct investments. Second, Billington (1999) found that the host country's unemployment rate (UNEMPLOYMENT) was also a positive significant determinant of the location of FDI inflows. Also, political stability (PVE) has been singled out as a beneficial influence that can interpret FDI (Busse & Hefeker, 2007).

According to Nunnenkamp (2002), population growth (POP) belongs to the group of market factors that positively affect FDI inflows in the host countries. Moreover, GDP was shown to be related to the degree of FDI input. Asiedu (2002) discovered a greater GDP per capita (CAPITA) indicates good possibilities for foreign direct investment in the host country. The established paradigm that suggested a rise in FDI would cause a rise in GDP, was not producing results; rather, as GDP grows, a country becomes more appealing to foreign investment funds. Therefore, we conclude that GDP growth (GDPGROWTH) is linked to FDI inflows and has a positive impact on FDI.

Finally, as our final control variable, we considered the urban population (URBAN). The reason for this is that He Canfei’s 2002 research on the destinations of FDI in China found that FDI tends to prefer cities with higher urban population concentrations due to urbanisation economies.

3.5 Basic models

The effects of economic freedom on FDI are empirically investigated using the multiple linear regression (MLR) model as follows:

$$LOG(FDI)_{i,t} = \beta_0 + \beta_1 ECON_FREE_{i,t} + \alpha'Control_{i,t} + \delta_t + \delta_i + u_{i,t} \quad (1)$$

where i and t denote country and time, respectively. In this equation, the capital inflows of the country i from abroad in the year t are known as foreign direct investment ($FDI_{i,t}$) which is the dependent variable. The independent variable economic freedom, which $ECON_FREE$ illustrates, is represented in country i in year t . β_0 is the intercept while β_j is the slope parameter of the explanatory variables. In addition, we include a rich set of control variables, “Control”, that may influence the relationship between economic freedom and foreign direct investment. Specifically, we employ Unemployment rate, Inflation rate, Financial development, Population growth, Political stability, Urban population, GDP per capita, and GDP growth; and Financial development. To capture country- and time-invariant unobservable factors that may influence the relationship between economic freedom and foreign direct investment. We include year (δ_t) and country (δ_i) fixed effects in the model. Our main focus in Eq. (2) is the coefficient on $ECON_FREE$ (β_1). Consistent with Hypothesis 1, if an improvement in economic freedom leads to an increase in foreign direct investment, we should expect that β_1 becomes positive and statistically significant.

Further, to investigate the moderating role of financial development in the economic freedom and foreign direct investment nexus, we estimate the following model:

$$LOG(FDI) = \beta_0 + \beta_1 ECON_FREE_{i,t} + \beta_2 High_FD_{i,t} + \beta_3 ECON_FREE_{i,t} \times High_FD_{i,t} + \alpha'Control_{i,t} + \delta_t + \delta_i + u_{i,t} \quad (2)$$

where sub-indexes i and t represent the country and the year, respectively. All variables are well defined in equation (2). We define $High_FD$ as an indicator variable that equals 1 for countries that have financial development index which is greater than the yearly sample median. Notably, the coefficients of the interaction term $ECON_FREE_{i,t} * High_FD_{i,t}$ ($\beta_3\beta_3$) will explain whether economic freedom with financial development enhances or sets back FDI. This suggests that $\beta_3\beta_3$ indicates the economic freedom’s impact on the FDI rate if the appearance of the financial development is taken into consideration, or else. To be more specific, if economic freedom is linked more strongly with the FDI given the assistance of financial development, the coefficient of the interaction term $\beta_3\beta_3$ would be anticipated to be significant and negative.

4. RESULTS AND DISCUSSIONS

4.1. Descriptive statistics and correlation matrix

	N	MEAN	STD. DEV.	MIN	MEDIAN	P75	MAX
LOG(FDI)	3634	20.699	2.578	0.000	20.709	22.386	27.322
ECON_FREE	3634	60.949	10.279	15.600	60.600	67.700	90.500
FD	3602	0.328	0.237	0.026	0.248	0.485	1.000
POP	3634	1.409	1.496	-5.280	1.286	2.309	19.360
UNEMPLOYMENT	3634	0.079	0.060	0.001	0.062	0.103	0.376
PVE	3634	-0.031	0.901	-2.810	0.006	0.715	1.760
URBAN	3634	0.572	0.230	0.076	0.583	0.756	1.000
INFLATION	3634	0.092	0.862	-0.161	0.036	0.073	41.451
CAPITA	3634	9.114	1.192	6.015	9.189	10.113	12.003
GDPGROWTH	3634	0.036	0.048	-0.503	0.038	0.058	0.868

Table 1. Descriptive statistics. This table provides variable descriptive statistics as well as a summary of all variables. It contains 3634 observations from 161 countries spanning the years 1995 to 2020.

Table 1 depicts the descriptive statistics for all variables in our model from 1995 to 2020. The main independent variable ECON_FREE has a mean of 60.949 and a standard deviation of 10.279, with the minimum and maximum values being 15.6 and 90.5, respectively. The Financial development index shows a mean of 0.328 with a standard deviation of 0.237. Political stability index varies from -2.81 to 1.76, providing a mean of -0.031 and a standard deviation of 0.901. The population growth rate ranges from -5.28 to 19.36, with the mean and standard deviation being 1.409 and 1.496 sequentially. On average, countries in our sample have a GDP growth rate of 3.6% per year and inflation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ECON_FREE	1.000							
(2) POP	-0.203***	1.000						
(3) UNEMPLOYMENT	-0.073***	-0.280***	1.000					
(4) PVE	0.559***	-0.239***	0.004	1.000				
(5) URBAN	0.545***	-0.184***	0.092***	0.451***	1.000			
(6) INFLATION	-0.137***	0.026	-0.004	-0.086***	-0.029*	1.000		
(7) CAPITA	0.647***	-0.267***	0.064***	0.576***	0.814***	-0.059***	1.000	
(8) GDPGROWTH	-0.146***	0.178***	-0.108***	-0.100***	-0.161***	0.020	-0.167***	1.000

Table 2. Correlation coefficient matrix. This table provides the correlation coefficient matrix of the independent variables for our main model. The sample includes 3634 observations in 161 countries, for the period from 1995 to 2020.

The pairwise correlations between the independent variables in our main regression are reported in Table 2. The main independent variable ECON_FREE is connected with all of the control variables since the correlations between them are statistically significant at 1%. The association between Economic freedom overall score and the Political stability index is positive, while the data implies a negative relationship between the ECON_FREE and population growth. Such correlations suggest that nations that enjoy a high stage of economic freedom have greater levels of political stability and lower rate of population growth. We also receive a significant and negative correlation between Political stability index, which suggests that countries with higher levels of political stability tend to be involved with lower inflation rates. Because correlations between variables are quite small, multicollinearity is not a big issue in our model.

4.2. Baseline results: Economic freedom and foreign direct investment

Our estimations to test Hypothesis 1 are reported in Table 3. The findings of Eq.(2) are shown for the entire sample in models (1) and (2), while the results for the developing country subsample are illustrated in models (3) and (4). The findings for developed nations are depicted in the two last columns which are models (5) and (6). We do not include control variables in columns (1), (3), and (5).

After running the regression test, we discover that ECON_FREE and FDI are reported to have a beneficial relationship that is significant in both the entire sample and developing nations. These findings indicate that countries experience a higher level of FDI under the increase of economic freedom, which is consistent with a study of Quazi (2007). Figure 1 plots the fitted regression for the impact of economic freedom on FDI in developing countries. Specifically, we obtain country-level ECON_FREE and LOG(FDI) by taking the averages over the sample period. Consistent with the results from columns (3) and (4). The fitted regression line shows an upward-sloping trend in the relationship between economic freedom and foreign direct investment in developing countries.

As given in Models (1) and (2), the coefficients of ECON_FREE are 0.026 and 0.021, respectively, explaining approximately from 2.1% to 2.6% of FDI's growth with a one-unit increase in Economic freedom index when other factors are kept constant. This result bears similarity to the findings that economic freedom connects with FDI inflows positively in a study conducted by Imtiaz and Bashir (2017).

Based on our analysis in Models (3) and (4), nations with developing economies experiencing a one-unit index increment in ECON_FREE could enhance their performance in the range of 3.2%–3.5% in FDI, ceteris

paribus. However, the coefficients are witnessed to be insignificant for developed countries. This outcome is supported by several previous papers stating similar results by Saini & Singhania (2018) and Singh & Gal (2020).

Although we include both control variables and fixed effects that may capture time-invariant unobservable factors, the coefficients on ECON_FREE are not significant, even at 10%.

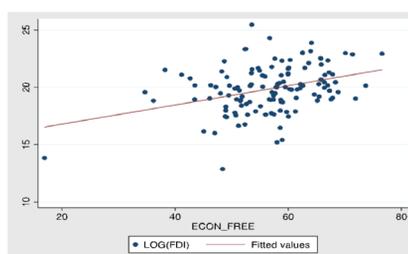


Figure 1. Economic Freedom and Foreign Direct Investment in developing countries. ECON_FREE is the proxy variable for economic freedom; LOG(FDI) is the natural logarithm of foreign direct investment. We obtain country-level ECON_FREE and LOG(FDI) by taking the averages over the sample period. The line shows an upward-sloping trend in the relationship between economic freedom and foreign direct investment in developing countries.

	Dependent Variable: LOG(FDI)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	Full	Developing	Developing	Developed	Developed
ECON_FREE	0.026*** (3.037)	0.021** (2.239)	0.035*** (3.958)	0.032*** (3.208)	-0.038 (-1.384)	-0.035 (-1.283)
POP		0.078 (1.29)		0.103 (1.514)		-0.088 (-1.055)
UNEMPLOYMENT		1.235 (0.745)		0.651 (0.336)		3.575 (1.31)
PVE		0.289** (2.125)		0.264* (1.86)		0.411 (1.34)
URBAN		4.167*** (3.043)		2.889* (1.895)		3.816 (1.303)
INFLATION		0.018* (1.843)		0.019* (1.905)		-0.122 (-0.062)
CAPITA		0.224 (0.827)		0.051 (0.176)		0.941* (2.017)
GDPGROWTH		5.368*** (4.458)		5.57*** (4.245)		0.253 (0.141)
Observations	3634	3634	2775	2775	859	859
R-squared	0.821	0.832	0.781	0.795	0.77	0.775
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes

Table 3. Economic freedom and Foreign direct investment. This table depicts the findings of effects of economic freedom on FDI. Models (1) to (6) describe the regression outcomes for each subsample (i.e., full sample, developing countries, and developed countries). The dependent variable for all specifications is LOG(FDI).

The given table also reports the impacts of control variables. URBAN and GDPGROWTH share the same significance level of 1% for the full sample. However, there is a significant difference in significance level in the subsample of developing countries. In the full sample, the coefficient of the urban population is 4.167, indicating that higher urban population results in properly increasing the FDI. A 0.01 percent-point increase in the ratio of urban population could lead to a rise of 4.167% in FDI, ceteris paribus. The same trend goes for the subsample of developing countries. Evidently, the more densely populated the nations are, the more attractive the area is to offshore investors. This is aligned with the study of He Canfei (2002), which stated that the greater the urban population, the greater the growth of FDI inflows. While URBAN remains at its significance level, the coefficient of GDP growth is only significant at 10% in the fourth column. The coefficients on GDP growth show that it has a positive linkage with FDI in developing nations.

As reported in Models (2) and (4), the coefficients and significance level for INFLATION share a resemblance. The statistically significant coefficients of PVE are 0.289 in the full sample and only 0.264 for the developing countries, showing that if other parameters remain constant, a one-unit index increase in political stability might lead to a 28% and 26% rise in FDI respectively. By contrast, population growth, unemployment rate, and GDP per capita all have no effect on FDI.

4.3. Endogeneity concerns

One may argue that our results suffer from endogenous problems. For example, although we included year and country fixed effects that capture time-invariant unobservable factors, omitted important variables that may influence both economic freedom and foreign direct investment. In addition, reverse causality raises another concern whether countries with high FDI inflows may increase their economic freedom status. To deal with issues, we employ two-stage systems generalised method of moments estimation developed by Blundell and Bond (1998). This model uses a dynamic perspective setting to address endogeneity concerns by solving unobserved heterogeneity and simultaneity. Specifically, it controls the lagged dependent variable in a model and employs lagged independent variables as instruments. To reduce the model's instrumental weakness, we limit the number of instruments by limiting the lag range used in their generation to three (Roodman, 2009). We also use the Hansen test and AR (2) test to make sure the validity of the model (Arellano and Bover, 1995). The results are reported in Table 4. We find consistent results that the coefficients on ECON_FREE are positive and statistically significant at 1% significance level for the full sample and developing countries. However, there is no significant impact of economic freedom on FDI in developed countries, even at 10% significance level. Overall, the results are robust and consistent with baseline results. Therefore, endogeneity caveats are not a big problem in our model.

	<i>Dependent Variable: LOG(FDI)</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	Full	Developing	Developing	Developed	Developed
LOG(FDI)t-1	0.593*** (444.24)	0.390*** (85.86)				
ECON_FREE	0.053*** (351.789)	0.026*** (18.194)	0.036*** (37.785)	0.03*** (22)	0.028 (1.595)	-0.026 (-0.622)
POP		0.224*** (16.3)		0.213*** (13.353)		-0.138 (-0.643)
UNEMPLOYMENT		-6.592*** (-17.539)		-4.152*** (-8.017)		-2.859 (-0.9)
PVE		0.182*** (10.747)		-0.063** (-2.187)		-0.794 (-1.4)
URBAN		0.958*** (4.745)		0.671** (2.254)		2.784 (0.601)
INFLATION		1.196*** (10.838)		0.794*** (12.096)		2.96 (1.037)
CAPITA		0.919*** (26.911)		0.813*** (16.284)		0.489* (1.686)
GDPGROWTH		5.768*** (52.073)		5.514*** (48.608)		7.199*** (8.041)
Observations	3295	3295	2504	2504	791	791
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes

Table 4. Endogeneity addressing. GMM approach. This table depicts the findings of effects of economic freedom on FDI, as estimated by the country fixed-effects model. Models (1) to (6) describe the regression outcomes for the full sample, and two subsamples (developing countries and developed countries). The dependent variable for all specifications is LOG(FDI). Standard errors are robust and clustered at the country level.

4.4 Cross-sectional tests: the role of financial development

Table 5 illustrates the statistical significance and how the effect of financial development implies on the relationship between economic freedom and FDI for the second hypothesis. We then define High_FD as a dummy variable that equals 1 for countries with high financial development. Specifically, a country is classified as high financial development if its index is greater than the yearly sample median, 0 otherwise. We then interact this variable with ECON_FREE, noting that the coefficients on the interaction terms reflect the moderating role of financial development on the EF - FDI linkage. If high financial development constrains the beneficial impact of economic freedom on FDI, we should expect the coefficient, $\beta_3\beta_3$ is negative and statistically significant.

Empirically, the result provides that financial development has a meaningful impact only on the relationship in full and developing countries samples. with the negative coefficients of 1% significance. Therefore, we conclude a less intense effect on the relationship in high-level financial development countries. Furthermore, Worldbank (2017) suggests that developing countries are believed to be more favorable for growth than developed countries. Taking column (4) of Table 5 as an example, the coefficient on ECON_FREE*HIGH_FD is -0.043 and statistically significant at 10%. In terms of economic magnitude, compared to low financial development countries, the positive impact of economic freedom on FDI is lower by 0.045 units for countries that have high financial development. This is consistent with the hypothesis that for countries with higher levels of financial development, available financing convenience and resources, the effect of economic freedom on FDI is less intense.

About control variables, similarly, we found that almost all the coefficients (except for capita) are statistically insignificant for the developed countries group. For the first 4 Models, many variables have similarities in significance level. Nonetheless, the coefficients of the Unemployment rate, Population growth, and GDP per capita are consistently insignificant for the two samples. It is explicit that, regardless of whether financial development is included, the consistency of most variables' coefficients changes only slightly.

	Dependent Variable: LOG(FDI)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	Full	Developing	Developing	Developed	Developed
ECON_FREE	0.046*** (4.544)	0.039*** (3.32)	0.05*** (4.592)	0.046*** (3.785)	-0.018 (-0.939)	-0.035 (-1.569)
HIGH_FD	3.42*** (3.746)	2.758*** (2.937)	2.789*** (2.887)	2.511** (2.583)	2.042 (1.156)	0.068 (0.051)
ECON_FREE*HIGH_FD	-0.055*** (-3.848)	-0.046*** (-3.085)	-0.046*** (-3.011)	-0.043*** (-2.834)	-0.028 (-1.076)	0 (-0.01)
POP		0.075 (1.222)		0.099 (1.42)		-0.086 (-0.978)
UNEMPLOYMENT		0.593 (0.348)		0.071 (0.036)		3.614 (1.339)
PVE		0.281** (2.069)		0.269* (1.888)		0.411 (1.337)
URBAN		3.878*** (2.929)		2.865* (1.905)		3.853 (1.298)
INFLATION		0.025*** (2.851)		0.026*** (2.746)		-0.075 (-0.036)
CAPITA		0.193 (0.723)		0.053 (0.187)		0.921* (1.78)
GDPGROWTH		5.265*** (4.259)		5.551*** (4.188)		0.284 (0.157)
Observations	3634	3634	2775	2775	859	859
R-squared	0.823	0.833	0.783	0.797	0.771	0.775
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes

Table 5. Interaction of economic freedom and financial development. This table reports the effects of economic freedom and FDI on the degree of financial development. Models (1) through (6) show the basic regression results for each of the examined samples (full sample, developing countries, and developed countries) with LOG(FDI) as the dependent variable.

5. CONCLUSIONS

Economic freedom has a beneficial impact on FDI, which is statistically significant across the board and in emerging nations. These data suggest that as economic freedom increases, countries see increasing levels of FDI. Yet, for industrialised nations, the coefficients are seen to be small. Remarkably, for wealthy nations, the influence of all factors on FDI is negligible, with the exception of GDP per capita. Finally, to increase the dependability of our results, we used the robust standard error check via the GMM technique, which shows that the favorable impact of economic freedom on FDI is more prominent in emerging economies. Generally, the findings are consistent with the baseline findings.

This conclusion could be very relevant; developing countries should continue their efforts to attract foreign direct investment by offering various investment incentives and increasing economic freedom. Greater trade openness appears to be an important tool for economic growth and another way for developing countries to support and encourage foreign direct investment. However, governments should weigh the costs of attracting FDI against the benefits of increasing economic freedom. Policies that promote greater economic freedom should precede measures aimed at attracting foreign direct investment, as greater freedom is likely to yield greater benefits. Before implementing other strategies to encourage higher levels of foreign direct investment, policymakers should develop procedures that are clear to potential investors.

Data collection was challenging, which is the main limitation of this study. The study only included 161 nations as a result due to the lack of data in some countries. The choice of control variables is also limited by this issue, which has an impact on the empirical findings of the study. The second problem is that our research estimates the aggregate measurement of FDI that may conceal the variety of MNEs' reactions to the institutional environment. The question of how a country's institutions between a host and a home country affect the FDI flow between them cannot be answered by looking at data on inward FDI that is only one way. Therefore, we see this article as a viable beginning point for analyzing the aspects that show to be critical for FDI, whether from an internal or external viewpoint. Future research will investigate the dynamic combination of all of these views.

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THE BRIGHT SIDE OF CORRUPTION CONTROL IN THE AGE OF PRESS FREEDOM: EVIDENCE FROM CORPORATE ENVIRONMENTAL PERFORMANCE AROUND THE WORLD

**Author: Huynh Huu Thuy Tien¹, Nhan Khanh Linh¹, Tran Ngoc Minh Tam¹, Nguyen Minh Anh¹
Mentor: Le Anh Tuan¹**

ABSTRACT: Corruption is a severe problem, and social ethics significantly impact all societies. It is a global phenomenon defined broadly as using public power to benefit a private interest. It is a complex and multifaceted concept with numerous and significant economic and environmental implications. This paper examines the impact of control of corruption on corporate environmental performance. Using a large sample of 19,666 firm-year observations of 2,063 unique firms in 28 countries between 2003 and 2018, we find that control of corruption has a significant and positive impact on corporate environmental performance. Our findings remain econometrically sound even after controlling for the corruption-environmental performance relationship's inherent endogeneity and we also examine the cross-sectional analysis for the role of press freedom in our research. We provide evidence that press freedom strengthens the beneficial impact of corruption control on corporate environmental performance.

Keywords: corruption; corporate environment; press freedom

1. INTRODUCTION

In recent years, international organizations, national governments, nonprofit organizations, and other entities have regularly fought corruption due to its serious threats to political, economic, and social life. It's interesting since economic and social breakdown costs affect many groups. Investment and economic growth are mainly affected by these variables. The environment is one of corruption's most evident and harmful effects. Corruption harms the environment. Forestry, endangered species conservation, water supply, oil production, fisheries, and hazardous waste management are vulnerable to corruption (UNODC, 2015). Corruption happens at every level, from small-scale bribery of officials to grand corruption when permits and licenses for exploiting natural resources are issued. Additionally, corruption makes it possible to disregard or go through social and environmental regulations.

Even though corruption is a severe issue, there is not much research on how it affects corporate environmental performance. In this study, we fill the gap in the literature by investigating the impact of control of corruption on corporate environmental performance. Corrupt politicians, judges, attorneys, prosecutors, police officers, investigators, and auditors obstruct law enforcement, legal reform, and the impartial administration of justice in nations where corruption permeates the government and judicial systems.

The accountability systems responsible for preserving the environment are compromised by corruption in the rule of law establishment, which also fosters an atmosphere of impunity. Since crimes remain unpunished and may shift blame to innocent parties, remedies may thwart, and may not always enforce laws.

It is widely perceived that the extractive industries' environmental risks include pollution, dangers to biodiversity, greenhouse gas emissions, and land degradation. Extractive industries have environmental risks and also corruption risks. Lower revenue doesn't always mean less corruption. Corruption can negatively impact the environmental performance of firms. Corruption is more than simply individual activities; it is a wider issue that affects environmental stability and society. Policymakers should evaluate the implications.

¹ University of Economics Ho Chi Minh city.

Our research enriches the literature. The ASSET4 database's business Environmental Performance Index (Environment score) assesses emission reduction, product innovation, and resource reduction. Second, we examine the association between control of corruption and environmental performance using the Environment Score, Control of Corruption, and other country-level variables to ensure that omitted factors do not skew our findings. We also discover global corporate data. We also examine heterogeneities in the connection using country-level press freedom status. Thus, we examine press freedom's moderating effect on corruption and environmental performance.

We found a strong and positive association between corruption control and corporate environmental performance in an international sample of 19,666 firm-year observations of 2,063 unique businesses in 28 countries between 2003 and 2018. After resolving endogeneity using a two-stage least squares estimate with instrumental factors, the findings are robust. In nations without press freedom, corruption control has a less positive influence on business and environmental performance. Press freedom eliminates corruption and improves business environmental performance, as shown by this research.

After media reports of illegal telecom contract payments in Uzbekistan, Telia Corporation agreed to pay at most \$965 million in penalties to US and international authorities (Schoenberg & Dolmetsch, 2017). VimpelCom settled a 2016 case for \$835 million after a media probe into unethical payments. (Scannell, 2016). These examples show how important press freedom and investigative journalists are in uncovering and prosecuting wrongdoing. Current research suggests that press freedom is linked to perceived corruption and that media freedom may decrease corruption through stronger corporate governance.

Our study has five sections. Our paper proceeds as follows: The second part analyzes relevant literature, then we provide our assumptions concerning corruption, environmental performance, and press freedom. We will pick data, variables, and sample and develop the model in the third section. The fourth section presents descriptive statistics and empirical outcomes. Our study paper references are in the final part.

2. LITERATURE REVIEW

2.1. Corruption and environmental performance

In a developing economy, academics and legislators address environmental performance and quality. Human survival and economic prosperity depend on environmental performance. According to various classic studies, productive factor inputs and environmental shocks impact economic growth and development. For the former, Everett et al. (2010) indicate that outstanding environmental performance is an input of a better production component, typically resulting in more economic growth (Beckerman, 1992). The state could use cleaner energy and technology, limit trade openness, and modify the industrial structure to enhance environmental performance from an economic perspective (Grossman & Krueger, 1995; Press, 2007; Managi & Kumar, 2009). Corruption is as old as civilization. Since ancient Egypt, it has existed. It seems inevitable in human societies. The World Bank Group has been fighting corruption in its client states for almost two decades. Corruption may range from tiny payments to large-scale schemes in which high-level government officials make millions in unlawful revenues.

In China, over three-quarters of those polled thought corruption had worsened in the previous three years, implying that people do not believe the significant anti-corruption effort is succeeding. In 2017, governments worldwide prioritized inclusive development as people expressed worry about rising inequality, persisting poverty, and the exclusion of the most vulnerable. Asia Pacific countries must achieve sustainable and equitable development as a varied and fast-developing area. ("Corruption in Asia Pacific: What 20,000+ people told us," 2017).

Corruption's acceptance in many countries is the biggest problem. Corruption ripples across society, especially in developing nations, by diverting funds. Corruption-free enterprises grow 3% faster, according to the World Bank and Transparency.org. Corruption may be a 20% "tax" on business in certain countries. After the "tangentopoli" bribery scandal and punishment, city rail construction plummeted 52% and subway line building dropped 57%, respectively. The scandal reduced public construction project corruption, lowering construction costs. Illicit activities used most of these projects' public cash. (Turpeinen, 2020).

According to Judge et al. (2011), corruption indicators have been studied. Existing research has employed country-level corruption indices and addressed issues regarding perception-based indices (Abrate et al., 2015; Seim & Soreide, 2009). Corruption doesn't hurt the organization receiving the bribe, but it does hurt society via poor product quality or overcharging. Corruption has been linked to inefficient use of natural resources, improper land use, increased CO2 emissions, and misuse of infrastructure funding. Corruption affects the ecosystem, according to Cole (2007). Corruption affected environmental policy directly and indirectly. Corruption has positive environmental advantages, but its indirect effects are damaging. Corruption worsens air pollution, though. The model provides insight into setting a pollution tax in a protected industry within a political corruption environment and makes some accurate theoretical predictions.

The first prediction is that trade policy is preventative; trade liberalization raises (lowers) the pollution tax if public corruption is high (low). When there is little to no corruption (high), trade policy is anti-protective, and trade liberalization boosts (decreases) the pollution tax.

The second prediction is that reducing corruption makes pollution tax increase. Government is more accountable for social welfare when there is less corruption in the system. Due to this, there will be a significant difference between the environmental tax and the Pigouvian tax, a tax on market transactions that imposes a surcharge on those not directly affected by the trade.

The third prediction is that environmental policy will respond positively to growing environmental demand. It is true that this technique would increase environmental demand, but only if the level of corruption remained constant. Organized groups will have minimal influence on environmental policy in countries with high levels of corruption since such policies are made from and for bribes.

We tested our theoretical premise using panel data from 28 developing and developed nations. Regression estimates provide support for our theoretical model's fundamental assumptions. Corruption and environmental policy were examined empirically by Pellegrini (2003). Institutions predict income levels. It also shows that as prosperity grows, institutional quality will lead to stronger environmental legislation. The U-shape Environmental Kuznets Curve (EKC) was introduced by Grossman and Krueger (1991) to show a correlation between production and environmental quality. Commerce increases emissions by 10%, according to Grether et al. (2007). Birdsall and Wheeler (1992) agreed that "imported" environmental rules from affluent and industrialized nations boosted clean sector development in developing economies.

Based on several pieces of evidence, we expect a positive relationship between control of corruption and corporate environmental performance. Therefore, we propose our first testable hypothesis as follows:

Hypothesis 1: Control of corruption is positively associated with corporate environmental performance.

2.2. The role of press freedom

Press freedom and corruption go hand in hand (Kalenborn & Lessmann, 2013; Norris, 2004). Brunetti and Weder (2003) use cross-country data from 125 countries between 1994 and 1998 to support

their thesis that press freedom may curb corruption. On a scale of 0 to 6, enhancing press freedom by one standard deviation decreases corruption by 0.4–0.9 points. Strong press freedom helps lower a nation's corruption, according to a study. Ahrend (2002) provides further empirical evidence that a lack of press freedom increases corruption. Freille, Haque, and Kneller (2007) examine the relationship between media freedom and corruption by differentiating between political, legal, and economic constraints. Their results suggest that political boundaries affect corruption more than legal limits. FOIL legislation has also been linked to lower corruption (Islam, 2006). According to Nam (2012), states adopting FOIL must consider media freedom and corruption. According to Camaj (2012), “the link between media freedom and corruption is stronger in countries with parliamentary systems than in those with presidential systems.” The media's economic independence and competition also help fight corruption (Suphachalasai, 2005). Government media ownership is strongly linked to corruption, according to Djankov, McLeish, Nenova, and Shleifer (2003).

Press freedom's potential to fight corruption is plausible. Becker's (1968) model of crime states that criminals assess the anticipated benefits against the projected costs. According to this notion, increasing penalties or detection deters criminals. Independent media should discourage crime by increasing the probability of detection. These people are either public officials who demand bribes from companies or firms that offer fixes in return for favorable treatment, either via collusive corruption or in reaction to extortion. The press policies corruption with the idea that these individuals are alert to even little changes in detection. In an experimental bribery game, Abbink et al. (2002) demonstrate that the low chance of detection and hefty punishment considerably limit the probability of offering or taking a bribe. The higher the danger of discovery for bribery, the fewer businesses engage.

Hypothesis 2: The positive effect of control of corruption on corporate environmental performance is less pronounced for firms in non-press-freedom countries.

3. METHODOLOGY

3.1. Data selection

Compustat North America and Compustat Global are our primary data sources for firms' accounting data. The sample for this paper was chosen primarily based on the availability of reliable data. Our sample includes developed, developing, emerging, and least developed countries worldwide. These countries' economic development and geographic area meet the requirements for spatial analysis. We then merge it with corporate environmental performance data from the Thomson Reuters ASSET4. Our main independent variable, control of corruption, is collected from the Worldwide Governance Indicators. Country-level variables such as GDP per capita and inflation are collected from the World Bank database and press freedom from the Freedom House.

Following previous studies, we exclude firms that have negative total assets and firms in utilities (SIC codes 4900 – 4999) and financial industries (SIC codes 6000-6999). All continuous financial variables are consolidated at 1% and 99% of the distributions to reduce the influence of outliers. After dropping firm-year observations with missing values, our final sample includes 19,666 firm-year observations of 2,063 unique firms in 28 countries between 2003 and 2018.

3.2. Model

3.2.1. Basic model

To study how corruption affects environmental performance, we build the basic model as follows:

$$\begin{aligned}
 \text{Environment score}_{i,j,t} = & \beta_0 + \beta_1 \text{Control of Corruption}_{j,t} + \alpha' \text{Country Controls}_{j,t} \\
 & + \delta' \text{Firm Controls}_{i,j,t} + \text{Industry fixed effects} \\
 & + \text{Year fixed effects} + \mu_{i,j,t}; \quad (1)
 \end{aligned}$$

where our main dependent variable (*Environment score*_{*i,j,t*}) is the indicator for the environmental performance for firm *i* country *j* in year *t*. *Control of Corruption*_{*j,t*} captures the corruption control level in a given country *j* in year *t*.

*Firm Controls*_{*i,j,t*} are a set of firm-level control variables, including *ROA*, *Size*, *Sales Growth*, *Leverage*, *Tangible*, *Intangible*, *Market-to-book*. Additionally, *Country Controls*_{*j,t*} including *Inflation*, which is gauged by the annual inflation rate (GDP deflator); and *GDP per capita*, shows a country's GDP divided by its total population. Section 3.2.2 and Table 1 both provide definitions for these variables. We also add industry dummies to capture all time-invariant industry-level parameters that may be related to both the level of corruption control and environmental performance. Furthermore, we account for the time-fixed impacts of common macroeconomic shocks. For all specifications, the standard errors are heteroskedasticity-resistant and clustered at the country level. It is worth noting that 1 in equation (1) captures the impact of corruption control on environmental performance. One would anticipate 1 to be positive if eliminating corruption causes firms in a specific country to enhance their environmental performance.

3.2.2. Variables and data sources

a) Measurement of Corporate Environmental Performance

We use environmental performance scores from the Thomson Reuters ASSET4 database to measure our key dependent variable, as in prior studies (Ioannou & Serafeim, 2012; El Ghoul et al., 2017). A higher environmental performance score suggests greater risk-reduction techniques. Emission reduction, product innovation, and resource reduction are all major aspects of environmental performance. An objective to reduce emissions, for example, may boost the environmental score. A unique environmental pillar score goes from 0 to 100, with higher values indicating greater environmental performance. We rescale this variable, *Environment score*, to a new scale ranging from 0 to 1 in order to better grasp the regression results proposed by Cheng et al. (2014). Higher *Environment score* values indicate improved environmental performance.

b) Measurement of Control of Corruption

Though public opinion of corruption has increased in recent years and researchers are interested in it (Transparency International, 2010a, p. 3), cross-national studies on the corruption issue date back decades (Scott, 1969, 1972). According to the literature, one of the main drivers of the global phenomenon of states globally implementing access-to-information legislation is corruption (Roberts, 2006, p. 110). Because public usage of access-to-information legislation leads to holding the government accountable for its activities (Birkinshaw, 2010), it has been claimed that access-to-information legislation may be “a tool that can be used to gain accountability” in government (Piotrowski, 2008, p. 10).

Following Nguyen et al. (2015) and Le et al. (2021), we use the Worldwide Governance Indicators control of corruption index as our main independent variable. The control of corruption index measures how much public power is utilized for private gain, including both petty and grand corruption, as well as the “capture” of the state by elites and private interests. It also examines a country's anti-corruption policy and institutional framework's strength and effectiveness. Control of Corruption has a range of -2.5 to 2.5; higher numbers indicate stronger corruption control.

c) Measurement of Control variables

We also include a rich set of firm-level and country-level control variables that are commonly used in the literature to prevent omitted factors from skewing our results.

In terms of company controls, we include *ROA*, which is the net income-to-total-assets ratio. Myers and Rajan (1998) contend that liquid assets are the least expensive option for managers to earn personal rewards. Profitable organizations with more cash flow motivate managers to be more opportunistic, which leads to more corruption (Jensen & Meckling, 1976). *Size* is calculated using the log of total assets at the end of the fiscal year. The link between business size and corruption is murky. On the one hand, when larger enterprises become involved with more businesses, the business becomes more complex and dangerous, increasing the chance of fraud and corruption. Large firms, on the other hand, are investigated intensively by the media and the general public, which can limit managers' ability to abuse authority and engage in corruption (Dyck et al., 2008).

We also follow Faccio et al. (2011) and Coles et al. (2006) and adjust for the effects of sales growth since firm sales growth and cash holdings behavior are anticipated to have direct effects on risk performance (*Sales Growth*), the percentage growth of sales over a sixteen-year period. Furthermore, because the leverage proportion is important in firm-level risk (Huang & Wang, 2015; Gande & Kalpathy, 2017), we include the *Leverage variable*, which is calculated as the sum of total debt in current liabilities and total long-term debts scaled by total assets; and *Tangible*, which is the ratio of tangible assets to total assets. *Intangible*, which is the ratio of intangible assets to total assets, is also included. To capture growth opportunities, we include *Market-to-book*, which is the market-to-book ratio.

Regarding country-level controls, we include the natural logarithm of real GDP per capita (*GDP per capita*). We also use *Inflation*, which is measured by the annual inflation rate (GDP deflator).

Table 1. Variable Definitions

Variable	Description	Source
Environment score	Environmental performance scores. A higher environmental performance score indicates higher corporate environmental performance	Thomson Reuters ASSET4 database
Control of Corruption	Corruption management. The control of corruption index measures how often public power is utilized for private gain. Higher levels indicate less corruption.	Worldwide Governance Indicators
ROA	Ratio of net income before extraordinary items or preferred dividend to total assets	Federal Reserve Economic Data
Size	Logarithm of total assets in millions	Federal Reserve Economic Data
Sales Growth	Annual growth of net sales	The World Bank
Leverage	Ratio of total liabilities to total assets.	The World Bank
Tangible	Ratio of tangible assets to total assets.	Federal Reserve Economic Data
Intangible	Ratio of intangible assets to total assets.	Federal Reserve Economic Data
Market-to-book	Ratio between its market value and its book or equity value	Federal Reserve Economic Data
GDP per capita	The logarithm of GDP per capita.	World Development Indicator
Inflation	The inflation rate determined by each nation's GDP deflator index.	World Development Indicator

4. EMPIRICAL RESULTS

4.1. Descriptive statistical analysis

Table 2 shows the descriptive statistics for the main variables, which include mean, standard deviation, median, 25th, and 75th percentiles from 19,600 firm-year observations. The mean and median of the

Environment score are 0.426 and 0.411, respectively. As indicated in Table 3, the Netherlands has the highest Environment score of 0.629, but this has little impact because the amount of observations from this nation accounts for only 0.051% of the total of 28 countries. In terms of Control of Corruption, the mean is relatively high (1.188). This is due to the fact that the United States and Japan have the most observations, accounting for 23.467% and 25.47%, respectively, and their levels of corruption control are generally outstanding, at 1.416 and 1.42, respectively.

The pairwise correlation between independent variables is seen in Table 4. At the 1% level, we find a positive and statistically significant relationship between Control of Corruption and Environment score. According to this study, corporations in high-corruption countries will improve their environmental performance. Furthermore, it revealed a moderate association, but it was not severe enough for the researcher to seek corrective measures, equating to a variance inflation factor of roughly 2.24 (unreported in the table). According to our calculations, there is no possibility of multicollinearity.

Table 2. Summary statistics

	N	Mean	Std. Dev.	P25	Median	P75
Environment score	19,666	0.426	0.252	0.216	0.411	0.628
Control of Corruption	19,666	1.188	0.775	1.211	1.397	1.695
ROA	19,666	0.055	0.098	0.022	0.052	0.094
Size	19,666	9.974	2.994	7.735	9.398	12.612
Sales Growth	19,666	0.126	0.370	-0.007	0.069	0.173
Leverage	19,666	0.207	0.164	0.066	0.189	0.314
Tangible	19,666	0.265	0.190	0.118	0.227	0.367
Intangible	19,666	0.134	0.175	0.011	0.047	0.202
Market-to-book	19,666	2.613	2.221	2.042	2.175	2.441
GDP per capita	19,666	10.291	0.961	10.543	10.713	10.797
Inflation	19,666	0.018	0.024	0.001	0.017	0.027

This table provides a descriptive statistic for all variables, with 19,666 firm-year observations from 28 countries from 2003 to 2018. Table 1 contains the definitions of the variables.

Table 3. Descriptive statistics by countries

	N	Percent	Firms	Environment score	Control of Corruption
Australia	1,377	7.002	170	0.279	1.934
Brazil	31	0.158	8	0.520	-0.153
Chile	19	0.097	3	0.538	1.418
China	1,994	10.139	207	0.237	-0.387
Denmark	35	0.178	7	0.494	2.386
Finland	56	0.285	4	0.343	2.280
France	574	2.919	54	0.519	1.380
Germany	774	3.936	65	0.442	1.824
Hong Kong	488	2.481	59	0.315	1.731
India	905	4.602	79	0.418	-0.386
Ireland	3	0.015	0	0.553	1.572
Israel	56	0.285	7	0.372	0.878
Italy	36	0.183	7	0.281	0.114
Japan	5,009	25.47	325	0.489	1.420

Malaysia	217	1.103	17	0.496	0.193
Mexico	22	0.112	2	0.461	-0.327
Netherlands	10	0.051	2	0.626	2.028
Norway	27	0.137	5	0.329	2.153
Poland	67	0.341	10	0.181	0.650
Singapore	109	0.554	14	0.342	2.147
South Africa	182	0.925	19	0.442	0.140
South Korea	743	3.778	59	0.526	0.509
Sweden	222	1.129	24	0.395	2.203
Switzerland	214	1.088	15	0.447	2.078
Thailand	11	0.056	2	0.340	-0.409
Turkey	119	0.605	15	0.489	-0.089
United Kingdom	1,751	8.904	171	0.380	1.786
United States	4,615	23.467	713	0.485	1.416

This table presents a descriptive statistic of the mean Environment score and Corruption Control in 28 nations from 2003 to 2018. Table 1 contains the definitions of the variables.

Table 4. Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Environment score	1.000										
(2) Control of Corruption	0.114***	1.000									
(3) ROA	0.030***	-0.085***	1.000								
(4) Size	0.329***	-0.207***	-0.043***	1.000							
(5) Sales Growth	-0.109***	-0.081***	0.108***	-0.131***	1.000						
(6) Leverage	0.100***	-0.038***	-0.153***	0.129***	-0.041***	1.000					
(7) Tangible	0.030***	-0.072***	-0.193***	0.124***	-0.098***	0.254***	1.000				
(8) Intangible	0.012*	0.234***	0.028***	-0.286***	0.001*	0.110***	-0.396***	1.000			
(9) Market-to-book	0.011**	0.015**	0.166***	-0.115***	0.147***	0.015**	-0.129***	0.092***	1.000		
(10) GDP per capita	0.153***	0.898***	-0.085***	-0.086***	-0.110***	-0.022***	-0.073***	0.210***	0.054***	1.000	
(11) Inflation	-0.097***	-0.439***	0.124***	-0.231***	0.159***	0.023***	0.023***	0.034***	0.033***	-0.552***	1.000

This table provides the correlation coefficient matrix of the main independent variables. The sample includes 19,666 firm-year observations in 28 countries over the 2003–2018 period. The definitions of the variables are provided in Table 1. (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$

4.2. Baseline Results

The impact of corruption control on environmental performance is investigated using a static panel data model. The sample studied includes enterprises from 28 countries, with data ranging from 2003 to 2018. The random effects model was rejected when the Hausman test was used to compare it to fixed effects models. As a result, as illustrated in equation (1), a fixed effects panel data model is adopted.

Table 5 shows the regression findings for the principal analysis as indicated in the basic model. We employ a variety of control combinations. Column (1) is our naive model because it lacks control variables and fixed effects. Column (2) includes firm-control and country-control variables, but we also account for industry fixed effects and year fixed effects. In Column (3), we list the control variables and year fixed effects. For the last column, we aggregate all of the independent variables and the set of fixed effects. Column (4) has the highest R-squared in terms of goodness-of-fit, highlighting the importance of controlling heterogeneity in the independent variables.

Across the model specification, the *Control of Corruption* coefficients are positive and statistically significant at 1%, indicating that increasing the level of control of corruption leads to improved environmental performance in firms in a given country. Keeping all other variables constant, a one-point improvement in the level of corruption control boosts the *Environment score* by 0.034 points on average. In terms of economic significance, a one standard deviation increase in *Control of Corruption* improves environmental performance by 6.2% over the sample mean. The findings corroborate Hypothesis 1, suggesting that anti-corruption efforts improve environmental performance. As a result, our findings are consistent with those of Lv, Z., and Gao, Z. (2021), who demonstrated that the cumulative impacts of corruption on environmental performance are negative and statistically significant.

Turning to control variables, we observe that the signs are quietly consistent with prior studies. Specifically, according to the findings of Aulia and Agustina (2015), Hadjoh and Sukarta (2013), and Effendi et al (2012), *firm size* has a strong beneficial effect on environmental performance. *ROA* is positive and statistically significant at 1% for models (2), (3), and (4). It is consistent with prior research by Aulia and Agustina (2015) that found profitability had a significant and favorable impact on environmental performance. In addition, other variables' sign and statistical significance are positive for *Leverage*, *Tangible*, *Intangible*, and *Market-to-book* but negative for *Sales Growth*. At the 1% level, the effect is statistically significant and positive in terms of *GDP per capita* and *Inflation* for country-control variables.

Table 5. Control of corruption and Corporate environmental performance

Dependent variable: Environment score				
	(1)	(2)	(3)	(4)
Control of Corruption	0.037*** (16.06)	0.038*** (7.444)	0.030*** (5.834)	0.030*** (6.010)
ROA		0.164*** (9.362)	0.166*** (9.478)	0.184*** (10.659)
Size		0.034*** (53.291)	0.034*** (54.289)	0.035*** (53.53)
Sales Growth		-0.041*** (-8.912)	-0.039*** (-8.477)	-0.041*** (-9.018)
Leverage		0.071*** (6.537)	0.058*** (5.384)	0.075*** (6.843)
Tangible		0.029*** (2.809)	0.024** (2.415)	0.024* (1.886)
Intangible		0.094*** (8.355)	0.103*** (9.178)	0.153*** (13.025)
Market-to-book		0.004*** (5.625)	0.004*** (5.079)	0.005*** (6.175)
GDP per capita		0.035*** (8.225)	0.042*** (9.767)	0.043*** (10.168)
Inflation		1.236*** (14.032)	1.484*** (16.257)	1.319*** (14.653)
Constant	0.382*** (116.847)	-0.391*** (-9.891)	-0.46*** (-11.544)	-0.485*** (-12.337)
Observations	19,666	19,666	19,666	19,666
R-squared	0.013	0.170	0.183	0.232
Industry Fixed Effects	No	No	No	Yes
Year Fixed Effects	No	No	Yes	Yes

This table displays the results of a test to see how corruption affects environmental performance. For all specifications, the environment score is the dependent variable. Table 2 contains the definitions of the variables. Except for Column (1), the models contain year fixed effects. Robust standard errors are used to calculate the coefficient estimates and t-statistics. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

4.3. Endogeneity Concerns

The possibility of endogeneity in the two-way interaction between corruption and environmental performance influences internal validity. An IV estimation using two stage least squares (2SLS) is performed to overcome this issue. It should be highlighted that IV estimation is less prone to misspecification and yields more consistent estimators. The first stage is to find a legitimate instrument (Z) for corruption that is both exogenous and relevant, as expressed by the following two conditions:

- i. $Cov(Z, \mu) = 0$
- ii. $Cov(Z, Corr) \neq 0$

It is critical to notice that the first requirement is difficult to assess because there is no unbiased estimator. As a result, in this scenario, researchers rely on their economic intuition. The second criterion, on the other hand, can be tested. The relevance of the instrumental variable to satisfy condition (ii) is tested by running an auxiliary regression in which corruption is regressed on its instrument as well as all other environmental performance variables. If the instrument’s coefficient is significant, the instrument is relevant. The initial stage of the regression procedure. The environmental performance is then regressed on all explanatory variables that are instrumented on itself, with the exception of corruption, which is instrumented on Z in a 2SLS estimation.

It is crucial to note that the government integrity index is used as a corrupting weapon (Z). In environments with low government integrity, corporate governance reasoning deviates from values of accountability, responsibility, and openness for company executives. Previous research backs up this assertion. According to Keig et al. (2015), firms that create and sustain operations in portfolios of places with greater degrees of corruption are more likely to engage in irresponsible behavior, as such environments may allow or even encourage corporate executives to avoid socially responsible behavior. As a result, there is strong evidence that the government integrity index can be used to facilitate corruption.

The results of the first stage regression IV regression are shown in Column (1) of Table 6. Government Integrity coefficients are both positive and significant, adding support to our premise that countries with high government integrity have better corruption control. Furthermore, the Cragg-Donald Wald F-statistic is 33.001, indicating that the null hypothesis that our instrumental variables are weak is rejected. In column (2), we regress the *Environment score* against the fitted value of *Control of Corruption* from the first-stage regression. For the *Environment score*, the *Control of Corruption* (fitted) coefficient remains positive and significant. These data imply that improved corruption control leads to a higher *Environment score*.

Table 6. Two-stage least squares estimation (2SLS)

	(1)	(2)
	Control of Corruption	Environment score
<i>Control of Corruption (fitted)</i>		0.049*** (3.274)

Government Integrity	0.041*** (25.277)	
ROA	-0.027** (-2.27)	0.173*** (10.049)
Size	-0.006*** (-13.898)	0.035*** (54.13)
Sales Growth	-0.004 (-1.199)	-0.041*** (-8.964)
Leverage	0.005 (.676)	0.081*** (7.41)
Tangible	0.042*** (4.811)	0.02 (1.621)
Intangible	0.055*** (6.732)	0.158*** (13.424)
Market-to-book	-0.004*** (-7.082)	0.005*** (6.263)
GDP per capita	0.119*** (41.808)	0.054*** (11.575)
Inflation	1.579*** (24.973)	1.374*** (15.05)
Constant	-2.801*** (-12.871)	-0.597*** (-14.021)
Observations	19,437	19,437
R-squared	0.961	0.24
Cragg-Donald Wald F statistic	33.001***	
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

This table reports the regression results of control of corruption on environmental performance addressing endogeneity. Columns (1) – (2) estimate the two-stage least square estimation. In all models, the *t*-values are computed for the heteroskedasticity-robust standard errors at the country level. The definitions of the variables are provided in Table 1. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively

4.4. Cross-sectional Analysis

We also investigate how press freedom influences the relationship between corruption and environmental performance (Hypothesis 2). For all regressions, we use the same set of control variables as in equation (1), as well as the interaction factors between control of corruption and no press freedom (*Control of Corruption*No Press Freedom*). We use country-level statistics from the Freedom House database on the “Freedom of the Press” index. Each country is rated as Free, Partly Free, or Not Free. For each year, we define the dummy variable No Press Freedom, which takes 1 if a country’s status is Not Free. We estimate the following model to test Hypothesis 2:

$$\begin{aligned}
 \text{Environment score}_{i,j,t} = & \beta_0 + \beta_1 \text{Control of Corruption}_{j,t} + \beta_2 \text{No Press Freedom}_{j,t} + \\
 & \beta_3 \text{No Press Freedom}_{j,t} * \text{Control of Corruption}_{j,t} + \\
 & \alpha' \text{Country Controls}_{j,t} + \delta' \text{Firm Controls}_{i,j,t} + \\
 & \text{Industry Fixed effects} + \text{Year fixed effects} + \mu_{i,j,t} \quad (2)
 \end{aligned}$$

All of the coefficients of the interaction terms in Table 7 are negative and statistically significant at 1% level, which is consistent with our prediction. This suggests that firms in non-press-freedom countries will have worse environmental performance (higher *Environment score*). These findings support the assumption that the beneficial association between *Control of Corruption* and environmental performance is less pronounced for firms in countries with no press freedom. In order to achieve the required accountability within a system, which enhances openness, reduces information asymmetry, and creates stronger monitoring capacity, a free and independent press (free of government or private democratization strongholds) is crucial (Dutta and Roy, 2016). According to research, this function makes a free press an effective tool for combating corruption (Brunetti and Weder, 2003; Chowdhury, 2004; Freille et al., 2007). Our data thus support Hypothesis 2, which asserts that firms in press-free nations perform worse for the environment because corruption is more tightly controlled than firms in press-free countries.

Table 7. Interaction between Control of Corruption and No Press Freedom

Dependent variable: Environment score		
	(1)	(2)
Control of Corruption	-0.02*** (-6.474)	-0.023*** (-3.931)
No Press Freedom	-0.312*** (-15.508)	-0.219*** (-11.145)
Control of Corruption*No Press Freedom	-0.110** (-2.279)	-0.206*** (-4.460)
ROA		0.173*** (10.037)
Size		0.03*** (43.257)
Sales Growth		-0.034*** (-7.529)
Leverage		0.079*** (7.231)
Tangible		0.016 (1.279)
Intangible		0.136*** (11.609)
Market-to-book		0.004*** (5.487)
GDP per capita		0.052*** (12.267)
Inflation		0.957*** (10.335)
Constant	0.478*** (103.023)	-0.443*** (-11.298)
Observations	19,651	19,651

R-squared	0.138	0.244
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

*Interaction of corruption and press freedom. This table reports the effects of corruption and environmental performance conditional on the level of press freedom. The definitions of the variables are provided in the Table 1. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively*

5. CONCLUSION, IMPLICATIONS AND LIMITATIONS

We used panel data with 19,666 firm-year observations from 2003 to 2018 to investigate the relationship between corporate environmental performance and corruption control. To further account for potential endogeneity, the 2SLS technique is utilized, and the industry fixed effect and year fixed effects are controlled for using the fixed effects estimator for static panel data. Several inferences can be drawn from our empirical data. Corruption control is an important factor in determining corporate environmental performance. It has a consistent, significant, positive, and essentially stable effect across all empirical estimators and specifications. As a result, our findings on corruption confirm previous research by Lv, Z., and Gao, Z. (2021), who discovered it to be a key determinant in environmental performance.

To progress sustainable development, relevant policy implications that take these findings into consideration must be established. To eliminate corruption, laws must be strictly enforced. It is critical to have clear standards with all necessary information put down in rules and regulations. The public's access to this information is critical since people occasionally break the law without realizing it. In order to do this, incentives and sanctions will be utilized to encourage compliance. Second, using the media to inform the public about those discovered to be corrupt.

Our study, however, has several drawbacks. Using data from corporations in 28 different countries, our study only examines the total impact of corruption control on corporate environmental performance. Future studies may investigate and compare the influence of corruption control on business environmental performance by group countries. Furthermore, our research focuses on the firm-level link between corruption control and environmental performance. Future study may analyze this association using country-level parameters.

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IMPACT OF CREDIT POLICY ON IMPROVING VIETNAMESE HOUSEHOLD LIVING STANDARDS IN THE TIME OF COVID-19 PANDEMIC

**Author: Vo Minh Quan¹, Vo Thanh Thang¹, Vo Huynh Bao Nguyen¹,
Vu Ngoc Quynh Nhu¹, Pham Nhut Hao¹**

ABSTRACT : This paper explores how credit policy impacts the living standards of Vietnamese households during the COVID-19 pandemic using panel data from the Vietnam Household Living Standard Survey (VHLSS) in 2018 and 2020. By employing the Difference-in-Differences (DiD) method along with Propensity Score Matching (PSM), this study specifically examines the effect of formal credit on household income in Vietnam. We find strong evidence that timely and efficient credit assistance during the pandemic significantly improves the living conditions of all households. Credit enables households to invest in crucial areas like education and living standards, which is important in combating the pandemic. The finding emphasizes the need to consider geographical factors when designing accessible and effective credit policies. These results provide principles for achieving the policy goals of enhancing household well-being and addressing future shocks.

Keywords: credit policy, household income, household living, COVID-19, DiD, PSM

1. INTRODUCTION

Credit is a critical financial resource that enables households to overcome barriers, participate in markets, and adopt modern technologies. It has been widely recognized for its positive impacts on productivity, living standards, poverty reduction, and welfare equality (Abosedra et al., 2016; Clarke et al., 2006; Guirkingner and Boucher, 2008; Liverpool and Alex, 2010; Shahbaz et al., 2015; Thanh et al., 2019). Consumer credit serves as a means to enhance household consumption and address temporary financial gaps. Additionally, credit plays a crucial role in meeting basic needs, such as food, clothing, and healthcare, particularly for lower-income households.

Vietnam, as a developing country in Southeast Asia, presents a particularly relevant case for the above issues. Access to credit has been a significant barrier to agricultural production in rural Vietnam, which is home to about 66.90% of the population (GSO, 2014). The COVID-19 pandemic adversely affected industries like manufacturing, tourism, and retail trade, resulting in limited credit availability and slow GDP growth (GSO, 2020). This study aims to fill gaps in the literature by investigating the impact of credit on households before and during the pandemic, shedding light on its role in enhancing living standards during difficult times.

This paper investigates the impact of COVID-19 on credit access in Vietnam and its effect on household living standards. First, we analyze the empirical evidence to understand how credit policies support Vietnamese households during the pandemic. Most importantly, we examine public confidence and trust in government responses to COVID-19, considering the perception and experiences of the Vietnamese people. Using nationwide household-level data from 2018-2020, we employ DiD and PSM techniques to compare Vietnam's socio-economic status before and during the pandemic.

Our analysis reveals a significant relationship between credit access and household income, particularly for the region variable. While credit positively impacts urban income with a 13% growth, its effect on rural income

¹ University of Economics Ho Chi Minh city.

is limited. From a policy perspective, our findings underscore the transformative role of credit in empowering households and driving economic growth. The finding also emphasizes the necessity of incorporating geographical considerations when formulating credit policies that are accessible and impactful.

The study is structured as follows: Section 2 presents the theoretical background on credit, income, formal credit relations, and farmers' income, with a summary of previous empirical studies. Section 3 describes the research methodology and data description. Section 4 shows the discussion of results. Section 5 is the conclusion.

2. THEORETICAL FRAMEWORK

2.1. Credit

Credit holds significant importance as a source of finance for households, particularly in developing nations. The coexistence of formal and informal credit is a common characteristic of the credit industry in these countries (Guirkinger and Boucher, 2008).

In Vietnam, the recognition of rural credit's significance has grown. Studies by Manh Hao (2005) and Cuong (2008) highlight the positive impact of credit on poverty reduction. Access to formal financial services tends to favor wealthier households, but credit plays a crucial role in reducing poverty. However, these studies did not thoroughly examine the distributional effects of rural credit among different recipient groups. Credit also helps individuals in Vietnam smooth their consumption patterns over time, bridging the gap between income and desired spending for a more stable standard of living.

2.1. Theory of access to credit

Access to capital can be generalized as a sequential two-step decision-making process that starts on the demand side and then goes on the supply side. Households' access to rural credit markets can be simply defined as approaching credit services. Subsequently, access to credit is measured by the largest amount of money households can borrow (Diagne and Zeller, 2001). Access to rural credit in some papers is defined as the difficulty of capital access by poor households.

The determinants of credit access can be divided into observable and unobservable factors. Observable factors have been identified in numerous studies in many developing countries. Household income, family size, bank distance, loan duration, loan processing, interest rate, and loan size were the main factors affecting households' credit accessibility in the Philippines (Chandio and Jiang, 2018).

In addition to observable factors, unobservable factors play a significant role in credit access. These factors, such as social capital and social networks, are difficult to measure but have been observed to impact farmer's credit rationing and constraints. For instance, social capital enhances credit access by increasing information availability, and reducing opportunistic behavior within networks (Fukuyama, 2001).

2.2. Formal credit relations and farmers' income

Credit access significantly impacts rural households, increasing income, reducing poverty, and improving welfare equality (Imai et al., 2010; Imai and Azam, 2012; Li et al., 2016). Constrained households without credit experience lower farm productivity (Guirkinger and Boucher, 2008). Moreover, it enables households to better cope with shocks and pursue successful livelihood alternatives (Diagne and Zeller, 2001; Tung et al., 2020). Despite positive associations between institutional credit access and productivity growth among subsistence food crop farmers in Nigeria, challenges in accessing credit hinder efforts to enhance production, income, and well-being, impeding poverty reduction (Olagunju, 2007).

2.3. Conceptual model

Based on the literature review, **Figure 1** respectively represents the comprehensive research model with variables affecting access on credit and household income.

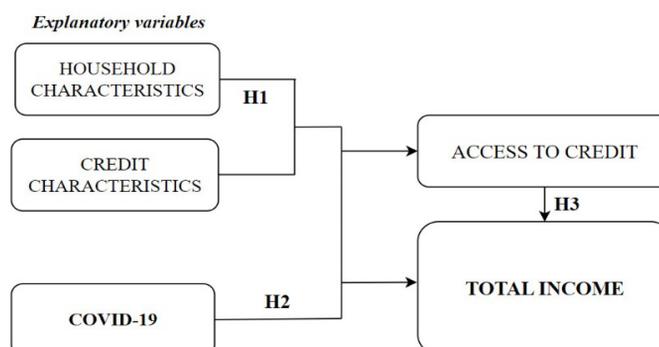


Figure 1. The theoretical framework for accessing credit and determinants affecting the household income.

Although the studies above all attempt to estimate the impact of credit, they do not sufficiently discuss the distributional effects of credit on various geographical factors. Hypotheses are built based on evidence from previous studies to better clarify the research problem and the relationship of the theories. At the same time, we apply logical economic theories to reinforce the role of credit policy. Therefore, the paper aims to examine three hypotheses constructed as follows:

Hypothesis 1: The differences of households characteristics impact on credit access.

Access to credit can be generalized as a sequential decision-making process that starts with the demand side, followed by the supply side. This is a standard framework analyzing credit accessibility (Thanh et al., 2019). Factors affecting household accessibility to applied credit include basic household characteristics such as individual-level characteristics (age, marital status, gender, education), occupation, ethnicity, household level (household size, living area), regional level (geographical location) (Duong and Izumida, 2002).

Hypothesis 2: COVID-19 is an obstruction of accessing on credit.

The emergence of COVID-19 raises concerns about its repercussions on households. Specifically, this study questions the adverse impact of COVID-19 on credit access for households, as the pandemic brings about undesirable global constraints.

Hypothesis 3: Credit has a positive impact on the total income of households in calamity.

According to prior studies, credit increases financial stability, asset growth, health, food security, nutrition, education, women’s suffrage, housing, job creation, poverty reduction, and social cohesion. In addition, credit improves productivity and raises living standards by breaking the vicious cycle of poverty and positively impacting incomes (Thanh et al., 2019).

3. RESEARCH METHODOLOGY

3.1. Empirical approach

3.1.1. Analyze the factors affecting on access to credit

To determine the factors influencing household access to credit, we examine the characteristics that affect credit accessibility for households before and during the pandemic. A linear probability model is employed to estimate this relationship. This model allows for identifying variables that affect credit access

for Vietnamese households, shedding light on the factors that shape credit availability in urban and rural areas during the COVID-19 period.

$$\Pr(\mathbf{CR})_i = \alpha_0 + \alpha_1 \mathbf{HC}_i + \alpha_2 \mathbf{CC}_i + \alpha_3 \mathbf{CV}_i + \varepsilon_i$$

where $\Pr(\mathbf{CR})$ is probability of accessing credit for a household, while \mathbf{HC} is a vector of observed household characteristics (e.g., household size, regional dummies, gender of respondents). \mathbf{CC} is a vector of observed credit characteristics, including loan value, loan interest rate, and collateral assets. \mathbf{CV} is a dummy variable indicating whether the household was infected with COVID-19 in 2020.

3.1.2. Difference-in-Differences

Based on the estimation model proposed by Lechner (2011), this study extends the model by incorporating the Difference-in-Differences (DiD) approach as follows:

$$\mathbf{hhinc}_{it} = \delta_0 + \delta_1 \mathbf{CR} + \delta_2 \mathbf{T} + \delta_3 (\mathbf{CR} \times \mathbf{T}) + \delta_4 \mathbf{HC}_{it} + \delta_5 \mathbf{CC}_{it} + \delta_6 \mathbf{CV}_{it} + \gamma_{it}$$

where \mathbf{hhinc}_{it} is the total income of household it in year tt , measured in million dong. \mathbf{CR} is a dummy variable that equals 1 if the household has access to credit (referred to as the Treatment group), otherwise equals 0 if the household has no access to credit (Control group). \mathbf{T} is a dummy variable indicating the survey time, equal to 1 for 2020 and 0 for 2018. $\mathbf{CR} \times \mathbf{T}$ is the interaction between \mathbf{CR} and \mathbf{T} capturing the effect of the credit policy, with δ_3 is the estimator for the DiD approach (as summarized in **Table 1**).

Table 1. Summary of DiD estimation.

	2018	2020	Difference
Treatment Group	$\delta_0 + \delta_1$	$\delta_0 + \delta_1 + \delta_2 + \delta_3$	$\delta_2 + \delta_3$
Control Group	δ_0	$\delta_0 + \delta_2$	δ_2
Difference-in-Differences Estimation			δ_3

Source: Synthesis of the authors

3.1.3. Propensity Score Matching

Propensity Score Matching (PSM), originally developed by Rosenbaum and Rubin (1983) and further refined by Becker and Ichino (2002) and Dehejia and Wahba (2002), is a commonly used method to evaluate the effectiveness of projects or policies. We employ PSM in this study to estimate the impact of credit policy by comparing households with (treatment) and without (control) access to credit. The PSM procedures involve: First, use the Logit model to identify the factors affecting credit accessibility. Then, calculating propensity scores. Ensuring balance and common support zone between two groups and matching observations on similar scores. Finally, calculating the average difference in outcomes to determine the credit policy's effect. To address bias and obtain accurate standard errors, we employ a bootstrap method.

3.1.4. Combining PSM – DiD

The PSM-DiD method combines two methods: Propensity Score Matching (PSM) is a quasi-experimental method, and Difference-in-Differences (DiD) is a statistical technique. This approach is specifically applied to panel data. By integrating PSM and DiD, the PSM-DiD method reduces estimation bias and provides more accurate results.

Applying the PSM-DiD method involves the following steps: Step 1: Calculating the propensity score. Step 2: Testing for the balancing property and determining the common support region. Step 3: Matching treatment and control groups based on the propensity score.

By applying DiD estimation within the matched groups, the PSM-DiD method estimates the effect of the credit policy. The equation for evaluating the credit policy using PSM-DiD can be expressed:

$$ATT = [\Delta hhinc_{1i}|p(HC_i), CR = 1] - [\Delta hhinc_{0i}|p(HC_i), CR = 0]$$

where ATT is Average Treatment effects on the Treated. $\Delta hhinc_{1i}$ and $\Delta hhinc_{0i}$ are respectively estimated between Treatment group and Control group in year tt .

3.2. Data

This study follows a systematic approach by selecting appropriate variables and models based on the research method. The variables corresponding to each characteristic are described in **Table 2** under the theoretical framework (**Figure 1**). Data for the study is collected from two datasets: VHLSS 2018 and VHLSS 2020.

Table 2. Variables list and conventions.

Variables	Definition	Source
Dependent Variables		
income	Total income of respondent (mil. dong)	
hhinc	Total income of a household (mil. dong/household/month)	
Explanatory Variables		
HOUSEHOLD (HC)		
region	Area which they live (Urban = 1; Rural = 0)	(Luan and Bauer, 2016)
ethnic	Whether the respondent is Kinh (Yes = 1; No = 0)	
hysize	Number of household members (people)	
gender	Respondent gender (Male = 1; Female = 0)	
age	Respondent actual age (years)	
married	Get married (Yes = 1; No = 0)	
edu	Actual schooling years of householder (years)	
landpro	Get married (Yes = 1; No = 0)	
collateral	Household has collateral (Yes = 1; No = 0)	(Vu and Ho, 2021)
job	Occupation of respondent (The profession needs professional expertise = 1; Service industry group = 2; Technical occupation, labor = 3; Otherwise = 4)	
CREDIT (CC)		
CR	Access to credit (Yes = 1; No = 0)	
value	The value of loan (mil. dong)	(Vu and Ho, 2021)
paid	A loan origination fee (mil. dong)	(Vu and Ho, 2021)
interest	The interest rate charged to the borrower (%)	(Vu and Ho, 2021)
debt	Unpaid debt (mil. dong)	(Vu and Ho, 2021)
other	Household has other loans (Yes = 1; No = 0)	
HEALTH SHOCK		
CV	Household had/has infected with Covid (Yes = 1; No = 0)	

Source: Synthesis of the authors

3.3. Descriptive statistics

From the variables selected in **Table 2**, we conduct descriptive statistics from two data sets by two years, including min, max, mean, standard deviation, and standard error. **Table 3** shows the summary statistics of variables in this study.

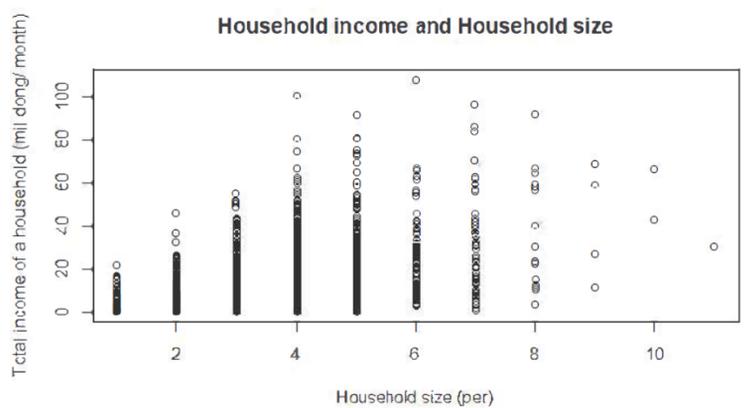
Table 3. Descriptive statistics.

Variables	2018				2020			
	Min	Max	Mean	Std.Dev.	Min	Max	Mean	Std.Dev.
income	0.04	22.53	3.43	2.69	0.03	25.12	4.63	3.47
hhinc	0.10	135.20	12.99	12.18	15.32	108.00	17.42	15.32
region	-	-	20%	0.40	-	-	24%	0.43
ethnic	-	-	73%	0.43	-	-	73%	0.44
hhsz	1.00	10.00	3.7	1.56	1.00	11.00	3.72	1.54
gender	-	-	75%	0.43	-	-	75%	0.43
age	22.00	96.00	49.24	11.28	22.00	93.00	47.81	11.56
married	-	-	81%	0.39	-	-	82%	0.39
edu	0.00	18.00	6.88	4.48	0.00	16.00	7.03	4.03
landpro	12.00	500.00	80.30	49.78	10.00	450.00	86.76	53.57
collateral	-	-	32%	0.35	-	-	35%	0.35
job = 1	-	-	31%	0.34	-	-	32%	0.32
job = 2	-	-	20%	0.24	-	-	23%	0.31
job = 3	-	-	25%	0.22	-	-	20%	0.23
credit	-	-	2%	0.13	-	-	3%	0.18
value	0.27	2600.00	71.62	133.43	1.00	2500.00	101.49	165.77
paid	0.00	20.00	0.05	0.65	0.00	33.00	0.09	1.17
interest	0.00	27.00	2.03	3.19	0.00	24.00	2.86	3.82
debt	0.00	2600.00	62.50	118.88	0.00	2212.00	86.70	149.98
other	-	-	62%	0.48	-	-	59%	0.49
covid	-	-	-	-	-	-	56%	0.33
Obs.	1657				1540			

Source: Authors' calculations

In terms of income, in 2018, the average income of respondents was approximately 3 million dong/month, while the maximum income reached 22 million dong, with a standard deviation of 2.69.

In 2020, the income range shifted slightly, with the average income recorded at 4.5 million dong, the maximum income at 135 million dong, and the standard deviation rising to 3.47. Moving on to the household income variable, we see a similar pattern. The mean household income was 13 million dong corresponding with the household members being 4 people. Follows **Figure 2** which describes the relationship between household income and members of the household:

**Figure 2. Household income and household size.**

Most respondents in both years identified as belonging to a particular region (20% in 2018 and 24% in 2020) and the same ethnic group (73%). The average household size remained consistent at around 3 to 4

members. The gender distribution also remained unchanged, with 75% of respondents identifying as male in both years. The average age decreased slightly from 49.24 in 2018 to 47.81 in 2020. Marital status slightly increased from 81% to 82% in both years, indicating a predominantly married population. Education levels exhibited similar patterns, with mean scores of 6.88 and 7.03 in 2018 and 2020, respectively.

Regarding land property, the mean value increased from 80.30 to 86.76, while collateral remained relatively stable at around 32% to 35%. Job types showed a slight variation, with different proportions across three categories (job = 1, job = 2, job = 3).

Households have shown an increasing inclination to participate in credit, with credit values rising from VND 71.6 million dong in 2018 to VND 102 million dong in 2020. Correspondingly, interest rates have also increased from 2.03% to 2.87% during the same period (**Table 3**). These trends suggest a growing demand for larger credit amounts. The proportion of respondents reporting other factors and the impact of COVID-19 in 2020 has also increased, highlighting changing circumstances and potential pandemic effects on the surveyed population.

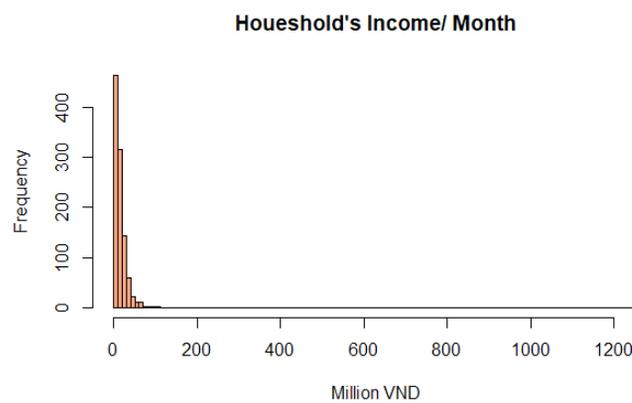


Figure 3. Distribution of household income in Vietnam.

Figure 3 shows that household incomes have a left-skewed distribution, so this study transforms the model into a log-lin model:

$$\ln(\text{hhinc})_{it} = \delta_0 + \delta_1 \text{CR} + \delta_2 \text{T} + \delta_3 (\text{CR} \times \text{T}) + \delta_4 \text{HC}_{it} + \delta_5 \text{CH}_{it} + \delta_6 \text{CV} + \gamma_{it}$$

Taking the logarithm of household income makes the model with the “hhinc” variable normally distributed in **Figure 4**.

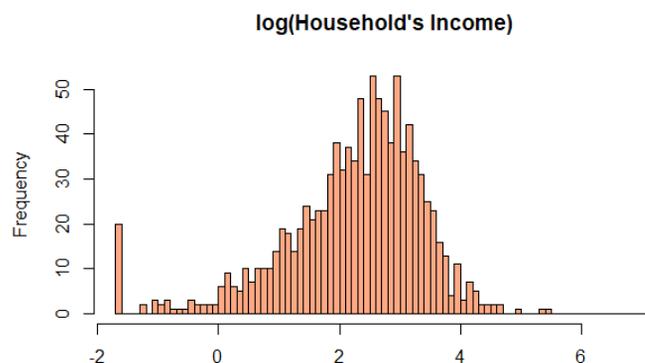


Figure 4. Distribution of the logarithm of household income.

4. RESULTS AND DISCUSSION

4.1. Estimated factors affecting access on credit

Table 4 shows logit regression results for credit access of Vietnamese people at two-time points: pre-COVID-19 and post-COVID-19. The results of this analysis are also consistent with (Vu and Ho, 2021).

Table 4. Factors affect access on credit.

Variables	Vietnam			
	Before calamity (2018)		In calamity (2020)	
	Coeff.	Std.Err.	Coeff.	Std.Err.
(_constant)	0.04***	0.09	0.07***	0.12
region	0.91**	0.39	0.71***	0.40
ethnic	-0.44	0.48	-0.30	0.49
hhsz	0.04	0.12	0.08	0.12
gender	-0.13	0.47	-0.17	0.48
age	-0.01	0.01	-0.01	0.02
married	0.10	0.61	0.14	0.62
edu	0.08	0.05	0.08*	0.04
landpro	0.01	0.01	-0.01	0.01
collateral	-0.43	0.43	-0.63*	0.45
job = 1	0.30	0.48	0.26	0.49
job = 2	-0.03	0.52	-0.21	0.55
job = 3	-0.17	0.49	-0.04	0.49
value	0.01	0.01	0.01	0.01
paid	0.04	0.11	0.06	0.11
interest	0.01	0.04	-0.02**	0.05
debt	0.01	0.01	0.01	0.01
other	-0.45	0.36	-0.53	0.37
covid			-0.11**	0.37
Number of obs.	521		521	

Note: *, **, *** indicate the significant at level 10%, 5% and 1%.

Source: Authors' calculations

In 2018 and 2020, access to credit was dominated by the area in which the household head lived (results in **Table 4**, significance level of 5% in 2018 and 1% in 2020). In other words, the diverse living areas of households are influenced by factors like credit, smart technology, and modernization, which are prevalent in densely populated regions. The cultural characteristics of these regions strongly impact accessibility. This raises questions about Vietnamese people's aversion to credit risk and the quality of information provided by unsecured credit sources to household.

In 2020, the appearance of Covid reduced people's ability to participate in credit. Particularly, households who have been infected with Covid have a lower ability to access credit than households who have never been infected at this time about 11% at 5% significance level. The lack of statistical significance among variables, such as household and credit characteristics, underscores the profound impact of Covid on credit access. The pandemic not only affects health and mental well-being, but also restricts access external information and human interaction.

4.2. The impact of credit policy on improving Vietnamese household income

After analyzing the factors affecting the credit access of Vietnamese households using the results in **Table 4**, we carry out a regression of the total average income of households with the proposed variables according to the previous explanation.

The regression model results without explanatory variables show that the effect of credit policy raising session model results without explanatory variables show that credit policy raises household income to 56%. From **Table 5**, DiD approach shows that distinctive from two groups is 15%. Nevertheless, R^2 and Adjusted R^2 only reach 0.23 and 0.25, respectively, so we carry out the regression within explanatory variables (**Table 5**).

Table 5. Result of log-lin model in Vietnam.

Variables	Vietnam			
	Without explanatory variables		Within explanatory variables	
	Coeff.	Std.Err.	Coeff.	Std.Err.
(_constant)	2.23***	0.05	0.29***	0.19
CR	0.56**	0.20	0.34**	0.17
T	-0.06	0.07	0.06	0.08
CR×T	0.15**	0.28	0.14**	0.24
region			0.25**	0.08
ethnic			0.57	0.08
hysize			0.30***	0.02
gender			0.12	0.09
age			-0.01	0.00
married			0.03	0.03
edu			0.02	0.01
landpro			0.00	0.00
collateral			-0.01	0.07
job = 1			0.24	0.09
job = 2			-0.03	0.09
job = 3			0.11	0.09
value			0.00	0.00
paid			0.02	0.02
interest			0.01	0.01
debt			0.00	0.00
other			0.02	0.06
covid			-0.25**	0.10
Obs.		521		521
R^2		0.23		0.44
Adj R^2		0.25		0.39

Note: *, **, *** indicate the significance at level 10%, 5% and 1%.

Source: Authors' calculations

At a 95% confidence interval, credit improves household income by 34%, with participating households experiencing even greater increases. This highlights the timely support credit provides to households during peak periods in Vietnam.

Furthermore, urban households have a 25% higher income compared to rural households, indicating the influence of higher-paying urban occupations and cultural factors. Household size also plays a significant role, with each additional member leading to a 30% increase in income. However, the health shock of COVID-19 has had a negative impact, with infected households experiencing a 25% income decrease.

This study primarily focuses on assessing the impact of credit policy at the average income level. To underscore the impact of the policy, we conducted a similar regression but divided it into urban and rural areas.

Table 6. Results of regression with dividing into two areas.

Variables	Rural				Urban			
	Without explanatory variables		Within explanatory variables		Without explanatory variables		Within explanatory variables	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
(_constant)	2.14***	0.07	0.27	0.25	2.45***	0.10	0.52	0.37
CR	0.64*	0.29	0.42	0.26	0.29	0.27	0.13**	0.24
T	-0.14	0.09	0.001	0.10	0.03	0.14	0.22	0.16
CR×T	0.45	0.41	0.45	0.36	-0.19	0.39	0.25**	0.34
ethnic			0.62***	0.10			0.75***	0.21
hhsiz			0.32***	0.03			0.25***	0.04
gender			0.18	0.13			0.19	0.15
age			-0.01*	0.004			-0.00	0.01
married			-0.03	0.15			-0.04	0.19
edu			0.02*	0.01			0.00	0.02
landpro			0.00	0.00			0.00	0.00
collateral			0.01	0.09			-0.26	0.15
job = 1			0.36**	0.11			-0.01	0.17
job = 2			0.009	0.11			0.08	0.17
job = 3			0.16	0.11			0.02	0.16
value paid			0.00	0.00			-0.00	0.00
interest			0.03	0.02			0.27	0.12
debt			0.02	0.01			0.02	0.02
other			-0.00	0.00			0.00	0.00
covid			-0.05	0.08			0.10	0.12
covid			-0.29	0.11			-0.32**	0.17
Obs.	385		385		136		136	
R ²	0.03		0.22		0.05		0.16	
Adj R ²	0.02		0.20		0.04		0.14	

Note: *, **, *** indicate the significant at level 10%, 5% and 1%

Source: Authors' calculations

Firstly, in rural areas, credit has no effect on improving household income. In contrast, in urban areas, households improved by 13% and differed from non-participating households by 25% (Table 6). This finding raises a big question about why rural credit is inefficient. Limited knowledge and usage of credit in rural areas contribute to income inequality, particularly among poorer households, risking further impoverishment. This loophole must be addressed further.

The next difference between urban and rural areas is the effect of COVID-19 on income. Compared with rural areas, urban areas have to suffer a decrease of about 32% in household income when someone is infected, and the difference between the two regions can be explained in many ways, such as: regional culture, occupation characteristics, size of the area.

Including other explanatory variables such as age, household size, and occupation into the model reinforces the cultural factor that directly affects the characteristics of households in different regions and the income of households in the high and low groups.

4.3. Evaluating the impact of credit policy by using PSM-DiD

Following the suggested steps for the PSM method, the study provides Table 7 of the matching results based on the “nearest” method.

Table 7. Statistical result of PSM with “nearest” method.

Variables	In common support zone	Out common support zone
region	0.46	0.46
ethnic	0.81	0.84
hhsiz	4.00	4.03
gender	0.70	0.78
age	46.19	45.92
married	0.86	0.92
edu	8.24	8.05
landpro	93.35	106.16
collateral	0.38	0.30
job = 1	0.00	0.00
job = 2	0.00	0.00
job = 3	0.00	0.00
value	0.22	0.18
paid	0.00	0.00
interest	3.96	3.67
debt	0.19	0.14
other	0.51	0.46
covid	0.54	0.38
Obs.	37	484

Source: Authors’ calculations

After performing the pairing, we calculate the Average Treatment effects on the Treated (ATT) index to estimate the total income for the treatment group with a common support zone.

Table 8 provides the results from the two methods’ estimated coefficients. All believe credit has a positive effect (99% and 95% confidence levels).

Table 8. Summary of two methods.

Variables	ATT (2020)		DiD Estimation	
	Coeff.	t-test	Coeff.	t-test
CR	0.11***	1.62	0.34**	2.78
Obs.	37		521	

Note: *, **, *** indicate the significant at level 10%, 5% and 1%

Source: Authors’ calculations

The study uses ATT to diagnose the expected value that a household receives when participating in credit in the context of the COVID-19 epidemic by kernel pairing. **Table 8** shows that credit always has a positive effect on income growth. On average, household income only rise by 11% expected in the epidemic context. However, in the DiD method, households participating in credit will increase their income by 34%. In conclusion, the PSM-DiD method comprehensively estimates people’s income during the Covid period.

4.4. Specification tests

After utilizing the methods to estimate the model, the team continues to execute tests to check the model’s often encountered faults. First, to check whether the model has multicollinearity, we use the Variance Inflation Factor (VIF) system.

The VIF value of two independent variables (debt and value) is more than 10 (21.83 and 20.74, respectively), so these variables have multicollinearity. To solve this problem, this study decides to drop two variables out of the model.

Then, we also check heteroskedasticity by using a graph of variance prediction (**Figure 5**).

Using graph residuals against the predicted variable, **Figure 5** shows intermittent and low distribution, which indicates the model has heteroskedasticity. To remove this, we use Robust Standard Error (RSE).

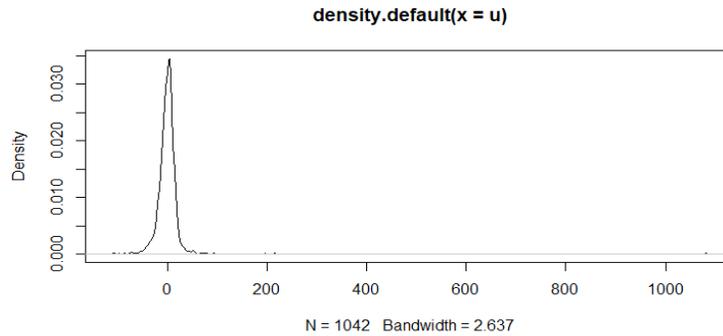


Figure 5. Graph residuals against predicted dependent variable.

Next, we use F-Test with estimated model in Vietnam with hypothesis:

H0: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = 0$

H1: At least one δ different from 0

Table 9. F-Test.

Estimated model in Vietnam	R ²	Adj R ²	F-Test
	0.44	0.39	(0.000) < 1%

Source: Authors' calculations

Table 9 shows p-value < 1%, so we reject H0. The hypothesis that all coefficients are equal to zero simultaneously is rejected at 1%.

As noted in **Table 9**, Adjusted R Squared reaches 39%, which indicates that the four independent variables have been able to explain (39%) the changes occurring in the dependent variable.

4.5. Discussion

The results indicate that area of residence is the dominant determinant of household credit access in both pre-pandemic periods and during the pandemic. This credit access increases Vietnamese household income significantly while it is expected to reduce income. Despite increasing income, household’s credit participation is still very limited when only 3.24% of households participate in credit.

Finally, after using regression analysis, two of the three hypotheses (H2 and H3) are accepted and the first hypothesis is rejected (H1) by the regression results.

Regarding Hypothesis 1, the results indicate that only “region” has significance, however, it cannot comprehensively describe the differences of households. Household characteristics include household size, and information about householders. Thus, we must reject H1 because of being not similar to Woo (2019).

Regarding Hypothesis 2, Covid affects Vietnam and the world in many aspects, such as social communication, movement restrictions, service trade, etc. This shows that Covid is a big obstruction for humans. The hypothesis mentioned in the study that Covid is an impediment to access to credit, this is accepted with a confidence interval is 95% ($\alpha = -0.11$).

Hypothesis 3 indicates that access to credit has a positive impact on the total income of a household. The significance level is 5%, hence, we accept H3. This result is similar to the studies of Trumbull (2008)

in France and the USA, and Bocher et al. (2017). The treatment group has a higher improving income than the control group in 2020, the $\delta\delta$ estimated is 0.34.

Table 10. Summary of the hypothesis.

Hypothesis	Conclusion
H1: The differences of household characteristics impact on credit access.	Sig. = 0.00 < 1% and $\alpha = 0.71$ Rejected
H2: COVID-19 is an obstruction of accessing on credit.	Sig. = 0.034 < 5% and $\alpha = -0.11$ Supported
H3: Credit has a positive impact on the total income of households in calamity.	Sig. = 0.027 < 5% and $\delta = 0.34$ Supported

Source: Synthesis of the authors

In addition to approaching the research objectives through the hypotheses summarized in **Table 10**, this study pays special attention to the two goals of the Sustainable Development Goals (SDGs): “No Poverty” and “Reduce Inequalities”. These goals focus on reducing income inequality and ensuring equitable access to credit. The impact of the pandemic resulted in significant financial pressure not only for impoverished households but also for well-to-do households. Research findings indicate that households experienced a 25% income reduction due to COVID-19. Notably, the epidemic had a more pronounced effect on urban households (**Table 11**) when considering the regional aspect.

Table 11. The difference effects of COVID-19 between rural and urban.

	Variables	Conclusion	Confidence Interval
Rural	CV → ln(hhinc)	No Impact	< 90%
	CV → CR	No Impact	< 90%
Urban	CV → ln(hhinc)	Impact	95%
	CV → CR	Impact	95%

Research indicates that COVID-19 has a disproportionately negative impact on urban households compared to rural areas, particularly in terms of household income and credit access (95% confidence interval). Urban areas, characterized by thriving industries, banking systems, and financial facilities, exhibit greater economic development than rural areas. This economic disparity not only exacerbates income inequalities but also affects other aspects of life. Additionally, urban areas face challenges in enforcing social distancing measures, resulting in strict government regulations. As a result, these places experience more pronounced economic repercussions, making it challenging for individuals to manage expenses such as rent. This represents a major crisis and aligns with the “No Poverty” goal of the SDGs. Moreover, the limited access to credit in urban and rural areas underscores the presence of inequality.

Table 12. Accessing on credit in 2018 and 2020.

	Variables	Conclusion	Confidence Interval
Before calamity	CR ← region	Impact	95%
In calamity	CR ← region	Impact	99%

Source: Synthesis of the authors

Access to credit is more readily available in urban areas due to the presence of diverse credit support and extensive banking systems. This means that impoverished households in urban areas have greater access to credit compared to their rural counterparts. The disparity in credit access between urban and rural areas is a concerning

issue for credit policy makers, particularly as rural households face significant disadvantages. The SDGs goal of “Reduce Inequalities” should serve as a guiding principle for the government to address this regional gap.

5. CONCLUSION

This study contributes to both methodology and policy.

From a methodology perspective, our analysis reveals a significant relationship between credit access and household income, particularly for the region variable. Urban residents have significantly higher credit accessibility than their rural counterparts (approximately 71%). Credit positively impacts urban income, with a notable 13% growth. However, its effect on rural income is limited. Unequal credit distribution in rural areas hampers substantial income growth. Failure to distribute credit market benefits fairly among different population groups may lead to inequality and social instability.

From a policy perspective, this study sheds light on the factors contributing to increased access to credit among Vietnamese individuals, emphasizing the transformative role of credit in empowering households and fostering economic growth. By facilitating opportunities and driving entrepreneurship, credit plays a pivotal role in poverty reduction, income enhancement, and efficient resource allocation. However, realizing substantial household income and living standards improvements necessitates strategically focusing on effective and profitable business investments.

This study provides an understanding for further research, despite acknowledging certain limitations. It should be noted that the data set used in this study only covers the year 2020, which may not fully capture the evolving impact of the epidemic during its peak period in 2021. The available data lack information on financial resources, capital constraints, and specific credit needs, which could provide a more comprehensive understanding of credit access. While the study primarily focuses on observable factors, it is important to recognize the limited emphasis on unobservable factors, such as social networks and social capital.

For future research, we recommend comparing the effects of credit and credit support policies in the pre-and post-COVID-19 pandemic periods. To ensure accurate impact estimation, it is crucial to account for and measure such differences in the data. Moreover, it is worth noting that only a subset of variables demonstrates statistical significance, suggesting a lack of credit knowledge and concerns about credit risks among many households in Vietnam. Therefore, providing more information on poverty alleviation conditions and streamlining procedures is crucial for formulating effective policies. Inefficient credit utilization could lead to over-indebtedness or default among households, imposing significant stress and jeopardizing their well-being (Seng, 2018; Tsai et al., 2016).

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TECHNOLOGY - ORGANIZATION - ENVIRONMENT (TOE) FRAMEWORK: PROPOSED FOR VIETNAMESE BUSINESS IN THE DIGITAL AGE BASED ON SDGS

Author: Le Hong Diem¹, Luu Tuan Khang¹, Ngo Trieu Chau¹, Nguyen Thuy Linh¹, Huynh Le Thuy Van¹

ABSTRACT: The article discusses the impact of e-commerce on organizational performance and the evaluation of Sustainable Development Goals (SDGs) in the online retailing world. The study focuses on Vietnamese companies in the early stages of digital transformation and uses an extended Technology-Organization-Environment (TOE) framework aligned with SDGs to identify motivations and factors influencing business performance. The research employs a deductive approach and quantitative methods, collecting data through a questionnaire from a sample size of 300. The collected data undergoes testing, reliability assessment, exploratory factor analysis, and multivariate regression analysis to measure the impact of variables in the research model. The results indicate that factors related to technological context, organizational context, and environmental context significantly contribute to digital adoption among Vietnamese businesses. Surprisingly, firm size, same-industry competition, and control variables such as the number of employees do not have a significant effect. The article discusses theoretical and practical implications, highlighting the potential of the TOE framework based on SDGs and providing recommendations for businesses.

Keywords: TOE framework, sustainable development goal, Vietnamese business

1. INTRODUCTION

Organizations are undergoing a significant shift toward digital transformation to ensure long-term viability in a highly competitive global landscape. Managers are recognizing the importance of incorporating innovative technologies into their growth strategies. The COVID-19 pandemic has been a catalyst for businesses to embrace digital transformation and adapt to new market conditions. Integrating technologies into business operations has emerged as a promising approach, allowing firms to expand their customer base, improve operational efficiency, and achieve sustainable growth. Additionally, the United Nations' Sustainable Development Goals (SDGs) have become a prominent agenda for organizations seeking to align their operations with global sustainability objectives.

Current literature focuses on technological, organizational, and environmental contexts, utilizing various models such as the Technology Acceptance Model (TAM), Diffusion of Innovation (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT). The TOE framework, recommended by Tornatzky, is widely used to understand the adoption of various innovations at the firm level, emphasizing a holistic mechanism that flexibly incorporates influential technological, organizational, and environmental contexts. Therefore, according to several studies, there are significant drawbacks in developing digital implementation among Vietnamese firms concerning infrastructure, management, and internal and external facilitators.

The Covid-19 period has induced companies to the importance of technology in expanding business models and gaining sustainable development (Fonseka, 2022). The digital economy and sustainable consumption are interconnected aspects that are increasingly intertwined. With the projected growth of internet users to 76 million by 2023, firms are driven to pursue technological innovations aligned with the SDGs. Nonetheless, SDGs require thorough study to determine which business practices align with sustainable development approaches (Haffar & Searcy, 2018). In this context, the authors consider TOE Framework and SDGs as the main foundations to research proposed for Vietnamese businesses in the digital

1 University of Economics Ho Chi Minh City.

age. It can broadly apply as TOE Framework is non-restricted by industry and business size (Tornatzky & Fleischer, 1990). Besides, TOE Framework by Tornatzky et al. (1990) is strongly advocated by diversified studies toward a wide range of innovations at the firm level (Chatterjee et al., 2020; Abed, 2020; Abbasi et al., 2022; Maroufkhani et al., 2022).

The research aims to deeply study the factors that affect Business Performance through 16 hypotheses. The study considers the supposed model with three main aspects, including Technology, Organization, and Environment directly affect to Adoption Intention and thereby impact Business Performance. At the same time, some crucial variables such as Business Age, Number Of Employees, Type Of Business, and Field Of Business are added to expand the model and enrich the analysis of Business Performance. Consequently, the study can draw objective judgments through profound insights to make practical recommendations for increasing business performance in Vietnam following SDGs goals.

2. THEORETICAL BASIS

2.1. Study Overview

The Technology-Organization-Environment (TOE) framework, introduced by Tornatzky and Fleischer, delves into the innovation development process and its implementation within enterprises. TOE is an organization-level theory that considers three key factors: technology, organization, and environment, which influence adoption decisions. Unlike other models, TOE comprehensively captures internal and external impacts. It covers technological landscapes, environmental contexts, and organizational characteristics. The 2030 Agenda for Sustainable Development outlines the 17 Sustainable Development Goals (SDGs), aiming to promote peace, prosperity, and environmental sustainability. The UN Department of Economic and Social Affairs Division for SDG supports the implementation and adoption of the SDGs. It plays a vital role in monitoring progress and advocating for the goals across the UN system. By embracing the SDGs, the 2030 Agenda can be translated into tangible outcomes, and the DSDG is committed to facilitating this process.

2.2. Relationship between TOE framework and business in digital context

Several studies have demonstrated the influence of technology, organization, and environment on a company's identification, search, and adoption of new technology. Chatzoglou and Chatzoudes (2016) outlined the key premises of the TOE framework in fostering e-business adoption. The TOE Framework and sustainable development have been studied in relation to various applications. El-Haddadeh et al. (2021) proposed TOE-based tuning as a new explanatory model for large data analytics. TOE is often combined with other models to examine innovation adoption. Chatterjee et al. (2020) developed a hybrid TOE-TAM (Technology Acceptance Model) to clarify Industry 4.0's relevance and driving forces for digital manufacturing. Khan et al. (2021) proposed a mobile payment system based on the expanded TOE framework, identifying key drivers for behavioral intention and actual use in enterprise systems. Hiran and Henten (2020) established a link between TOE and DOI in the context of cloud computing use in educational organizations. Various studies highlight TOE's application in different areas such as AI, e-commerce, big data, and social media marketing.

In recent research, the application of the TOE framework has been explored in various fields and industries. Lin (2023) suggests using TOE in the maritime industry by applying to blockchain technology. Abdullah et al. (2023) focus on developing communication within businesses under the Zakat organization using the TOE framework. Rawashdeh & Rawashdeh (2023) examine the effects of TOE on small and medium-sized enterprises when implementing cloud accounting. Additionally, Rawashdeh and colleagues (2023) investigate the use of AI in automated accounting and its application in human resource management.

Bratec et al. (2023) study the impact of TOE-based incentives on hotels in Slovenia, while Nikopoulou et al. (2023) analyze factors influencing digital transformation in the hospitality industry. Sulaiman et al. (2023) propose the integration of TOE with TAM for a learning management system among university lecturers. Awaluddin et al. (2023) emphasize the significant effect of TOE on the food and beverage sector, stressing the importance of technology awareness and e-commerce skills. Finally, Medennikov (2023) presents a sustainable development model for agricultural organizations, incorporating strategic management and a digital platform.

The research recommends sustainable development strategies for businesses based on the UN's Sustainable Development Goals (SDGs). Previous studies have utilized the TOE framework to guide small and medium-sized enterprises (SMEs) in their sustainability efforts. In Taiwan, a study explored the application of Technology 4.0 to assist enterprises in achieving the SDGs. Digital transformation, as discussed by Popescu & González, has the potential to impact organizational culture and employee motivation. Integrating industry 4.0 and SDGs can enhance enterprise efficiency and contribute to sustainable development, as highlighted by Karamustafa & Arsan. Zhong et al. (2023) demonstrated the impact of digital transformation on an enterprise's environmental, social, and governance (ESG) performance, emphasizing its significance for sustainable development.

2.3. Theoretical Framework

The TOE framework was established by Tornatzky et al. (1990) to thoroughly explicate behavioral intentions, adoption and implement business intelligence at a business level. Besides, the framework looks more into the whole organization (Ashraf et al., 2022) and is not limited to specific industry and business size (Tornatzky and Fleischer, 1990), thus, it is broadly applied from in technology adoption and risk management (Dewi et al., 2018), integrated platforms (Anindra et al., 2018), data-driven and innovative solutions for sustainability (Bibri and Krogstie, 2020), digital nations development (Kar et al., 2019), etc. In comparison with most other frameworks, TOE's profound examination of both human and nonhuman actors are assessed as a significant strength in measuring technology adoption and scalability towards SDGs (Ashraf et al., 2022). Several studies have added different variables to modify their models. Thus, the study constructs the combination of TOE-TAM and also adds variables to suggest an extended model. Consequently, the TOE framework induces businesses to achieve a more complete understanding of business performance in the Vietnam digital age.

Besides, TAM is useful in examining business performance influenced by factors from technology and adoption intention (Tran et al., 2022). In the study context, TAM antecedents are combined with the TOE framework to figure out the crucial influencers of adoption (Chatterjee et al., 2020) and performance. TAM was developed by Davis in 1989 and evolved from the theory of reasoned action (TRA). In the TAM, perceived ease of use and perceived usefulness are two main elements. Perceived ease of use is the degree to which an individual believes that using a particular information technology saves effort. Based on perceived ease of use and perceived usefulness, the research examined its similarities with Relative Advantage and Observability to measure the positive effect of adoption intentions under technology innovations. Despite TRA and the Theory of Planned Behavior can apply by incorporating subjective norms and perceived behavioral controls with attitudes toward using technology, TAM is more appropriate. TAM is quite similar to TOE in that it is not restricted to specific industries or businesses. Thus, it can be expanded and has applicable features for business in Vietnam which are relevant to the direction of the article. Consequently, TAM is selected as the foundation theory to conduct research and proposals for businesses in the digital transformation period in Vietnam.

The factors belonging to firm characteristics including Business Age, Number Of Employees, Type of Business and Field Of Business were formed on the basis of previous studies, specifically the study of Tran et al., (2022) on online retailing, Fahim et al., (2021) on sustainable smart cities governance which impact on Business Performance based on from TOE Framework. Hence, the conceptual framework of the study as described served as the foundation for the specific hypotheses and revealed correlations between the variables accepted.

3. RESEARCH HYPOTHESIS

3.1. Relative Advantage

The phrase “*relative advantage*” describes how much a certain product looks to be superior to another existing product. Businesses can use this concept to gauge customer preference for their product compared to competitors. The more advantageous the product, the higher the likelihood of consumer acceptance, and vice versa. Decisions to implement innovation policies are influenced by the perceived relative advantage (Abbasi et al., 2022).

Hypothesis 1: Relative advantage has a positive effect on the TOE framework adoption intention of the business.

3.2. Compatibility

Compatibility refers to the interoperability of different products, including hardware, software, and goods of various versions, without causing disruptions (Géczy et al., 2012). It is crucial for businesses as it determines how well an innovation aligns with their existing practices, values, and requirements. Tajudeen et al. (2018) also highlight the significance of compatibility in social media marketing interactions. Furthermore, Maroufkhani et al. (2022) conducted a study on big data analytics usage and its quantitative relationship with compatibility.

Hypothesis 2: Compatibility has a positive effect on the TOE framework adoption intention of the business.

3.3. Observability

According to Roger (2003), observability can be understood as the ability to display the expected outcomes of an innovation. Gartner Research defines observability as “*the evolution of monitoring into a process that offers insight into digital business applications, speeds innovation and enhances customer experience.*” Previous studies have highlighted that businesses are more likely to adopt innovations when they are easily observable (Jilani et al., 2022). AlBar and Hoque (2019) emphasize that observability plays a crucial role in predicting the adoption of cloud enterprise resource planning (ERP) by businesses. Similarly, Khan et al. (2021) explored the significance of observability in promoting the adoption of mobile payment systems. Jilani et al. (2022) found that increasing the visibility of the mHealth app to potential users results in higher user interactions. In essence, making innovations more visible facilitates their rapid adoption.

Hypothesis 3: Observability has a positive effect on the TOE framework adoption intention of the business.

3.4. Managerial Support

The topic of research on the linkages and mutual support among managers, leaders and employees has recently attracted a lot of research participation (Kurtessis et al., 2017; Van Buren et al., 2011). Perceived organizational support acknowledges interdependence and mutual aid (POS). High managerial support is determined by managers’ comprehension and appreciation of technological innovations’ potential (Maroufkhani et al., 2022). This component contributes to creating a conducive environment, optimizing resource utilization, and promoting innovation process growth (Abbasi et al., 2022).

Hypothesis 4: Managerial support has a positive effect on the TOE framework adoption intention of the business.

3.5. Business Size

Previous research has debated the significance of organizational factors, specifically business size. Some studies indicate that business size acts as a moderating factor influencing decision-making (Zona et al., 2013). Larger businesses tend to find it easier to secure investment cash, which is attributed to their perceived better management skills compared to smaller competitors (Santoso & Junaeni, 2022; Ludianingsih et al., 2022). Moreover, larger businesses are considered more efficient and financially stable, enhancing their overall value (Murti & Purwaningsih, 2022). The adoption of the TOE framework is influenced by business size even if it entails time-consuming and expensive processes (Cho et al., 2022).

Hypothesis 5: Business size has a positive effect on the TOE framework adoption intention of the business.

3.6. Business Orientation

Business orientation refers to an organization's capacity to identify and capitalize on opportunities in new markets through creative decision-making, risk-taking, and innovation (Lumpkin & Dess, 1996; Wiklund & Shepherd, 2003). It is characterized by proactive assessment and utilization of emerging business opportunities (Rubin & Callaghan, 2019). Research suggests that businesses aiming to compete in the digital landscape require a strong business focus (Tajudeen et al., 2018). High business orientation organizations exhibit a willingness to experiment, champion novel concepts, and deviate from established norms. They must also anticipate both positive and negative consumer reactions (Susanto et al., 2020). Specifically, during the pandemic, social media usage and company success are closely associated with business orientation (Susanto et al., 2020).

Hypothesis 6: Business orientation has a positive effect on the TOE framework adoption intention of the business.

3.7. Technology Orientation

An organization's technology orientation reveals its capacity to spot and adopt innovations. Businesses enhance knowledge of how digital technology breakthroughs are influencing company services in the context of the present digital transformation scenario (Rupeika-Apoga et al., 2022). Upadhyay et al. (2023) showed that a family firm's technological orientation toward AI in digital entrepreneurship leads to the adoption of AI because it raises the business's strategic and operational business value. Additionally, technology orientation is crucial for creating novel concepts and improving existing systems and processes.

Hypothesis 7: Technology orientation has a positive effect on the TOE framework adoption intention of the business.

3.8. Same-Industry Competition

Rivalry among businesses in the same sector is linked to competition in that industry (Oliveira et al., 2014). As market competition intensifies, businesses are compelled to develop new approaches, solutions, and resources and seek innovative methods to gain a competitive advantage. The TOE framework can facilitate the creation of a successful business model, enhance operational efficiency, reduce expenses, improve communication, and facilitate information access. To keep pace with competitors who have already implemented TOE-based operations, businesses must embrace the same transformation and strive for improved performance (Abbasi et al., 2022). Embracing innovation can help businesses enhance their competitive position amid changing industry structures (Hiran and Henten, 2020).

Hypothesis 8: Same-industry competition has a positive effect on the TOE framework adoption intention of the business.

3.9. Business Trend Awareness

The ability to step back from everyday business concerns in order to grasp the wider picture is what is essentially meant by the term “*business awareness*” (Jorge, 2019). Similarly, it positively affects attitudes and behavioral intentions towards blockchain based on its technical advantages and merits from a corporate perspective (Li, 2020).

Hypothesis 9: Business trend awareness has a positive effect on the TOE framework adoption intention of the business.

3.10. Governmental Support

Governmental support is the term for the function that the government plays in fostering and encouraging the adoption and utilization of technology (Tornatzky & Fleischer, 1990). The government is a significant external force that has the power to provide favorable conditions and offer incentives for the adoption of technology. As a result, when implementing the TOE framework, customers anticipate government assistance in the form of regulations, rewards, and financial aid. Therefore, governmental assistance can be operationalized as the function of government-related policies that encompass a new set of guidelines and adoption incentives for the TOE framework.

Hypothesis 10: Governmental support has a positive effect on the TOE framework adoption intention of the business.

3.11. Legal Framework

Compliance with legal requirements is crucial for businesses to participate in a nation’s economy. The legal system consists of essential documents like constitutions, laws, rules, and contracts. A company’s adherence to these rules is reflected in the regulatory framework (Hiran and Henten, 2020). Understanding industry-specific regulations in the Internet environment is vital. Some laws may require businesses to adopt the TOE framework for research purposes (Hiran and Henten, 2020). Research by Maroufkhani et al. (2022) revealed that heavy regulation and government pressure prompt businesses to use big data. The regulatory environment also influences the widespread use of big data (Park and Kim, 2021).

Hypothesis 11: Governmental support has a positive effect on the TOE framework adoption intention of the business.

3.12. TOE Framework Adoption Intention and Business Performance

Businesses’ perceptions of their intentions to employ an invention are described by the term “*adoption intention*”. It is recognized as a crucial motivator for creative use (Venkatesh et al., 2012). Adoption intentions significantly influence the implementation of technologies in organizations. In the case of mobile payments in China and Pakistan, Khan et al. (2021) found a strong link between behavioral intention and actual use among SMEs. However, Hashimy et al. (2022) discovered a weak and insignificant correlation between the intention to adopt blockchain technology and its actual use among Spanish enterprises. This study uses business performance as an indicator of actual technology usage, considering its impact on profitability, survival rates, and future expansion.

Hypothesis 12: TOE framework adoption intention of the business has a positive effect on the business performance.

3.13. Control Variables and Business Performance

Consideration of various factors such as business age, number of employees, business type, and industry is crucial when assessing their impact on business performance. Previous studies have explored how these factors influence a business’s behavioral intention. For instance, Cruz-Jesus et al. (2019) found that business age and industry significantly influence CRM adoption. Furthermore, this study introduces the variable of company type, expanding on Nguyen et al.’s (2022) research model. Since the type of business is diverse and holds significant importance in decision-making for innovation, this aspect deserves attention in both the context of Vietnam and the global economy.

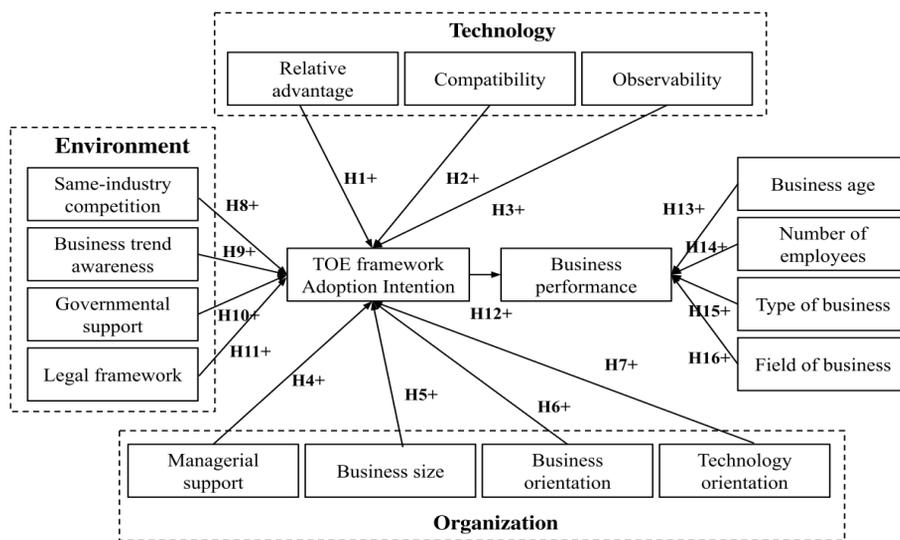
Hypothesis 13: Business age has a positive effect on the business performance.

Hypothesis 14: Number of employees has a positive effect on the business performance.

Hypothesis 15: Type of business has a positive effect on the business performance.

Hypothesis 16: Field of business has a positive effect on the business performance.

Figure 1: Research Model



Source: Synthesized research team

4. RESEARCH METHOD

4.1. Sample

A cross-sectional study was conducted in Vietnam, involving 300 participants of varying ages, from high school students to postgraduates. Data was collected through a self-administered survey created using Google Forms. Permission to participate was obtained after explaining the research goals to managers, directors, and officers. Subsequently, 300 valid responses were retained for data analysis, collected since May 2022.

4.2. Instrument Development

This study utilized a questionnaire-based survey, divided into three sections, to gather data. The first section provided research context and objectives, the second described respondents’ demographic characteristics, and the third contained measurement items for the constructs. Experts’ advice was sought to ensure questionnaire relevance, and a 5-point Likert scale was used (ranging from “1” for “*extremely disagree*” to “5” for “*extremely agree*”)

Various multi-variable scales were adapted from previous literature to measure latent variables in the study. For the technological context, scales from Grandon and Pearson, Al-Qirim, and Kendall et al. were utilized. Organizational context scales incorporated top management support, firm size, entrepreneurial orientation, and technological orientation from multiple sources. The environmental context was assessed

through scales for competitive pressure, perceived trend, government support, and legal framework. Additionally, adoption intention and business performance were adapted from specific authors' works.

For EFA exploratory factor analysis, a recommended minimum of 5 valid data samples per observed variable and a total sample size of at least 100 were followed, as indicated by Hair et al. (1998). The minimum sample size for regression analysis was calculated using the formula $n \geq 50 + 8 * (\text{number of independent variables})$ as suggested by Tabachnick and Fidell (1996). For a model with 13 independent variables, the calculated minimum sample size would be 154.

5. RESULTS AND DISCUSSION

5.1. Respondents' Demographic Characteristics

The survey collected demographic information from respondents, with 76% falling within the 18 to 50 age range. In terms of education, 25% had graduate degrees, 27.3% had postgraduate degrees, and 47.7% had high school qualifications or undergraduate degrees. In regards to salary, 73.3% earned less than 50 million VND, while 26.7% earned above that level. In terms of professional experience, 20.3% had 3 to less than 5 years, 28% had 5 to 10 years, 25.7% had less than 3 years, and 26% had over 10 years of experience. Respondents mainly came from small and medium firms (50.3%) with 10 to 300 employees, followed by very small firms (26%) with less than 10 employees, and large firms (23.7%) with over 300 employees. The study also gathered data on business types, with joint stock companies, one-member limited liability companies, and partnerships being popular. In terms of fields, the service sector accounted for 14.0% of respondents, while the manufacturing sector comprised 16.0%.

5.2. Evaluating Scales of Concepts (Reliability Test with Cronbach Alpha, Validity Test with EFA)

5.2.1. Reliability Test with Cronbach Alpha

The reliability of the scales used in the study was assessed using Cronbach's Alpha coefficient, with all scales demonstrating satisfactory levels of internal consistency. The Relative Advantage scale had a Cronbach's Alpha of 0.703, the Compatibility scale had a Cronbach's Alpha of 0.699, the Observability scale had a Cronbach's Alpha of 0.703, the Top Management Support scale had a Cronbach's Alpha of 0.746, the Business Size scale had a Cronbach's Alpha of 0.786, the Business Orientation scale had a Cronbach's Alpha of 0.753, the Technological Orientation scale had a Cronbach's Alpha of 0.743, the Same-industry Competition scale had a Cronbach's Alpha of 0.706, the Business Trend Awareness scale had a Cronbach's Alpha of 0.714, the Governmental Support scale had a Cronbach's Alpha of 0.763, the Legal Framework scale had a Cronbach's Alpha of 0.658, the Adoption Intention scale had a Cronbach's Alpha of 0.612, and the Business Performance scale had a Cronbach's Alpha of 0.683. Additionally, all observed variables within each scale demonstrated correlations higher than 0.3, further confirming the satisfactory nature of the scales.

5.2.2. Validity Test with EFA Exploratory Factor Analysis

a) Evaluations criteria

With the objective to avoid the occurrence of multicollinearity when applying the TOE model, the study conducted to add variables into groups according to the TOE framework as following table:

Table 5.1: Adjusted sign

Adjusted sign	Sign	Mean
TE1	RA	Relative advantage
TE2	CP	Compatibility
TE3	OS	Observability
OR1	MS	Managerial support

OR2	BS	Business size
OR3	BO	Business orientation
OR4	TO	Technology orientation
EV1	SC	Same-industry competition
EV2	BTA	Business trend awareness
EV3	GS	Governmental support
EV4	LF	Legal framework

Source: Authors' Research Results

b) EFA analysis result

The method of extracting Principal components along with Varimax rotation used to conduct EFA exploratory factor analysis. The EFA factor analysis extracted 4 factors from 14 observed variables, explaining 67.124% of the data variation. The total variance extracted meets the condition of being greater than 50%, indicating that the EFA model is suitable.

Table 5.2: Rotated Component Matrix

Rotated Component Matrix ^a				
EV1	0.982			
EV3	0.969			
EV2	0.905			
EV4	0.884			
AI2		0.717		
AI1		0.694		
AI3		0.622		
OR4			0.766	
OR3			0.759	
OR2			0.610	
OR1			0.599	
TE2				0.759
TE1				0.697
TE3				0.560

Source: Authors' research results

From the analysis results table of the Rotated Component Matrix, the factor loading coefficients of the observed variables are all > 0.5 and 4 factors are generated. Thus, exploratory factor analysis EFA for independent variables was performed four times, 14 observed variables converged and differentiated into 4 factors.

5.3. Testing of Research Hypotheses (Testing by Correlation and Multiple Regression)

The significance level (Sig.) of ≤ 0.05 indicates a significant correlation. A positive correlation coefficient close to 1 indicates a strong positive relationship, while a negative coefficient close to -1 indicates a strong negative relationship. A coefficient close to 0 suggests a weak correlation or no linear/nonlinear relationship. The dependent variable Adoption Intention (AI) is correlated with the independent variables (TE, OG, EV), as indicated by their Sig. values of 0.000 (< 0.05). The Pearson correlation values for these factors are similar, and none of them show a strong correlation. Additionally, some independent variables show correlations with each other, indicating potential multicollinearity that requires further analysis.

5.4. Regression Analysis

5.4.1. Evaluating the Fitness of the Regression Model – Correlation Test

The R - squared coefficient is 0.228 and the corrected squared coefficient is 0.220. From here, we can see 3 independent variables including Technology (TE), Organization (OG) and Environment (EV) are

included in the model that explains 22.0% of the impact of Adoption Intention. The Sig. value. = 0.000b < 0.05, thus, the proposed linear regression model is suitable for the collected data.

5.4.2. Regression Coefficient Test – Multicollinearity

Research results state the complete regression equation as follows:

$$\mathbf{AI = 0.024 + 0.370TE + 0.434OG + 0.134EV}$$

The research team chooses the 5% test level, from which we have the Sig condition. < 0.05. Thereby, the variables that are correlated with the dependent variable include Technology (0.000), Organization (0.000) and Environment (0.006). In other words, variables: Technology, Organization and Environment have an impact on the dependent variable Adoption intention (AI).

Next, the Unstandardized Coefficients B data showed that most of the independent variables have positive regression coefficients, specifically these are Technology (B = 0.370), Organization (B = 0.434) and Environment (B = 0.134). Thus, the above independent variables all have a positive effect on the dependent variable Adoption intention.

The larger the absolute value of Standardized Coefficients β , the larger the independent variable has a stronger effect on the dependent variable. From the table, the normalized regression coefficient of the variable Organization is the largest (0.270), followed by Technology (0.228) and finally Environment (0.103). Therefore, the variable Organization has the strongest impact on the dependent variable Adoption intention and the variable Environment has the weakest.

Next, the group conducts the multicollinearity test. The table shows that the VIF of all the independent variables is less than 2, so the variables have a close relationship with each other and there is no multicollinearity phenomenon.

5.5. Testing by Correlation and Multiple Regression between Toe-Framework Adoption Intention and Business Performance

5.5.1. Pearson Correlation Coefficient Analysis

The topic has Pearson correlation coefficient analysis to examine the linear relationship between Adoption Intention variable and Business Performance variable. There is a correlation between “*Business Performance*” (BP) and “*Adoption Attention*” (AI). However, the AI variable (Sig of AI) is 0.000 and has a correlation with BP because it is smaller than 0.05. The factor has Pearson correlation values approximately the same and both of the two factors have strongly correlated.

5.5.2. The Influence of Examined Factors On Adoption Intention And Business Performance

The R - squared coefficient is 0.564 and the Adjusted R-squared coefficient is 0.562. From here, we can see an independent variable AI (Adoption Intention) value is included in the model that explains 56.2% of the Business Performance. The Sig value. = 0.000b < 0.05, thus the proposed linear regression model is suitable for the collected data.

Research results states the complete regression equation as follows:

$$\mathbf{BP = 0.884 + 0.710AI}$$

The variable of Adoption Intention (Sig 0.000) is correlated with the dependent variable of Business Performance. Besides, the Unstandardized Coefficients B data showed that Adoption Intention (B = 0.751) has a positive effect on the dependent variable, which is Business Performance. As for the impact of the independent variables on the dependent variable, the normalized regression coefficient of the variable Adoption Intention is 0.751. Next, the group conducts the multicollinearity test, the VIF of the only independent value (1.000) is less than 2, so the variables have a close relationship with each other and there is no multicollinearity phenomenon.

6. CONCLUSION

6.1. Discussion

Vietnamese businesses recognize the significance of SDGs and the TOE Framework in the digital era. This study investigates the impact of technology, organizational factors, and the environment on business performance through 16 hypotheses, considering industry, business type, field, company age, and personnel count. The TOE framework offers insights into how technology, organizational culture, and the external environment shape a company's strategy, product development, and operations. It stresses leveraging existing technologies and embracing emerging trends for competitiveness. Collaboration among governments, corporations, and civil society organizations within the 17 SDGs framework is crucial for fostering a sustainable future. Vietnamese businesses can thrive by adopting the TOE Framework and aligning with the SDGs for sustainable development.

6.2. Implications

6.2.1. Theoretical Implications

The study introduces the “*TOE Framework for Vietnamese Business in the Digital Age based on SDGs*”, expanding the existing TOE framework to encompass SDGs, thus understanding the factors influencing digital transformation in Vietnamese firms. It stresses the significance of this framework in guiding technological decisions and exploring how its components interact to impact digital technology adoption, considering organizational, technological, and environmental factors.

The research holds theoretical implications for organizational strategy in the digital era, emphasizing the alignment of technical advancements with corporate goals and environmental sustainability. It recommends strategic integration of digital technologies to address social and environmental challenges faced by Vietnamese firms. Regarding policy implications, the study advocates creating a supportive environment for digital technology use aligned with SDGs in Vietnam's corporate and government sectors. It suggests integrating the TOE framework and SDGs into plans and laws to support sustainable digital transformation in Vietnamese companies. Additionally, the study offers practical frameworks to evaluate the alignment of digital transformation efforts with the SDGs, enabling businesses to implement sustainable and ethical practices.

6.2.2. Managerial Implications

The SDGs are crucial for businesses' long-term performance. They offer a framework to establish sustainability goals and gain a competitive edge. Utilizing SDGs improves brand reputation, trust, and sales. Governments must incentivize sustainable development, while entrepreneurs overcome legal issues. TOE framework's SDG integration boosts market share, profitability, and customer experiences. Vietnamese enterprises implementing sustainability receive government support, market potential, and rewards. The TOE framework has applications in social media, integrated platforms, data-driven solutions, and technology adoption. The study recommends using TAM for Vietnam's digital transition, validating its efficacy in explaining user adoption of self-service technologies.

6.3. Limitations

This research acknowledges limitations in relying on previous studies and the need for a comprehensive enterprise overview. It recognizes constraints and opportunities, but with a restricted scope. Applying findings to specific businesses in Vietnam is challenging due to diverse enterprise models. However, studying different models reveals patterns informing better business strategies. The study introduces two new factors to the TOE Framework, enhancing understanding of technology, organizations, and the external environment interactions.

The “*New Normal*” phase in Vietnam presents economic challenges and opportunities. The pandemic significantly impacted the economy, and the government aims for ambitious growth through recovery strategies. Staying well-informed is crucial for optimizing efficiency and considering broader implications on Vietnam’s stable economy.

6.4. Recommendations

Companies prioritizing sustainability plans must emphasize key functions based on their objectives. Organizational change is vital for success, achieved through raising stakeholder awareness, seeking external expertise, and adopting innovative processes or technologies. Huawei sets a corporate responsibility benchmark by investing in renewable energy and promoting workplace diversity and inclusion. Small actions like providing reusable cups to new employees enhance environmental impact. Larger projects, such as adopting power-saving technologies and constructing green ecosystems, can also be pursued. Huawei’s Environmental Report reaffirms its commitment to Environmental, Social, and Governance (ESG) principles, improving its environmental footprint and strengthening stakeholder relations through low-carbon campuses and eco-friendly practices across facilities, R&D labs, and factories.

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THE IMPACTS OF TRADE LIBERALIZATION ON CLIMATE CHANGE OF ASIAN DEVELOPING ECONOMIES

Author: Duong Thuy Linh¹, Nguyen Phuong Ngan², Tran My Hieu², Phung Minh Anh², Tran Minh Anh²

Mentor: Nguyen Thi Mai²

ABSTRACT: To estimate the impact of trade liberalization on climate change, our study uses data from more than 50 countries in Asia from 1990-2020 in the World Bank. According to the GLS model result, trade openness has no significant impact on environment via methane (CH₄), carbon dioxide (CO₂), nitrous oxide (N₂O), and greenhouse gasses emissions (GHG), however based on creating the interaction variables from trade openness and income groups show that in lower-middle-income countries, trade openness has a much more significant positive impact on carbon dioxide emission than upper-middle income. Thus, the authors mention suggested policies in economic activities emphasizing on promoting the use of renewable energy and stricter environmental regulations on enterprises to alleviate negatively-affected environment by trade liberalization.

Keywords: Asia, carbon dioxide, climate change, GLS, trade openness.

1. INTRODUCTION

International trade allows countries to access international markets, thus expanding and improving productivity through the division of labor (Smith, 1776). In developing countries, where the biggest barrier is the small market, the benefit of international trade is that domestic producers have the opportunity to run their business in a larger external market (Thirlwall, 2000). In addition, the theory of comparative advantage holds that international trade is beneficial and brings production and consumption benefits to economies (Ricardo, 1817). Open economies can expand their domestic industrial sectors more quickly by importing inputs, technology and machinery from more advanced economies around the world, which in turn will have a positive effect on economic growth. In addition, Dollar (1992) found that per capita income increased at a significant rate for 16 Asian economies between 1976 and 1985 as Asia's exchange rate accelerated and has a positive relationship to economic development in Asia.

However, besides the great benefits in terms of economic development of countries, trade liberalization also has negative effects on the environment, especially climate change in countries around the world (Cole, 2004), especially in developing countries after the 2008 crisis (Emir and Bekun, 2018). Grossman and Krueger (1991) and Shafik (1994) propose a practical basis for the link between trade and the environment. Free cross-border trade has led to challenges to the global ecosystem. Li et al. (2015) found that trade openness is harmful to the environment in developing countries, especially in Asia. The increase in emissions from 2004 to 2011 was mainly due to increased domestic consumption, but the increase in emissions related to exports is also notable (McDuffie et al., 2020). In addition, according to the "Global Carbon Budget" report at the COP27 Conference, emissions from oil in 2022 are likely to increase by more than 2% compared to 2021, while emissions from coal, which are believed to have already peaked in 2014, will record a new record increase. For Asia, the relationship between the economy and climate change was studied by Khan et al. (2019) using the FMOLS (Fully modified ordinary least squares) model and gave

¹ Foreign Trade University, Email: k60.2112153081@ftu.edu.vn.

² Foreign Trade University

results about the causal relationship between environmental pollution due to CO₂ emissions and net foreign direct investment, investment among a number of other variables. It implies that FDI is found to have an adverse effect on environmental quality, supporting the pollution haven hypothesis in 17 Asian countries for the period 1980–2014. Another variable of trade openness in the CO₂ emission model was found to have a positive and serious impact on environmental pollution.

One common point between all previous studies is that there is still no clear distinction between developing and developed economies in the world. Different levels of development, thus using different production technologies and having different trade-offs between economic growth and environmental degradation, this view is expressed in the work of Khan, Ozturk (2019), focusing on the impact of FDI on environmental pollution in Asia, or in the study by Sun et al. (2019) analyzing the relationship between trade liberalization and climate change in 49 countries. has high emissions in the “Belt and Road” area. Trade liberalization will affect climate change in different ways, Bulus and Koc (2021) who studied the Pollution Haven Hypothesis (PHH) found that the impact of foreign direct investment (FDI) caused environmental degradation in Korea through increased emissions. However, according to Alex (2018), it was shown that energy consumption causes carbon emissions and this relationship is negative, specifically, a 1% increase in energy consumption will reduce 0.357% of energy consumption. carbon emissions. This negative impact can be explained by the decline in energy consumption intensity caused by the relatively recent increase in energy prices and the region’s commitment to adopting clean energy production.

Currently, research on the impact of trade liberalization on the environment in developing countries is still limited and mainly focuses on trade openness to carbon dioxide (CO₂). Recognizing the gaps that still exist in previous studies, the authors have chosen the topic: “Impacts of trade liberalization on climate change of Asian developing economies” in order to study the link between trade openness and climate change during and after the economic and global recession, thereby proposing some recommendations to contribute to mitigating climate change. developing countries in Asia in the context of trade liberalization.

2. THEORETICAL FRAMEWORK

As trade openness has been attributed to the speedy growth of world economic integration (Jun et al., 2020), more and more research has been conducted about its climatic impact on countries that joined and accelerated this trend. The key points from these articles about the affected-environmental quality are based on 3 main aspects: the Pollution Haven Hypothesis (PHH), the Pollution Halo Hypothesis (PHT) and the Environment Kuznets Curve (EKC).

With regard to the close relationship between the intensity of environmental policies and the potential resources in a country, the Pollution Haven Hypothesis, which was initially introduced by Copeland and Taylor (1994) in the context of North-South trade under the North American Free Trade Agreement (NAFTA) (Bulus and Koc, 2021). When trade barriers are reduced, pollution-intensive industries from countries with stringent environmental regulations will be transferred to countries with looser laws (Makiyan et al., 2022). More specifically, the PHH theory has the following basic explanation: developed countries usually set strict environmental standards. This will increase costs related to environmental protection, such as increasing production costs, management costs due to the need to strictly control inputs or establish standards for emission and increasing cost of changing individual technologies to handle waste... Therefore, in order to maximize profits, multinational corporations in pollution-intensive manufacturing industries will transfer their operations or some of them to branches in developing

countries with less stringent environmental regulations (Gill, Viswanathan, and Karim, 2018). On the other hand, the looser the environmental policies of developing countries are, the more they can attract foreign direct investment from contaminating manufacturers. This may lead developing countries to enter the “bottom race” and environmental pollution levels may also rise.

Contrary to the pollution haven hypothesis, the pollution halo hypothesis (PHT) suggests an opposite relationship between foreign direct investment inflows and environmental pollution (Atici, 2012; Balsalobre Lorente et al., 2019). This hypothesis stems from the ideas of Grossman and Krueger (1995), who analyzed the environmental impacts of foreign direct investment and GDP growth through three analytical mechanisms: scale effects, component effects, and technology effects. The spillover effect shows that positive externality originates from the potential of foreign direct investment to bring advanced technology transfer to the recipient countries (Vu Thi Thuy Kieu and Le Thong Tien, 2019). On the one hand, the economy is driven by the growth of foreign direct investment (FDI), which in turn increases people’s awareness of environmental quality, corresponds to the increase in income, and promotes the process of utilizing new green and clean resources. On the other hand, the import of advanced technology, the application of higher environmental standards, the development of mining tools, and green production also contribute to improving the environmental quality of recipient countries (Zarsky, 1999; Asghari, 2013; Bruce and Roberts, 2017). In many studies, PHT has been proven to improve environmental quality in the BRICS countries (Tamazian et al., 2009), the United States (Eskeland and Harrison, 2003), and China (Liu and Kim, 2018). In addition to supporting the PHT theory, there are also experimental findings opposing PHT (Millimet and Roy, 2016; Neequaye and Oladi, 2015; Chung 2014). But overall, PHT theory provides valuable discoveries and foundations for environmental and economic growth theories.

Another aspect is the Environment Kuznets Curve (EKC), which became the main concept defining the relationship between income and environmental degradation in the early 1990s. Grossman and Krueger (1991), Shafik and Bandyopadhyay (1992) conducted their first experimental study on EKC and found a nonlinear inverse U-shaped relationship between income and pollution. The EKC hypothesis suggests that in the early stages of economic development, industrialization and urbanization deplete natural resources and generate urban as well as industrial waste. At this stage, there is a positive relationship between economic growth and pollution. As industrialization continues, technology has improved and services have expanded, resulting in a decrease in pollution (Panayotou, 1993). The basic message of EKC is to “develop first, sustainable after”. The way to “develop first, sustainable after” of EKC’s has put the world at risk of environmental changes, including global warming and climate change. In summary, although there are many different viewpoints around EKC, it is undeniable that EKC is an important and meaningful theory in economic and environmental issues.

Generally speaking, trade openness has a direct and indirect impact on the environment, thus the topic of the correlation between trade liberalization and the environment has been discussed controversially. However, the number of studies on trade openness and climate alteration by measurement of methane, nitrous oxide is still limited. The previous research is mainly concentrated on economic growth, FDI and lack of other vital factors such as renewable energy consumption and energy use.

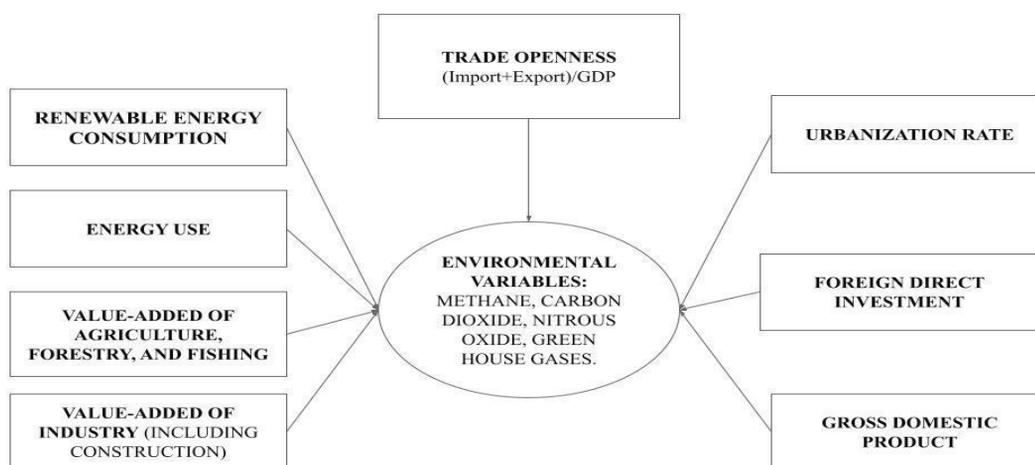


Diagram 1. Theoretical Framework

Source: Yan and Tu (2021).

3. RESEARCH METHOD

Gujarati (2015) recommends starting with the three models: pooled ordinary least squares (POLS) regression model, the fixed effects model (FEM), and the random effects model (REM)) and performing hypothesis testing to find the most suitable one, but there exist other worth-considering models, Generalized Least Squares (GLS) typically. In this study, the authors will perform regression on all models and choose the one that best suits their research. The variables are listed in table 1.

The formula showing the relationship between trade liberalization of the economies and 4 dependent variables of climate change: CO₂, CH₄, GHG, N₂O:

$$X_{it} = \beta_{1it} + \beta_{2it} * ope_{2it} + \beta_{3it} * int_{23it} + \beta_{4it} * int_{34it} + \beta_{5it} * lnagri_{5it} + \beta_{6it} * lnen_{6it} + \beta_{7it} * rne_{7it} + \beta_{8it} * lnind_{8it} + \beta_{9it} * urb_{9it} + \beta_{10it} * lngdp_{10it} + \beta_{11it} * lnfdi_{11it} + \beta_{12it} * yr_{12it} + \beta_{13it} * inc_{13it} + u_{it};$$

Given X = {co₂; lnch₄; lnghg; lnn₂o}.

Table 1. Sources and description of study variables

Variables	Description	Expected Sign	Research Source	Data source
Dependent variables to measure climate change				
co2	Carbon dioxide emissions, in metric tons per capita		Bulus and Koc (2021)	WB
lnn2o	The natural logarithm of nitrous oxide emissions in the energy sector, thousand metric tons of carbon dioxide equivalent		Onwachukwu et al. (2021)	WB
lnch4	The natural logarithm of methane emissions in the energy sector, in thousand metric tons of carbon dioxide equivalent		Ali et al. (2020)	WB
lnghg	The natural logarithm total greenhouse gas emission, in kt of carbon dioxide equivalent		Nemati et al. (2018)	WB
Independent variable				
ope	Trade openness (the total ratio of exports and imports of goods and services to the gross domestic product as a percentage)	+	Soylu et al. (2021)	WB
int2	int2=inc2*ope (middle-low income * trade openness),	+	Kazemi and Mousavi (2015)	WB
int3	int3=inc3*ope (middle-high income * trade openness)		Li and Haneklaus (2022)	WB
lnfdi	The natural logarithm of net foreign direct investment inflows, measured by percentage of foreign direct investment over gross domestic product	+	Onwachukwu et al. (2021)	WB

Variables	Description	Expected Sign	Research Source	Data source
lngdp	The natural logarithm of the number of gross domestic product per capita, in current US\$	+	Bengoa et al. (2021)	WB
urb	The ratio of urban population to total national population, in percentage	+/-	Ali et al. (2020) Xu et al. (2018)	WB
rne	Renewable energy consumption over total final energy consumption, in percentage	-	Soylu et al. (2021)	WB
lnen	The natural logarithm of the energy consumption, in kg of oil equivalent per capita	+/-	Sun et al. (2019), Khoshnevisan et al. (2013)	WB
lnagri	Agriculture, forestry, and fishing, value added, in current US\$	-	Orhan et al. (2021)	WB
lnind	Value-added of industry (including construction), in current US\$	-	Jebli et al. (2020)	WB
yr	yr=1 if year>2007, yr=0 otherwise	-	Wang and Wang (2021)	WB
incit	incit is a dummy variable with: low income country then i=1, lower middle income country then i=2, upper middle income country then i=3, high income country then i=4	+	Yao et al. (2019)	WB

The data is collected mainly from the World Bank. The dataset provides a wealth of data at the global level, enabling the research team to conduct analysis and testing across 50 countries in Asia, from 1990 to 2020. Data were processed to ensure consistency in research data. However, the data of some economies in some years are omitted and fall short of estimates. The authors have overcome this by finding more reputable data sources with more complete information such as: Statista, BP, ..., thereby increasing the accuracy of the research model.

In addition, according to Wang et al. (2022), Asian emerging economies underwent a global economic crisis in 2007, influencing these countries' total import value, export value, and GDP. In order to clarify the effects of trade openness and other factors on climate change throughout different situations, the author group splits the study period into two phases namely during and after the global recession, applying income and year as dummy variables.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Descriptive statistics

Before performing regression analysis, the author performs descriptive statistics on the variables in the mentioned research model. Table 2 presents the descriptive statistics for the variables included in the model.

Table 2. Descriptive statistics of variables in the model

Variable	Obs	Mean	Std. Dev.	Min	Max
lnch4	1,365	8.6679	2.3647	2.3026	13.9778
co2	1,550	5.7906	7.8794	0	50.9540
lnn2o	1,361	6.9258	2.2869	2.3026	13.2220
lnghg	1,440	11.1368	1.9115	5.2983	16.3575

ope	1,550	1.26555	4.2883	0	61.1411
lnfdi	1,343	-3.9665	1.6531	-19.5840	1.0301
lngdp	1,482	24.7418	3.0561	19.1864	38.5353
rne	1,485	0.2061	0.2721	0	0.9592
lnagri	1,328	21.9594	2.1258	17.3423	27.7539
urb	1,550	0.5669	0.2589	0.8854	1
lnen	1,110	7.2640	1.1683	4.0830	10.0043
lnind	1,366	23.3077	2.3072	16.9473	29.3463
yr	1,550	0.4194	0.4936	0	1
inc2	1,530	0.3223	0.4675	0	1
inc3	1,530	0.1660	0.3722	0	1
inc4	1,530	0.2503	0.4333	0	1

Source: The authors (2023)

Descriptive statistics table includes 16 variables, among which *ch4*, *co2*, *n2o*, and *ghg*, the value-added of agriculture, forestry, and fishery industry (*agri*), energy use (*en*) and industrial added value (*ind*) are variables that possess relatively large standard deviations, causing disproportions in the overall value. Therefore, the authors decided to take the natural logarithm of these variables to gain normal distribution. Looking at the detail, the standard deviations and net levels of dependent variables, consisting of *lnch4*, *lnn2o*, and *lnghg* lie in the range of around 2 and 11 respectively, while their values for average mean vary widely. Regarding independent and control variables, *trade openness (ope)* shows the largest net value among the variables, with 61.14 and the second largest standard deviation after *co2*. This indicates that trade openness has a widespread dispersion among Asian developing countries. *the net inflows of foreign direct investment (lnfdi)*, *gross domestic product (lngdp)*, *the value-added of agriculture, forestry, and fishery industry (lnagri)*, *energy use (lnen)* and *the value-added of industry (including construction) (ind)* show a considerable disparity in their net values, as well as mean numbers. However, these variables all have comparable standard deviations, ranging from 1.16 of *energy use (lnen)* to 3.0 of *gross domestic product (lngdp)*. Except for *the net inflows of foreign direct investment (lnfdi)*, the four variables *gross domestic product (lngdp)*, *the added value of agriculture, forestry, and fishery industry (lnagri)*, *energy use (lnen)* and *added value of industry (including construction) (lnind)* all have bigger average mean values than *trade openness (ope)*.

Among all variables, *lngdp* holds the largest average value of 24.74, while *the net inflows of foreign direct investment (lnfdi)* average value, the only below-zero average value, is the smallest at -3.967. Regarding the standard deviation of the examined variables, *co2* has the highest number of 7.88, and *the urbanization rate (urb)* has the lowest with 0.26. This implies that there is a large disparity in the carbon dioxide level among developing Asian nations and regions, meanwhile, a subtle urbanization dispersion is witnessed among the research countries.

A model where the independent variables satisfy the condition of being not correlated with each other is an ideal model, denoting that each independent variable carries exclusive and non-repeated information about the dependent variables. To effectively examine the correlation between the dependent variables and independent and control variables in the model, the correlation coefficient matrix of variables in the model will be applied. The results explain that the correlation coefficient between the pairs of explanatory variables in the model is less than 0.8. Therefore, it can be concluded that the two dependent variables are not strongly correlated with each other and that there is no multicollinearity in the model.

4.1.2. Model testing

Several tests have been performed in this study to investigate defects in regression models. Variance Inflation Factor (VIF), Modified Wald test, and Wooldridge test are used to analyze the level of multicollinearity, heteroskedasticity, and autocorrelation of variables in the model.

Before ending up with the GLS model, the study had conducted the F test and Hausman test to opt for the most suitable model among Pooled OLS, FEM, and REM. However, due to the presence of heteroskedasticity and autocorrelation mentioned above, GLS is used for the result discussion of the four models in this study.

4.1.3. Model results measuring the impact of trade liberalization on climate change

This study analyzes the impact of trade liberalization on climate change through the interaction between four dependent variables regarding pollutants and independent variables relating to economics as the table below:

Table 3. Regression results of impacts of trade liberalization on climate change without interaction variables

VARIABLES	Model (1) lnch4	Model (2) co2	Model (3) lnn2o	Model (4) lnghg
ope: Trade openness	-0.00634	0.00188	0.000428	0.00297
	(0.00972)	(0.00968)	(0.00906)	(0.00313)
lngdp: The rate of growth of gross domestic product	-0.0182**	-0.0157	0.00192	-0.0131***
	(0.00713)	(0.0149)	(0.00543)	(0.00468)
rne: Percentage of renewable energy out of total final energy consumption	0.0259**	-0.0127	0.0399***	0.0189***
	(0.0119)	(0.0137)	(0.0123)	(0.00655)
lnagri: Value-added of agriculture, forestry, and fishing	-1.825***	3.036***	-0.962***	-0.368**
	(0.247)	(0.536)	(0.258)	(0.145)
urb: Urbanization rate	0.535***	-0.119***	0.513***	0.637***
	(0.0217)	(0.0387)	(0.0209)	(0.0135)
lnen: Energy use	-2.521***	0.537	-1.416***	0.836***
	(0.409)	(0.651)	(0.345)	(0.208)
lnind: Industry (including construction) value added	0.661***	4.553***	0.241***	0.353***
	(0.0630)	(0.161)	(0.0556)	(0.0345)
yr if year>2007, yr=0 otherwise	-0.105***	-0.124***	-0.132***	-0.117***
	(0.0166)	(0.0322)	(0.0139)	(0.00988)
inc2=1 if it is lower middle income country, inc2=0 otherwise	-0.0433	0.0595	-0.0197	-0.0682***
	(0.0293)	(0.0546)	(0.0233)	(0.0196)
inc3=1 if it is upper middle income country, inc3=0 otherwise	-0.0270	-0.00504	-0.0352	-0.0678***
	(0.0342)	(0.0614)	(0.0282)	(0.0262)
inc4=1 if it is high income country, inc4=0 otherwise	-0.148**	0.0353	-0.104**	-0.218***
	(0.0693)	(0.0880)	(0.0514)	(0.0434)
inc4	-0.288***	0.680***	-0.156*	-0.225***
	(0.0913)	(0.182)	(0.0802)	(0.0582)

VARIABLES	Model (1) lnch4	Model (2) co2	Model (3) lnn2o	Model (4) lnghg
Constant	-3.911***	-22.88***	-2.993***	-3.158***
	(0.729)	(1.573)	(0.651)	(0.429)
Observations	791	815	795	800
Number of ctry1	41	44	42	43

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: The authors (2023)

It can be seen from the table 3 that trade openness (ope) does not have a considerable impact on the emission of methane, carbon dioxide, nitrous oxide, and greenhouse gasses. This result is consistent with the study of Ansari *et al.* (2019) indicating that trade openness is statistically insignificant for Iran, the UK, Australia, France, and Spain on *co2* as the increase in *co2* due to higher rates of production resulting from freer trade (scale effect) is compensated by the impacts of changing industrial structure towards environmentally friendly activities (composition effect) and the use of cleaner production processes (technique effect). The result is also consistent with the study of Jayanthakumaran *et al.* (2012) and Farrhani and Shahbaz (2014), indicating that in the early stages of economic development, emissions including CO2 will increase because in this period most modern technologies have not been widely applied. At the same time, the government also tends to prioritize policies on economic development, leading to increased emissions along with economic activity, especially in big cities. However, when the economy grows to a certain point, the government pays more attention to environmental issues by giving priority to sustainable development projects, tightening environmental laws. Besides, the research results of Sun (2019) also show that trade openness actually has a positive impact on the environment in European countries but not in Asia because countries in The European region is shifting its pollutant-intensive industries to emerging economies with lax or non-existent environmental regulations.

Table 4. Regression results of impacts of trade liberalization on climate change with interaction variables

VARIABLES	Model (1) lnch4	Model (2) co2	Model (3) lnn2o	Model (4) lnghg
int2=inc2*ope	-0.0616	0.2870**	0.0753	-0.0117
	(0.0871)	(0.1160)	(0.0668)	(0.0498)
int3=inc3*ope	-0.3090**	0.4600**	0.0713	-0.1550**
	(0.1200)	(0.2220)	(0.1000)	(0.0778)
ope: Trade openness	-0.00424	0.000860	-0.00316	0.00253
	(0.00954)	(0.00847)	(0.00949)	(0.00328)
lnfdi: Net foreign direct investment inflows	-0.0195**	-0.0183	0.00298	-0.0124**
	(0.0077)	(0.0151)	(0.0061)	(0.0052)
lngdp: The rate of growth of gross domestic product	0.0202	0.0009	0.0509***	0.0177**
	(0.0133)	(0.0155)	(0.0137)	(0.00720)
rne: Percentage of renewable energy out of total final energy consumption	-1.5660***	3.8180***	-0.7580***	-0.6250***
	(0.2850)	(0.5790)	(0.2930)	(0.1620)

VARIABLES	Model (1) lnch4	Model (2) co2	Model (3) lnn2o	Model (4) lnghg
lnagri: Value-added of agriculture, forestry, and fishing	0.5630*** (0.0228)	-0.1140*** (0.0436)	0.5420*** (0.0221)	0.6420*** (0.0138)
urb: Urbanization rate	-2.176*** (0.4320)	1.494** (0.7520)	-1.100*** (0.3630)	0.610*** (0.2130)
lnen: Energy use	0.730*** (0.0672)	4.625*** (0.1760)	0.261*** (0.0623)	0.360*** (0.0356)
lnind: Industry (including construction) value added	-0.1310*** (0.0177)	-0.1200*** (0.0364)	-0.1410*** (0.0150)	-0.1270*** (0.0102)
yr if year>2007, yr=0 otherwise	-0.0451 (0.0316)	0.0611 (0.0608)	-0.0275 (0.0256)	-0.0698*** (0.0212)
inc2=1 if it is lower middle income country,inc2=0 otherwise	0.0181 (0.0609)	-0.1860** (0.0926)	-0.0792 (0.0498)	-0.0650 (0.0432)
inc3=1 if it is upper middle income country,inc3=0 otherwise	0.0401 (0.1040)	-0.2560 (0.1570)	-0.1610* (0.0921)	-0.1330* (0.0693)
inc4=1 if it is high income country,inc4=0 otherwise	-0.3420*** (0.0989)	0.7100*** (0.1970)	-0.2000** (0.0885)	-0.2450*** (0.0625)
Constant	-4.5590*** (0.8070)	-24.6700*** (1.7400)	-4.1120*** (0.7640)	-2.8730*** (0.4650)
Observations	757	762	757	762
Number of ctry1	40	41	40	41

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: The authors (2023)

In this study, authors create two interaction variables based on trade openness and income groups. The aim is to analyze the difference in the impact of trade openness on *lnch4*, *co2*, *lnn2o*, and *lnghg* in different groups of income levels. The two new variables *int2* and *int3* represent the middle income groups. The table 4 shows that the two interaction variables are statistically significant.

The interaction variable *int2*, which is calculated by lower-middle income x trade openness, has a positive impact on *co2* at a 5% significance level, which is similar to the impact of variable *int3*, which is measured by upper-middle income x trade openness. However, this impact in lower-middle-income countries is more than double that in upper-middle-income countries. This is due to the scale effect of trade openness and the fact that at the early stage of development, more attention is paid to growth than the quality of the environment, which is according to Ali *et al.* (2020).

In addition, the authors have created a variable *yr* to identify the pattern between emissions of four kinds in the pre-recession period and the post-recession period. From the result, in the post-recession period, greenhouse gasses emissions in Asian countries have been decreasing. This result is similar to the study of Nemati *et al.* (2021) in which greenhouse gasses emissions reduce in the long run under the influence of free trade agreements between developing countries.

Besides, *the net inflows of foreign direct investment (lnfdi)* have a significant negative impact on emissions of *lnch4* and *lnghg* at the significant level of 5%, which is similar to renewable energy consumption at a 1% significant level. The increase in *lnfdi* or *renewable energy consumption (rne)* will lower *lnch4* and *lnghg*, holding all other factors unchanged; this finding is similar to Paul *et al.* (2021) that concludes *lnfdi* had a negative impact on *lnch4*. However, renewable energy also has a significant negative impact on *lnn2o* and a positive impact on *co2*, both at the level of 1%. The result of *rne* impact on *lnn2o* is in line with the study of Sinha *et al.* (2019). The result of the positive impact on *co2* is in line with the research of Soylu *et al.* (2021).

From table 4, we can also conclude that GDP has a significant positive impact on the emissions of nitrous oxide and greenhouse gasses at 1% and 5% significant levels, in turn. This result is the same as the results examined in Higher-income OIC countries by Ali, S. *et al.* (2020). Regarding *the urbanization rate (urb)*, it is significant at the level of 5% for *co2* and 1% for the remaining 3 pollutant emissions. Holding other factors the same, the more the urbanization rate is, the more emissions of carbon dioxide and greenhouse gasses are while there will be fewer methane and nitrous oxide emissions. This is consistent with the study of Li, B. and Haneklaus, N. (2022), saying that a 1% increase in the long term causes a change in urbanization in the form of a 1.27% decrease in *co2* at a 1% significance level.

Energy use, the value-added of agriculture, forestry, and fishery industry (lnagri) and *the value-added of industry (including construction) (lnind)* all have a significant impact on four pollutant emissions at a 1% significance level. But it is noticeable that *energy use* impacts them positively while *lnind* impacts them all negatively.

It is noticeable that there is a difference in the impact of trade openness on *ch4* and *lnghg* in lower-middle-income countries and higher-middle-income countries. Whereas the impact is insignificant in lower-middle-income countries, *ope* has a negative impact on the two pollutant emissions at a 5% level of significance. If all other factors are unchanged, an increase of 1% in trade openness leads to a decrease of 0.3090% and 0.1550% for *lnch4* and *lnghg*, respectively.

4.2. Discussion

As shown in the above results, the authors conclude that the general air quality of Asian developing countries suffers from negative effects when trade liberalization is widely adopted. To clarify the claim above, the authors discovered that: i) Trade activities in Asian countries with different income levels contribute significantly to the increased CO₂; ii) Increasing urban population in an area equals the speed of the area's urbanization rate, leading to rising air pollution from construction, factories, and daily transportation; iii) The more people living in urban regions, along with higher overall energy use, the worse the air quality evolves, making allergies and respiratory problems a huge health hazard; iv) The value-added of agriculture, forestry and fishery industry also mitigate emissions intensity and contribute to cutting the greenhouse-gas emissions but this requires technology application, and consent of principles of sustainability; v) Industries and investors still exploit resources in high-income economies, making carbon emission worsened despite environment policies. As trade liberalization continues, high-income countries incline to invest and conduct more economic activities in low-middle and upper-middle-income countries to avoid a solid legal system.

5. CONCLUSION

The regression results indicate that trade openness solely does not have a considerable impact, yet when in combination with income levels then trade openness shows statistical significance on the climate in developing Asian economies surveyed. To be more specific, while trade openness tends to decrease the amount of emitted methane and greenhouse gases in countries with upper middle income, it leads to higher

emissions of carbon dioxide in both lower middle income and upper middle income nations. Therefore, to lessen the burden on the atmosphere brought about by trade liberalization, governments and policy makers must reckon with the downsides of trade openness on the atmosphere, then alter policies on economic activities and implement environmental protection measures in the most effective way. The authors propose the following recommendations:

In terms of energy consumption and infrastructure, policymakers should reduce air pollution by cutting down the usage of fossil fuels and upgrading greener energy use. With the innovative wave brought by trade openness, authorities should make the most use of it to innovate infrastructure and machines using renewable energy, as well as accelerating electrification process on multiple energy resources. Authorities should renew propositions and improve alternative transport systems in urbanisation areas and moderate-large urban areas, also work with people's awareness onto accepting environmentally friendly public transport systems instead of private vehicles.

In terms of financing and investing, trade openness should also undergo careful censorship by authorities, based on a greener and more sustainable approach. Additionally, trade barriers on producing green and environmentally friendly products should be removed to encourage minimum-cost green innovation. National budgets should be partially spent to invest in modern manufacturing technology and equipment so as not to cause high pollution as well as strictly comply with environmental regulations. Moreover, policies and laws should incorporate stringent regulations, responsibilities on foreign direct investments for investors and investees to ensure environment protection measures, as well as the level of tax payment based on the amount of emission their work has produced.

In terms of acts on consolidating social behaviors, settlement structure and employment distribution should be modified in conformity with ecological volume of the area, meaning re-distributing the working and accommodation system to smaller urbans to lessen burdens on large urban's atmosphere during urbanisation. On top of that, a rising number of public-private cooperation plans, including enterprises, government or social organizations, should be carried out in the field of waste treatment and management, aiming at developing people's awareness and their voluntary behaviors in behalf of the environment.

With the efficiency of the GLS model, this study has combined the prerequisite variable, which is trade liberalization, with income level variable and resulted in new and comparative findings on this trade liberalization - climate change topic. However, further reliable data or some other models can also be examined in the future to alleviate limitations of lacking data and strengthen the knowledge of the trade liberalization's impact on the environment.

APPENDIX

Appendix 1. Correlation coefficient matrix of variables in the model with lnch4

	lnch4	ope	lnfdi	lngdp	rne	lnagri	urb
lnch4	1						
ope	-0.270***	1					
lnfdi	-0.247***	0.0554	1				
lngdp	0.512***	-0.228***	-0.0706	1			
rne	-0.106**	0.217***	-0.0604	-0.0573	1		
lnagri	0.616***	-0.203***	-0.176***	0.609***	0.238***	1	
urb	-0.0783*	-0.167***	-0.00149	-0.000530	-0.817***	-0.331***	1

	lnch4	ope	lnfdi	lngdp	rne	lnagri	urb
lnen	0.137***	-0.166***	0.0570	0.0792*	-0.807***	-0.343***	0.834***
lnind	-0.215***	-0.0490	0.140***	0.0883*	-0.221***	-0.0704	0.269***
yr	0.0198	-0.0659	0.149***	0.213***	-0.0525	0.159***	0.134***
inc2	0.208***	-0.127***	-0.0534	0.159***	-0.0293	0.212***	-0.180***
inc3	0.148***	-0.0557	0.0779*	0.131***	-0.269***	0.117**	0.232***
inc4	-0.259***	-0.0666	-0.000784	0.00205	-0.397***	-0.369***	0.641***

	ope	lnfdi	lngdp	rne	lnagri	urb
lnen	1					
lnind	0.109**	1				
yr	0.104**	0.240***	1			
inc2	-0.190***	0.231***	-0.0552	1		
inc3	0.214***	-0.0266	0.171***	-0.332***	1	
inc4	0.644***	0.149***	0.126***	-0.406***	-0.237***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: The authors (2023)

Appendix 2. Correlation coefficient matrix of variables in the model with co2

	co2	ope	lnfdi	lngdp	rne	lnagri	urb
co2	1						
ope	-0.0981**	1					
lnfdi	0.0102	0.0556	1				
lngdp	-0.0184	-0.225***	-0.0674	1			
rne	-0.556***	0.210***	-0.0628	-0.0842*	1		
lnagri	-0.436***	-0.201***	-0.172***	0.615***	0.202***	1	
urb	0.711***	-0.165***	0.000631	0.0119	-0.813***	-0.314***	1
lnen	0.858***	-0.163***	0.0593	0.0939**	-0.808***	-0.322***	0.835***
lnind	0.0256	-0.0498	0.136***	0.0668	-0.177***	-0.0884*	0.250***
yr	0.0797*	-0.0653	0.150***	0.219***	-0.0640	0.164***	0.139***
inc2	-0.280***	-0.126***	-0.0514	0.157***	-0.0273	0.209***	-0.178***
inc3	0.0681	-0.0553	0.0784*	0.134***	-0.270***	0.120***	0.234***
inc4	0.673***	-0.0661	-0.0000307	0.00755	-0.396***	-0.360***	0.641***

	lnen	lnind	yr	inc2	inc3	inc4
lnen	1					
lnind	0.0888*	1				
yr	0.110**	0.227***	1			
inc2	-0.187***	0.230***	-0.0553	1		
inc3	0.216***	-0.0318	0.173***	-0.331***	1	

	lnen	lnind	yr	inc2	inc3	inc4
inc4	0.643***	0.140***	0.128***	-0.404***	-0.235***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: The authors (2023)

Appendix 3. Correlation coefficient matrix of variables in the model with ln2o

	ln2o	ope	lnfdi	lngdp	rne	lnagri	urb
ln2o	1						
ope	-0.318***	1					
lnfdi	-0.0774*	0.0554	1				
lngdp	0.559***	-0.228***	-0.0706	1			
rne	0.0496	0.217***	-0.0604	-0.0573	1		
lnagri	0.765***	-0.203***	-0.176***	0.609***	0.238***	1	
urb	-0.181***	-0.167***	-0.00149	-0.000530	-0.817***	-0.331***	1
lnen	-0.102**	-0.166***	0.0570	0.0792*	-0.807***	-0.343***	0.834***
lnind	-0.148***	-0.0490	0.140***	0.0883*	-0.221***	-0.0704	0.269***
yr	0.0461	-0.0659	0.149***	0.213***	-0.0525	0.159***	0.134***
inc2	0.129***	-0.127***	-0.0534	0.159***	-0.0293	0.212***	-0.180***
inc3	0.138***	-0.0557	0.0779*	0.131***	-0.269***	0.117**	0.232***
inc4	-0.297***	-0.0666	-0.000784	0.00205	-0.397***	-0.369***	0.641***

	lnen	lnind	yr	inc2	inc3	inc4
lnind	0.109**	1				
yr	0.104**	0.240***	1			
inc2	-0.190***	0.231***	-0.0552	1		
inc3	0.214***	-0.0266	0.171***	-0.332***	1	
inc4	0.644***	0.149***	0.126***	-0.406***	-0.237***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: The authors (2023)

Appendix 4. Correlation coefficient matrix of variables in the model with lnghg

	lnghg	ope	lnfdi	lngdp	rne	lnagri	urb
lnghg	1						
ope	-0.268***	1					
lnfdi	-0.203***	0.0556	1				
lngdp	0.622***	-0.225***	-0.0674	1			
rne	-0.123***	0.210***	-0.0628	-0.0842*	1		
lnagri	0.840***	-0.201***	-0.172***	0.615***	0.202***	1	
urb	0.00886	-0.165***	0.000631	0.0119	-0.813***	-0.314***	1
lnen	0.0794*	-0.163***	0.0593	0.0939**	-0.808***	-0.322***	0.835***
lnind	-0.183***	-0.0498	0.136***	0.0668	-0.177***	-0.0884*	0.250***
yr	0.0830*	-0.0653	0.150***	0.219***	-0.0640	0.164***	0.139***

	lnghg	ope	lnfdi	lngdp	rne	lnagri	urb
inc2	0.149***	-0.126***	-0.0514	0.157***	-0.0273	0.209***	-0.178***
inc3	0.130***	-0.0553	0.0784*	0.134***	-0.270***	0.120***	0.234***
inc4	-0.162***	-0.0661	-0.0000307	0.00755	-0.396***	-0.360***	0.641***

	lnen	lnind	yr	inc2	inc3	inc4
lnind	1					
yr	0.0888*	1				
inc2	0.110**	0.227***	1			
inc3	-0.187***	0.230***	-0.0553	1		
inc4	0.216***	-0.0318	0.173***	-0.331***	1	
lnind	0.643***	0.140***	0.128***	-0.404***	-0.235***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: The authors (2023)

Appendix 5. Variance inflation factor VIF with Inch4 dependent variable

Variable	urb	inc4	lnen	rne	inc3	inc2	lnagri	lngdp	lnind	yr	ope	lnfdi	Mean VIF
VIF	6.14	5.84	5.83	4.85	3.16	2.85	2.46	2.08	1.42	1.24	1.15	1.14	3.18

Source: The authors (2023)

Appendix 6. Variance inflation factor VIF with co2 dependent variable

Variable	urb	lnen	inc4	rne	inc3	inc2	lnagri	lngdp	lnind	yr	ope	lnfdi	Mean VIF
VIF	6.18	5.87	5.81	4.72	3.13	2.82	2.47	2.11	1.4	1.24	1.14	1.14	3.17

Source: The authors (2023)

Appendix 7. Variance inflation factor VIF with Inn2o dependent variable

Variable	urb	inc4	lnen	rne	inc3	inc2	lnagri	lngdp	lnind	yr	ope	lnfdi	Mean VIF
VIF	6.14	5.84	5.83	4.85	3.16	2.85	2.46	2.08	1.42	1.24	1.15	1.14	3.18

Source: The authors (2023)

Appendix 8. Variance inflation factor VIF with lnggh dependent variable

Variable	urb	lnen	inc4	rne	inc3	inc2	lnagri	lngdp	lnind	yr	ope	lnfdi	Mean VIF
VIF	6.18	5.87	5.81	4.72	3.13	2.82	2.47	2.11	1.4	1.24	1.14	1.14	3.17

Source: The authors (2023)

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HOW DOES TRADE OPENNESS AFFECT PRIVATE INVESTMENT? A GLS APPROACH

**Author: Truong Nguyen Thuy Duong¹, Nguyen Anh Ngoc², Vuong Bao Ngoc²,
Nguyen Tran Phuong Uyen², Mai Nu Song Ngan²
Mentor: Nguyen Thi Mai²**

ABSTRACT: Using GLS regression, the study examines the influence of trade openness on private investment in 33 developing Asian countries from 2001 to 2019. The dependent variable in the study is especially presented in two forms, corresponding to two measurements of private investment. Results show that trade openness has positive impacts on investment activities of the private sector. Besides, for the first time, through the use of interactive variables, the impact of trade openness on private investment (1) in high-income Asian developing countries, (2) in countries following constitutional rules, and (3) in the post-recession period are measured. From the results, it indicates that the private sector credit, net foreign direct investment inflows, broad money supply, GDP growth rate, population, high income countries, the post-recession period, the constitutional rules and inflation affect private investment positively. On the other hand, the negative impact is found in the foreign reserves. The results provide policy recommendations to the government and stakeholders, such as expanding export markets, boosting the competitiveness of domestic production, and efficiently regulating capital.

Keywords: Asia; developing countries; GLS regression; private investment; trade openness.

1. INTRODUCTION

One of any nation's top priorities should be to encourage private sector investment, which contributes to economic growth by generating production, revenue, and employment inside the nation. Additionally, productivity in the private sector is guaranteed by ongoing monitoring and assessment. Therefore, developing the private sector as a strategy to increase economic activity in developing countries to help promote economic growth and reduce poverty has begun to gain credibility in the years since 1980 (Ouattara, 2004).

It is crucial for planners and policymakers to be aware of the factors that influence private investment. Since many years ago, economists have regularly argued how trade liberalization and the country's economic circumstances may both significantly increase private investment. In which, trade openness can be one of the factors that help improve the quality of economic development (Raghutla, 2020). In addition, there are other factors that affect private investment in developing countries, among them are GDP growth, real exchange rate, public investment, real interest rate, public debt, and uncertainty (Serven & Solimano, 1993). However, Bibi et al (2012) show that trade openness has a detrimental effect on domestic investment in Pakistan because it increases the opportunity for capital outflows from the economy.

Nowadays, Asia has quickly emerged as a leader in the private market investment field, notably in the growth stock sector. The value of deals in South Korea, Southeast Asia, and Japan is more than quadrupled, and each nation in the region established new investment records. Private investment pledges are expected to reach \$76.2 billion in low- and middle-income countries in 2021, increasing 49% from 2020 (World Bank, 2022).

Generally, previous studies have analyzed the factors affecting private investment. Differences in results are explained by differences in geography, methods of data use, and duration of observations. In addition, examined studies show long-term and short-term effects to make a difference. Therefore, this

¹ Foreign Trade University, Email: truongnguyenthuyduong2011115115@ftu.edu.vn

² Foreign Trade University.

article uses a variety of indicators from 33 countries and data spanning 19 years to compare sharp differences and comparisons between countries in the same region.

This topic about the impact of trade openness on private investment has drawn a lot of attention and our study has some contributions as follows. First, the research is conducted on a large scale expanding 33 Asian developing countries in 19 years. Among a few topics investigating this causality, none has gone into deep research at such scale. Second, two dependent variables corresponding with two ways of measuring private investment, which means four models in total, were observed to produce the most accurate result. Third, the model is supplemented with interactive variables to clarify the impact of trade openness on private investment in specific situations: before and after the economic crisis in 2008, in high-income developing countries in Asia and in politically stable developing countries in Asia.

Regarding the practical contributions of our study, the research has clarified the relationship between trade openness and private investment in Asian developing economies in the period from 2001 to 2019. This would be a significant contribution in the context that many Asian nations under investigation have been recently emerging as dynamic developing countries and private investment has been proven to play a key role in that development. From the research results as well as the recommendations on the topic, policymakers and businesses in developing countries in Asia will have more references to come up with effective strategies and approaches to make the most of the relationship between trade openness and private investment. The rest of the article is presented as follows. The relevant literature will be reviewed in section 2 from which the framework of the analysis is provided. Section 3 presents the data system and evaluation method the group has chosen. The results of the method will be presented in Section 4. Section 5 is responsible for making conclusions and recommendations.

2. THEORETICAL FRAMEWORK

Trade openness is an important index in evaluating the statement of a national economy. OECD (2011) mentions it as an index used to evaluate the importance of foreign trade in comparison with domestic trade. Trade openness is assumed to be a potential factor for having an impact on private investment. Private investment is considered as the private sector's purchase of a capital asset that is expected to create profits and add value in the future (Marcos, 2019). Because of their important roles in the economy, many researchers work on analyzing the effect of trade openness to private investment.

In further research, the researchers come up with different conclusions about how trade openness affects private investment. The results could be divided into two main types: positive and negative. A typical research that confirms the positive effect is the study of Naa-Idar et al (2012) about 30 African countries. This research mentions that in the long term, trade openness brings beneficial contributions to private investment, and therefore free trade policy should be enhanced. Mohsen (2015) mentions that trade openness is helpful for acquiring machines and production inputs that can be used in the production activities. In addition, increasing exporting abroad motivates the private sector to improve and increase its production. By using the technique of estimating the distribution delay (ARDL), Suleman et al. (2020) analyze the factors that are significant to the rise of private investment in Pakistan from 1974 to 2013. The study revealed that trade openness encourages private investment through uplifting the export and import of capital goods and latest technology which motive domestic investment. Drawing the same conclusions as Suleman, Boachie et al (2020) used the IMF database to show that financial development and trade openness have a significant positive impact on regional investment. India's private sector, both in the long and short term. However, the impact of the correlation between financial development and trade openness on private investment is significantly negative, indicating that the impact of financial development on private investment depends on the open level. Therefore, if India

is to promote the formation of private sector capital for job creation, care should be taken in designing policies to allow financial development as well as open trade to coexist.

In contrast with these authors, other researchers state that there are cases where trade openness has a negative effect on private investment. Among them, the study of Asante (2000) shows that trade policies have a negative impact on private investment. For a country with a history of being controlled like Ghana, policies such as trade closures, overvalued exchange rates, lack of foreign exchange, etc. have hindered the development of import and export, have a profound impact on trade openness. The work of Hye & Lau (2018) came up with a contradictory result to Sulemant et al. (2020) when the ARDL model pointed out that 1% increase in trade openness lowered private investment by 3.162%. The explanation for this phenomenon is that Pakistan is still a raw material exporter with low income in export. The study of Frimpong & Marbuah (2010) about private investment of Ghana suppose the possibility of negative effect from trade openness. The development in trade brings advantages for export and increases competitiveness and productivity. In-depth research in the service sector, Abbas (2022) makes the following statement: private investment in services is significantly encouraged by the growth of value added output of the service industry (GVAS), credit capacity private employment (PC), GDP growth (G), physical infrastructure (PI), remittances (REM) and foreign direct investment (FDI). However, public investment in services (ISPUB) and trade openness (OP) discourage private investment in this sector.

The research framework focuses on how private investment is affected by trade openness. To get reliable results, we also analyze other factors that may have potential effects, which are social - economic characteristics and economic index. To estimate the effect, private investment is represented in two forms: value in USD and ratio of private investment to GDP.

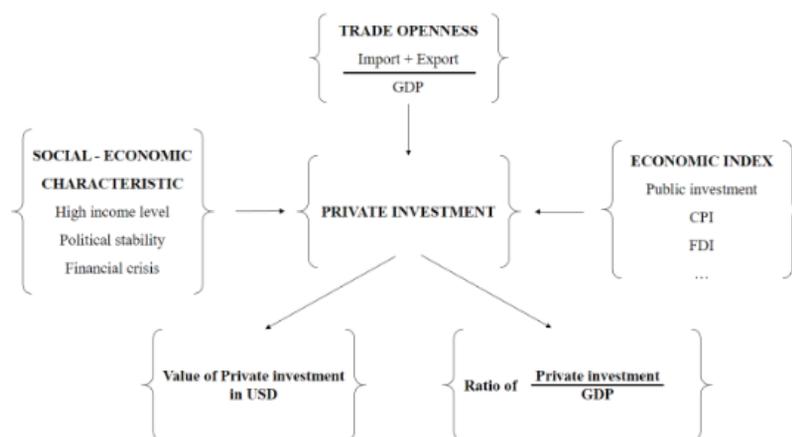


Figure 1. Analysis framework about the impact of trade openness on private investment

Source: Synthesized by the authors (2022)

3. RESEARCH METHOD

3.1. Data

To conduct our research, data from 39 developing economies in Asia were collected. According to IMF (2022), developing countries are classified based on 3 main criteria: per capita income, export diversification, and the level of union with the global financial system, The list includes Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, China, Gruzia, India, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Sri Lanka, Syria, Tajikistan, Thailand, Timor Leste, Turkey, Turkmenistan,

Uzbekistan, Vietnam, Yemen; however, Democratic People’s Republic of Korea is not included due to the missing of data. Data was collected from international statistics institutions such as World Bank, IMF and Penn World to ensure accuracy and consistency of measurement. The majority of data was collected from the World Development Indicators of the World Bank and the World Economic Outlook of the IMF.

Although the authors have made the best effort to gather data, missing data for some variables over a few years is inevitable. However, appropriate techniques have been adopted to overcome the data problem, ensuring an accurate result. That leaves us with 462 observations across 33 countries in the period of 19 years from 2001-2019. The steps of checking, processing, and cleaning data such as removing outliers, descriptive statistics, and standard distribution tests have also been conducted.

3.2. Research models

The quantitative research model aims to study the impact of trade openness on private investment in developing Asian countries. This model is based on the work of Boachie et al. (2020) and incorporates previous studies such as Sakyi et al. (2016) and Mbaye et al. (2014). The dependent variables in this study represent private investment and can be either the natural logarithm of private investment (lnpri) or private investment/GDP (prig). The independent variables include trade openness (ope), inflation rate (inf), public investment/GDP ratio (pui), relative price index of investment goods (rpi), broad money supply (brm), economic growth rate (gdp), net foreign direct investment (fdi), private sector credit (prc), foreign exchange reserves (lnfre), and population (lnpop). Model (2) incorporates interaction variables to observe changes in the model, including three interaction variables measuring trade openness in high-income countries (int1), countries with constitutional reforms (int2), and the post-recession period (int3).

The following is the estimated econometric model, with t representing the usual error term, 0 as the intercept coefficient, ln indicating the natural logarithm, and t as the time. The variables are described in Table 1.

$$pri_t = \beta_0 + \beta_1 open_t + \beta_2 inf_t + \beta_3 pui_t + \beta_4 rpi_t + \beta_5 brm_t + \beta_6 gdp_t + \beta_7 fdi_t + \beta_8 prc_t + \beta_9 lnfre_t + \beta_{10} lnpop_t + \beta_{11} hic_t + \beta_{12} pol_t + \beta_{13} yea_t + \mu_t \tag{1}$$

$$pri_t = \beta_0 + \beta_1 open_t + \beta_2 int1_t + \beta_3 int2_t + \beta_4 int3_t + \beta_5 inf_t + \beta_6 pui_t + \beta_7 rpi_t + \beta_8 brm_t + \beta_9 gdp_t + \beta_{10} fdi_t + \beta_{11} prc_t + \beta_{12} lnfre_t + \beta_{13} lnpop_t + \beta_{14} hic_t + \beta_{15} pol_t + \beta_{16} yea_t + \mu_t \tag{2}$$

Table 1. Declaration of variable in the model

Variables	Description	Expected sign	Research source	Data source
Dependent variables				
lnpri	Natural logarithm of private sector investment, current US dollars		Oshikoya (1994), Outtarra (2004), Kiptui (2005), Bibi et al. (2012), Hassan & Salim (2011), Obeng et al. (2018).	IMF
prig	The private sector investment to GDP ratio		Servén & Solimano (1993), Asante (2000), Mbaye (2014).	Authors self-synthesize using data from WB and IMF
Independent variables				
ope	The trade openness, the percentage of total exports and imports to GDP (unit: %)	+/-	Servén (2003), Oshikoya (1994), Frimpong & Marbuah (2010), Outtarra (2004), Hassan & Salim (2011).	WB
int1	Interaction variable, int1 = ope x hic	+	Greene & Villanueva (1991), Naa-Idar et al. (2015), Kiptui (2005).	Author’s calculation

Variables	Description	Expected sign	Research source	Data source
int2	Interaction variable, int2 = ope x ins	+	Mbaye (2014), Naa-Idar et al. (2012), Kiptui (2005)	WDI
int3	Interaction variable, int3 = ope x yea	-	Zubair et al. (2020), Naa-Idar et al. (2012), Kiptui (2005).	WDI
inf	Inflation rate	-	Frimpong & Marbuah (2010), Attefah & Enning (2016).	WB
pui	Public investment, measured as the percentage of GDP (%)	+/-	Blejar & Khan (1984), Aschauer (1989), Greene & Villanueva (1991), Rossiter (2002).	IMF
rpi	The relative price index of investment goods is calculated by dividing the investment deflator by the consumer deflator.	+	Akpalu (2002), Acosta & Loza (2005).	Penn World
brm	Broad money supply as the ratio of GDP	+	Teklay (2017), Dang et al. (2020).	WB
gdpg	Economic growth rate	+	Dailami & Walton (1992), Khan & Reinhart (1990), Sakr (1993).	WB
fdi	Net foreign direct investment inflow (as percentage of GDP)	+	Oloyede et al. (2021).	WB
prc	Private sector credit (as the percentage of GDP)	+	Al-Badry (1998), Bhaduri (2005), Ouattara (2004), Frimpong & Marbuah (2010), Erden & Holcombe (2006).	WB

Source: Synthesized by the author (2022)

This study analyzes panel data from 43 Asian developing economies, including Saudi Arabia, Afghanistan, India, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, East Timor, Fiji, Hong Kong, Korea, Indonesia, Iran, Iraq, Israel, Jordan, Kiribati, Kuwait, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Papua New Guinea, Philippines, Qatar, Samoa, Singapore, Solomon Islands, Sri Lanka, Syria, Thailand, Turkey, Taiwan, North Korea, and Palestine were excluded due to a lack of data on the FDI variable. The data set spans the years 2000 to 2020. The data is primarily from the World Bank and has been processed to match the properties of the variables in the quantitative model, ensuring consistency and uniformity. During the processing, some economies' data for a few years were missed and did not meet the estimate, so the authors excluded them from the model.

In addition, according to Laura Diaconu (2014), Asian emerging economies underwent a global recession from 2007 to 2009, which impacted the region's FDI inflows. The primary cause is that developed economies such as the United States and Europe ceased lending, disbursing or withdrawing capital. In order to clarify the fluctuation of the effects of FDI and other factors on climate change throughout different situations, the authors split the study period into 3 parts namely before, during, and after the global recession using dummy variables.

4. RESULTS AND DISCUSSION

According to the Wooldridge, White, and VIF tests, the Pool OLS models for those with lnpr and prig as dependent variables have autocorrelation, heteroscedasticity, but no multicollinearity problem. The F test for the model with the dependent variable lnpr and prig variable yielded p-values of $F < 0.010$, leading to the rejection of H_0 at a 1% significance level. Additionally, the Hausman test produced chi2 values of 141,450 and 38,480, respectively, with corresponding probabilities of 0.000 and 0.0002, both rejecting H_0 at the 1% significance level. These outcomes indicate that FEM models are more reliable than Pooled OLS and REM. After the Wooldridge and White tests, the results show that these two FEM models have heteroscedasticity and autocorrelation issues. In previous research on the determinants of private investment, such as that

of Mbaye (2014), endogeneity does not appear and is not mentioned in the relationship between private investment and its determinants. Therefore, GLS regression was conducted in order to solve the problems of heteroscedasticity and autocorrelation, and the results are presented in table 2 and 3.

GLS regression is employed as Wooldridge (2015) suggests that to address the issue of heteroscedasticity (i.e., differences in the variance of observed units), it uses a weight matrix to adjust the variance of the error in the data by assigning weights to the observations. The weights are increased for observations with smaller variance and decreased for observations with larger variance, thereby adjusting for differences in variance. This approach helps overcome the phenomenon of heteroscedasticity. Moreover, the weight matrix from the GLS regression also adjusts the correlation structure of the residuals, which helps address the issue of autocorrelation. Therefore, by using GLS regression, the accuracy of regression models can be improved and more reliable estimates are obtained.

Table 2. Model regression measures the impact of trade openness on private investment

VARIABLES	Model (1)	Model (2)
	Inpri	prig
ope: Trade openness	0,276** (0,123)	0,0440** (0,0210)
pui: Public investment (%GDP)	-0,355 (0,359)	0,0286 (0,0657)
rpi: Relative price of investment goods	-0,0471 (0,106)	-0,000248 (0,0191)
pol = 1 if follows constitutional rule	0,426*** (0,122)	0,0792*** (0,0240)
inf: Inflation	1,512*** (0,301)	0,159*** (0,0433)
brm: Broad money (%GDP)	0,391*** (0,106)	0,106*** (0,0241)
prc: Private sector credit (%GDP)	0,933*** (0,174)	0,0237 (0,0317)
fdi: Net FDI inflows	0,925*** (0,342)	0,282*** (0,0611)
gdpg: GDP growth rate	0,788** (0,321)	0,0272 (0,0539)
hic = 1 if high income country	1,265*** (0,150)	0,0148 (0,0200)
yea = 1 for post-recession period	0,272*** (0,0548)	0,0203** (0,00864)
Inpop: Population	0,829*** (0,0308)	0,00770 (0,00649)
Infre: Foreign reserve	0,0151 (0,0137)	-0,00450** (0,00190)
Constant	7,678*** (0,583)	0,0574 (0,125)
Observations	462	462
Countries	33	33

Standard errors in parentheses

*(***) 1% significance level, (**) 5% significance level, (*) 10% significance level*

Source: The authors (2022)

Trade openness. Increasing trade openness has a positive and statistically significant impact on private investment in developing Asian economies. Model (3) shows the strongest effect, with a significance level of 1%, while models (1), (2), and (4) also show significant effects at the 5% level. This suggests that an increase in trade openness is likely to lead to a corresponding increase in private investment, as evidenced by the findings presented in tables 2 and 3. The observed relationship between trade openness and private investment can be attributed to several factors. One possible explanation is that opening up the economy to international trade, through trade liberalization and other measures, can help attract investment from the private sector. Attefah & Enning (2016) suggest that increased international trade creates favorable conditions for private investment, as businesses are able to generate higher profits and expand their operations.

Le & Pham (2020) also support this view, arguing that greater trade openness provides businesses with more opportunities to interact with the global economy, leading to increased profits and investment. Additionally, promoting export activities and importing necessary materials and machinery can facilitate the development and adoption of new technologies, further enhancing the competitiveness of domestic businesses (Mbaye, 2014; Prabir, 2012). Moreover, the simplification of import and export procedures that typically accompanies increased trade openness can also encourage private investment by making it easier for businesses to access new markets and secure necessary resources (Mugumisi, 2021). These findings are consistent with previous studies by Ajide & Lawanson (2012), Naa-Idar et al. (2012), Mbaye (2014), and Mohsen (2015), but differ from Oshikoya (1994) and Servén (2003).

To examine differences in private investment levels between countries based on income, political institutions, and the post-2008 financial crisis period, the author employed interactive variables *int1* (trade openness x high-income nations), *int2* (trade openness x constitutional rules), and *int3* (trade openness x post-recession period). The results (table 3) found that high-income nations experience greater private investment increases due to their access to modern technology and high-quality workforces (Polpibulaya, 2015). However, increased trade openness in nations with constitutional political systems may decrease private investment (table 3). Investors may refrain from conducting investment activities in countries where the business environment is perceived as risky or where the investment conditions are not favorable. This is often the case in countries with poor institutions or high levels of corruption, such as Nepal, where supervisory authorities fail to effectively enforce corruption reductions, resulting in the country being ranked low in various international corruption indices (Shrestha, 2019). Furthermore, Haque's (2020) research suggests that an underdeveloped regulatory environment in the financial sector can also make investors hesitant to engage in investment activities. Moreover, post-recession period's increase in trade openness may result in reduced private investment, possibly due to the time needed for economies to recover after a recession, coupled with the private sector's reduced investment demand as sales prospects remain uncertain (Parisotto, 2009).

Table 3. Model regression measures the impact of trade openness on private investment with country groups by income, political institution with interactive variables

VARIABLES	(3)	(4)
	<i>lnpri</i>	<i>prig</i>
ope: Trade openness	0,484*** (0,145)	0,0428** (0,0200)
<i>int1</i> = Trade openness x High income countries	0,726*** (0,282)	-0,0113 (0,0574)
<i>int2</i> = Trade openness x Constitutional rule	-0,340** (0,162)	-0,00160 (0,0218)
<i>int3</i> = Trade openness x Post-recession period	-0,456*** (0,109)	-0,0463*** (0,0170)

VARIABLES	(3)	(4)
	lnpri	prig
pui: Public investment (%GDP)	-0,00653 (0,364)	0,0408 (0,0673)
rpi: Relative price of investment goods	-0,0648 (0,105)	0,00162 (0,0192)
pol = 1 if follows constitutional rule	0,753*** (0,196)	0,0822*** (0,0313)
inf: Inflation	1,569*** (0,310)	0,145*** (0,0442)
brm: Broad money (%GDP)	0,317*** (0,106)	0,0954*** (0,0234)
prc: Private sector credit (%GDP)	1,271*** (0,179)	0,0495 (0,0343)
fdi: Net FDI inflows	1,002*** (0,354)	0,293*** (0,0634)
gdpg: GDP growth rate	0,730** (0,329)	0,0356 (0,0562)
hic = 1 if high income country	0,616* (0,329)	0,0192 (0,0545)
yea = 1 for post-recession period	0,669*** (0,113)	0,0562*** (0,0168)
lnpop: Population	0,805*** (0,0294)	0,00415 (0,00634)

Standard errors in parentheses

*(***) 1% significance level, (**) 5% significance level, (*) 10% significance level*

Source: The authors (2022)

Several other control variables have been shown to be statistically significant in explaining private sector investment. An increase in the *inflation* promotes private investment at the 1% significance level (table 2 and 3), thereby deviating from the predictions of both the authors and most previous empirical studies, such as those by Gebremariam (2019) and Nguyen (2021). Nevertheless, there are some studies that report similar results to our findings. Frimpong & Marbuah (2010) and Attefah & Enning (2016) found a positive relationship between inflation and private investment in Ghana, while Acosta & Loza (2005) reported similar results for Argentina. The reason for this positive relationship in Ghana may be attributed to the fact that higher prices stimulate production and supply, leading to increased income and, in turn, more private investment (Attefah & Enning, 2016). Additionally, Jin & Zou (2005) suggest that inflation can promote saving and investment activities, while an increase in prices can boost the investment capital of private sector projects.

The findings reveal that *the ratio of M2 (broad money supply) to GDP* exhibits a positive impact on private investment. This is consistent with previous studies by Fu & Liu (2015) and Teklay (2017), which also discovered a positive association between M2/GDP and private sector investment in Ethiopia, when an increase in the money supply improves the financial conditions of consumers and companies, leading to lower lending rates, increased availability of credit to private investors, and this has stimulated investment activity. Additionally, *private sector credit/GDP* is found to influence private investment positively, indicating that development in the financial sector will promote private investment. This result is similar to that of Frimpong & Marbuah (2010), and Okorie & Chickwendu (2019). The results also highlight that private investment is positively affected by *net FDI inflow*. This finding aligns with the results from

Oloyede & Ejemeyovwi (2012) and Nguyen (2021), which found that capital from FDI activities can help supplement private investment, because then, domestic enterprises can cooperate with foreign enterprises as contractors for them, partners in the joint venture. investment business or raw material supplier.

Moreover, results reveal *economic growth* in developing countries in Asia can boost private sector investment. This is consistent with the research of Suhendra & Anwar (2014), which suggests that the positive relationship between economic growth and private sector investment can be explained by the development and expansion of production activities. As manufacturing industries grow, the output of goods and services in the domestic market increases. If the domestic market cannot consume all the products provided by the manufacturing industries, they can be sold to foreign markets, leading to increased levels of exports. This, in turn, can encourage private sector investment activities. These findings are consistent with those of Boachie et al. (2020), who also reported a positive relationship between economic growth and private sector investment.

The *population* is also found to have a positive effect on private investment, which is consistent with the findings of Mohsen (2015). Accordingly, the increase in population will increase the source of labor, as well as the demand for goods and services will also increase, and this will motivate manufacturers to increase output. goods and services. As a result, population growth can increase private sector investment (Mohsen, 2015). Furthermore, our results show that *dummy variables for the post-recession period and high-income countries* have a significant and positive impact on private investment. According to the studies conducted by Greene & Villanueva (1990) and Eyraud et al. (2021), there is a positive relationship between the value of private sector investment and income levels of countries. Specifically, their research suggests that countries with higher income levels tend to experience greater private sector investment. Finally, we find that *constitutional political institutions* have a positive effect on private investment in all models, which is consistent with the findings of Frimpong & Marbuah (2010) and Naa-Idar et al. (2012). Naa-Idar et al. (2012) have found that a smoothly operating constitutional system, coupled with well-resourced and effectively supervised state and quasi-state agencies, can provide a crucial link to the growth of private investment in Ghana. The study suggests that any unconstitutional overthrow or military takeover of the government may have negative consequences on private investment, as it can create an unfavorable environment for foreign investors and investment activities.

5. CONCLUSIONS

5.1. Conclusions

The study has demonstrated how trade openness influences investment activities of the private sector. In that process, other variables can have an impact on private investment. The study uses GLS regression and 33 Asian developing economies were studied for the period between 2001 and 2019. This group of nations has several economic development features as well as certain demographic and social traits.

Regression results in table 2 and 3 reveal that trade openness has a positive influence on private investment. Since capital is circulated, private investment is recruited when trade openness increases, and sustainable development goals are achieved through boosting import and export activity (Frimpong & Marbuah, 2010). The study of private sector investment is practical because long-term growth will be dependent on a move to private investment associated with efficiency, change, and innovation. Furthermore, for the first time, the authors performed a regression for the interaction variables int1 (trade openness x high income countries), int2 (trade openness x political institution), and int3 (trade openness x post-crisis period) to show the linkage between trade openness in countries with high income, countries with constitutional political rule, and the trade openness of economies in the post-recession period. Investigating and identifying the variables influencing private sector investment also helps with the development of suitable policies for the government and stakeholders.

For other control variables, the article found the private sector credit, net foreign direct investment inflows, broad money supply, GDP growth rate, population, high income countries, the post-recession period, the constitutional rules and inflation had a positive influence on private sector investment. On the contrary, the result reveals foreign reserves have a negative impact on private investment.

Based on the research results, the authors conclude that trade openness has a positive impact on private investment in developing Asian countries. Additionally, through the analysis of interactive variables, the study also highlights the influence of trade openness in Asian developing countries under three specific situations, namely: (1) high-income developing countries where trade openness has a positive effect on private investment; (2) countries with constitutional political institutions and (3) the years following the 2008 recession, where trade openness has a negative impact on private investment.

Taking the above findings into consideration, several recommendations are suggested to exploit the positive impact of trade openness on private investment. These include diversifying export markets to facilitate trade openness, improving competitiveness for domestic enterprises, and regulating the expansion of money supply and capital markets in a manner that supports the strategic manufacturing industry. By implementing these measures, policymakers can create a more favorable environment for private sector investment and promote economic growth in developing Asian countries.

5.2. Policy recommendations

To make the most of the positive impact and minimize the threat of trade openness, the following policies focusing on expanding export markets and developing local manufacturing should be placed on top priority:

First, diversify export markets. Most of the developing countries in Asia have adopted an export-led strategy (Paul R. Krugman et al, 2018). However, according to data from the Export Potential Map of the International Trade Centre, both South Asia and Southeast Asia, where the majority of developing nations lie, still rely on the United States and China for export and import. Therefore, they should speed up the process of exploiting other potential markets that allow preferential conditions thanks to the Free Trade Agreements (FTAs) they involve, such as Australia, New Zealand, and other European countries. Besides, data from the Asia Regional Integration Center revealed that most of the developing countries in Asia only have 10-15 FTAs in force, except for those with high degree of globalization, such as India, Thailand. Therefore, nations need to make their best efforts to propose more FTAs and bring those under negotiation to a conclusion to create more market opportunities for their domestic business.

Second, improve the competitiveness of domestic manufacturing. The government needs to have relevant measures to protect and support their domestic industries in a way that could help firms generate competitive advantages (Krugman et al, 2018). Export subsidy, despite being a popular promotion measure in the past, has become an ineffective solution in recent years due to the increasing number of cases of countries using anti-dumping and anti-subsidy measures (according to data from UNCTAD). Therefore, authorities should adopt measures focusing on capital, technology, human resources, and innovation as these are the resources that most SMEs are lacking (Yoshino & Taghizadeh-Hesary, 2018). Firms, along with the efforts made by states, need to constantly develop competitiveness using preferential offers provided by authorities.

Third, regulate the capital market to support strategic industry. According to the results from the model, private sector credit and the money supply ratio have a significant impact on private investment. This is because the above two factors are an essential supply for individual investments. However, up to 60% of SMEs - an important factor of the Asian economy - cannot conduct transactions due to difficulties in accessing financial resources (Azreny & Akamatsu, 2014). Therefore, the states need to establish financial institutions in dynamic economic areas to efficiently regulate capital from developed industries (such as agriculture) into strategic developing industries (such as manufacturing). These establishments should diversify their financial services and offer interest incentives to mobilize idle capital. Along with that, firms need to abide by regulations and provide transparent and trustworthy information when calling for capital.

APPENDIX

APPENDIX 1. DESCRIPTIVE STATICS

Variable	Obs	Mean	Std.Dev.	Min	Max
lnpri	687	23,252	2,181	16,690	29,375
prig	686	0,320	0,182	0,016	1,146
ope	684	0,807	0,383	0,001	2,104
int1	737	0,147	0,372	0	1,919
int2	737	0,756	0,444	0	2,104
int3	737	0,473	0,488	0	1,919
pui	659	0,132	0,098	0,008	0,849
rpi	722	1,189	0,441	0,303	3,751
pol	741	0,881	0,324	0	1
inf	687	0,062	0,071	-0,101	0,571
brm	674	0,630	0,447	0,079	2,606
prc	591	0,464	0,337	0,013	1,654
fdi	729	0,040	0,056	-0,372	0,551

Source: The authors (2022)

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“BEHIND-THE-BORDERS” DETERMINANTS OF VIETNAM RICE EXPORT

Author: Nguyen Thu Thuan An¹, Nguyen Bao Ngan², Đào Thao Linh², Đào Mai Phuong², Ha Vy²

Mentor: Dinh Thi Thanh Binh

ABSTRACT: As one of the biggest rice exporters in the world, Vietnam's quantity of this agricultural product is usually influenced by a plethora of factorial elements. However, not all of those factors exert a strong effect on the exporting quantity as previous researchers suggested. The study is conducted to examine the performance of rice export in Vietnam as well as to identify how each determinant affects the rice export quantity of Vietnam to different countries. The researchers focus on 31 exporting partners in the 4 years period from 2018-2021. The results show that: While the GDP and geographical distance index of exporting countries have a negative correlation on Vietnam's rice export, the population factor has a positive correlation. In addition, there is no evidence of top export and inflation of importing countries having any influence. Although previous research has pointed out the statistically significant effect of all “behind-the-borders” factors on Vietnam rice export mentioned in the research, due to the limitation of data availability, the individual effect of each determinant has not been identified yet.

Keywords: rice export; Vietnam; “behind-the-borders” factors.

1. INTRODUCTION

Vietnam is known as one of the biggest rice exporters in the world. According to CRI's analysis, rice exports from Vietnam hit USD 3.133 billion in 2021, available in more than 150 countries and territories on all continents and it has played a crucial role in ensuring global food security. Since exporting rice is important for Vietnam's economy, research on the factors of countries importing rice from Vietnam will be very necessary so that we can identify potential market to boost rice export. Moreover, with the factors being known, policymakers and stakeholders in the Vietnam rice industry could make effective strategies to increase the output of rice export to the world and strengthen Vietnam's position in the industry.

There are many factors that influence rice export quantity in general and has been a widely discussed topic among researchers. In the past, various methods have been used to evaluate and they all come up with different results due to different approaches and the time carrying out the research. Researchers have majorly targeted their view to domestic force such as: rice quality, tax rate, rain level, etc. while the external factors from our partners are somehow overlooked.

Moreover, the current data has supported a rising trend in global demand for rice reserves, particularly for rice from key exporters including the Philippines, Malaysia, China,.... For example, during the Covid-19 pandemic in 2020, rice export reached 6.25 million tons, worth 3.12 billion USD (by Vietnam Import - Export report). Although the amount of rice exported decreased by about 1.9% compared to 2019 mainly for the sake of ensuring national food security, the export value increased by 11.2%. Due to the complex circumstances surrounding the Covid-19 outbreak and its rapid global growth, which causes a rise in the demand for food in many nations, Vietnam's rice exports are benefiting from several double chances. Therefore, it is crucial to conduct a serious study that helps Vietnam increase the amount of rice export, thus supporting the Vietnam economy, increasing the GDP and improving the quality of Vietnamese brands.

¹ Foreign Trade University; Email: annguyenthuthuan@gmail.com.

² Foreign Trade University.

In summary, the purpose of our research is to provide an analysis of 5 “behind-the-border” determinants affecting Vietnam’s rice export value to 31 countries from 2018 to 2021: countries’ GDP, inflation rate, top 15 exporters, population, and geographical distance by using the gravity model. Finally, we will reach a conclusion and have some recommendations based on the result of the report.

2. LITERATURE REVIEW

Economists had affirmed that the development of a country can begin only when the agricultural sector has been able to create surpluses and keeps expanding while the industry sector is developing (Meijerink and Roza, 2007). In Vietnam, rice export played a crucial role in the development of the agriculture sector in particular and the national economy in general, however, predicting the right factors which influence this activity was challenging. Several factors were considered key to promoting or weakening rice’s exportation, such as population size, GDP, inflation and exchange rate, international organizations participants,...and several types of research were also conducted to confirm this forecast.

Research from Ms. Thi Hong Hanh Bui and Mr. Qiting Chen (2015) aimed to describe the processes involved in factors influencing rice export in Vietnam. Regardless of the high quantity, our export value is not high and increases slowly, which directly affects the benefits and incomes of the rice farmers. Although Vietnam became the second-largest rice-exporting nation in the world after India (2012), they found that Vietnamese rice export was still significantly influenced by the change in the gross domestic product (GDP), price, population, and exchange rate of import countries by using the gravity model with research time from 2004 to 2013.

In order to enhance Vietnam’s agriculture export in general, Mr. Dao Dinh Nguyen (2020) applied the stochastic frontier gravity model to estimate the factors affecting Vietnam’s export of rice, one of two most important agricultural products in Vietnam, especially in exploring the role of “behind-the-border” constraints of rice. This study found that the impact of “behind-the-border” constraints was statistically significant, suggesting that Vietnam’s exports of rice may be prevented from reaching their export potential by such factors. The Association of Southeast Asian Nations group (ASEAN) continued to be the major market of Vietnamese rice. Vietnam can also take advantage of the opportunity to export these commodities to the European Union (EU) (not including the UK) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. However, there were still significant limitations existing in this research, which is it cannot identify specific “behind-the-border” factors due to the limitation of data availability. In order to accomplish this research as well as confirm the impact of factors on Vietnam’s exports of rice, our paper will dig deeper into this limitation and provide some recommendations at the end.

Besides Dao Dinh Nguyen’s, a research conducted by Nguyen Thi Le Giang, Vu Duy Long, Cam Thuy Hang, and Le Ngoc Tram (2020) named “An analysis of factors influencing Vietnam’s rice export to the ASEAN +3 country” also examined similar determinants: GDP and rice growing area of Vietnam, GDP, and population of trading partners, geographical distance between 2 nations, the exchange rate between 2 nations and the dummy variable - WTO. This study found that the GDP of Vietnam, harvesting area, geographical distance, and population of importing nations had positive coefficients. Meanwhile, the GDP of importing countries, exchange rate, and WTO showcased strongly inverse effects on the total value of rice export.

Another group of authors Vo Thanh Danh, Truong Dong Loc, and Nguyen Tuan Kiet (2017) conducted research about factors that affect Vietnam’s rice export in the ASEAN market from 2000 to 2015 by using the Gravity Model (GM). This research found that, during the period, there were 4 factors that impacted

positively on total export revenue of Vietnamese rice such as: GDP of Vietnam, the geographical distance between import and export nations, Vietnam’s inflation rate, and the rice harvesting area of Vietnam. On the other hand, the total export volume was negatively influenced by the Economic Distance.

To conclude, the impact of GDP of importing countries, geographical distance, inflation, and population factors on Vietnam rice export should be taken into further research as these previous studies recommended.

3. DATA AND METHODOLOGY

3.1. Data description

The data was collected for the period from 2018-2021 for 31 rice-exporting partners of Vietnam based on their GDP, inflation, population, geographical distance from observed country to Vietnam, Vietnam’s export turnover to the country and whether observed country was in the list of top 15 global rice exporters or not. The countries represented in the dataset were originated in the report of Vietnam Institute of Strategy and Policy for Industry and Trade (Ministry of Industry and Trade). Some changes in rice export to observed countries are included in Figure 3.1.

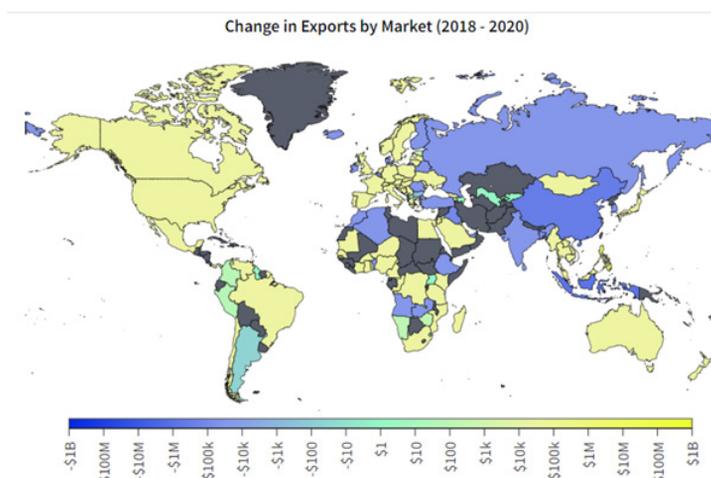


Figure 3.1 - Changes in rice exports by market (2018-2020)

The GDP and inflation figures were taken from the World Bank Data. The list of top 15 rice exporters originated from World’s Top Exports. The geographical distance was from Distancefromto.Net and Vietnam rice export turnover was cited in the report of Trade Map and Vietnam Institute of Strategy and Policy for Industry and Trade (Ministry of Industry and Trade). Table 3.1 below described each of the variables, their units, and their predicted effect on Vietnam’s quantity of rice export.

Variable name	Description	Predicted effect
Inexport	Natural logarithm of the amount of Vietnam’s rice export to observed country	Dependent variable
InGDP	Natural logarithm of GDP of observed country	+/-
Ingdis	Natural logarithm of geographical distance from Vietnam to the observed country	-
inflation	Inflation rate of the observed country	+/-
topexp	Whether the observed country is in the top 15 of global rice exporters or not: topexp = 0 if the country if not in top 15 topexpt = 1 if the country is in top 15	-
Inpop	Natural logarithm of population of the observed country	+/-

Table 3.1 - Name, description unit and predicted effect of included variables

The particular impact of each factor in rice export quantity from Vietnam to the observed country will be presented below.

GDP: When the gross domestic product (GDP) of importers increases, the demand for goods and services increases, which brings more export opportunities for Vietnam. The specific influence is different for individual economies. For countries consuming rice as normal goods, the increase in GDP will make the demand for rice growing. For countries that consider rice an inferior good, the fluctuation of GDP may affect rice import value in the opposite direction.

Geographical distance: The distance between countries apparently affects transportation costs and shipping risk. The closer the distance is, the higher the possibility rice will be exported from Vietnam to the observed country.

Inflation: An appropriate rate of inflation (at around 2%) is acceptable for the growth of the economy. However, when the inflation rate sharply accelerates and stays high, the purchasing power of money will be significantly affected; thus, it can decrease the quantity demanded of goods.

Top export: When a country was listed in the top 15 global rice exporters, it illustrated that the country can produce enough capacity for domestic consumption and the recessive amount will be used for exporting purposes. However, the data showed that some countries in the list were crucial partners of Vietnam in the rice exporting sector, which raises the question of the specific effect of this factor on the amount of rice imported from Vietnam by those countries.

Population: The population of importers affects the workforce, production capacity and the demand for goods; which, in turns, affect imports. Large population generated a huge work force and high production capacity that will theoretically reduce the demand for importing goods. On the other hand, a crowded population results in higher demand for goods, especially food products. Like the above analysis, population variables can cause various impacts on the export of goods, and in this case, rice.

3.2. Methodology

Our econometric model is set up based on the gravity model. There will be some existence of autonomous error term sort of due to the exclusion of some variables in this model. We use the model form as follow:

$$\ln \text{export} = \beta_0 + \beta_1 \cdot \ln \text{GDP} + \beta_2 \cdot \ln \text{gdis} + \beta_3 \cdot \text{inflation} + \beta_4 \cdot \text{topexp} + \beta_5 \cdot \ln \text{pop} + \mu^{\wedge}$$

4. RESULTS AND INTERPRETATION

4.1. Correlation between independent variables and dependent variable

The correlation results for 5 independent variables are represented in Table 4.1. The sample size of the test was 121 although we collected 124 data in total. This was due to the fact that 3 data of export quantity were equal to 0, which made the export function become nonsense.

All of the five independent variables chosen in this experiment ($\ln \text{GDP}$, $\ln \text{gdis}$, inflation, topexp and $\ln \text{pop}$) had correlation with the dependent variable. In detail, $\ln \text{GDP}$, $\ln \text{gdis}$, inflation and topexp showed a negative correlation with $\ln \text{export}$ (as their correlation coefficients were negative). In other words, Vietnam tends to export more rice to the trading partners which had lower GDP, shorter geographical distance, lower inflation and did not belong to the top 15 world exporters.

Meanwhile, $\ln \text{pop}$ was the only independent variable that was positively correlated with the dependent variable, which indicated that the nations with higher population tended to be the subject for Vietnam to export more rice.

```
. corr lnexport lngdp lngdis inflation topexp lnpop
(obs=121)
```

	lnexport	lngdp	lngdis	inflat-n	topexp	lnpop
lnexport	1.0000					
lngdp	-0.0741	1.0000				
lngdis	-0.4425	-0.0857	1.0000			
inflation	-0.1393	-0.0952	0.2063	1.0000		
topexp	-0.1137	0.4604	0.1698	-0.1335	1.0000	
lnpop	0.1477	0.6022	0.0608	0.1098	0.2852	1.0000

Table 4.1 - Correlation between independent variables and a dependent variable

4.2. Diagnose problems of the models

However, since the existence of variables’ problems can originate in the incorrectness of hypothesis conclusions, the dataset was tested to diagnose those problems. Here are the results after we tried to identify the compatibility with assumption from 5 to assumption 7.

4.2.1. $E(u|X) = 0$ (Assumption 5)

Assumption 5 is satisfied only when $E(u) = 0$. The violation of Assumption 5 originates from 2 reasons. Those are an exclusion of important variables in the model or misspecification of the functional form. The violation can lead to the biased estimation and inexact hypothesis test in the final.

To recognize the problem, Ramsey test was used and the result showed that our model had neither misspecification of functional form nor any exclusion of important variables as the Prob > F shown in Table 4.2 is larger than $\alpha = 5\%$.

```
. reg lnexport lngdp lngdis inflation topexp lnpop
```

Source	SS	df	MS	F	Prob > F
Model	208.012228	5	41.6024457	10.68	0.0000
Residual	440.042037	115	3.8264554		0.3271
Total	648.054265	120	5.4004522		0.2874

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnexport					
lngdp	-0.0740938	0.029027	-2.55	0.011	[-0.13211, -0.016076]
lngdis	-0.4425009	0.2256228	-1.96	0.050	[-0.893066, -0.0019352]
inflation	-0.1392603	0.0778852	-1.79	0.075	[-0.293052, 0.013846]
topexp	0.4604004	0.1670663	2.75	0.007	[0.126208, 0.804592]
lnpop	0.1477316	0.1634061	0.90	0.366	[-0.170269, 0.465270]
_cons	15.44782	3.078701	5.02	0.000	[9.348508, 21.54614]


```
. ovtest
```

Ramsey RESET test using powers of the fitted values of lnexport
H0: model has no omitted variables
F(3, 112) = 1.90
Prob > F = 0.1332

Table 4.2 - Ramsey test result

4.2.2. Multicollinearity

Multicollinearity occurs when independent variables have strong relationships with each other. We used the VIF test to check whether this case existed here or not. The result was 1.45, which was smaller than 10; therefore, the model did not have any multicollinearity (showcased in Table 4.3).

```
. vif
```

Variable	VIF	1/VIF
lnGDP	1.96	0.511444
lnpop	1.66	0.602626
topexp	1.38	0.725699
lngdis	1.14	0.878262
inflation	1.12	0.895911
Mean VIF	1.45	

Table 4.3 - VIF test result

4.2.3. Heteroskedasticity (Assumption 6)

Heteroskedasticity is caused by a violation of Assumption 6, in which estimators are not the best, still linear and unbiased. This leads to the biases of the coefficient's variance and an inexact hypothesis test. White test and Breusch - Pagan test's results indicated that the model was homoskedasticity (since the chi-results were higher than $\alpha = 5\%$). The results were represented in Table 4.4 and Table 4.5.

```
. imtest, white

White's test for Ho: homoskedasticity
against Ha: unrestricted heteroskedasticity

      chi2(19)    =    28.83
      Prob > chi2 =    0.0688

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	28.83	19	0.0688
Skewness	10.79	5	0.0556
Kurtosis	1.72	1	0.1899
Total	41.34	25	0.0211

Table 4.4 - White test's result of the dataset

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lnexport

      chi2(1)    =    2.96
      Prob > chi2 =    0.0853
```

Table 4.5 - Breusch - Pagan test's result of the dataset

4.2.4. Normality of u (Assumption 7)

It is necessary to check the normality distribution of residual u since the abnormality of u distribution can lead to an inexact hypothesis test. To verify that the u had a normal distribution, the Jacque - Bera test was conducted. If the p-value is smaller than 0.05 (the significance level in this model), u has no normal distribution. This is the case our model met when the p-value was only 0.0212, smaller than the significant level (Table 4.6). The only way to eliminate this problem is to increase the sample size.

```
. reg lnexport lngdp lngdis inflation topexp lnpop

Source |      SS      df       MS      Number of obs =    121
-----+-----+-----+-----+-----+-----
Model | 208.012228      5    41.6024457    F(5, 115)      =    10.68
Residual | 448.042037     115    3.89601771    Prob > F        =    0.0000
Total | 656.054265     120    5.46711888    R-squared       =    0.3171
                                           Adj R-squared   =    0.2874
                                           Root MSE      =    1.9738
```

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnexport					
lngdp	-.5342638	.150927	-3.54	0.001	-.8333211 - .2354065
lngdis	-1.30809	.2256228	-5.80	0.000	-1.755006 - .8611752
inflation	-.0410603	.0273852	-1.50	0.137	-.0953052 .0131845
topexp	.0469804	.5870863	0.08	0.934	-1.076308 1.170269
lnpop	.6875316	.1634061	4.21	0.000	.3638555 1.011208
_cons	15.44782	3.078701	5.02	0.000	9.349508 21.54614

```
. predict u, residuals
variable u already defined
r(110)

. sktest u

Skewness/Kurtosis tests for Normality
-----+-----+-----+-----+-----+-----
Variable |      Obs   Pr(Skewness)   Pr(Kurtosis)   adj chi2(2)   Joint Prob>chi2
-----+-----+-----+-----+-----+-----
u         |      121     0.0325         0.0475         7.71         0.0212
```

Table 4.6 - Jacque - Bera test result

4.3. Hypothesis postulated

After testing the statistical hypothesis using the final model and the problems had been corrected, we checked the overall significance of the model. The F-test was used. When F(5, 115) and F_{α} were compared, it showcased that our model had an overall statistical significance.

In addition, as the R - squared indicator was 0.3171, this means that the independent variables included in the model can explain 31.71% of the variation of the lnexport. Thus, 68.29% of the variation of lnexport is explained by other variables that are not included in the model. By theory, they are included in u (so-called error term or residual).

With the significance level of 5%, only 3 independent variables are statistically significant with the dependent variable in the model, which included lnGDP, lngdis and lnpop (since their P - values were smaller than α).

Nevertheless, those 3 independent variables had different relationships with the dependent variable. To illustrate, data in Table 4.7 showed the factors that lnGDP and lngdis had negative coefficients. Due to the fact that the functional form used here is logarithm - logarithm form, the relationships between dependent variable and independent variable were indicated by percentage. In detail, when GDP of one observed country increased by 1%, Vietnamese rice export quantity to that nation tended to decrease by 0.534%. Likewise, the amount of rice export to one country tended to decline by 1.308% if its geographical distance was raised by 1%. In contrast, the third variable - lnpop - represented a positive correlation with lnexport, which meant that Vietnam tended to export an increased amount of 0.687% of rice to a country in case its population rose by 1%.

```

. reg lnexport lngdp lngdis inflation topexp lnpop

```

Source	SS	df	MS	Number of obs	=	121
Model	208.012228	5	41.6024457	F(5, 115)	=	10.68
Residual	448.042037	115	3.89601771	Prob > F	=	0.0000
Total	656.054265	120	5.46711888	R-squared	=	0.3171
				Adj R-squared	=	0.2874
				Root MSE	=	1.9738

lnexport	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnGDP	-.5343638	.150927	-3.54	0.001	-.8333211 - .2354065
lngdis	-1.30809	.2256228	-5.80	0.000	-1.755006 - .8611752
inflation	-.0410603	.0273852	-1.50	0.137	-.0953052 .0131845
topexp	.0469804	.5670863	0.08	0.934	-1.076308 1.170269
lnpop	.6875316	.1634061	4.21	0.000	.3638555 1.011208
_cons	15.44782	3.078701	5.02	0.000	9.349508 21.54614

```

. predict u, residuals
variable u already defined
r(110);

. sktest u

```

Variable	Skewness/Kurtosis tests for Normality				
	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
u	121	0.0325	0.0475	7.71	0.0212

Table 4.7 - OLS results for the 2018 - 2021 period with dependent variable: lnexport

The report missed some key indicators of the total value of Vietnamese rice export compared to those studies that had been conducted previously. Price, tariff and non-tariff factors showed a negative effect on rice export (Cung et al.). Other papers also mentioned the exchange rate between Vietnam and trading partners as important indicators bearing a positive relationship with the export's value.

However, due to time constraints and inaccessibility of data, our model had not included all variables mentioned above. The inclusion of those variables can ameliorate the accuracy of the model, results and conclusion; thus, it allows us to propose better recommendations.

5. CONCLUSION & RECOMMENDATIONS

Our study uses Ordinary Least Squares regressions to investigate the “Behind-the-border” determinants that affect Vietnam’s rice export for the 2018-2021 period. With the data from 31 countries over 4 years, our study has found some significant results. There are 3 of 5 variables of our study that have an impact on Vietnam’s rice export. While the GDP and geographical distance index of exporting countries have a negative correlation on Vietnam’s rice export, the population factor has a positive correlation. In addition,

there is no evidence of top export and inflation of importing countries having any influence. These findings are consistent with previous research and study.

However, there are still some factors that could be possible determinants but are still not mentioned in the study such as the cultural difference, exchange rate, etc. This limitation is due to time constraints and the inaccessibility of data. In addition, the cross effects between factors have not been shown in this study, thus leaving a gap to be filled by future studies. Specific and related case studies from other exporting countries such as Thailand or India may help answer these puzzles, thus preventing data snooping or time period bias.

Besides, we would like to stress that with these statistically significant data, further research should take GDP, geographical distance and population of exporting countries into consideration carefully and thoroughly when looking for new potential markets for rice export as it could have an impact on Vietnam's economy. There are only 31 out of 193 countries importing rice from Vietnam, leaving us 162 markets to consider. These determinants proved from this research could help to narrow down to some potential market, which is low in GDP, high population, close geographical distance for the government & policymakers to contract a beneficial agreement. For example, those countries in Asia could be perfect markets to export rice as they are in the same continent with Vietnam, have lower GDP than those in Europe and America, and a high population. To be more specific, China and ASEAN countries are the most potential market based on the data of our study.

Therefore, we suggest that Vietnam should enter into trade agreements with countries which have a high potential for rice importation. The agreements could include tariff reductions, subsidies for rice production, etc. Thus, Vietnam can invest in improving its infrastructure to facilitate rice exportation to gain a more competitive edge and achieve efficiency in exporting rice. By implementing these policies, the country could increase its revenue and strengthen its economy. In summary, we believe that our study not only strengthen the conclusion of previous findings, but also provides valuable insights for policymakers and stakeholders in Vietnam rice industry to help them make informed decision and develop effective strategy to create a positive impact on Vietnam economy as a whole.

6. APPENDIX (DATA)

Year	No.	Name of Country	Total value of rice export (thousand usd)	GDP (million USD)	Geographical distance (km)	Inflation rate(%)	Top 15 rice exporters	Population (million people)
2021	1	Algeria	0	167983.14	10778	10.558	0	44177969
	2	Angola	918.19	72546.99	10358	31.398	0	34503774
	3	Saudi Arabia	19101.53	833541.24	6996	15.25	0	35950396
	4	Poland	7747.28	674048.27	8740	5.853	0	38307726
	5	Bangladesh	32206.78	416264.94	2273	4.121	0	169356251
	6	Belgium	2045.44	599879.03	9810	4.42	1	11611419
	7	Côte d'Ivoire	218346.17	69764.83	12024	2.172	0	27314589
	8	Brunei Darussalam	0	14006.57	1195	20.069	0	441532
	9	United Arab Emirates	28541.69	358868.77	5800	9.933	0	9991089
	10	Chile	301.35	317058.51	17959	7.616	0	19493184
	11	Taiwan Province of China	9325.63	789505.00	1710	2.999	0	23859912

	12	Ghana	393618.31	77594.28	11880	10.161	0	32833031
	13	Netherlands	6779	1018007.06	9674	2.485	1	17501696
	14	United States	11722.29	22996100.00	13814	4.156	1	336997624
	15	Hong Kong	50444.12	368139.25	1110	3.681	0	7494578
	16	Indonesia	32949.12	1186092.99	2041	6.015	0	273753191
	17	Iraq	0	207889.33	6820	33.446	0	43533592
	18	Malaysia	141859.97	372701.36	1295	5.697	0	33573874
	19	Mozambique	36216.98	16095.83	8759	5.618	0	32077072
	20	South Africa	4404.01	419946.43	10362	7.139	0	59392255
	21	Russia	1568.15	1775799.92	5274	5.105	0	145102755
	22	Australia	28038.15	1542659.90	5156	2.7	0	25921089
	23	France	2558.82	2937472.76	10086	0.84	0	64531444
	24	Philippines	1253143.32	394086.42	1467	2.346	0	113880328
	25	Singapore	67034.83	396986.90	1426	4.066	0	5941060
	26	Tanzania	4603.47	67775.10	8316	3.804	1	63588334
	27	Spain	417.8	1425276.59	10978	2.156	0	47486935
	28	Turkey	1077.56	815271.75	7658	28.701	0	85042738
	29	China	522724.29	17734062.65	2113	4.273	1	1425893465
	30	Ukraine	960.86	200085.54	7904	25.089	0	43531422
	31	Senegal	529.29	27625.39	12976	1.104	0	16436120
2020	32	Algeria	274	145009.18	10778	-4.687	0	43451666
	33	Angola	1696	53619.07	10358	15.022	0	33428486
	34	Saudi Arabia	19222	703367.84	6996	-7.711	0	35997107
	35	Poland	5209	596624.36	8740	4.119	0	38428366
	36	Bangladesh	341	373902.13	2273	5.15	0	167420951
	37	Belgium	268	521676.94	9810	0.889	1	11561717
	38	Côte d'Ivoire	211470	61348.58	12024	0.601	0	26378274
	39	Brunei Darussalam	136	12005.83	1195	-10.849	0	437479
	40	United Arab Emirates	25036	358868.77	5800	-10.58	0	9890402
	41	Chile	842	252727.19	17959	8.273	0	19300315
	42	Taiwan Province of China	11270	669250.00	1710	1.299	0	23821464
	43	Ghana	282248	70043.20	11880	8.647	0	32180401
	44	Netherlands	4472	913865.40	9674	2.235	1	17434557
	45	United States	2083	20893743.83	13814	1.212	1	335942003
	46	Hong Kong	50201	344881.40	1110	4.259	0	7500958
	47	Indonesia	49949	1058688.94	2041	-0.456	0	271857970
	48	Iraq	47610	184369.80	6820	-12.521	0	42556984
	49	Malaysia	239208	337006.02	1295	-0.779	0	33199993
	50	Mozambique	30367	14028.81	8759	3.8	0	31178239
	51	South Africa	3417	335442.10	10362	5.286	0	58801927
	52	Russia	15	1488321.88	5274	3.172	0	145617329
	53	Australia	18682	1327836.17	5156	0.852	0	25670051
	54	France	2114	2630317.73	10086	2.245	0	64480053
	55	Philippines	1073853	361751.12	1467	1.79	0	112190977
	56	Singapore	61033	345295.93	1426	-2.919	0	5909869

	57	Tanzania	11270	62409.71	8316	3.5	0	61704518
	58	Spain	806	1281484.64	10978	1.053	1	47363807
	59	Turkey	959	719954.82	7658	14.702	0	84339067
	60	China	464973	14687673.89	2113	0.275	1	1424929781
	61	Ukraine	1711	156617.86	7904	7.448	0	43909666
	62	Senegal	15030	24493.16	12976	2.056	0	16436120
2019	63	Algeria	6281	171767.40	10778	-0.91	0	42705368
	64	Angola	6071	69309.10	10358	22.929	0	32353588
	65	Saudi Arabia	17082	803616.26	6996	0.486	0	35827362
	66	Poland	4780	597280.56	8740	3.149	0	38493601
	67	Bangladesh	1948	351238.44	2273	4.459	0	165516222
	68	Belgium	990	535376.26	9810	1.655	1	11510568
	69	Côte d'Ivoire	252633	58539.42	12024	0.201	0	25716544
	70	Brunei Darussalam	3284	13469.42	1195	-3.336	0	433285
	71	United Arab Emirates	25701	417215.56	5800	-1.9	0	9770529
	72	Chile	760	278584.73	17959	1.937	0	19039485
	73	Taiwan Province of China	11936	611400.00	1710	0.067	0	23777737
	74	Ghana	212648	68337.54	11880	9.189	0	31522290
	75	Netherlands	3403	910194.35	9674	2.958	1	17363262
	76	United States	1495	21372572.44	13814	1.785	1	334319671
	77	Hong Kong	63307	363052.49	1110	4.34	0	7496122
	78	Indonesia	18396	1119099.87	2041	1.598	0	269582878
	79	Iraq	154439	233636.10	6820	-0.001	0	41563520
	80	Malaysia	218806	365276.38	1295	0.064	0	32804020
	81	Mozambique	27581	15390.03	8759	4.451	0	30285595
	82	South Africa	4308	387934.57	10362	4.021	0	58087055
	83	Russia	265	1693113.90	5274	6.778	0	145742286
	84	Australia	11137	1391952.51	5156	3.317	0	25357170
	85	France	1095	2728870.25	10086	1.226	0	64399759
	86	Philippines	888224	376823.28	1467	0.764	0	110380804
	87	Singapore	53391	375472.73	1426	-0.624	0	5866405
	88	Tanzania	11936	61136.87	8316	1.366	0	59872579
	89	Spain	414	1393046.09	10978	1.386	1	47131372
	90	Turkey	684	761004.43	7658	13.906	0	83429615
	91	China	240392	14279937.50	2113	2.23	1	1421864031
	92	Ukraine	1274	153882.98	7904	8.13	0	44211094
	93	Senegal	32620	23398.81	12976	1.865	0	16000781
2018	94	Algeria	5200	174910.88	10778	7.065	0	41927007
	95	Angola	2582	77792.94	10358	33.762	0	31273533
	96	Saudi Arabia	14398	816578.67	6996	11.508	0	35081133
	97	Poland	2091	587411.75	8740	1.202	0	38521457
	98	Bangladesh	9459	321379.02	2273	5.597	0	163683958
	99	Belgium	305	543347.37	9810	1.625	1	11448595
	100	Côte d'Ivoire	156571	58011.47	12024	0.635	0	25069230
	101	Brunei Darussalam	2513	13567.35	1195	9.218	0	428963

	102	United Arab Emirates	25752	422215.04	5800	8.206	0	9630959
	103	Chile	391	295402.65	17959	2.346	0	18701450
	104	Taiwan Province of China	9455	609200.00	1710	-0.592	0	23726185
	105	Ghana	214142	67299.28	11880	10.21	0	30870641
	106	Netherlands	2096	914043.44	9674	2.437	1	17286042
	107	United States	269	20527156.03	13814	2.401	1	332140037
	108	Hong Kong	50609	361731.07	1110	1.908	0	7481555
	109	Indonesia	362663	1042271.53	2041	3.819	0	267066843
	110	Iraq	168660	227367.47	6820	15.361	0	40590700
	111	Malaysia	216833	358791.51	1295	0.673	0	32399271
	112	Mozambique	24163	14845.40	8759	3.001	0	29423878
	113	South Africa	2253	404842.12	10362	3.917	0	57339635
	114	Russia	676	1657329.65	5274	6.186	0	145652293
	115	Australia	7208	1428529.57	5156	2.254	0	24979230
	116	France	616	2790956.88	10086	0.954	0	64277808
	117	Philippines	458122	346842.09	1467	3.741	0	108568836
	118	Singapore	46606	376998.15	1426	3.347	0	5814537
	119	Tanzania	9455	57003.71	8316	1.58	1	58090443
	120	Spain	449	1420994.14	10978	1.189	0	46792043
	121	Turkey	2824	778471.90	7658	16.485	0	82340088
	122	China	683363	13894817.55	2113	3.509	1	14170069068
	123	Ukraine	792	130891.05	7904	15.436	0	44446954
	124	Senegal	3197	23116.90	12976	-0.84	0	15574090

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EVALUATION AND PROPOSITIONS FOR THE DEVELOPMENT OF EXPORT CREDIT INSURANCE IN VIETNAM

**Author: Truong Thi Ha Ninh¹, Pham Ngoc Khanh², Tran Duc Toan, Dang Quoc Thanh,
Du Thi Duyen, Dao Xuan Anh
Mentor: MSc Pham Thi Hien Minh**

ABSTRACT: The development of international trade and payment brings a lot of economic benefits to countries as well as import-export businesses. However, the risks of payment and debt collection become a challenge in international transactions. Currently, export credit insurance has been widely applied in many countries around the world to protect exporters against the above risks, but in Vietnam this type of insurance is still not popular. The article explains the reasons why export credit insurance is not popular in Vietnam, along with the opportunities and challenges of applying this insurance, analyzes the case study of 100 container Vietnamese cashews exported to Italy and proposes recommendations for the development of ECI.

Keyword: Export credit insurance (ECI), opportunities, challenges, case study, recommendations for development

1. INTRODUCTION

International trade activities originate from the need to exchange and trade goods across national borders. Nowadays, there are various forms of transactions such as exports, imports, temporary imports and re-exports, which have led to the development of systems and payment methods. However, this development has also led to an increase in various risks, particularly those related to payment, recovery, and mobilization of receivables from exports. Although there has been positive support from banks with high-security payment methods, safe credit methods such as letters of credit are not widely used to increase competitiveness and provide favorable conditions for importing partners. In Vietnam, a country famous for exporting agricultural products, payment methods predominantly used are documents against payment (D/P) and telegraphic transfer (T/T), which entail significant credit risks, such as importers' failure to pay.

Therefore, export credit insurance has emerged as a solution to support Vietnamese enterprises in limiting credit risks in commodity transactions as well as expanding international trading markets. It is recognized that export credit insurance is an effective shield that helps Vietnamese export enterprises to be confident in their international business and transactions. However, it has not received much attention from businesses. This article aims to identify the current situation of export credit insurance in Vietnam, investigate the reasons why export credit insurance has not been popular in Vietnam, as well as to gain a clear understanding of the role of this insurance form in the case study that may occur in 2022 for Vietnamese cashew export enterprises. Based on that, the article proposes some suggestions to develop this insurance in our country.

2. LITERATURE REVIEW

2.1. Research history in Vietnam

Awareness of the role of export credit insurance activities, many lecturers in the world choose this problem to study and research. But in Vietnam, there are a little research focused in the export credit insurance activities, as follow:

¹ Foreign Trade University; Email: k59.2011110181@ftu.edu.vn

² Foreign Trade University.

Pham Thi Nguyet (2009) “Export credit insurance - from experience of some countries in the world and lessons learned for Vietnam”, Master thesis PhD, National Economics University. In the study, the author analyzed in detail the points of trade insurance activities in some developed countries around the world through active participation of organizations such as Bern Association, International Trade Center ITC... The highlight of the topic is to provide a rigorous theoretical basis, from which to base the assessment prices in Chapter 2. However, the essay has not specifically analyzed the measurement indicators of this insurance but only made general comments and many paragraphs are not logical.

Nguyen Thi Mai (2017), “The role of export credit insurance in promoting export activities in Vietnam”, thesis of business administration in HUTECH University. This master’s thesis studies the current situation of the application of export credit insurance in promoting exports in Vietnam, through specific quantitative indicators such as size, quantity, growth rate and risk factors. The limitation of this study is that the research scope is wide, the data does not reflect the actual export situation as proposed by the topic.

Le Van Truong (2021) with the topic “Solutions to develop export credit insurance” export in Vietnam”, Master thesis in Banking Academy. The thesis was based on the theoretical basis of export credit and export credit insurance, thereby analyzing the situation in Vietnam in the period 2018-2020, a period when the global economy was affected by the Covid 19 pandemic.

Huy Tuong (2022) article with the topic “Export Credit Insurance: Finding a solution measures to protect exporting enterprises against credit risks”, published on Industry and Trade paper on 08/2022. The article analyzes potential credit risks in loan activities for import and export of enterprises, especially contents of assessment of import and export risks and payment risks arising during the time of the COVID-19 epidemic; at the same time introduce security solutions that trade credit insurance for import and export enterprises with the goal of minimizing risks, improve protection for businesses.

In summary, most of the studies have mentioned and addressed many related issues and created the foundation of research methods for the topic development export credit insurance activities and international experience and lessons for Vietnam but lack of updating the current situation of export credit insurance activities in Vietnam in the period of global influence and recovery after Covid 19.

2.2. Definition

In commercial activities in general, and in export activities (EA) of goods in particular, credit serves as a bridge between production, distribution, and consumption. Before the industrial revolution, exporters often directly extended credit (commercial credit) to importers in the form of deferred payment sales to promote the circulation of goods. However, exporters cannot have full knowledge of the buyers in other countries, which can lead to risks of non-repayment of money or exported goods. To protect exporters from such risks, export credit insurance (ECI) was formed.

ECI is a form of financial guarantee for exporters in export contracts with open credit payment conditions, when they face risks of bad debt, loss of payment ability of importers due to insolvency. (According to the Vietnam Development Bank - VDB)

ECI does not only apply to trade but also provides effective protection for domestic investors when investing in other countries or vice versa for foreign investors to attract capital to Vietnam. However, in reality, there are very few companies in the import-export sector in Vietnam that purchase ECI because it increases costs and involves high risks in their activities.

2.2. The content of export credit insurance (ECI):

The participants of ECI are export companies or banks providing export credit.

The object of ECI is the credit provided by exporting companies to buyers or export credit provided by banks.

The insured value of ECI is the value of the credit granted by exporting companies to buyers or the export credit provided by banks in the case where banks participate in insurance.

The insured amount is based on the insured value

The ratios reflecting the support of ECI are:

- The percentage of cover: This is a percentage of the total value of the export contract or the total value of the project that is covered by the insurance. This ratio is usually between 90% and 95% in ECI. Exporters also bear a small portion of the risk of their revenue.

- The premium rate: This is a fee paid per unit (usually \$100) of the total value of the export contract or the project that the insured person has to pay to the insurer, thus determining the insurance premium that the insured person has to pay according to an insurance contract.

- The support of ECI is demonstrated through these two ratios: high coverage ratio and low premium rate provided to domestic exporters, ensuring financial security for businesses against potential risks with a small premium. The coverage ratio for political risks is usually higher than that for commercial risks, aimed at providing exporters with assurance, especially when exporting to new markets or those with political instability such as war or unrest, thereby encouraging them to expand and explore new markets. The benefits for small businesses, or businesses exporting key or encouraged products etc. are mainly reflected in these two ratios.

The determining factors of insurance fees and insured risk rate: Typically, ECI providers offer an insured risk ratio that is lower than the entire risk, indicating that they do not provide full coverage for the risk. Exporters also bear a portion of the risk related to their receivables. The insured rate depends on several factors, including:

- Types of potential risks: The premium for political risks is usually higher, ranging from 90-95%, compared to commercial risks, which typically have an insured rate of 80-85%.

- Importing country: Generally, the insured rate will be higher if the importing country is a member of the Organization for Economic Cooperation and Development (OECD).

- The premium rate will be determined based on several fundamental factors such as:

+ The potential level of risk (including risks associated with the importing country)

+ Credit terms (payment conditions) of the export contract

+ The expiration of credit

+ The potential discount value of export bills and documents

+ Experience in export activities of the exporter

Based on these factors, export credit agencies may offer fixed fees or determine a specific fee for each case. Typically, this fee is much lower than the cost of using a letter of credit at banks.

2.3. Risks covered in export credit insurance

Trade risks are those related to Exporters or Payment Banks, including:

- Inability to repay debt due to bankruptcy, prolonged losses, or asset liquidation

- Exporter's inability to make payment at the end of the credit period or after a specified period when the credit period has been agreed to terminate

- Exporter's refusal to receive goods even though the goods are delivered in accordance with the terms of the contract

- Exporter's refusal to pay terms related to exports, such as handling costs, processing costs, etc.

Political risks are risks associated with economic, political, and social instability in the buyer's country that affect foreign trade activities, such as:

- Cancellation or non-renewal of export licenses

- War, rebellion, strikes, or other disruptions in the exporter's country

- Risks in transferring money from the exporter's country when the Importing Government implements measures to delay foreign debt payments because such payments would increase losses for this government

- Prohibition of exports in payment, meaning that the exporter's foreign deposit account is blocked

- Actions by foreign governments that in some way hinder the execution of contracts, such as export/import restrictions, confiscation or seizure of goods, nationalization, etc.

- Trade between private exporters and state-owned or state-run importers that do not fulfill commitments in payment obligations

In addition, other types of risks such as financial risks, production and transportation risks, and exchange rate risks should also be considered.

3. RESEARCH METHOD

We use qualitative desk-based methodology by collecting data via the secondary data such as WTO, Ministry of Industry and Trade of Vietnam, Ministry of Finance of Vietnam... After that, we analyze the pros and cons of ECI and illustrate a case-study in which ECI should have been used to protect Vietnamese exporters. Finally, we suggest some solutions to develop ECI in Vietnam.

4. CURRENT SITUATION OF EXPORT CREDIT INSURANCE IN VIETNAM

In December 2006, due to price volatility, the Vietnam Rubber Association launched the Export Credit Insurance Fund for the industry, for the first time introducing the concept of ECI in Vietnam. They aimed to mitigate the risks in rubber exports due to unstable prices, new markets, and in the process of producing export goods. Furthermore, the Fund supports its members with short-term and medium-term loans to bolster production, exports, and trade promotion activities. Despite having been proved to be effective, the model is for the exclusive use of association members in one specific industry and operating based solely on their urgent needs.

In 2007, Bao Minh Insurance Corporation implemented credit insurance in collaboration with Coface SA (France's ECI organization), one of the world's leading export credit agencies. Despite the support of Coface in terms of risk assessment and transfer of expertise, Bao Minh only received a few small orders. The possible explanation is that ECI had yet to be considered as an effective financial tool according to export companies.

More than a decade ago, ECI was relatively new to the insurance's market in Vietnam. Therefore, to bolster its development, the Government and relevant ministries and agencies issued a relatively suitable legal framework. On November 5th, 2010, Decision No. 2011/2010/QD-TTg was issued to implement the pilot project of ECI during the period of 2011-2013. All exporters were encouraged to participate in ECI for goods belonging to two groups:

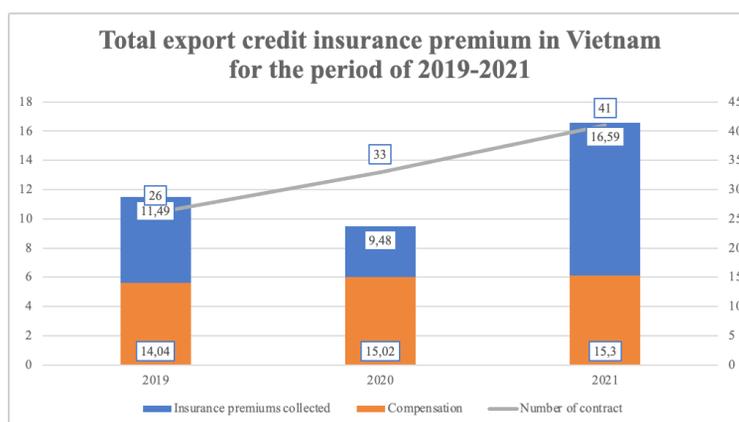
- Group 1: seafood, rice, coffee, fruits and vegetables, rubber, pepper, cashew nuts, tea, cassava and cassava-based products;

- Group 2: textiles, footwear, electronics and computer components, ceramics, glass, rattan and bamboo products, wooden products, plastic products, electrical wires and cables, bicycles and spare parts, handbags, hats, umbrellas, iron and steel products, machinery and equipment, and transport vehicles.

Subsequently, the Ministry of Finance issued several documents providing guidance for the initial implementation of ECI, including: Circular No. 99/2011/TT-BTC (July 07, 2011) directing the management of finances for the pilot implementation of ECI; Decision No. 2170/QD-BTC (September 9, 2011) declaring the list of insurance enterprises to participate in the ECI pilot program; and Decision No. 2766/QD-BTC (November 16, 2011) stipulating the general rules to govern ECI. The program provides support for traders engaged in ECI through a 20% reduction in the original premium of the ECI contract, while insurance enterprises are granted research and development costs for ECI Rules, expenses for organizing conferences and seminars to promote ECI, software installation costs for ECI database construction, ECI product design expenses, training costs, and propaganda expenses regarding ECI. The ECI pilot program has selected seven non-life insurers to participate: Bao Viet Insurance Corporation, Bao Minh Joint Stock Corporation, PVI Insurance Corporation, Bao Viet Tokio Marine Insurance Company, QBE Vietnam Insurance Company, Chartis Vietnam Insurance Company Limited, and Union Insurance Company.

With the tight coordination between relevant ministries and branches, the ECI pilot program has yielded certain outcomes after three years. Up to 2014, according to the Ministry of Industry and Trade, a total of 46 insurance policies were issued, including 23 ECI policies and 23 mixed insurance policies, which covered both export and domestic sales revenue (including some contracts that cannot be separated due to the essence of the business's total sales in the year). These policies insured a total export value of 12,592 billion VND, with a total collected insurance premium of 17.23 billion VND and total compensation of 13.33 billion VND.

In spite of some certain achievements during the pilot phase, the development has not lived up to expectations. Presently, the ECI has not flourished in Vietnam, as the number of businesses applying for the export insurance policy is not commensurate with the market size. According to Ministry of Finance, the number of licensed insurers and total insured exports for the period 2019 - 2021 are as follows:



Graph 1. Total export credit insurance premium in Vietnam for the period of 2019-2021

Unit: Billion VND

Source: tapchitaichinh.vn

It stands out that the insured export turnover has increased over the years, but only accounts for a very small proportion of the total export turnover of Vietnamese goods from 2019 to 2021.

5. ANALYSIS OF OPPORTUNITIES AND CHALLENGES OF EXPORT CREDIT INSURANCE AND ITS APPLICATION TO THE CASE OF 100 CONTAINERS OF CASHEW NUTS EXPORTED TO ITALY

5.1. Opportunities

Exporters face risks in using low-risk payment forms like L/C, D/A, D/P, or post-payment. To mitigate risks, exporters must adopt appropriate credit management programs, but the basic level of credit management in developing countries as Vietnam may not be sufficient. (Business Forum Magazine, 2022). Self-insurance faces limitations like capital stagnation and risk challenges. L/C payment methods can lead to low competitiveness and credibility, while ECI is an effective risk management tool for exporters to expand, safeguard receivables, minimize payments, and eliminate collateral requirements (Business Forum Magazine, 2022).

The cooperation of some insurance companies with foreign reinsurance partners also gives ECI a competitive advantage over other tools. Foreign reinsurance partners can provide their own professional collection services, which is crucial for exporters who may not be familiar with the practices, collection regulations, and legal regulations related to insolvency in the buyer's country, not to mention other barriers (language, geography) (Business Forum Magazine, 2022).

In addition, participation in new generation FTAs, such as Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), also opens up many opportunities for Vietnam's export insurance market as follows:

- Increase in the demand for ECI of export enterprises: CPTPP and other FTAs help promote international trade activities. Under these agreements, exporters are provided with opportunities to expand their markets and increase exports, which has resulted in an increase in the number of exporters in Vietnam and consequently, a heightened demand for insurance products (WTO Center, 2018).

- Opportunity to diversify the market of export insurance products in Vietnam: Foreign investors together with domestic insurance companies help expand opportunities to diversify products, improve service quality, and bring more suitable insurance products to exporters (WTO Center, 2018).

- Opportunity to improve the quality of human resources: The insurance industry (including the BHX) will benefit significantly from the labor flow, helping to solve the challenged problem of high-level personnel, especially personnel for insurance actuaries, and specialists majoring in investment, law, and risk analysis (WTO Center, 2018).

- Improving the financial capacity of the insurance industry and enhancing the reputation of insurance enterprises: When implementing integration commitments, the Government's intervention in the business activities of insurance enterprises will decrease and limit protection. Vietnamese insurers have a chance to participate in a level playing field and a highly professional environment (WTO Center, 2018).

In the Insurance Market Outlook 2023 report, Deloitte experts pointed out three main trends which will impact the global insurance industry. One of the three is the trend of developing the technology ecosystem, which can bring great opportunities for the ECI market in Vietnam. The fact that insurers have strategies to develop insurance products catching up with the trend of information technology applications and the trend of green economy development will help create market confidence in the insurance channel. This is not only a key solution to help insurance companies maximize profits and scale but also attracts more customers to use this risk management tool (VnEconomy, 2023).

5.2. Challenges

Analysts say that in 2023, the picture of the global insurance market will be extremely gloomy due to macro risks and geopolitical conflicts. For Vietnam, when the economic openness is nearly twice that of GDP, Vietnam is not out of the trend of the global economy. These risks will permeate and strongly impact the business performance of domestic insurance companies (VnEconomy, 2023).

According to research by the International Association of Insurance Supervisors (IAIS) presented in the Global Insurance Market Report 2022 (GIMAR) and Outline of Key Results of Global Oversight (GME) last year in 2022, systemic risk in the insurance sector is generally moderate and low compared to the risk in the banking sector. However, the total systematic risk scores of global insurers are on an upward trend.

ECI differs from traditional commercial insurance in that it compensates for losses from business risks (such as foreign exchange risks, and insolvency) and political risks, not unexpected risks such as natural disasters, accidents... Thus, while commercial insurance depends greatly on risk management, ECI depends heavily on third parties, so traditional insurance businesses do not dare to take risks with this product (Ministry of Finance e-Gateway, 2010). In addition, domestic insurers do not have credit information systems in the country and abroad but have to depend almost entirely on international export credit institutions (ECAs) in the process of collecting and evaluating buyer information for risk assessment and insurance. Especially in the context of the Covid-19 pandemic in recent years, many export businesses are having difficulty recovering money from foreign partners, which can lead to increased credit risk for ECI companies.

In addition, there are some forms of safer export support or other forms available in accordance with international practices, combined with risk provisioning or government guarantee for some specific export goods under contracts signed between governments (such as rice exports). Besides, export traders have not yet had the habit of buying export-import insurance. They are instead very familiar with export support measures or other forms of payment such as letters of credit, and telegraphic transfer. Along with not being aware of the benefits of ECI, they believe that buying ECI will increase costs, leading to an increase in export products prices and a competitive advantage decrease. Exporters who are subjective in their ability to assess the reliability of their customers will create a psychology of not wanting to participate in an ECI (Ministry of Finance e-Gateway, 2010).

Besides, ECI is closely related to the bank. However, banks have not yet required export organizations to have ECI as an amount of loan security. The coordination and cohesion between banks and insurance enterprises in ECI have not been paid attention to (Ministry of Finance e-Gateway, 2010).

Regarding the governing law, currently, in Vietnam, there is no legal document that directly and specifically regulates ECI. Legal documents were issued to pilot ECI in the period 2011 - 2013 such as Decision No. 2011/2010/QĐ - TTg dated November 5, 2010, of the Prime Minister on the pilot implementation of ECI in the period 2011 - 2013; Circular No. 99/2011/TT – BTC dated 07/7/2011 of the Ministry of Finance guiding financial management for the pilot implementation of ECI; Decision No. 1626/QĐ – BTC dated 07/7/2011 of the Ministry of Finance on promulgating criteria for selecting insurance enterprises to pilot ECI; Decision No. 2170/QĐ – BTC dated September 9, 2011, of the Ministry of Finance on the announcement of the list of insurers selected for pilot implementation of ECI and Decision No. 2766/QĐ – BTC dated November 16/ 2011 of the Ministry of Finance on the promulgation of the ECI General Rules has now expired (Ministry of Finance e-Gateway, 2011).

5.3. Case study of 100 containers of cashew nuts exported to Italy

Summary

In March 2022, a number of businesses (with 5 large companies) exported cashew kernels to Italy through a brokerage company in Vietnam with an amount of nearly 100 containers worth hundreds of

millions of USD but did not receive payment and faced risk of goods' loss. These shipments which are transported by carriers: Cosco, Yangming, HMM, One, ...have been arriving at some Italian ports.

After sending the goods, Vietnamese cashew nut businesses send payment documents in the form of D/P to a Turkish bank according to the SWIFT code provided by the buyer but this code was changed after sending the goods. In particular, there are shipments that send a bill of lading by name according to the shipping line and in the payment records that do not include the bill of lading.

At the same time, the buyer is constantly asking for the courier's bill of lading code of the consignment document.

When the set of documents arrived at the Turkish bank, Vietnamese businesses received a notice:

- Buyer is not a customer of the bank; the bank will return the set of payment documents.
- There is no bill of lading in the dossiers; if so, they are just photocopies, even blank papers.

Suspected of being scammed to steal the original bill of lading, do not know where the original records of the shipments are while anyone with the original records can go to the carrier to receive the goods, Vietnamese businesses have contacted the association. The Vinacas Cashew Association is asked for help. As soon as detected signs of fraud, Vietnamese businesses coordinated with other units to promptly stop the delivery of **26 containers**.

Out of **74 containers** delivered on board:

- **39 containers**: The Vietnamese party promptly stopped a number of containers at the transit port in Singapore... for returning to Vietnam. Some containers were already on their way to Italy, when Vietnam asked the delivery unit to hand over the original documents that had not been delivered to the buyer's bank.

- **35 containers**: The original documents have been lost, the Vietnamese party has handled **30 containers** to bring back to Vietnam, sell to other customers in Italy or sell to a third country. With **5 containers** remaining at the Italian port, after a process of working with the Italian authorities, on May 27, the Larino Civil Court issued a ruling to return the ownership of **3 containers** within the contract. Proceedings of this court, on June 15 and 16, Napoli Economic - Financial Police and Genoa Port Military Police made a decision to return the last **2 containers** to Vietnamese enterprises.

- **RISKS**

- ***The risk of full loss***

When the incident happened, the biggest risk that the exporters had to bear was the loss of the entire shipment of 35 containers of cashews, as they had lost control over the shipment's documents. Vietnamese businesses were afraid that if the scammer presented the original documents, they would receive the goods from the shipping company. Especially when using a bill of lading as in this case, the risk was even greater. According to the provisions of the International Commercial Maritime Law, the shipping line will have to deliver the goods to the person presenting the bill of lading if they are the legal bill of the lading holder. At that time, Vietnamese businesses will lose their shipments. In case the seller (shipper) requests the shipping company not to deliver the goods but a third party presents a legal bill of lading, the claim of the shipment will have to wait for a court hearing. This causes time consuming and very high cost of hiring lawyers and adjudicating, which greatly affects Vietnamese businesses.

In the case of loss of goods, export cargo insurance may be mentioned, but based on this fact, no insurance company and type of insurance can accept compensation or settlement. loss because of the situation of 100 containers of cashews exported to Italy related to commercial fraud. Vietnam's exporters have completely trusted their brokers and did not clearly verify the cashew import partners, thus leading to the risk that Vietnamese enterprises face the risk of losing their shipments due to the stolen documents. hands of fraudsters and not due to objective reasons to be insured.

However, if exporters have registered for ECI, the case of 100 containers of cashew nuts will develop in a more positive direction. Specifically, before the enterprise signs an ECI contract with the insurance company, the enterprise is responsible for providing sufficient information about the importer, detailed information about the shipment and brokerage. At that time, the ECI company will have a task to appraise the import partner. This can only be done by trade credit insurance, while import and export cargo insurance will be responsible for verification mainly with shipping lines. In fact, the international network of the insurance company is certainly wider than the network of Vietnamese enterprises, so the verification and detection of commercial frauds will be more convenient than that of enterprises. , thereby minimizing risks and losses for the business.

- The risk of payment

Besides the risk of loss of goods, the team proposed to develop more cases of the case of 100 containers of cashew nuts to analyze the risks that Vietnamese businesses may face. Supposedly, after the insurance company verified the Italian cashew import partner and agreed to sign an ECI contract with a Vietnamese enterprise (the enterprise signed an insurance contract and a commercial contract before , then made delivery and payment). When signing contracts and making payments, currently, Vietnamese enterprises in order to increase their competitiveness, safe payment methods such as L/C letters of credit are often not popular because they are costly. Time for your country's partner business, but risky methods such as D/P, D/A, T/T are often preferred. Therefore, the risk of successful delivery to your country's port but not being paid or refused to receive the goods is very high.

The reason is explained by the effects of the economic downturn, according to research by Atradius - a company specializing in providing commercial credit insurance products, Swiss guarantees, bankruptcy rate, insolvency. Payment capacity is expected to increase in the years after the Covid pandemic because the Governments of some countries, especially countries in Europe, have completely eliminated financial support for businesses. Specifically, with Italian partners in the situation, bankruptcy and default of businesses, Italy is ranked first with a growth rate of 34%, the highest in the world. Therefore, when Italian businesses face financial problems due to the government cutting subsidies, they are unable to pay for the shipment or apply for payment later than the contract, then the business Vietnam faces the risk of not being paid, late payment will even have to sell the shipment to another partner or re-import it back to Vietnam. In this situation, ECI will maximize its effect when compensating Vietnamese businesses up to 90% of the value of the shipment. Then the insurance company will go to work with the Italian import partner, the risk has been transferred from the Vietnamese exporter to the insurance company.

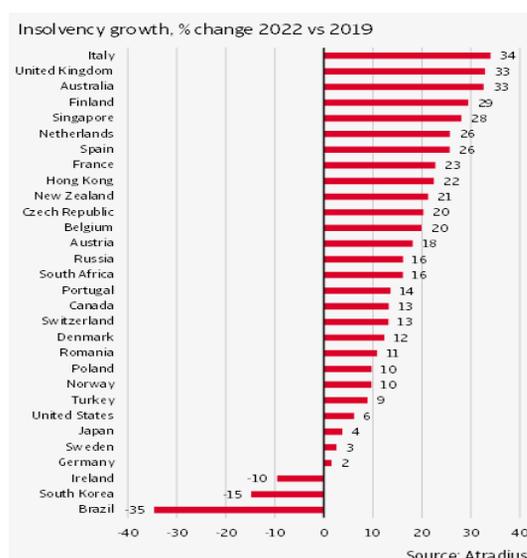


Figure 1. The growth of business insolvency in the world % change 2022 vs 2019

In particular, according to the situation of a shipment of 100 containers of seeds worth more than 20 million USD by the method of collection and delivery of documents (D/P), which has a relatively high risk because it does not require the buyer's deposition. Therefore, the buyer has the ability to use the original documents to receive the goods without paying any money to the seller, as happened with the Vietnam Cashew business. Buyer can refuse to accept the goods even though the goods are delivered in full compliance with the terms of the contract.

And according to the hypothetical situation, when the goods arrive at the enterprise due to unstable political, social and economic situations, the Italian importer goes bankrupt and is unable to pay for the shipment or ask for payment. slow, greatly affecting the business situation as well as the financial capacity of Vietnamese enterprises. And in this situation, when the Vietnamese cashew exporter signed short-term ECI contracts after sending goods with Bao Viet insurance company. Specifically, the period of credit granted to the buyer does not exceed 180 days from the date of issue of the bill of lading, which is the maximum accepted worldwide for all types of consumables. After 180 days from the date of issuing the bill of lading, the Italian enterprise is unable to pay and refuses to pay the shipment due to bankruptcy, then the Vietnamese enterprise will send a claim to Bao Viet. After verifying and determining that the risk is insured in the contract signed by the two parties, Bao Viet will compensate the Vietnamese enterprise from 90-95%, equivalent to more than 18 million USD for the contract. whole shipment of 100 containers of cashews. Therefore, Vietnamese enterprises will minimize financial losses and limit the risk of bankruptcy. Not to mention, the insurance company will also cover typical loss prevention and collection related costs such as telegraphic costs, moving, negotiating, negotiating to expedite the process. payment process, all these costs will be paid by the insurance company supporting the business.

6. RECOMMENDATIONS

6.1. Development orientation of export credit insurance in Vietnam

International experience shows that ECI is directly managed by a Government agency, in accordance with legal regulations on commercial insurance business, although operating according to market principles and the law of supply and demand. The development of import-export credit insurance has received the attention of the Government, insurance companies, and bancassurance companies in increasing supply scale, increasing competitiveness, diversifying insurance items on the basis of risk assessment and controlling, and ensuring the quality of credit insurance services for the import-export industry.

a. Growth in scale

Development of import and export credit insurance according to the content of scale development is mainly understood as concentrating resources to promote outstanding insurance for import and export loans at banks. In addition, the scale development also aims to attract more customers – mainly Vietnamese traders implementing export contracts and growing credit contracts. Finally, the development in scale is also reflected in the expansion of the area of operation; the increase in the number of transaction offices, which is towards the development of Vietnam's insurance industry, and access to large enterprises in the world.

b. Growth in market share

To show their position, insurance businesses often mainly implement strategies to increase their competitiveness compared to other companies in the same area. In addition, to develop market share, insurance companies also focus on creating increasing business efficiency to increase prestige and position, showing strong brands in the eyes of customers.

c. Product structure rationalization

First of all, in developing import-export credit insurance according to the content of rationalizing the product structure, it is necessary to pay attention to the level of changes in the structure of import-export credit insurance services and products. The goal of product structure rationalization is to offer flexible insurance terms, meet the needs of import-export enterprises, and ensure that customers feel the benefits when signing ECI contracts.

d. Income growth from the insurance business

Income growth is the growth in revenue from import and export credit insurance activities. The source of income of companies is reflected in interest income from lending activities, and collecting insurance premiums for reinvestment.

e. Risk management

The objective of strengthening risk control in the development of import and export credit insurance is to balance the benefits from the development of import and export credit insurance according to other contents with the risks that insurance companies can bear.

f. Service quality improvement

The orientation of import-export credit insurance development towards improving service quality is how to satisfy customer needs to the maximum, taking quality as the foundation for customer development. Regular evaluation of customer satisfaction is the foundation of the service quality improvement strategy because the purpose of improving service quality is to maximize customer needs.

6.2. Solutions to develop export credit insurance in Vietnam

Vietnam should promote the use of export-import insurance and strengthen the risk assessment capacity for export enterprises. Because global trade has an enormous transaction value, the capital, executive ability, and expertise requirements for credit insurance institutions are very high, along with the requirements for the process of assessment, analysis of insurance risks, risk management controls, claims handling, and debt collection are also wide-ranging.

Roles of Government agencies

State agencies are not directly involved in the company's business activities but only make important decisions to help insurance companies operate flexibly and adapt faster and more appropriately when the market fluctuates. This model has many outstanding advantages compared to the model that the State both owns and intervenes directly in the company's business. In detail:

- Improving the legal and business environment on WTO principles in parallel with researching and perfecting the model of the organization providing ECI.

- Completing the law on registration and governance of credit insurance enterprises in the import-export industry. Centralized supervision, monitoring, and management of law enforcement. For developing countries such as Vietnam, the operation of ECI providers in the early stages always faces obstacles.

- Creating a mechanism for full and transparent information on the business and financial situation of credit insurance enterprises in the import-export industry. When grasping the financial situation of the above-mentioned enterprises, the competent agency then makes timely assessments of enterprises and takes measures and policies to encourage or support them.

- Encouraging the establishment of companies specializing in providing ECI.

Regarding the ECI company establishment model, the specialization of core activities brings highly specialized products and services. Therefore, when the international market situation fluctuates, these companies can change their policies flexibly, suitable for the highest goal of maximum support for exporting

enterprises, without affecting the policies and operations of other types of insurance products such as banks or an existing insurance company. In addition, the company specializing in ECI will have favorable conditions to specialize in business activities in each stage and each cycle, thereby, gradually improving the professional level of human resources, as well as focusing on researching to find out the limitations to perfect products, and offering more suitable products to meet the increasingly diverse needs of exporters in the context of many fluctuations in the world economy.

- In order to encourage the participation in ECI, the Ministry of Finance may study and amend the mechanism and policy of provisions for bad receivable debts applied to enterprises by allowing enterprises participating in ECI not to have to deduct provisions for bad receivable debts.

- Establishing an export coordination center as a focal point to advise enterprises on information on export markets, and arranging credit insurance contracts for exporting enterprises (Ministry of Finance e-Gateway, 2013).

The provision of insurance services will be open to all insurance companies worldwide, without a monopoly mechanism. In fact, businesses can directly sign insurance contracts, but the scale will be very small and they have difficulty accessing large corporations. If through a focal point – buying common insurance for a large number of exporters for a fee of up to several tens or hundreds of millions of dollars with a large insurance corporation, the cost of insurance and the form of insurance are also different.

- Establishing its own bank to finance the export sector, applying ECI as a tool for breakthrough development of export markets, having plans to ensure credit and payment risks, and creating conditions for enterprises to access large import corporations through credit insurance contracts that most Vietnamese banks have not used.

- Encouraging domestic exporting enterprises, especially those with large export turnover, to participate in ECI as a measure to ensure safety in international trade. Thereby encouraging enterprises to promote export contracts, bringing Vietnamese brands to reach out to the world market.

Roles of export credit insurance enterprises

- Improving professional skills

Focusing on training human resources with executive ability and professional experience in the industry by training courses abroad, organizing seminars to exchange experiences and learning experiences of foreign countries or field surveys, using advanced technology to access business information systems, building transparent and reliable finance situation,...; improving the reliable audit service system, professional skills meeting international auditing standards to ensure the correct reflection of financial information about the enterprise; and cooperating with international ECI organizations to establish an appropriate credit insurance risk acceptance and transfer structure.

- Diversifying services provided to customers

In addition to providing ECI services, organizations providing ECI services should provide additional services such as updating business information according to industry groups of each country, country risk analysis, etc.

- Transparency, efficiency, and shortening the dispute settlement process

The process of dispute settlement and judgment enforcement should be speeded up, transparent, and avoid leaving a bad impression on large export enterprises.

- Insurers also need to focus on promoting import-export credit insurance marketing through strengthening customer conferences.

Specifically, it is possible to reduce insurance premiums and procedure fees to attract customers, because in Vietnam, apart from large companies, the rest are still mostly small and medium enterprises. For traditional customers, there should be surveys to assess the level of satisfaction of customers regularly.

For potential customers, organize customer meetings, invite customers to import and export activities in new fields, and the State's orientation fields to collect information to know the real needs of customers. In addition, it is necessary to promote the marketing of import and export credit insurance through mass media such as television, radio, newspapers, and information channels... related to import and export activities.

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ASSESSING THE EVFTA'S IMPACTS ON EXPORTING WOOD AND WOOD PRODUCTS FROM VIETNAM TO THE EU AND SOME PROPOSALS: A SMART ANALYSIS APPLICATION

Nguyen Truong Giang¹, Truong Thi Ha Ninh², Nguyen Viet Tuan¹, Nguyen Duc Anh¹
Mentor: Pham Thi Hien Minh¹

ABSTRACT: After more than three years of negotiating, Vietnam and the European Union (EU) officially concluded the negotiation of the Vietnam - EU Free Trade Agreement (EVFTA) in December 2015. The analysis and assessment of the impact of the EVFTA on Vietnam's export and import industries with the EU are of great significance to Vietnam. However, obviously, when participating in a new generation trade agreements like EVFTA, wood and wood products will have to face more consciousness. The research emphasizes analyzing the impact of the European-Vietnam Free Trade Agreement (EVFTA) on exporting wood and wood products from Vietnam to Europe. EVFTA is supposed to have a positive influence on Vietnam with the advantages of exporting wood and wood products. With the qualitative methods of the SMART model and collected data about 4-digit HS codes of wood and wood products, the research suggests that there has been a significant increase in exporting these products from Vietnam to Europe in the context of EVFTA but it has not been optimistic and taken full advantages. Based on this result, we would like to propose some suggestions to improve it in the future.

Keywords: EU, EVFTA, exporting, Vietnam, wood and articles of wood.

1. INTRODUCTION

The EU-Vietnam Free Trade Agreement (EVFTA) officially came into force on 01/08/2020, creating opportunities and special advantages for Vietnamese goods, marking an important step forward in the comprehensive cooperative partnership between Vietnam and the European Union. It is an achievement based on the efforts of the political system during the decade since Vietnam and the EU started negotiating a free trade agreement (FTA).

According to economic professors, the activated EVFTA will contribute to the restructuring of import and export products, helping Vietnam to create a proactive position in markets and diversified supply chains, reduce risks of disruption in trade and supply chains due to changes in trade relationships, climate change, natural disasters, and epidemics, and ensure the sustainable development of the economy. After one year of implementing the EVFTA, two-way trade between Vietnam and the EU still reached more than 54 billion USD, an increase of 12%, and total exports reached more than 38 billion USD, an increase of 11% (General Department of Vietnam Customs, 2021). The Commission of European Communities (2018) forecasts that exports from Vietnam to the EU will increase by about 18%, equivalent to an increase of 15 billion EUR in 2035 under the impact of EVFTA.

In particular, the export of wood and products related to wood is considered to be an eligible field to benefit from great tariff incentives, especially Vietnamese wood and wood products with comparative advantages. For example, import duties on the remaining 17%, consisting of particle boards, fiber boards, plywood, and so forth, will be eliminated according to a schedule of 3-5 years, which opens up opportunities for Vietnam to enhance its competitiveness as well as promote exporting wood and wood products from Vietnam to the EU.

1 Foreign Trade University.

2 Foreign Trade University, Email: k59.2014110073@ftu.edu.vn.

In a comprehensive way, the EVFTA is a prerequisite for wood and wood products from Vietnam to effectively take advantage of the extremely large market through the EVFTA. According to the Vietnam Timber and Forest Products Association, since the EVFTA was signed in September 2019, the export value of wood and wood products to the markets of the EVFTA has increased by 17.1%, from 510.37 million USD in 2020 to 597.76 million USD in 2021. However, the achieved result is not commensurate with Vietnam's potential, has not fully benefited from the tariff preferences from EVFTA and Vietnam's comparative advantages.

Therefore, the analysis and assessment of the impact of the EVFTA on the export of wood and wood products from Vietnam to the EU is necessary for Vietnam to make specific adjustments and plans for the immediate priority goals as well as the long-term benefits, thereby improving the effectiveness of supporting Vietnamese enterprises in the future and promoting the export of wood and wood products from Vietnam to the EU in the context of EVFTA implementation.

2. LITERATURE REVIEW

Researching the impact of FTAs on member countries, Viner (1950) proposed two main trends impacting FTAs, namely the trade creation effect and the trade diversion effect. The trade creation effect occurs when the quantity of domestically produced goods decreases and is replaced by imports from the FTA partners, while increased consumption is supported by imported goods. The trade diversion effect occurs when imports from non-FTA members decrease and are replaced by imports from FTA member countries because of the tariff reduction, which causes the price of imported goods from these countries to be cheaper than those from other countries. If the positive effects of trade creation outweigh the negative effects of trade diversion, the FTA will improve national welfare.

When applying the theories of trade diversion and trade creation to analyze the impact of the FTA between the EU and South Africa, Johanna Assarson (2005) concluded: from 1999-2004, exports from South Africa to the EU increased by 75% and imports increased by 93%, which shows that the trade creation impact has already taken place and South Africa has benefited from the FTA established with the EU.

Paul Baker (2015) uses the overall equilibrium model and the local equilibrium model to analyze the expected impacts of the EVFTA, applying a standard sustainable impact assessment framework with a forecast period up to 2025. Thanks to capital inflows and improved labor productivity, Vietnam is forecast to grow significantly, with an estimated increase of 7-8% GDP in terms of economic growth by 2025.

Hadjinikolov et al. (2018) use a local equilibrium model to analyze the impact of the EVFTA on Bulgaria's exports to Vietnam. The results show that the EVFTA will create an opportunity to increase Bulgaria's exports to Vietnam, with the highest positive impact on products from the food, chemical, and textile industries. The limitation of this study is that when performing the simulation, it defaulted to the case of full liberalization even though tariffs still exist for some products.

Do Huyen Mai (2021) assessed the current export performance of Vietnam to the EU to realize the opportunities and challenges to the goods export performance of Vietnam in the context of implementing EVFTA. From that, the author suggested some solutions to promote exporting goods from Vietnam to the EU.

Pham Van Phuc Tan (2019) conducted a SMART simulation to study the impact of EVFTA on Vietnam's key commodities to the EU and showed that the trade creation effect outweighs the trade diversion effect, accounting for about 69% of the total impact of the EVFTA on Vietnam's seafood exports. Meanwhile, Trinh Thuy Ngan (2020) concluded that the EVFTA will create a positive impact, making the value of Vietnam's agricultural exports to the EU increase by more than \$37.352 million.

Huong Thanh Vu (2016) adopted the SMART approach to market analysis and restrictions on trade to assess the ex-ante influence of tariff elimination under EVFTA. The findings indicated that although Vietnam’s imports of medicines from the EU would not significantly increase as a result of the removal of tariffs, its imports from the EU would slightly decrease as a result of its deeper integration with ASEAN + 3 and TPP (the Trans-Pacific Partnership) nations. Moreover, the simulation findings also showed that the EVFTA would increase Vietnam’s welfare because its positive trade creation effect would outweigh its negative trade diversion effect.

To conclude, it can be said that the above studies have not fully and comprehensively studied the impact of the EVFTA on the export of wood and wood products from Vietnam to the EU. Therefore, this is a study that contributes to filling the above gap on the impacts of the EVFTA on the export of wood and wood products from Vietnam to the EU, then proposes some recommendations to promote exporting wood and wood products from Vietnam to the EU.

3. METHODOLOGY

To use and analyze the collected data, the authors used statistical comparisons, trade indicator analysis methods, and the SMART model and Revealed Comparative Advantage (RCA). Liesner (1985), based on the theory of comparative advantage, proposed the idea of evaluating the comparative advantage product of a country through the analysis of its exports. If $RCA > 1$, country i has a comparative advantage in product j . If $RCA < 1$, country i has no comparative advantage over product j . To specifically evaluate the level of comparative advantage, the RCA index is classified into 4 groups:

Table 1: Classify the level of comparative advantage through the RCA Index

No.	RCA value	Interpretation
1	$0 < RCA \leq 1$	No comparative advantage
2	$1 < RCA \leq 2$	Weak comparative advantage
3	$2 < RCA \leq 4$	Moderate comparative advantage
4	$RCA > 4$	Strong comparative advantage

Source: Hinloopen & Van Marrewijk (2001)

The RCA Index is calculated by this formula:

$$RCA_{ij} = \frac{\frac{x_{ij}}{x_{it}}}{\frac{x_{wj}}{x_{wt}}}$$

Where:

RCA is an indicator of the comparative index in the exports of product j of country i

x_{ij} : the export turnover of product j of country i

x_{it} : the total export turnover of country i

x_{wj} : the export turnover of products in the whole world

x_{wt} : the total export turnover in the whole world

SMART analysis method

The SMART model (Software for Market Analysis and Restrictions on Trade) is based on partial equilibrium theory and is accompanied by a simulation tool that is part of the database system for WITS Trade Software developed by the World Bank.

There are two approaches to assessing the impact of an FTA on a country's trade, including potential impact assessment (ex-ante) and real impact assessment (ex-post). Through background theory and empirical models, the EVFTA will take effect on August 1st, 2020, so it will be difficult to assess the real impact of the EVFTA when there is not enough necessary data. Therefore, choosing a model to assess the potential impact of EVFTA on Vietnam's export of wood and articles of wood to the EU market is the most appropriate method.

The advantage of the SMART model is that it is easy to access and implement with the WITS database and provides important quantitative results on trade impact, welfare, and tariff revenue for a fairly detailed industry and analysis at the most isolated trade data level. However, the SMART model has limitations, with the result that the model is limited to the direct effects of a change in the trade policy of a market because the model is based on the partial equilibrium theory. Therefore, the model ignores the indirect effects of trade policy changes in other markets (intersectoral effects) and feedback effects (effects resulting from a change in trade policy in a particular market spill over into the relevant markets and back to the market under consideration).

With the SMART model, to assess the impact of the proposed tariff reduction scenario under the EVFTA on Vietnam's trade in wood and wood products with the EU. The selected tariff reduction scenario is a 100% tax reduction. By using the SMART tool, the authors consider and assess the impact of tariff elimination on the export of wood and wood products from Vietnam to the EU. In this scenario, only the impacts on wood and wood products are analyzed and assessed, specifically the code of chapter 44 - HS 44 (including items from 4401 to 4421), and wood products is one number of articles of chapter 94 - HS 94 (including codes 9401, 9402 and 9403). The data to run the model is the 2022 data taken from the WITS system of the World Bank (World Bank, 2022).

The Revealed Competitive Advantage - RCA

RCA analysis helps identify the products and services in which a country has a comparative advantage. Countries can use this information to select the products they want to specialize in and allocate resources to areas where they have a competitive edge. The analysis can also help assess a country's trade competitiveness in global markets. If a country's RCA value is high in a particular product or service, it means that the country is competitive in that sector. This can help countries attract foreign direct investment and build a strong global reputation. By identifying the country's export strengths and weaknesses, RCA analysis can support export diversification efforts. Countries can use their competitive advantages to expand their exports into new markets, which can help reduce their reliance on a single product or market and increase their chances of sustained economic growth.

4. RESULTS

4.1. Revealed Competitive Advantage (RCA)

RCA of wood and wood products of Vietnam in the period of 2012-2022 compared to the world (4-digit HS codes) shown in table 2. In the period of 2012-2018, "tableware and kitchenware of wood" (HS 4419) had a strong comparative advantage with RCA from about 4 - 8. However, recently, it has only had a moderate comparative advantage with RCA of about 2 - 4. Besides, there are also some goods with a moderate comparative advantage, such as "wood marquetry and inlaid wood; caskets and cases for jewelry or cutlery, and similar articles, of wood; statuettes and other ornaments, of wood; wooden articles of furniture not falling in Chapter 94" (HS 4420), "Other articles of wood" (HS 4421), "Seats (other than those of heading 94.02) whether or not convertible into beds and parts thereof" (HS 9401) and "Other

furniture and parts thereof” (HS 9403). In fact, there are many goods with no comparative advantage because of $RCA < 1$ such as HS 4401, 4402, 4403, 4404, 4405, 4406, 4407, 4408, 4409, 4410, 4411, 4412, 4413, 4414, 4415, 4416, 4417, 4418 and 9402.

Table 2: RCA of wood and wood products from Vietnam compared to the world in the period of 2012-2022

HS	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
4401	0.047	0.019	0.099	0.005	0.010	0.006	0.081	0.082	0.008	0.004	0.529
4402	0.005	0.013	0.028	0.023	0.096	0.138	0.429	0.539	0.440	0.934	1.106
4403	0.000	0.000	0.000	0.001	0.004	0.008	0.011	0.000	0.005	0.006	0.004
4404	0.048	0.000	0.037	0.012	0.002	0.001	0.000	0.000	0.000	0.003	0.037
4405	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.205	0.133	0.000
4406	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4407	0.038	0.090	0.094	0.062	0.075	0.053	0.064	0.067	0.046	0.041	0.081
4408	0.000	0.016	0.008	0.011	0.002	0.011	0.003	0.011	0.012	0.012	0.219
4409	0.355	0.338	0.164	0.080	0.104	0.096	0.199	0.187	0.175	0.087	0.091
4410	0.001	0.000	0.000	0.000	0.001	0.002	0.002	0.000	0.000	0.001	0.000
4411	0.002	0.001	0.002	0.000	0.005	0.004	0.007	0.003	0.001	0.002	0.003
4412	0.055	0.056	0.085	0.105	0.178	0.178	0.354	0.295	0.234	0.265	0.553
4413	0.000	0.096	0.089	0.127	0.075	0.005	0.042	0.028	0.325	0.001	0.015
4414	0.254	0.137	0.155	0.198	0.137	0.135	0.080	0.084	0.075	0.146	0.148
4415	0.058	0.042	0.028	0.064	0.061	0.026	0.043	0.021	0.013	0.018	0.011
4416	0.667	1.111	0.422	0.331	0.247	0.160	0.270	0.164	0.181	0.349	0.327
4417	0.190	0.039	0.024	0.043	0.152	0.189	0.223	0.246	0.186	0.837	0.453
4418	0.950	0.768	0.586	0.629	0.419	0.386	0.491	0.515	0.456	0.524	0.724
4419	7.606	5.597	4.844	4.868	5.060	4.990	4.879	3.940	3.100	2.807	2.894
4420	5.559	4.298	3.093	3.404	2.057	2.498	2.455	2.319	2.707	2.703	3.137
4421	3.846	3.228	3.213	2.698	2.438	2.344	1.973	2.368	2.257	2.203	2.167
9401	3.205	2.586	2.801	2.436	2.068	2.048	2.041	2.175	2.076	2.407	2.544
9402	0.827	0.938	1.142	0.724	0.759	0.856	0.826	0.784	0.471	0.361	0.433
9403	5.294	4.366	4.721	4.112	3.558	3.338	3.277	3.430	2.071	2.210	2.675

Source: Calculated on Eurostat data

Generally, some 4-digit HS products have a decreasing RCA such as HS 4419, 4420, 9401, 9403. The causes are supply constraints, inflationary pressures, energy costs, logistics problems, especially technical standards, conformity, origin certificates of wood ... that the EU posed are still problems that are not easy to overcome. Moreover, the Covid-19 is also regarded as one of the most significant reasons leading to this decrease. Time constraints are especially a restriction for EVFTA to impact on the practice. However, exporting wood and wood products from Vietnam to the EU has been expected to be optimistic in the future.

4.2 Scenario and model estimation results

Within the scope of the article, the authors use the SMART model to assess the impact of the expected tariff reduction scenario under the EVFTA on Vietnam’s trade in wood and wood products with the EU. The selected tariff reduction scenario is a 100% tax reduction. Using the SMART tool, the authors considered assessing the impact of tariff elimination on the export of wood and wood products from Vietnam to the EU.

The tariff reduction scenario is evaluated on the model of Vietnam as an exporter, cutting tariffs on wood and articles of wood to the EU. In this model, the results will show changes in the export value of wood and articles of wood of Vietnam to the EU when tariffs are reduced.

4.2.1. General information

Export country: Vietnam

Import countries: EU

The year survey: 2021

4.2.2. Trade impact of wood and wood products (EU with Vietnam)**Table 3. Trade impact of wood and wood products (EU with Vietnam)***Unit: thousand of USD*

HS codes	Impact on the total trade	Trade creation	Trade diversion
4401	0	0	0
4402	0	0	0
4403	0	0	0
4404	0	0	0
4405	0	0	0
4406	0	0	0
4407	0	0	0
4408	0	0	0
4409	0	0	0
4410	0.016	0.016	0
4411	0.022	0.02	0.002
4412	10.499	6.023	4.476
4413	0	0	0
4414	0	0	0
4415	0	0	0
4416	0	0	0
4417	0	0	0
4418	0	0	0
4419	0	0	0
4420	0	0	0
4421	0	0	0
9401	0	0	0
9402	0	0	0
9403	0	0	0
Total	10.537	6.059	4.478

Source: Synthesized from the results of the SMART-WITS model

Table 3 specifically explains the impact of the complete reduction of tariffs under the EVFTA on the export value of wood and articles of wood from Vietnam to the EU through trade creation and trade diversion effects. In particular, EVFTA has no impact on codes HS 4401, 4402, 4403, 4404, 4405, 4406, 4407, 4408, 4409, 4413, 4414, 4415, 4416, 4417, 4418, 4419, 4420, 4421, 9401, 9402, 9403.

In the remaining product groups, trade creation and trade diversion from the EU market to Vietnam have positive values. This shows that in the EU, there is a shift in importing wood and wood products from other countries to Vietnam. Accordingly, the impact on total trade is 10.537 thousand USD; trade creation is 6.059 thousand USD; and trade diversion is 4.478 thousand USD.

The data from the model show that the trade diversion effect is smaller than the trade creation effect. This shows that when the EVFTA came into effect, it did not have much impact on the wood and wood products of Vietnam.

4.2.3. Impact on the export turnover of wood and wood products in Vietnam

Table 4. Impact on the export turnover of wood and wood products in Vietnam

Unit: thousand of USD

HS codes	Export before changing	Export after changing	Changed value	Changed proposition
4401	118.518	118.518	0.000	0.000%
4402	3,675.063	3,675.063	0.000	0.000%
4403	92.340	92.340	0.000	0.000%
4404	4.080	4.080	0.000	0.000%
4405	22.085	22.085	0.000	0.000%
4406	0.000	0.000	0.000	0.000%
4407	4,310.410	4,310.410	0.000	0.000%
4408	145.921	145.921	0.000	0.000%
4409	810.333	810.333	0.000	0.000%
4410	39.027	39.049	0.022	0.056%
4411	37.390	37.410	0.020	0.053%
4412	4,967.785	4,976.314	8.529	0.172%
4413	1.753	1.753	0.000	0.000%
4414	379.136	379.136	0.000	0.000%
4415	498.349	498.349	0.000	0.000%
4416	586.285	586.285	0.000	0.000%
4417	925.350	925.350	0.000	0.000%
4418	6,266.883	6,266.883	0.000	0.000%
4419	15667.084	15,667.084	0.000	0.000%
4420	15,242.688	15,242.688	0.000	0.000%
4421	66.370	66.370	0.000	0.000%
9401	588,733.149	588,733.149	0.000	0.000%
9402	3,849.588	3,849.588	0.000	0.000%
9403	512,367.930	512,367.930	0.000	0.000%
Total	1,158,807.517	1,158,816.088	8.571	0.281%

Source: Synthesized from the results of the SMART-WITS model

Table 4 shows the change in exports of wood and wood products from Vietnam to the EU. It can be seen that the tariff reduction in the EVFTA does not bring export benefits for some products. The export product groups HS 4401, 4402, 4403, 4404, 4405, 4406, 4407, 4408, 4409, 4413, 4414, 4415, 4416, 4417, 4418, 4419, 4420, 4421, 9401, 9402, and 9403 have no change before and after tax reduction. In contrast, groups of HS 4410, 4411, and 4412 had a positive change.

5. CONCLUSION AND PROPOSALS

5.1. Conclusion

The results of the research show that the activated EVFTA brings many economic benefits to Vietnam by helping to increase the export turnover of wood and wood products from Vietnam to the EU. Based on the SMART model, the activated EVFTA increases 8.571 thousands of USD, and the trade creation impact outweighs the trade diversion effect when accounting for about 57.5% of the total trade impact, while trade diversion accounts for about 42.5% of the total trade impact. This shows that under the impact of EVFTA, Vietnamese goods become more competitive with those of rival countries when exporting similar products to the EU.

In terms of trade creation, wood and wood products from Vietnam that are exported to the EU when the EVFTA has not been affected have to suffer from a low tax rate of 3.5% - 6%. Therefore, within 7 years, when the EVFTA is activated, the tax rate reduced to 0% will not have a breakthrough impact on Vietnam's wood industry at the tariff level. In addition, most of Vietnam's wood products exported to the EU have enjoyed universal preferences (GSP) since before the EVFTA took effect. This leads to the fact that as soon as the EVFTA comes into effect, it will not affect many of the products in this group.

However, the advantages of tariff reduction due to EVFTA should be carefully considered when competitors are constantly promoting the process of launching, negotiating, and signing FTAs with the EU in order to reduce tax pressure on their exported goods. In addition, Vietnam cannot only rely on tariff preferences to fully take advantage of the positive impact of the EVFTA but also must pay attention to the issue of origin and sustainable development to be able to provide high requirements for goods exported to the EU in general and technical standards, conformity, and origin certificates of wood in particular.

5.2. Proposals

For the government

The government needs to strengthen the dissemination of information about the EVFTA for the business community and workers to have a better understanding of the commitments given by the EVFTA and, thereby, continue to innovate awareness in enforcing the EVFTA. Along with that, the government needs to analyze and evaluate the potential impacts of the EVFTA to find out which products are capable of taking advantage of opportunities and which can be challenged under the EVFTA. Based on that basis, a thorough analysis is needed to determine the costs and benefits of opening the market for these items and their associated solutions.

For wood and wood products, it is necessary to improve the competitiveness of exported wood and wood products by ensuring food safety and hygiene, origin, and technological innovation to increase product quality and diversify products, attracting more partners in the EU. Policies to improve the competitiveness of enterprises need to be focused on and supported appropriately, promptly, and quickly.

For enterprises

On the business side, it is necessary to show a more proactive spirit in learning about the EVFTA Agreement, because only when we understand these commitments clearly, we apply them effectively in real business. Enterprises need to strengthen cooperation, learn from each other, change management and business thinking by themselves, and cooperate to form production and business chains to be able to gather enough resources against competitive pressure.

Enterprises also need to pay close attention to commitments on sustainable development, such as principles and standards on labor and environmental protection, because these are issues that the EU is particularly interested in. Based on the tasks assigned by the government in the government's implementation plan of the EVFTA Agreement, ministries, ministerial-level agencies, provinces, and cities across the country will develop specific implementation plans for their own locations.

For industry associations

Industry associations, especially VIFOREST (Association of Vietnam Timber and Forest Product) need to serve as a connector between the agency that promulgates regulations on legal documents related to EVFTA, the EVFTA implementing agency at the ministerial, sectoral, and enterprise levels. With the role of a connector, industry associations need to update regulations and legal documents related to businesses as quickly as possible, guide implementation, and provide advice and support to solve difficulties for businesses.

Along with that, industry associations need to support businesses' access to the market. The association needs to review and provide information on the market through the network of industry associations in different countries and Vietnamese embassies in other countries. The process of reviewing and providing information will assist businesses in making appropriate decisions and orienting domestic enterprises to establish commercial relationships in line with targets, orientations, and management policies for exporting wood and wood products.

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ASSESSMENT ON THE POTENTIAL IMPACTS (EX-ANTE) OF REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP (RCEP) ON VIETNAM'S EXPORTS OF TEXTILES

Authors: Nguyen Ha Phuong¹, Nguyen Thu Phuong²

Mentors: Tran Thi Bich Nhung³, Nguyen Thi Phuong Linh²

ABSTRACT: Regional Comprehensive Economic Partnership Agreement (RCEP), is currently considered the largest Free Trade Agreement in the world. The Agreement has entered into force in Vietnam since January 1st, 2022 and is expected to optimize mutual benefits for all member countries. This paper attempts to assess the potential impacts (ex-ante) of the RCEP on the Vietnamese exportation of textile products to the RCEP market under the impact of the tariff reduction roadmap. Projected effects, including Trade Creation and Trade Diversion, are simulated by the WITS software developed by the World Bank. Contrary to positive scenarios expected, the simulation results show a 'dark picture' that when the tariff reduction is fully performed after around 20 years from 2022, Vietnam's textile exports to RCEP countries witness a loss of more than 839 million USD. It is solely Malaysia that Vietnam has gained the value of the Trade Creation Effect. Accordingly, research results also show that the trade diversion effect is expected to be greater than the trade creation effect. Based on results calculated by SMART, implications and recommendations are given. Due to practical constraints, this paper cannot provide a comprehensive review of wholly affected factors.

Keywords: Ex-ante; export; RCEP; textile; Vietnam.

1. INTRODUCTION

From January 1st, 2022, the Regional Comprehensive Economic Partnership (RCEP) has officially come into effect in Vietnam after nearly 08 years of negotiation and completion of documents. According to Vietnam Chamber of Commerce and Industry, up to 02 June 2023, the Agreement has officially entered into force for all members. As this agreement was signed, it would create a market of 2,2 billion people, equivalent to 26,2 trillion USD, accounting for nearly 30% of the global GDP, 29,5% of exports and 25,9% of worldwide imports of goods (According to the Ministry of Industry and Trade of the Socialist Republic of Vietnam, 2022), and it is also the largest free trade area in the world. RCEP is expected to bring many opportunities for the countries in the bloc in terms of economic development potential as the Agreement will eliminate at least 92% of import tax lines between the signatories within 20 years (According to The Ministry of Finance of Vietnam, 2022) and strengthen rules of origin in ASEAN+1 Free Trade Agreements e.g. ACFTA, AJCEP.

Telecommunications, information technology, textile, footwear and agricultural sectors are major beneficiaries of Vietnam's participation. For such a long time, textiles have been one of the key export commodities of Vietnam to the world. In 2021, Vietnam's textile ranked the third in the world exporting market with 5,7% market share (According to Vietnam National Textile and Garment Group). Up to now, Vietnamese textile products have been present in 66 countries and territories with 47-50 different products.

In view of export markets, besides the US, RCEP market is Vietnam's main one. The principle of origin accumulation in RCEP is a great opportunity for Vietnam in the production of processed goods for export. However, the implementation of RCEP comes with both great opportunities and challenges due

¹ Foreign Trade University, Email: nguyenhaphuong201115475@ftu.edu.vn

² Foreign Trade University.

³ Foreign Trade University, Email: tranhibichnhung.cs2@ftu.edu.vn

to its wide scope. Vietnamese products and goods, when exported to RCEP countries, would meet strict regulations and standards on traceability, origin, labeling, design specifications, etc.

With the above opportunities and challenges, the question arises as to how the export of textile products of Vietnam would change and adapt under the current situation. Stemming from this practice, authors carried out the research “*Assessment on the potential impacts (ex-ante) of Regional Comprehensive Economic Partnership (RCEP) on Vietnam’s exports of textiles*” to show the quantifiable impacts of RCEP on Vietnam’s textile exports to intra-regional countries.

This paper is composed of 05 chapters. The first section of this paper will examine the subject matter, the second is the theoretical framework as well as the research model suggested by the authors. The third chapter is concerned with the methodology used for this study, which is followed by result discussion and some recommendations for related organizations in two final parts.

2. THEORETICAL FRAMEWORK

The study applies the SMART model to quantify and forecast the impact of tariffs on Vietnam’s textile exports to RCEP countries when tariffs are reduced according to specific commitments. Up to June 2023, RCEP has fully entered into force in 15 countries, attracting much attention from governments, agencies and scholars. Scientific researches recently published focus on 05 key theories:

2.1. Overall assessment of the impact of RCEP in general

Alessandro Nicita (2021) in “*An Assessment of the Regional Comprehensive Economic Partnership (RCEP) - Tariff Concessions*” claims that most of the tariff preferences applied to trade involve major and key RCEP economies such as China, Korea, and Japan. According to this study, trade diversion prevails over the impact trade creation. To assess more specifically the impact of RCEP on a particular region such as ASEAN, Shandre Mugan Thangavelu, Shujiro Urata, and Dionisius A. Narjoko (2021) in “*Impacts of the Regional Comprehensive Economic Partnership on ASEAN and ASEAN Least Developed Countries in the Post-pandemic Recovery*” studied the possible effects of RCEP on ASEAN countries, especially the least developed ASEAN countries. Specifically, RCEP is an important stepping stone for countries to recover their economies after the pandemic, with the creation of a single framework of rules of origins for 15 member countries. Besides, Petri and Plummer (2020) in “*East Asia Decouples from the United States - Trade War, COVID-19, and East Asia’s New Trade Blocs*” focused on East Asia under the impacts of the trade war between the US and China, stated that East Asian countries are expected to benefit the most from RCEP. The above studies have shown a certain interest of international scholars in RCEP and related international events.

2.2. Assess the impact of RCEP on supply chain operations

Lingling Zhou et al (2021) in “*The Impact of RCEP on Chinese Regional Economy From Global Value Chains Perspective*” adopts the GTAP model to analyze and examine the impact of RCEP on China’s industry when participating in various global value chains. From an industrial perspective, the impact of RCEP on exports of different industrial products is different among them. However, the study covers the analysis of the impact of RCEP on overall manufacturing in China’s global supply chain. A serious weakness with this argument, however, is that researchers have not treated the impacts on particular countries in much detail.

2.3. Assessment of the potential impacts of RCEP on the economies of several member countries

A qualitative study by Damuri and Friawan (2023) titled “*RCEP and Indonesia - Economic Reform and Prospects for Implementation*” describes how RCEP had helped Indonesia improve relations with member countries as well as participate more deeply in the global supply chain and create a driving force for reform of the national economy. Similarly, Thangavelu et al (2022) in “Potential Impact of RCEP and Structural Transformation on Cambodia” highlights the importance of RCEP during the COVID-19 pandemic and post-pandemic recovery. Nguyen Khanh Linh et al (2022) in “*Study on the impact of the Regional Comprehensive Economic Partnership (RCEP) on Vietnam’s agricultural exports*” states that Vietnam mainly exports raw or minimally processed products, which seems difficult to compete with low prices in the region. Because the study uses a qualitative research method, the impacts of FTAs on trade have not been quantified.

Nguyen Thi Hoang Oanh (2017) in “*How Free Trade Agreements Affect Exports and Imports in Vietnam*” estimates 03 factors: bilateral trade relationship, market size and geographical distance. The key problem with this explanation is that this study applied the model mentioned by Tinbergen (1962). Some bilateral FTAs such as VJEP, VCFTA have positive impacts on Vietnam’s exports while some free trade agreements reduce exports such as AIFTA and ACFTA. However, this theory does not fully explain the quantitative impacts that illustrate the extent of the impact of FTAs on Vietnam’s import and export activities, as well as not going into each specific commodity.

2.4. Assessment using SMART model for analysis on potential impacts of RCEP

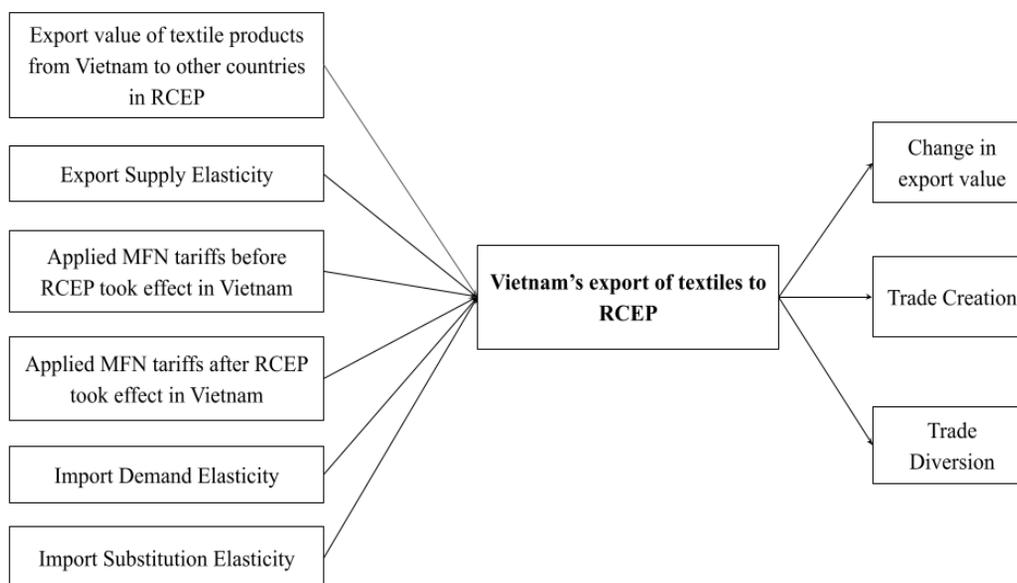
Rashmi Banga et al (2021) in “*RCEP - Goods Market Access Implications for ASEAN*” argues that tariff liberalization under RCEP will worsen existing BOT of ASEAN countries by 6% per year, while BOT will improve for some non-ASEAN countries in RCEP. ASEAN will gradually lose its export market share to non-ASEAN countries. Total export turnover of RCEP members will increase by 24.8 billion USD after RCEP comes into effect. However, the study covers an overview of the economy in general, not to certain industries.

To better understand the mechanisms of RCEP and its effects on textiles, Sheng Lu (2017) in “*Regional Comprehensive Economic Partnership (RCEP) - Impact on the Integration of Textile and Apparel Supply Chain in the Asia-Pacific Region*” points out that the overall textile industry and textile supply chain in Asia - Pacific under the impact of RCEP. Apparel exports from non-RCEP members to these markets will suffer decline and loss of market share due to stiff competition from RCEP members.

Do Minh Thu (2017) in “*Vietnamese agricultural products and opportunities from the Regional Comprehensive Economic Partnership (RCEP)*” using the SMART model quantifies potential changes in the value of agricultural products exported to RCEP countries. The study aims to project changes in the total export value of 04 key agricultural products of Vietnam. On that basis, the author gives some policy implications for agricultural product exporters as well as the Government on attracting investment, improving competitive advantages, linking product value chains, etc. to be able to seize the opportunities from RCEP effectively.

However, such studies remain narrow in focus dealing only with qualitative and quantitative methods used to analyze different types of commodity and various Free Trade Agreement. Based on these previous researches, authors suggest a research model with 06 inputs and 03 outputs as described in Figure 1 below.

Figure 1: Proposed research model



Source: Authors' compilation

3. RESEARCH METHOD

3.1. Qualitative research

The authors collect data related to the trade value of textile products whose code belong to two HS groups 61 and 62, the tariffs applied before and after RCEP taking effect, and trade indicator (RCA) and 03 types of elasticity used in SMART simulations from UN's COMTRADE, Trade Map, UNCTAD's TRAINS, WTO's IDB. Together these indicators provide important insights into the potential importers to which Vietnamese textile products are exported.

3.2. Quantitative research

By employing quantitative modes of enquiry, this research attempts to illuminate the potential of RCEP on Vietnam's exportation of textiles, using RCA trade indicator and results simulated by SMART model.

3.1.1. Trade Indicator - RCA

This qualitative research focuses on the indicators of import and export turnover of textile products of RCEP countries, the comparative advantage index of RCA. The research data in this paper is drawn from 05 main sources: The United Nations Statistical Database of Consumer Trade Data (UN COMTRADE), Trade Map, UNCTAD, WTO IDB, the Ministry of Finance and the Ministry of Industry and Trade of Vietnam.

3.1.2. SMART Model by WITS

The paper employs the SMART model with input data including the trade value of selected textile products (details up to 06 HS digits) and MFN tariff rate. Two product categories of chapters 61 and 62 of the Harmonized System (HS), detailed data level to 06 digits, divided into 34 groups of 04 digits (HS 6101 to HS 6117; HS 6201 to HS 6217).

Table 1: Summary of data sources in this research

Data	Source of data
Commercial value of textile products HS 61, 62 (detailed to 06-digit)	WITS - World Integrated Trade Solutions of UNCTAD (TRAINS) based on data from UN COMTRADE
	Trade Map
MFN tariffs	WITS - World Integrated Trade Solutions of UNCTAD (TRAINS) based on data from UN COMTRADE
	WTO's IDB
	Vietnam's Ministry of Finance

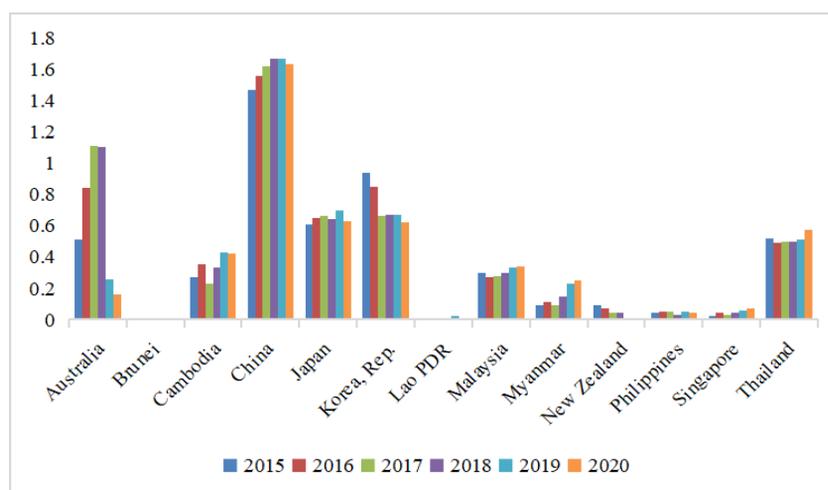
Source: Authors compiled from WITS

The collected data will be simulated by SMART software, after selecting the appropriate data and parameters, the software will process and output the results through 05 types of reports including: Detailed Data; Export View; Market View; Revenue Impact; Trade Creation Effect. Then these data would be used to analyze and explain the trade effect including trade creation and trade diversion.

4. RESULTS AND DISCUSSION

4.1. RCA Analysis

As was mentioned in the previous chapter, it is therefore likely that such connections exist between RCA and Vietnam's textile exportation in the period of 2015-2020.

Figure 2: RCA index of Vietnam's textile industry exports to RCEP from 2015 to 2020

Source: Authors compiled from WITS

From 2015 to 2020, China was the most outstanding trade partner of Vietnam. During the 05-year study period, China's RCA was always greater than 1 and always higher than the index in other countries within RCEP. Although Vietnam and China have not had any bilateral FTA, Vietnam has still achieved some economic and trade benefits over the years with ACFTA. In addition, other potential and promising trading partners such as Japan, Korea, and Thailand also show their relatively high RCA on the chart. Australia is a potential export country for Vietnam's textile products when RCA is quite high and greater than 1 in the period 2017-2018. However, in the period 2019-2020, RCA of all members decreased significantly compared to the previous period.

4.2. Trade creation impact & trade diversion

The total change in export turnover includes trade creation effect and trade diversion effect, so it is important to analyze these effects by using the SMART model to guide current and future trade policies.

Table 2: Change in Vietnam’s export turnover to RCEP market by typical HS

Unit: Thousand USD

HS Code	Export before RCEP entered into force	Export after RCEP entered into force	Proportion of export after RCEP entered into force	Change in export
6103	283.990,27	256.512,55	3,09%	-27.477,71
6104	542.922,00	479.433,85	5,77%	-63.488,15
6105	273.159,54	253.326,81	3,05%	-19.832,73
6109	1.023.894,92	940.791,30	11,33%	-83.103,62
6110	1.079.720,67	926.412,45	11,15%	-153.308,22
6114	190.363,77	182.988,71	2,20%	-7.375,05
61	4.327.296,01	3.879.997,08	46,71%	-447.298,93
6201	788.839,17	738.434,89	8,89%	-50.404,28
6202	565.998,48	532.046,84	6,41%	-33.951,64
6203	961.747,54	882.033,82	10,62%	-79.713,72
6204	670.819,51	588.773,21	7,09%	-82.046,30
6210	395.659,95	361.864,07	4,36%	-33.795,88
6211	632.561,23	572.383,75	6,89%	-60.177,47
62	4.818.196,56	4.426.090,44	53,29%	-392.106,11
Total	9.145.492,57	8.306.087,52	100,00%	-839.405,04

Source: Authors synthesized from SMART model results

In terms of overall impact, after the tax rate applied to Vietnam’s textile and apparel products was reduced to 0%, the export level of all HS 61 and 62 items decreased (in which, two groups of HS 6110 and 6109 had the widest change). In fact, two commodity groups 6109 and 6110 continue to be the main imported products of Vietnam into the RCEP market, accounting for 11.33% and 11.15% respectively. Compared to 2021 and earlier, we can see a change in the structure of the most imported products to RCEP countries. Considering the total of 02-digit HS codes, the proportion in exports is not too different between HS 61 and 62 before and after the Agreement comes into force, with HS 62 items are higher in share. By the end of the roadmap, the tax rate 0% is not only beneficial for Vietnam to enjoy this tax incentive but also for other member countries, especially Indonesia, Malaysia, China, or Cambodia - which compete strongly with us in the textile industry. Therefore, it can be seen that by the end of the roadmap (about 20 years), the export volume of two groups of goods HS 61 and 62 of Vietnam decreased and the loss fell to about 839 million USD. That said, although RCEP is expected to support and stimulate Vietnam’s textile exports, the simulation results show a decrease in total turnover.

Table 3: Trade creation and diversion effects by RCEP

Unit: Thousand USD

Countries	Trade creation effect	Proportion in the sum of trade creation effect	Trade diversion effect	Proportion in the sum of trade diversion effect	Total impact
Australia	0,00	0,00%	0,00	0,00%	0,00
Brunei	0,00	0,00%	0,00	0,00%	0,00
Cambodia	0,00	0,00%	-1.350,59	0,16%	-1.350,59

Countries	Trade creation effect	Proportion in the sum of trade creation effect	Trade diversion effect	Proportion in the sum of trade diversion effect	Total impact
China	0,00	0,00%	-13.766,02	1,64%	-13.766,02
Indonesia	0,00	0,00%	-2.378,57	0,28%	-2.378,57
Japan	0,00	0,00%	-612.388,87	72,95%	-612.388,87
Korea, Rep.	0,00	0,00%	-209.345,13	24,94%	-209.345,13
Lao PDR	0,00	0,00%	-1,82	0,00%	-1,82
Malaysia	5,76	100,00%	1,29	0,00%	7,05
Myanmar	0,00	0,00%	-12,85	0,00%	-12,85
New Zealand	0,00	0,00%	-4,78	0,00%	-4,78
Philippines	0,00	0,00%	-162,97	0,02%	-162,97
Singapore	0,00	0,00%	0,00	0,00%	0,00
Thailand	0,00	0,00%	-0,47	0,00%	-0,47
Total	5,76	100,00%	-839.410,78	100,00%	-839.405,02

Source: Authors synthesized from SMART model results

In terms of trade creation and diversion by country, we can see that the simulation results are not as expected. As follows:

Regarding trade creation effect, only Malaysia has a creation effect with Vietnam with the value created at 5,757 USD, accounting for 100% of the total value. By the end of the roadmap, ASEAN countries, including Vietnam, would mostly enjoy 0% tax incentives, which is an opportunity but also increases competitive pressure on prices of goods exported. Vietnamese products would compete with goods of both third member countries and domestic goods of these countries. Thanks to the positive development of the trade between Vietnam and Malaysia, the import and export turnover between the two countries has continuously increased over the years. Although currently Vietnam's main export products to the Malaysian market include machinery, equipment and spare parts; computer; electronics and components;... textile is one of the industry groups with the highest growth rate of export turnover in recent years.

For trade diversion, Australia, Brunei and Singapore have no diversion, only Malaysia has a positive value of 1,294 USD, and the remaining 10 countries all have negative diversion value - this means these countries would divert their importing from Vietnam to other nations. Japan is the country with the highest negative diversion value with more than 612 million USD, accounting for 72.95% of the total value created, followed by South Korea with more than 209 million USD and 24.94% of the total value.

The above data shows that there would be a big change from the time RCEP comes into force until the end of the tax-cutting roadmap. From 2021 onward, Japan, Korea and China have always been the top 3 countries in the total textile export turnover of Vietnam to the RCEP market. However, when the tax rate is reduced to 0% at the end of the route, these countries will redirect imports to other countries or import from their own partners in East Asia, making Vietnam's textile export South to these countries decrease and the deficit is higher than before.

Table 4: Trade Creation and Trade Diversion according to 04-digit HS

Unit: Thousand USD

HS Code	Trade creation effect	Proportion in the sum of trade creation effect	Trade diversion effect	Proportion in the sum of trade diversion effect	Total impact
6103	0,00	0,00%	-27.477,71	3,27%	-27.477,71
6104	0,00	0,00%	-63.488,15	7,56%	-63.488,15
6105	0,00	0,00%	-19.832,73	2,36%	-19.832,73
6106	0,00	0,00%	-24.343,05	2,90%	-24.343,05
6109	0,00	0,00%	-83.103,62	9,90%	-83.103,62
6110	0,00	0,00%	-153.308,22	18,26%	-153.308,22
6117	5,18	89,89%	-1.692,14	0,20%	-1.686,97
6203	0,00	0,00%	-79.713,73	9,50%	-79.713,73
6204	0,00	0,00%	-82.046,30	9,77%	-82.046,30
6211	0,33	5,68%	-60.177,80	7,17%	-60.177,48
6213	0,00	0,00%	-169,18	0,02%	-169,18
6214	0,00	0,00%	-145,00	0,02%	-145,00
6215	0,00	0,00%	-15,44	0,00%	-15,44
6217	0,26	4,43%	-1.349,20	0,16%	-1.348,94
Total	5,76	100,00%	-839.410,78	100,00%	-839.405,03

Source: Authors synthesized from SMART model results

Considering two particular effects based on the product code structure, the research results show the difference and uneven distribution of values. The only three product codes with commercial value are 6117, 6211 and 6217, all concentrated in Malaysia. In view of the diversion effect, no HS code presents a positive total value of redirecting into Vietnam. 6110, 6109 and 6204 are the 3 codes with the highest and lowest change of 6215, respectively.

Table 5: Trade Creation and Trade Diversion of HS 6110 (06-digit HS)

Unit: Thousand USD

HS Code	Trade creation effect	Trade diversion effect	Total impact
611011	0,00	-11.914,57	-11.914,57
611012	0,00	-2.644,28	-2.644,28
611019	0,00	-166,98	-166,98
611020	0,00	-62.868,25	-62.868,25
611030	0,00	-75.114,79	-75.114,79
611090	0,00	-599,35	-599,35
Total	0,00	-153.308,22	-153.308,22

Source: Authors synthesized from SMART model results

Considering six 06-digit subgroups under HS 6110, 611020 and 611030 dominate most of the diversion impact. 6110 always occupies a high position among export textile codes, and the fact that the value of this code also occupies the highest position shows that the member countries' demand for this item is very large.

With the tax cut, partners that previously imported Vietnamese goods have now found a cheaper source to redirect, no longer importing from Vietnam as before.

As the only country that has both creating and diverting effects for Vietnam in apparel trade, Malaysia is expected to be the most potential country in the future among Vietnam's textile exporting markets.

Table 6: Trade Creation and Trade Diversion Effect of particular commodity group

Unit: Thousand USD

HS Code	Trade Creation Effect			Trade Diversion Effect		
	Trade creation effect	Proportion in the sum of trade creation effect	Proportion in the total impact	Trade diversion effect	Proportion in the sum of trade diversion effect	Proportion in the total impact
6117	5,175	89,89%	91,27%	0,495	38,25%	8,73%
6211	0,327	5,68%	45,35%	0,394	30,45%	54,65%
6217	0,255	4,43%	38,64%	0,405	31,30%	61,36%
Total	5,757	100,00%	-	1,294	100,00%	-

Source: Authors synthesized from SMART model results

In terms of the impact of Malaysia's creating and diverting by product codes, the results from SMART show that there are only 3 product codes that can show non-zero values, they are 6117, 6211 and 6217. For the creation effect, code 6117 dominates with 89.89% of the total value created. As for the diversion effect, all 3 codes have a relatively even distribution, with 6117 still accounting for the highest proportion (38.25%). Thus, when the tax rate is reduced to 0%, textile exports from Vietnam to the RCEP market would decrease. The creation impact is not significant, concentrated in a few industry groups and only one country, Malaysia. The effect of trade diversion is clearly shown, but it is in the outward diversion, meaning that countries would shift from Vietnam's imports to other countries.

4.3. Discussion

According to the results obtained from the SMART model, when RCEP countries remove tariff barriers as committed, textile exports from Vietnam to this huge market would decrease to more than 839 million USD. This decline is analyzed based on two effects: Trade creation and Trade diversion. To explain these negative effects, the study focuses on three main reasons:

Firstly, before RCEP officially took effect, Vietnam has participated in many FTAs with partners in RCEP, including regional ones such as ATIGA. Therefore, the tax rate for textiles has long enjoyed a relatively low tax rate, even at 0% when exporting to these countries. When RCEP comes into force, the difference between the tax rates before and after taking effect is not as significant, leading to the change in turnover not being too large, compared to other countries that had to be subject to high tariffs (due to few FTAs or no preferences).

Secondly, when tax rates are reduced to 0%, competition in price increases and requires countries to improve their competitiveness in export products. However, the advantage of cheap labor is no longer a bright spot of Vietnam compared to neighboring countries such as Laos and Cambodia.

Thirdly, auxiliary materials for textiles are also subject to preferential tariffs, not just finished goods. This means that raw materials for the manufacturing process would be cheaper than before, making domestic prices more competitive than foreign imports.

5. CONCLUSION AND RECOMMENDATIONS

The findings of this study have a number of important implications for future practice. With the use of the SMART model, the results of the evaluation of the potential impact (ex-ante) of RCEP Agreement on Vietnam's exports of textiles indicate that RCEP will have a negative impact. With the total export turnover forecasted to decrease by more than 839 million USD, it is not expected that the Agreement will bring great benefits to textile exports. The above results also show many similarities with the observations of previous studies. Specifically, Petri and Plummer (2020) and Sheng Lu (2017) illustrate that RCEP will better enhance the trade power of the group of 03 countries in East Asia (Japan, China, Korea). This also helps explain why India withdrew from RCEP at the end of the negotiation process. At the same time, Alessandro Nicita (2021) also confirmed that trade diversion will prevail over creation, and that the negative diversion sometimes overwhelms.

One source of weakness in this study which could have affected the measurements of RCEP's impacts is that data used in this research must be interpreted with caution because it is only a simulation not taking into account many other factors in the economy although there are some similarities compared with previous studies. Therefore, in order to make good use of the incentives that RCEP will probably bring in the early stages of its validity, Vietnam needs to pay attention to the rules, regulations and barriers when exporting to this market.

Recommendations for state authorities

One possible implication of this is that the government needs to develop a suitable roadmap to effectively implement the commitments in RCEP. The increasing protectionism of the domestic industry of the importing country creates many challenges for Vietnam's exports. The dissemination and mastery of regulations, requirements and technical standards are all extremely important. Therefore, experts who are directly involved in the negotiations, who are familiar with RCEP can launch appropriate publications and issues related to the Agreement. The government and import-export management agencies play an important role in exporting goods in general and exporting textiles in particular. Customs procedures need to be simplified, clear and transparent. In addition, policy makers need to consider an appropriate legal environment to attract and encourage enterprises to pursue an environmentally-friendly export strategy. It is necessary to have policies that encourage exporters to have annual environmental reports and activities.

Recommendations for enterprises manufacturing and exporting textiles

Vietnam's export turnover will decrease and trade will be diverted according to the CJK effect. RCEP marginally set out to leverage to facilitate trade for developed countries and can negatively affect developing countries (Rashmi Banga et al, 2021). Therefore, greater efforts are needed to ensure Vietnamese businesses prioritize learning about related corporations coming from those countries to identify competitors and offer effective solutions to help businesses for mutual benefits after RCEP enters into effect.

Another important practical implication is that enterprises should be well-prepared for the competitive process by enhancing production capacity and investing in Research and Development activities to participate more deeply in the global value chain and maintain a competitive advantage. Additionally, businesses need to regularly review and update to be able to understand all the problems or pressures from the market to adjust the business strategy towards an environmentally friendly export strategy. Enterprises should follow regulations, join associations to liaise with both domestic and foreign businesses, and reduce information gaps between the states and businesses.

Recommendations for intermediate support structures

Associations play an important role in investigating the signed trade agreements and related regulations to quickly inform businesses of necessary content, helping businesses orient production and export. On the contrary, If difficulties and problems arise, they need to be summarized and proposed by the corporations to relevant Departments and Ministries. There is, therefore, a definite need for enterprises to be helped to solve exact problems with timely support. Associations as well as Trade Promotion Centers need to strengthen the role of supporting enterprises in trade promotion, international cooperation, investment or and joint ventures to create opportunities and cooperation between businesses.

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OUTWARD FOREIGN DIRECT INVESTMENT ACTIVITIES OF VIETNAMESE ENTERPRISES TO MEMBER COUNTRIES OF THE REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP (RCEP)

Author: Huynh Nguyen Vinh¹

Mentor: Le Son Dai

Abstract: *The Regional Comprehensive Economic Partnership (RCEP) came into force in early 2022 has marked an important transition for Vietnamese investors to have the opportunity to integrate deeply into these potential markets. In that context, outward foreign direct investment (OFDI) is really an ideal direction, compatible with the actual conditions in Vietnam to exploit the incentives that this agreement brings. This article aims to understand the current situation and discover factors promoting or hindering OFDI investment process of Vietnamese enterprises into 14 member countries from 2010-2021 within the RCEP Agreement. Through the application of panel data in FGLS model (Feasible Generalized Least Square), the empirical results show the scale of inward foreign direct investment (IFDI) from RCEP member countries into Vietnam, economic openness, labor productivity, natural resources, infrastructure, return on sales ratio, political stability and non-violence have positive impacts on encouraging Vietnamese enterprises to make OFDI investment in these markets, while the price level ratio of PPP conversion factor (GDP) to market exchange rate hinders this activity.*

Keywords: *OFDI, RCEP, Vietnamese enterprises, RCEP member countries, FGLS model*

1. INTRODUCTION

Outward Foreign Direct Investment (OFDI) is an important economic activity, creating a driving force for the sustainable development of countries in the globalization trend and deep integration into the world economy (Xiaolan et al., 2018; Jianing, 2022). OFDI helps to free up the available resources of each country (Dong et al., 2021). Thereby, enterprises participate in restructuring the global production networks by expanding and exploiting the potentials in the host-country markets, creating spillover effects among countries in the region and internationally (Changjun et al., 2019; Zhuang et al., 2021). In addition to bring in foreign currency revenue and contributing to the prosperity of the home country, nations also use OFDI as an efficacious approach to influence the host country in solving problems of economic and political benefits in favor of the home country (Chen et al., 2022). Businesses throughout the world are well aware of the power that OFDI brings, therefore, current OFDI activities are not only conducted from one side by developed countries but also by developing countries. In fact, capital outflows from developing nations continuously increased rapidly, accounting for 43% of international investment capital (UNCTAD, 2021). Therefore, developing country governments lay great emphasis on engaging in the negotiation of bilateral and multilateral trade facilitation agreements in order to support all domestic economic sectors to have the opportunity to fully promote their capacity in international markets.

The Regional Comprehensive Economic Partnership (RCEP) was formed with the aim of strengthening ASEAN's cooperation with China, South Korea, Japan, Australia, and New Zealand on the basis of promoting trade and investment in the region in an comprehensive way, for mutual benefits. The RCEP has been negotiated since 2012 and officially entered into force on January 1st, 2022. With the participation of 15 member countries, RCEP is a region with gross domestic product (GDP) of USD 26.2 trillion, accounting for nearly 30% of global GDP with the largest population in the world, over 2.2 billion people, about 30% of the world's population (Center for WTO&IntlTrade-VCCI, 2021). This proves that RCEP promises to bring a number of positive prospects in

¹ Foreign Trade University Ho Chi Minh City Campus: huynhnguyenvinh1911115609@ftu.edu.vn

solving problems of employment, technology transfer, strengthening production systems, sharing and utilizing available resources, thereby improving the region's supply chain networks (Dordi et al., 2018).

Therefore, OFDI is not only a driving force for businesses to expand their markets and seek efficiency in production, but also enhancing a country's competitiveness and ability to integrate into the global economy. In that context, the negotiation of trade facilitation agreements is an inevitable trend when opening up the economy, OFDI is really a suitable direction for practical conditions in Vietnam to exploit the potentials and incentives that these agreements bring. With members being important strategic partners, RCEP is promising to create many attractive incentives, attracting Vietnamese investors to implement OFDI projects. The competitive advantage will belong to businesses that know how to quickly seize this opportunity to penetrate deeply into these markets. However, the fact that RCEP has just been put into effect from the beginning of 2022 may generate certain hesitations for Vietnamese enterprises when conducting OFDI projects.

2. THEORETICAL FRAMEWORK

On the basis of summarizing theories related to OFDI and the current situation of OFDI from Vietnamese enterprises to internationally and RCEP over the past time, I propose a model to study factors affecting OFDI activities from Vietnamese enterprises, including:(1)Driving factors from the home country (Push Factors); (2)Factors attracting from host country (Pull Factors);(3)OFDI decisions are evaluated by 4 motives: market-seeking, resource-seeking, efficiency-seeking and strategic asset-seeking.

2.1. Push factors from the home country

Research on the factors promoting OFDI activities from the investor's side is diverse. Notably, the report of UNCTAD (2006) is a complete study, pointed out the impact aspects of four key factors in promoting OFDI from a developing country to international market:(1) Domestic macroeconomic market;(2) Cost of domestic production;(3) Institutional factors from home country government. Accordingly:

(1) Domestic macroeconomic factors:

Enterprises tend to actively promote OFDI activities abroad to seek new investment locations when they are hindered by small market size, disproportionate to their production capacity as well as the growing presence of domestic competitors (Piperopoulos et al., 2018). Additionally, for developing countries, the constraints of domestic market size as well as limited business expansion opportunities will motivate domestic firms to invest abroad (UNCTAD, 2006).

Hence, the scale and level of domestic market competition are factors that promote enterprises to invest directly abroad. According to Cai et al.(2019), in an economy with slow growth rate, while enterprises are holding many ownership advantages (strategic assets, financial capacity, management skills, technological innovation), businesses are inevitably forced to find a new market to be able to fully promote the economic potential they are holding. This makes expanding scope of operations to other countries be a proper solution to maximize profits by diversifying customer files, and to share risks instead of just relying on domestic market.

(2) Domestic production costs:

The production costs that cause enterprises to promote OFDI activities are reflected in two main aspects: The limitation and scarcity of resources, and the escalation of production costs in domestic market (Trinh Quang Hung, 2021). For countries with limited input materials, businesses are forced to import to carry out next production stages. However, this will not be cost-effective in the long run. Therefore, enterprises choose OFDI to invest directly in that country with abundant natural resources and reduce transportation costs. Chinese firms tend to focus on OFDI in mineral-rich markets, while those in Europe actively expand their investments into emerging markets to cut labor costs (Levitin et al., 2016).

Additionally, production costs also take into account infrastructure factors (Bersant et al., 2017). When domestic transportation and telecommunications expenditures increase, businesses tend to shift OFDI flows

to lower-cost markets to fulfill basic requirements for business operations. Especially, operating in a market with modern facilities will support businesses to cut down on initial investment spending, helping the production process become smooth at a reasonable cost.

(3) Institutional factors from the home country government

Economic openness level of home country will affect directly to domestic economic sectors in conducting OFDI (Bhasin, 2021). Thanks to the supporting policy packages, which create favorable conditions in trade and promoting investment, the government has opened a wide door for businesses to easily enter the international market.

In addition, the socio-political situation in home country is also essential in promoting OFDI. According to Chen et al.(2022), enterprises operate in an environment with a clear and stable institutional regime and legal framework to help them understand the mechanisms for outward investment smoothly, avoiding problems arising during the operation process. That not only supports domestic enterprises to confidently promote OFDI but also creates trust and peace of mind from host country in welcoming foreign investors.

2.2. Pull factors from the host country

Besides these push factors from the home country, the influencing factors from host country also play a crucial and decisive role in choosing where to conduct OFDI projects. Accordingly:

(1) The host-country market:

Businesses in their efforts to find the destination of OFDI capital flows tend to choose which countries have attractive environmental conditions to invest in (UNCTAD, 2020;Chen et al., 2021). The market with a wide consumption scale, large purchasing power, along with rapid GDP growth will be ideal conditions and have a significant impact on the strategy of choosing the location and estimate the initial investment capital to conduct OFDI projects in that country (Xiaoqing et al., 2020).

Moreover, indicators of macro-stability in host country, including foreign exchange management policy, exchange rate, and inflation act as catalysts to attract investors (Hossain et al., 2021). Investors boldly invest in their country when the information is transparent, which can help businesses build a suitable roadmap with company's expansion strategy (Behera et al., 2020).

(2) Production in the host country:

(i) Costs

In the process of carrying out OFDI activities in foreign markets, enterprises may face the burden of paying expenses related to input production costs such as wages, transportation charges, telecommunications infrastructure, project maintenance costs (Liu et al., 2020). Moreover, when operating a business in another country, investors also have to bear additional disadvantages due to additional costs stemming from geographical distance between two countries, cultural differences, or requirements of the host government. Hence, the cost factor in organizing OFDI in another market is an important criterion that businesses must consider carefully before making a decision on choosing an OFDI location. Therefore, countries with abundant, highly skilled labor resources, or reasonable transaction costs will prevail in attracting foreign investors.

(ii) Labor force

Investing in human factors is a long-term strategic direction when implementing OFDI projects in foreign markets (Ramasamy and Yeung, 2022). Labor is the subject of the production process, which is an important resource determining the feasibility and success of projects. Additionally, in the face of the current innovation requirements, the application of newly-emerging technology in the production process is an inevitable trend, requiring highly skilled and specialized workers to operate automatic production lines. Therefore, exploiting this qualified human resource in developed countries is a suitable direction for Vietnamese SMEs to minimize training costs.

(iii) Natural resources

Investment activities are currently focusing on fields with high intellectual content, gradually reducing dependence on natural conditions due to the depletion of resource reserves (Xiaolan et al., 2018). However, for some specific fields such as agro-forestry-fishery, mining, oil and gas, natural resources of host country are still a prerequisite and decisive for investors in the strategy of expanding their operating areas. Therefore, a country possessing abundant natural resources will naturally have an advantage over the rest in the race to attract OFDI flows from other countries.

(iv) Infrastructure

Infrastructure acts as a catalyst to help investment activities take place smoothly and this is considered a basic component to attract investors from abroad. According to Kumari (2018), infrastructure is divided into two main groups: physical group and social group. The physical group includes transportation systems, internet networks, telecommunications, the availability of financial channels, distribution channel systems, energy sources. And the social group is included in responding to service requests for the community including health, education and recreation systems. The fact that OFDI host countries own a quality and modern infrastructure system will help businesses reduce initial investment activities, optimize costs as well as shorten OFDI project implementation time.

(3) Political stability and the absence of violence in host countries

Political institutional factor of host country has a strong and direct impact on the orientation of OFDI’s operation (Chen et al., 2022). OFDI activities require a long-term investment process and therefore selecting a country with stable political regimes, clear regulations will have strategic implications for businesses (Muhammad, 2019). Operating within a stable legal framework will ensure that investors enjoy commitments from the host state in matters of foreign nationalization or investment incentives. As a result, the investor’s mentality becomes secure as well as actively avoid risks during the OFDI projects implementation.

In conclusion, to assess the impact of each different factor, I summarize factors related to OFDI activities of Vietnamese enterprises within RCEP framework. The details are shown in Figure 1.

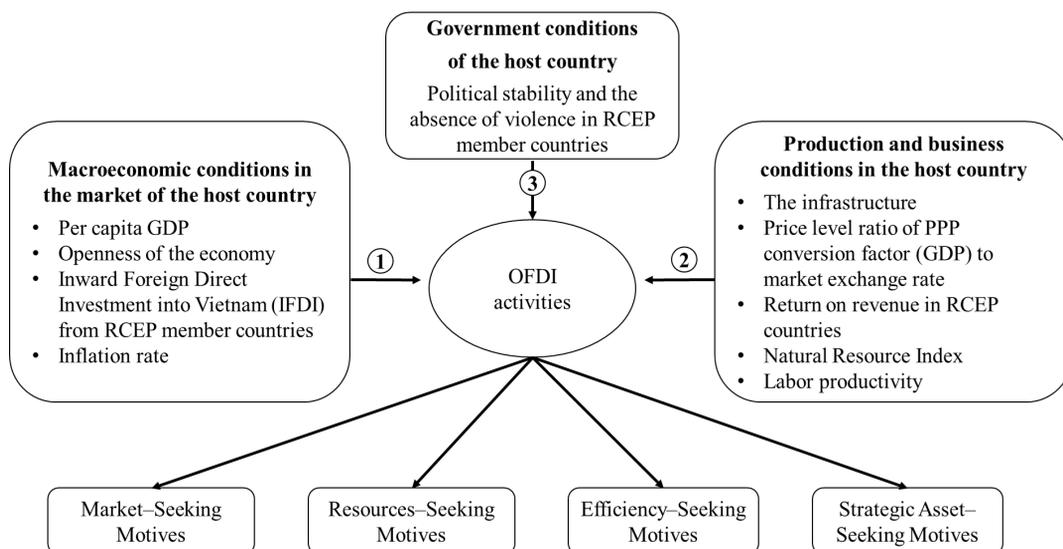


Figure 1. Theoretical model identifying factors affecting OFDI activities of Vietnamese enterprises to RCEP member countries

3. RESEARCH METHOD

- Descriptive statistics: On the basis of collected dataset, I interpret and consider the relationship and impact level of variables used in quantitative model.

- Quantitative research: Feasibility generalized least squares (FGLS) estimation is applied on the basis of overcoming defects and hypothesis violation of estimator models using panel data (Pooled OLS, FEM, REM) when analyzing the influence of each factor on OFDI investment activities of Vietnamese enterprises in 15 member countries.

- Data are collected from officially published data sources, including annual report on the size of Vietnam’s OFDI capital from Foreign Investment Agency - FIA (Ministry of Planning and Investment), Statistical Yearbook (General Statistics Office). Data on macro indicators of 15 countries receiving Vietnam’s investment are collected from the World Bank, Worldwide Governance Indicators (WGI) from 2010-2021, processed through STATA 14 software.

Table 1. Variable measurement

Abbrev.	Explanation	Expectation	References
Dependent variable			
InOFDI	Scale of Vietnam’s OFDI capital to RCEP, calculated by logarithm of Vietnam’s OFDI to these countries		Nguyen Binh Duong et al.(2019), Xiaolan et al.(2020), Chen et al.(2022)
Independent variables			
InPCGDP	GDP per capita, calculated by taking logarithm of GDP ratio of RCEP countries divided by the population of that country.	+	Author
tra	Economy openness, measured by total export-import output/GDP of RCEP countries. $tra_{it} = \frac{ex_{it} + im_{it}}{GDP_{it}}$ Inside: i: RCEP member countries (i = 1, ..., 14); t: time (t = 2010, ..., 2021).	+	Bhasin (2021), Chen et al.(2022)
InIFDI	The amount of inward foreign direct investment from RCEP into Vietnam, calculated by logarithm of IFDI Vietnam received from host countries.	+	Rosfadzimi et al.(2014)
inf	Inflation rate of RCEP countries.	-	Chen et al.(2022)
fac	Infrastructure, by proportion of individuals using Internet in RCEP.	+/-	Kumari (2018), Chen et al.(2022)
pri	Price level ratio of PPP conversion factor (GDP) to market exchange rate in RCEP.	-	Carmen Stoian (2013), Bhasin (2021)
ros	Return on revenue ratio in RCEP.	+	Nguyen Thi Ngoc Mai (2018)
nat	Natural resources, calculated by total reserves of oil, natural gas, coal, minerals and forest resources per GDP of RCEP.	+	Xiaolan (2018), Trinh Quang Hung (2021)
lab	Labor productivity, calculated as the number of workers over 15 divided by that country’s GDP.	+	Ramasamy and Yeung (2022)
pol	Political stability and absence of violence index in RCEP.	+/-	Author

Source: Author (2023)

4. RESULT AND DISCUSSION

4.1. Current situation of Vietnam’s OFDI activities to RCEP member countries from 2010 - 2021

4.1.1. Regarding investment location

According to FIA (2021), Vietnam has a total of 1,448 valid OFDI projects accumulated by 2021 with a total capital of over 20.9 billion USD. OFDI Vietnam’s activities to 14 RCEP member countries accounted for a significant proportion and played a leading role in international investment activities of Vietnam, 963 projects

were approved and licensed (accounting for 66.5% of total project) with a total registered capital of 11,569 billion USD (accounting for 55.4% of total capital scale). Particularly, in 2021 only, Vietnamese enterprises carried out 61 OFDI projects to RCEP countries with an implemented capital of over 409 million USD (up 29.8% over the same period). This is considered a positive sign in the efforts of Vietnamese enterprises to integrate deeply into RCEP member partners’ economies once this Agreement come into force.

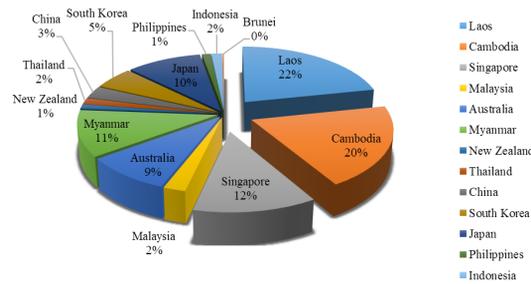


Figure 2. Statistics on the number of OFDI projects of Vietnamese enterprises to RCEP, accumulating valid projects until 31st Dec, 2021

Source: Author's data processing results from FIA (2022)

Figure 2 shows that Laos (209 projects, accounting for 21.7%), Cambodia (190 projects, accounting for 19.73%) and Singapore (118 projects, accounting for 12.25%) are three regions where Vietnamese enterprises conduct OFDI projects actively, accounting for 53.69% of total number of OFDI projects in Vietnam from 2010-2021. However, in terms of total registered capital of Vietnamese enterprises when conducting OFDI to 14 RCEP member countries (Figure 3), it can be seen that projects implemented in Singapore have a large number but the average scale of each project is still small (4,219 USD/project, accounting for about 4.3% of total registered capital). The reason is that Vietnamese SMEs are currently focusing on boosting FDI attraction from Singapore. With the number of valid projects reaching 2,959 with a scale of 69.86 Bil USD (accounting for 16.3% of Vietnam’s total FDI capital by the end of 2021), Singapore is the largest investment partner out of 139 countries investing in Vietnam (Center for WTO&Intl Trade-VCCI, 2022). On the other hand, most of Vietnam’s OFDI projects conducted abroad are focusing on fields that are mainly dependent on natural resources of host country such as mining, oil and gas (32.3% of OFDI Vietnam’s structure), agriculture-forestry-fishery (16%), while Singapore has no strengths in these areas and instead possesses advantages in other areas such as technology, electronics, banking, logistics, which are areas where Vietnamese SMEs are still in poverty of experience, management capacity, leading to the restriction in OFDI scale (FIA, 2021).

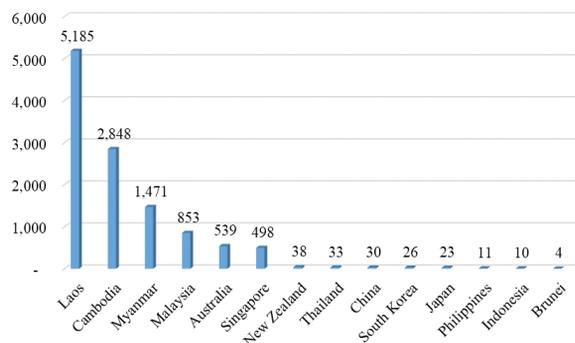


Figure 3. OFDI scale of Vietnamese enterprises to RCEP countries in 2010-2021

Unit: Million USD

Source: Author's data processing results from FIA(2022)

Meanwhile, Myanmar is considered the third-largest market in attracting Vietnamese investors to conduct OFDI, reaching 108 projects with the registered capital of 1,470.57 million USD, accounting for 12.71% of Vietnam's total OFDI capital. Thus, Vietnam's OFDI projects to RCEP in 2010 - 2021 mostly focus on three main markets, namely Laos, Cambodia and Myanmar, and have achieved some encouraging results from a number of pioneering Vietnamese enterprises in the trend of promoting Vietnam's OFDI flows such as Viettel, Vinamilk, Hoang Anh Gia Lai. Reasons explaining these choice of location: **Firstly**, these countries are located in favorable locations, having borders with Vietnam, so it simplifies the movement and transaction process, saving time and investment costs. Particularly, these are neighboring countries with a culture relatively close to Vietnam, so it minimizes disagreements that may arise during OFDI projects, ensuring timely completion. **Secondly**, these countries possess abundant natural resources (land, minerals, forests) along with a cheap labor force while lacking financial capacity and modern technological equipment. Therefore, these resources seem to have not been fully utilized, which are the ideal conditions suitable for Vietnamese enterprises' strengths. **Thirdly**, with the support from the home-country government, OFDI activities of Vietnamese enterprises are deployed smoothly thanks to preferential policies and investment incentives, thereby, bringing them both production efficiency while contributing to efforts to improve the quality of local residents' lives in host country.

4.1.2. Regarding investment stage

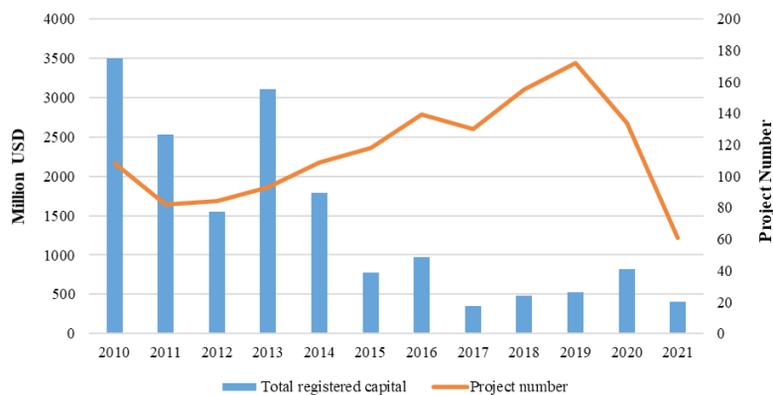


Figure 4. Current situation of Vietnamese OFDI projects to RCEP member countries in 2010-2021

Source: Author's data processing results from GSO (2021), FIA (2022)

Figure 4 shows the implementation of OFDI investment by Vietnamese enterprises to RCEP from 2010 to 2021, which is divided into two phases, specifically:

For the 2010-2016 period: The number of projects, in general, tends to increase steadily. Although the number of projects in the early part of this period decreased significantly, from 108 OFDI projects in 2010 down to 82 projects that were licensed until 2011 (a 24.07% decrease in the number of projects over the same period). However, from 2012 onwards, the number of OFDI projects from Vietnam to RCEP members has increased continuously and peaked in 2016 with a total of 139 OFDI projects implemented (increasing 69.51% compared to 2011). The explanation for this decline in 2010 and 2011 is that Vietnam's economy have suffered heavy consequences due to the impact of the post-world financial crisis and the global economic recession in 2007-2009, causing economic sectors, especially in developing and underdeveloped countries, to struggle and recover. In addition, the total registered OFDI capital of Vietnamese enterprises in this period witnessed strong and unstable fluctuations, peaking in 2010 at 3,503 million USD and falling to the lowest

level in 2015 with 774.8 million USD of OFDI registered capital. The reason for this phenomenon is that in the trend of increasing international integration, the Vietnamese government has issued a series of regulations to encourage SMEs, typically the Investment Law 2005, Decision 236/QD-Circular in 2009 to promote OFDI implementation of Vietnamese enterprises, Decree 83/2015/DN-CP controls the procedures of OFDI activities. However, most of the projects implemented during this period focused on sectors requiring large-scale capital (mining, oil and gas, hydropower, telecommunications) and the majority of OFDI enterprises during this period were state-owned, while the domestic economy faced many challenges due to the influence of global situation, so investment resources have not been balanced over the years.

For the 2016-2021 period: This period witnessed two opposing trends in both the number of OFDI projects and the total registered capital. Specifically, in the first half of this period (from 2016-2019), although there was a slight decline in the previous 2 years, at the end of 2016 and 2017 due to the influence of China’s deceleration and economic downturn in Japan, are considered the two most promising markets in RCEP, but since 2017 (130 projects with 350.1 million USD of registered capital) there has been a remarkable growth and achieved an all-time high in 2019 with 172 valid OFDI projects (up 32.3% compared to 2017) and 528.8 million USD disbursed (up 51.04% compared to 2017).

However, entering the second half of this period (from 2019-2021), Vietnam witnessed a serious decline in both the number of projects and the capital scale. Specifically, from the peak of 172 projects in 2019 to 2021, only 61 OFDI projects were licensed to implement (down 64.5%) with 409 million USD registered for investment by Vietnamese enterprises (down 50.1% compared to 2019). The key reason for this situation is the serious consequences of Covid-19 pandemic, the disruption in supply chain due to social distancing, and the remnants left over until the post-Covid-19 era, which have created causing certain negative consequences, especially serious to the economic pillars of Vietnam and causing SMEs to scale down OFDI projects to focus their resources on restoring the domestic economy.

4.1.3. Regarding investment field

Table 2. Current situation of Vietnamese OFDI activities to RCEP by sector in 2010-2021

No.	Field	Number of new projects	Total registered capital (Mil USD)	Proportion (%)
1	Oil and gas exploration	59	6.758,463	32,33
2	Agriculture-Forestry-Fisheries	118	3.343,923	16
3	Mass communication	145	2.668,009	12,76
4	Electricity, gas, water, air conditioning	9	1.579,124	7,55
5	Manufacturing Industry	143	1.424,876	6,82
6	Art	9	1.016,921	4,86
7	Real estate	52	932.753	4,46
8	Banking, insurance	27	929.286	4,45
9	Invention of technology and science	87	870.263	4,16
10	Retail business	420	757.501	3,62
11	Travel services, restaurants	85	269.679	1,29
12	Other services	64	93.715	0,45
13	Administration, public service	57	92.054	0,44
14	Logistics	44	74.466	0,36

15	Project design	105	68.559	0,33
16	Public Health	8	18.070	0,09
17	Education	15	7.168	0,03
18	Water, waste treatment	1	0.5	0,004
Total		1.448	20.905,336	100

Source: Author's data processing results from FIA (2022)

Table 2 shows that Vietnamese OFDI activities to RCEP countries have increased significantly through diversity in industries and investment fields. Accordingly, OFDI implementation has been expanded from 10 fields in 2000-2010 to 18 fields since 2010 (up 44%). In terms of the number of investment projects, wholesale and retail activities witnessed outstanding growth with 420 projects, accounting for nearly one-third of the total 1,448 licensed projects valid by the end of 2021. In addition, the information and communication industry (145 projects, accounting for 10.01%), processing industry (143 projects, reaching 9.87%), and agriculture-forestry-fishery (118 projects, reaching 8.15%) are the three most active investment sectors of Vietnamese enterprises in these markets. In terms of investment capital scale, mining ranked first with 59 projects with a total capital of 6,758.46 million USD, accounting for 32.33% of Vietnam's OFDI capital structure to RCEP in 2010-2021. Next are the fields with the strengths of Vietnamese investors in agriculture-forestry-fishery (16%), telecommunications (12.76%). In addition to these traditional sectors that require a long investment period, Vietnamese SMEs also confidently redirect OFDI investment to new industries that contain more risks such as real estate (4.46%), banking (4.45%). Particularly, Vietnamese SMEs tend to focus on fields requiring high professional qualifications and intellectual content like manufacturing industry (6.82%), professional and scientific research (4.16%). Besides helping Vietnamese SMEs to make full use of strategic assets that they own, this is also a direction to create more added value while improving the quality of OFDI projects for Vietnamese investors.

4.3.4. Regression model selection test

Table 3. Regression results of factors affecting OFDI activities of Vietnamese enterprises to RCEP member countries

Model	(1)	(2)	(3)
Variable	lnOFDI	lnOFDI	lnOFDI
lnPCGDP	-0.5836 (-1.01)	3.8169*** (5.00)	-0.5836 (-1.01)
tra	0.0030 (1.46)	-0.0134*** (-2.70)	0.00303 (1.46)
lnIFDI	0.4693*** (3.91)	-0.1574 (-0.66)	0.4693*** (3.91)
inf	-0.0191 (-0.44)	0.0254 (1.00)	-0.0191 (-0.44)
fac	0.0174* (1.83)	-0.0157* (-1.92)	0.0174* (1.83)
pri	-0.9609 (-1.00)	-4.5105*** (-5.78)	-0.9609 (-1.00)
ros	0.0641*** (4.15)	-0.0261 (-1.36)	0.0641*** (4.15)
nat	0.2566*** (4.75)	0.1104*** (2.69)	0.257*** (4.75)

Model	(1)	(2)	(3)
Variable	lnOFDI	lnOFDI	lnOFDI
lab	157.8837*** (6.40)	51.4402 (1.40)	157.9*** (6.40)
pol	0.0459*** (3.69)	0.0169 (1.14)	0.0459*** (3.69)
Constant	-1.8820 (-0.46)	-26.3782*** (-4.23)	-1.882 (-0.46)
Observations	801	801	801
R-squared	0.8627	0.6159	0.8627

Standard deviation values in parentheses

*(***) 1% significance level, (**) 5% significance level, (*) 10% significance level*

Source: Author (2023)

Table 3 shows the results of regression models that I use to estimate: (1) Pooled OLS regression model; (2) Fixed-effects model (FEM); (3) Random effects model (REM). Accordingly, the independent variables in Pooled OLS explain 86.3% of the variation of OFDI capital flows from Vietnamese SMEs to RCEP countries ($R^2=0.863$). However, this Pooled OLS estimate does not show whether or not there is a (random/fixed) impact of individual RCEP country characteristics, e.g. each country’s legal institutions, geographical distance to this activity. Therefore, I use F-test to see if there is a fixed influence of these differentiating factors from RCEP countries to Vietnam’s OFDI activity and this will be the basis for deciding whether to choose Pooled OLS or FEM. The test result receives $\text{Prob}>F=0.0001 < 5\%$, so H_0 : “The Pooled OLS model is suitable” was rejected, which means FEM is selected in this case at a significance of 5% (Appendix 04).

Next, I carried out Breusch - Pagan Lagrangian test to examine the suitability of REM compared to PooledOLS and found that REM model was consistent with a 95% confidence interval (Appendix 05). Therefore, Pooled OLS model is not recommended after comparing both cases. Following this, I used Hausman test to choose FEM or REM. The result is $\text{Prob}>\chi^2=0.0000$, which means that FEM is consistent with research data at 95% confidence interval (Appendix 06).

After that, I performed tests to check the compliance with the assumptions of FEM model, including (1) Autocorrelation test and (2) Heteroskedasticity test:

(1) Autocorrelation occurs when random errors in regression model using panel data correlate with each other, i.e. violate the assumption $\text{Cov}(u_i, u_j) = 0$. Although the estimated result is unbiased linearity but autocorrelation falsifies the t-Student and F-test values, leading to unreliable regression results (Nguyen Quang Dong, 2012). Therefore, I used Wooldridge test to detect autocorrelation in FEM model. The test results show that $\text{Prob}>F=0.0001 < \alpha=5\%$, the conclusion rejects hypothesis H_0 (H_0 : The model does not have autocorrelation), means FEM appears autocorrelation at 5% significance level (Appendix 7).

(2) The classical linear regression model assumes that the variance of random errors is constant. The model’s violation of this assumption causes statistical inference of regression parameters based on the t and F distributions with low confidence. Thus, I used Breusch-Pagan to examine whether FEM has heteroskedasticity. The results showed $\text{Prob}>\chi^2=0.0000 < \alpha=5\%$, which means that this model has heteroskedasticity at 5% significance level (Appendix 8).

4.3.5. Regression model results

FEM model appears simultaneously with both defects as heteroskedasticity and autocorrelation through Modified Wald, Wooldridge tests at 5% significance level. Thus, Feasible Generalized Least Squares (FGLS) estimation is recommended tool to fix these defects on the basis of recalculation and increase statistical inference reliability of regression parameters.

Table 4. Estimation results of FGLS model of factors affecting OFDI activities of Vietnamese enterprises to RCEP

Model	FGLS	Model	FGLS
Variable	lnOFDI	Variable	lnOFDI
lnPCGDP	0.0348 (0.08)	ros	0.0707*** (5.88)
tra	0.00286* (1.92)	nat	0.2509*** (6.18)
lnIFDI	0.4485*** (5.12)	lab	198.2*** (10.04)
inf	-0.000474 (-0.01)	pol	0.0323*** (3.40)
fac	0.0245*** (3.19)	Constant	-7.411*** (-2.58)
pri	-1.6982*** (-2.70)	Observations	801
		R-squared	0.6159

Standard deviation values in parentheses

*(***) 1% significance level, (**) 5% significance level, (*) 10% significance level*

Source: Author (2023)

The Wald Chi2 test in FGLS model (Appendix 9) gives the result Prob>chi2=0.0000, which proves that the model estimated in this study has completely overcome all defects and has a high degree of suitability at a 5% significance level.

4.4. Discussion

Labor productivity has the strongest influence in encouraging Vietnamese investors to carry out OFDI to RCEP markets. This is explained by the fact that Vietnam’s OFDI projects in 2010-2021 mostly focus on labor-intensive fields, requiring an abundant human resources to be able to conduct production, e.g. mining, oil and gas (32.3%), agro-forestry-fishery (16%), processing-manufacturing industry (6.82%) (FIA, 2021). Therefore, the more countries possess rich labor force, the more motivated Vietnamese investors will be to carry out OFDI in these countries. Particularly, China, Cambodia, and Indonesia are top-three potential markets that Vietnamese enterprises are focusing on exploiting in the race of cutting labor costs. Moreover, besides the quantity requirements, the workforce’s quality is also prioritized to consider because businesses are struggling with innovation requirements in the context of the explosion of industrial revolutions. Currently, Vietnamese enterprises redirect their investment to industries that require high technology application to increase labor productivity. This requires a high level of knowledge about host-country workforce. Thus, countries possessing skilled and high-performing labor force will be prioritized by Vietnamese SMEs to consider as destination of OFDI flow.

Natural resource in RCEP member countries also had a significant influence on implementing OFDI from Vietnam at a 1% significance level. Vietnamese enterprises invest in foreign markets to seek production

efficiency by taking advantage of available natural conditions in host country to promote their strengths. The reason comes from investment fields' characteristics are highly dependent on natural resources such as oil and gas, land for growing industrial crops, and hydropower. Meanwhile, domestic production faces many difficulties due to the limited resources while the number of enterprises operating in these industries is continuously increasing, putting great pressure on some Vietnamese enterprises. Thus, OFDI is a proper solution for them to seek production efficiency in foreign markets. As a result, countries with rich resources such as Laos, Brunei, and Australia will attract Vietnamese investors. However, natural resources serve as a national treasure that is valuable asset of an economy, so countries are acutely aware of the urgency in tightening the conservation of their own resources. This process will place certain barriers and restrictions on foreign investors operating in these industries (Seyfettin, 2021). Thus, Vietnamese SMEs need to actively develop appropriate investment diversion plans in the near future.

Meanwhile, infrastructure of RCEP countries has a positive impact on attracting Vietnam's OFDI flows to these markets at 1% significance level. This result is considered a new finding of this study because it is in stark contrast to the previous conclusions when studying Vietnam's OFDI capital flows. While Nguyen Thi Ngoc Mai (2018) said that this factor had no impact, Trinh Quang Hung (2021) argued that infrastructure has a negative impact, causing OFDI Vietnam's investment to decline. Specifically, when increasing infrastructure costs by 1%, Vietnamese SMEs' OFDI decreased by 0.03% provided that other factors were fixed. The basis for these authors to make such a judgment is due to the fact that Vietnamese SMEs currently account for the majority of Vietnam's economy, more than 98% (GSO, 2022), leading to investment in developed economies such as Australia, Japan, Singapore will create a large cost burden for Vietnamese SMEs. On the other hand, some authors also stated that Vietnamese enterprises' capacity is still weak, so it is just suitable for countries with similar qualifications such as Cambodia, Laos and Myanmar. However, this study found that developed economies with modern infrastructure are Vietnamese SMEs' choice when investing in RCEP. The reason is that under the government's recent policy of promoting investment in the international market, the strengthening of cooperation between Vietnam and other countries helps SMEs enjoy much preferential treatment from these policies. Therefore, financial issues are no longer a decisive factor in the investment. Instead, Vietnamese SMEs currently go abroad to seek strategic assets of host country, and recent investment areas have witnessed a significant increase in the high technology application in accordance with the trend of the industrial revolution 4.0. Therefore, a market with adequate infrastructure, especially developed countries in RCEP such as Japan, Korea, Australia will create favorable conditions for Vietnamese enterprises to cut initial investment activities, optimize costs and shorten OFDI project implementation time.

The regression coefficient of IFDI from RCEP into Vietnam has a positive value, implying that this factor has a positive influence in promoting Vietnam's OFDI back to those that invest at a 1% significance level. When the amount of IFDI capital received by Vietnam increases by 1%, it will lead to an increase of 0.45% in Vietnam's OFDI outflows. The reason is that when an economy receives IFDI inflows from another country, it will create proper conditions for domestic supporting industries to have the opportunity to be developed to stimulate the production process take place quickly. Thereby, encouraging domestic enterprises to promote outward investment in production networks. In addition, the return on revenue ratio in RCEP also affects the encouragement of OFDI investment from Vietnam at a 1% significance level. By promoting the internal advantages, most parent companies in Vietnam will gradually shift and replace external transactions to save costs and operate safely. Furthermore, RCEP countries have enhanced linkages in the regional production network by establishing subsidiaries in member countries of MNCs Korea, Japan, and Singapore. Moreover, tariff barriers tend to be removed when participating in international integration, causing the Corporate Incomes Tax (CIT) rate to gradually decrease, encouraging Vietnamese investors to increase investment activities in this region.

The stable political situation and absence of violence in RCEP have positive implications for promoting Vietnamese OFDI investment at a 1% significance level. OFDI activities require a long investment process and this is closely related to risk-taking ability of investors when deploying projects abroad. In fact, investment flows from Vietnam tend to be limited into countries where war and terrorism take place with high frequency as well as low political stability index like Myanmar (9.91%), Thailand (13.27%), Indonesia (24.76%) (WGI, 2021). These are places where Vietnamese SMEs will be more disadvantaged because of potential risks due to institutional distance between two countries as well as understanding host country's market restricted than domestic investment (Tran Hoai Nam, 2021). Therefore, countries with stable political regime and transparent legal regulations will have strategic implications for businesses. In addition, the results also show that economic openness of RCEP countries has a positive influence on the increase of OFDI sources from Vietnam to this region. When the host state creates an open investment environment by reducing administrative procedures and increasing preferential policies, it will support enterprises easily access deeper into partner country market. However, this result is true at the significance level of 10%, which implies that when joining RCEP, countries have been obliged to make commitments to promote investment promotion in the region extensively in accordance with the goals of RCEP agreement, so member countries have basically created an open mechanism to welcome investors and ensure the implementation of preferential regimes. Therefore, although this factor has a positive impact, its role does not have a significant impact on OFDI by Vietnamese SMEs at this stage.

In contrast, price level ratio of PPP conversion factor (GDP) to market exchange rate in RCEP markets negatively affects Vietnam's OFDI capital flows at 1% significance level. The reason for this situation is the conversion of local currency into USD is mainly for the disbursement of projects while USD/VND exchange rate fluctuates strongly and tends to increase frequently (on average 1.5% to 2%/year), causing Vietnamese investors to spend more local currency in exchange for foreign currency (Truong Van Phuoc, 2022). This will cause great barriers for Vietnamese SMEs with limited capital, especially in the post-Covid-19 recovery period when implementing OFDI projects. In addition, the size of GDP/person in RCEP does not affect OFDI flows of Vietnamese SMEs at 10% significance level. This result also agrees with Chen (2022) when saying that investors from developing countries invest overseas, the search for economies of scale and output optimization will depend on the characteristics of different organizational structures in each business when possessing different capabilities and strategies. Additionally, this study also found that inflation is not statistically significant at 10%, implying that this factor does not affect the decision to conduct OFDI from Vietnam to RCEP region. Since inflation causes distortions in relative prices, some investors cannot be wise in the decision-making process to carry out OFDI activities.

5. CONCLUSION

In current context, participating in trade facilitation agreements is an inevitable trend when opening up the economy, OFDI is strategic orientation compatible with actual conditions in Vietnam to exploit incentives that these agreements bring. Therefore, this study has outlined an overview, contributing to changing the perspective of business executives in conducting OFDI projects from a developing country as well as minimizing hesitations in the early-stage of this agreement application.

By proposing panel data regression model, I quantified the impact level of factors on OFDI activities of Vietnamese enterprises in RCEP from 2010–2021. The discussion analysis helped concretize the meaning of quantitative analysis and shortening the gap in previous research. Moreover, this study has discovered some new findings compared to previous research, e.g infrastructure factor that has a positive impact on attracting OFDI investment flows from Vietnam. Besides the characteristics of host country that has positive implications for OFDI activities, including openness of economy, and the amount of IFDI flows Vietnam receives from RCEP, this activity is also subject to the influence of the group of factors about production

and business conditions, including infrastructure, price index converted at market exchange rates, return on revenue ratio, natural resources, labor productivity along with the group of factors from host-country government as shown in the index of political stability and absence of violence. Thereby, Vietnamese enterprises need to show a proactive spirit and promote their internal strengths on the basis of combining efforts from the government to maximize benefits brought by this agreement. Since then, Vietnamese enterprises can grow and affirm their position in the process of deep integration into RCEP markets.

APPENDIX

Appendix 1. Statistics of variables used in quantitative models

Variable	Obs	Mean	Std. Dev.	Min	Max
Countries	1680	7.5	4.04318	1	14
Year	1680	2015.5	3.462373	2010	2021
OFDI	1600	708.5745	1338.405	1.5	5273.9
PCGDP	1680	21518.26	21398.5	746.9454	72794
tra	1610	95.39279	79.22661	11.8554	379.0986
IFDI	1610	12292.75	18907.64	52.2	78501.2
inf	1680	2.503985	3.929946	-17.6128	20.18051
fac	1510	56.77221	30.22933	.25	96.50506
pri	1680	.5971839	.3124782	.2522982	1.588075
ros	1180	35.70669	14.96144	7.563448	65.85269
nat	1540	4.544818	5.907772	.0001614	29.88731
pol	1540	54.17734	30.53138	5.21327	99.52381
lnOFDI	1310	4.655027	2.266614	.9555115	8.570525
lnPCGDP	1680	9.207413	1.411045	6.615992	11.19539
lnIFDI	1420	7.933769	2.270856	3.981549	11.27087

Appendix 2. Matrix of correlation coefficients

	lnOFDI	lnPCGDP	tra	lnIFDI	inf	fac	pri	ros	nat	lab	pol
lnOFDI	1.0000										
lnPCGDP	0.1197	1.0000									
tra	0.3626	0.3249	1.0000								
lnIFDI	0.0549	0.3602	0.5081	1.0000							
inf	-0.1226	-0.3267	-0.2516	-0.3393	1.0000						
fac	0.1742	0.8564	0.1949	0.4218	-0.4879	1.0000					
pri	0.0147	0.7864	-0.1686	-0.0993	-0.1255	0.6161	1.0000				
ros	0.2882	0.4791	-0.2069	-0.2750	-0.0522	0.3721	0.6013	1.0000			
nat	0.3915	-0.1872	-0.3306	-0.2098	0.3862	-0.2321	0.0179	0.5206	1.0000		
lab	0.1899	-0.7857	-0.1432	-0.4895	0.2186	-0.7067	-0.5046	-0.4515	0.0305	1.0000	
pol	0.3650	0.8608	0.4017	0.0708	-0.2720	0.7569	0.6931	0.4241	-0.2044	-0.4630	1.0000

Appendix 3. Multicollinearity test using variance inflation factor

Variable	VIF	1/VIF
fac	6.87	0.145606
lab	6.27	0.159390
pol	5.59	0.178758
pri	4.23	0.236582
lnIFDI	3.54	0.282342
lnPCGDP	3.02	0.331625
ros	2.80	0.357189
tra	1.70	0.589142
inf	1.25	0.801767
nat	1.13	0.883961
Mean VIF	3.64	

Appendix 4. Results of f-test to choose Pooled OLS or FEM model

Wooldridge test for autocorrelation in panel data
 H0: no first-order autocorrelation
 $F(1, 8) = 57.673$
 Prob > F = 0.0001

Appendix 5. Breusch – pagan lagrangian test results to consider the suitability of REM compared with Pooled OLS model

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
 H0: Constant variance
 Variables: fitted values of lnOFDI

 $\chi^2(1) = 2.18$
 Prob > $\chi^2 = 0.1401$

Appendix 6. Hausman test results to choose FEM or REM models

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
lnPCGDP	3.816874	-.583599	4.400473	.4954877
tra	-.0134097	.0030254	-.016435	.0045131
lnIFDI	-.1573651	.4692862	-.6266513	.2064275
inf	.025405	-.0191396	.0445445	.
fac	-.0157485	.0174138	-.0331624	.
pri	-4.510508	-.9608889	-3.549619	.
ros	-.0260744	.0641155	-.0901899	.0113335
nat	.1104449	.2565526	-.1461078	.
lab	51.44019	157.8837	-106.4435	27.21924
pol	.0169466	.0459963	-.0290497	.0081095

b = consistent under H0 and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under H0; obtained from xtreg

Test: H0: difference in coefficients not systematic

$\chi^2(10) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$
 = 127.61
 Prob> $\chi^2 = 0.0000$
 (V_b-V_B is not positive definite)

Appendix 6. Autocorrelation test results in FEM model

Wooldridge test for autocorrelation in panel data
 H0: no first-order autocorrelation
 $F(1, 8) = 57.673$
 Prob > F = 0.0001

Appendix 7. The results of heteroskedasticity test in FEM model

Modified Wald test for groupwise heteroskedasticity
 in fixed effect regression model

 H0: $\sigma(i)^2 = \sigma^2$ for all i

 $\chi^2(10) = 853.55$
 Prob> $\chi^2 = 0.0000$

Appendix 9. Wald Chi2 test results in FGLS model

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares
 Panels: heteroskedastic
 Correlation: no autocorrelation
 Modified Wald test for groupwise heteroskedasticity
 in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (10) = 831.15
 Prob>chi2 = 0.0000

Appendix 10. Compare the statistical results of models using in this study

. esttab pool fe re fgls, r2 star(* 0.1 ** 0.05 *** 0.01)				
	(1)	(2)	(3)	(4)
	lnOFDI	lnOFDI	lnOFDI	lnOFDI
lnPCGDP	-0.584 (-1.01)	3.817*** (5.00)	-0.584 (-1.01)	0.0348 (0.08)
tra	0.00303 (1.46)	-0.0134*** (-2.70)	0.00303 (1.46)	0.00286* (1.92)
lnIFDI	0.469*** (3.91)	-0.157 (-0.66)	0.469*** (3.91)	0.449*** (5.12)
inf	-0.0191 (-0.44)	0.0254 (1.00)	-0.0191 (-0.44)	-0.000474 (-0.01)
fac	0.0174* (1.83)	-0.0157* (-1.92)	0.0174* (1.83)	0.0245*** (3.19)
pri	-0.961 (-1.00)	-4.511*** (-5.78)	-0.961 (-1.00)	-1.698*** (-2.70)
ros	0.0641*** (4.15)	-0.0261 (-1.36)	0.0641*** (4.15)	0.0707*** (5.88)
nat	0.257*** (4.75)	0.110*** (2.69)	0.257*** (4.75)	0.251*** (6.18)
lab	157.9*** (6.40)	51.44 (1.40)	157.9*** (6.40)	198.2*** (10.04)
pol	0.0460*** (3.69)	0.0169 (1.14)	0.0460*** (3.69)	0.0323*** (3.40)
_cons	-1.882 (-0.46)	-26.38*** (-4.23)	-1.882 (-0.46)	-7.411*** (-2.58)
N	801	801	801	801
R-sq	0.863	0.616		
t statistics in parentheses * p<0.1, ** p<0.05, *** p<0.01				

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EFFECTS OF ICT DEVELOPMENT ON ECONOMIC GROWTH: AN EMPIRICAL STUDY OF DEVELOPING COUNTRIES

**Author: Nguyen Duong Viet Anh¹, Nguyen Thuy Trang², Nguyen Ngoc Thao Huong²
Mentor: Pham Xuan Truong³**

ABSTRACT: *This paper aims to analyze effects of ICT development on economic growth in developing countries. By using the sample of 44 developing nations and the pool mean group (PMG) estimator, the effects of ICT factors (mobile cellular, fixed broadband, fixed telephone, and internet) were evaluated not only on the whole sample but also on different groups of countries by regions and income levels. Results show that, while all ICT variables have positive long-run effects on economic growth, the short-term effects are still controversial under different circumstances. From research results, we give further discussion and policy recommendations for developing countries to develop and apply ICT in economic aspects.*

Keywords: *ICT development, Economic growth, Developing countries*

1. INTRODUCTION

Theoretically, ICT and economic growth have a strong association, as demonstrated by neoclassical ideas (Solow, 1956; Schumpeter, 1994). According to these views, ICT contributes to the economic supply as capital and enhances the production process by increasing prosperity, advancing technology, and improving the quality of the labor force. ICT is expected to create added values for enterprises and sectors, as well as to promote economic growth at the national level (Aghaei and Rezagholizadeh, 2017; Bahrini and Qaffas, 2019; Adeleye and Eboagu, 2019; Cheng *et al.*, 2021; Appiah-Otoo and Song, 2021). Practically, ICT has the ability to extend accessibility to the population in developing countries that lives outside of ICT networks; increase access to more advanced ICT services; and improve service delivery by the new ICT infrastructure, then contributes to economic aspects.

Since the 21st century, studies have concentrated on researching the impacts of ICT on economic growth, especially at the cross-country level due to the growing significance of ICT and the ways in which it is changing the world. However, not many studies on developing countries have thoroughly examined how ICT elements affect economic growth. Several earlier research that concentrated on developing nations used cross-country data and various econometric models to perform empirical studies to explore the connection between ICT diffusion and economic growth (Aghaei and Rezagholizadeh, 2017; Bahrini and Qaffas, 2019; Hussain *et al.*, 2021). Many studies still provided unclear results, and there were debates among academics about the issue of whether ICT spread in the setting of developing countries had a large growth-enhancing effect. As a result, further research into this matter is still possible as not many studies have fully analyzed how ICT factors contribute to economic growth, especially in developing nations. Also, by the updated data of developed economies, the authors expect to clarify results of ICT on economic growth.

In acknowledgment of ICT's importance in developing economies, we choose the topic "Effects of ICT development on developing countries' economic growth". This topic is expected to analyze the

¹ Foreign Trade University, Email: dgvietanhnguyen@gmail.com

² Foreign Trade University.

³ Foreign Trade University, Email: truongpx@ftu.edu.vn

impacts of ICT Development on Economic Growth in developing countries, then give policy implications for countries to develop ICT aspects and apply them in economic activities.

2. THEORETICAL FRAMEWORK

2.1. Definitions

2.1.1. ICT development

The term “Information and Communication Technologies” (ICT) is defined as a diverse set of technological tools and resources used to transmit, store, create, share, and exchange information (UNESCO, 2009). Computers, the Internet (websites, blogs, and emails), live broadcasting technologies (radio, television, and webcasting), recorded broadcasting technologies (podcasting, audio and video players, and storage devices), and telephony (fixed or mobile, satellite, vision/video-conferencing, and so on) are examples of these technological tools and resources. From this definition, it can be understood that ICT covers all advanced resources, tools and equipment that help to send information. More simply, “ICT” refers to the blend of manufacturing and service industries that electronically capture, transmit, and display data and information (OECD, 2002). In general, ICT is understood as capital and infrastructure aspects.

ITU (2017) defined measurement of ICT development: ICT access – reflecting the level of networked infrastructure and access to ICTs; ICT use – reflecting the level of use of ICTs in the society; and ICT skills – reflecting the outcomes of more efficient and effective ICT use. The sub-components of these stages are given in the Table 1.

Table 1. ICT development measurement

ICT measurement	Indicators
ICT access	Fixed-telephone subscriptions
	Mobile-cellular telephone subscriptions
	International Internet bandwidth per Internet user
	Households with a computer
	Households with Internet access
ICT use	Individuals using the Internet
	Fixed-broadband subscriptions
	Mobile-broadband subscriptions
ICT skills	Mean years of schooling
	Gross secondary enrolment
	Gross tertiary enrolment

Source: ITU, 2017

2.1.2. Economic growth

Economic growth is one of the most popular terms in economic studies, which have been defined in different ways since the 20th century. Kuznets (1973) defined national economic growth as a long-term rise in capacity to provide diverse economic goods to residents, which is based on advanced technologies and institutional and ideological changes that country requires. Also in this definition, technology is considered as a permissive source of economic growth, but it is not the sufficient condition itself. More simply, growth is mentioned as an increase in terms of measurable quantity, which is different from “development” that is in way of qualitative changes (Flammang, 1979). Early definitions agreed that economic growth is simply the rise in quantity of goods and resources.

Since the 21st century, economic growth has been officially defined in international organizations. Growth in an economy is measured by change in the volume of its output or in the real expenditure or income of its residents (United Nations, 2008). From this definition, it can be understood that economic growth is changes in a nation's outputs or in its income per capita. The United Nations System of National Accounts provides three plausible growth indicators: the volume of gross domestic product (GDP), real gross domestic income, and real gross national income. Among these, GDP is the sum of the value added by households, government, and industries operating in the economy, measured at constant prices. Moreover, GDP accounts for all domestic production, whether the income is received by domestic or foreign institutions. As can be seen from these official definitions, GDP is preferred to be calculated at constant currencies (usually USD), as well as considers foreign institutions.

2.2. Literature review

Since the 21st century, a great numbers of research have been conducted in developing nations on the effects of ICT factors on economic growth, despite the fact that there have been conflicting findings regarding the impacts of these factors.

Ahmed and Ridzuan (2012) analyzed the effects of ICT investments on countries' GDP, which found long-term connections between GDP and production variables. Aghaei and Rezagholizadeh (2017) also found the positive effects of ICT investments on the economic growth of Organization of Islamic Conference (OIC) nations. However, these studies only discussed ICT in terms of investment aspects and leaving out other factors such as infrastructure, ICT human resources and other considerations.

Beside factors of ICT investments or ICT capital mentioned above, variables of ICT infrastructure such as mobile cellular, fixed telephone, fixed broadband, and Inter-net are also expected to significantly contribute to economic growth. Several studies have incorporated ICT infrastructure variables into their development models in recent years. Pradhan et al. (2015) found significant contributions of Internet and broadband on 21 Asian economies. Similarly, Sapuan and Roly (2021) assessed ICT growth in ASEAN countries based on two infrastructural indicators: fixed broadband subscribers and percentage of Internet usage and also discovered positive impacts of ICT development on economic growth of ASEAN members. Shodiev et al. (2021) proved that ICT factors have positive and statistically significant effects on GDP of Central Asian countries. Nevertheless, the research only included two variables of infrastructure development and there were no capital and labor factors in the growth models. Conversely, Cheng et al. (2021) asserted that only mobile subscribers contribute to economic growth, whereas internet infrastructure and services have no significant impacts in middle-income and low-income nations. Furthermore, the research stated that ICT dispersion can enhance economic growth in developed nations while the influence in developing ones is ambiguous. Hussain et al. (2021) developed a growth model using three ICT infrastructure variables: internet users as a proportion of the population, fixed-telephone subscribers per 100 people, and mobile-cellular subscribers per 100 people, which were found to significantly contribute to economic growth of South Asian countries. Adeleye and Eboagu (2019) identified positive contributions of the Internet, mobile cellular, and fixed telephone to economic growth. Albiman and Sulong (2017) identified minimal and negative impacts of these infrastructural elements on the economic growth of Sub-Saharan African nations and suggested that lower-middle-income countries had greater first-mover advantages in absorbing the benefits of ICT. Meanwhile, Appiah-Otoo and Song (2021) found positive effects of ICT variables on both middle-income and low-income nations. Belloumi and Touati (2022) examined both long-run and short-run effects of ICT factors on 15 Arabian economies, which only showed long-run contributions of Internet and

fixed telephone to growth. Also, Bahrini and Qaffas (2019) found different results of ICT factors' effects on developing nations.

3. RESEARCH METHODOLOGY

3.1. Model specification

Based on previous studies on growth models with ICT factors (Albiman and Sulong, 2017; Adeleye and Eboagu, 2019; Hussain et al., 2021...), the growth function is proposed as follows:

$$GDP_{it} = A_{it} L_{it}^{\beta_1} K_{it}^{\beta_2} X_{it}^{\beta_3} ICT_{it}^{\beta_4} e^{u_{it}} = f(A_{it}, L_{it}, K_{it}, ICT_{it}) \quad (*)$$

Where GDP_{it} is the total GDP of the country i , year t ; A_{it} is the technological parameter; L_{it} is the total labor force; K_{it} is the gross fixed capital formation; X_{it} is the vector of control variables; ICT_{it} is the vector of ICT variables; u_{it} is the random disturbance. By taking natural logarithms, the equation (*) is rewritten as follows:

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \beta_3 \ln X_{it} + \beta_4 \ln ICT_{it} + u_{it} \quad (**)$$

In this paper, to measure ICT development, 4 indicators: Mobile Cellular subscriptions, Fixed Broadband subscriptions, Fixed Telephone subscriptions, and Internet individual users are chosen. These indicators were commonly used in previous studies to measure contributions of ICT to economies (Albiman and Sulong, 2017; Adeleye and Eboagu, 2019; Appiah-Otoo and Song, 2021; Hussain et al., 2021; Belloumi and Touati, 2022). The models also include total labor force (L_{it}), gross fixed capital formation (K_{it}), and trade openness ($trade_{it}$) as control variables.

Deriving the equation (2) with the natural logarithm, the growth functions with ICT factors are written as follows:

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \beta_3 \ln trade_{it} + \beta_4 \ln mob_{it} + u_{it} \quad (1)$$

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \beta_3 \ln trade_{it} + \beta_4 \ln fbb_{it} + u_{it} \quad (2)$$

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \beta_3 \ln trade_{it} + \beta_4 \ln ft_{it} + u_{it} \quad (3)$$

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln L_{it} + \beta_2 \ln K_{it} + \beta_3 \ln trade_{it} + \beta_4 \ln inte_{it} + u_{it} \quad (4)$$

Where: $\ln GDP_{it}$ is the natural logarithm of GDP; $\ln K_{it}$ is the natural logarithm of gross fixed capital formation; $\ln L_{it}$ is the natural logarithm of total labors; $\ln trade_{it}$ is the natural logarithm of trade openness; $\ln mob_{it}$ is the natural logarithm of Mobile Cellular subscriptions; $\ln fbb_{it}$ is the natural logarithm of Fixed Broadband subscriptions; $\ln ft_{it}$ is the natural logarithm of Fixed Telephone subscriptions; $\ln inte_{it}$ is the natural logarithm of Internet individual users.

3.2. Analyzing methods

3.2.1. Unit-root and cointegration test methods

In this research, the Levin-Lin-Chu unit-root test was used (Levin et al., 2002). The null hypothesis and the alternative hypothesis for the panel unit root test are given as follows:

$$\begin{cases} H_0: \text{Panels contain unit roots} \\ H_a: \text{Panels are stationary} \end{cases}$$

To test cointegration, the Kao test was used, which is based on the residual of cointegrating regression (Kao, 1999). The null hypothesis and the alternative hypothesis for the panel cointegration test are given as follows:

$$\begin{cases} H_0: \text{No cointegration} \\ H_a: \text{All panels are cointegrated} \end{cases}$$

3.2.2. Causality test methods

In this research, the Granger causality test (Granger, 1969) was used to examine causality relationship between variables. The null hypothesis and the alternative hypothesis for the Granger causality test are given as follows:

$$\begin{cases} H_0: X \text{ does not Granger cause } Y \\ H_a: X \text{ does Granger cause } Y \end{cases}$$

3.2.3. Estimation method

In this paper, the Pooled Mean Group (PMG) estimator was used to analyse effects of independent variables on the dependent variable. PMG is used for this study as it imposes on long-run coefficients while allowing short-run coefficients to vary freely across countries (Pesaran and Smith, 1995). Some previous studies also used the PMG estimator to analyse long-run and short-run effects of ICT on economic growth (Salahuddin and Alam, 2016; Albiman and Sulong, 2017; Kallal et al., 2021; Belloumi and Touati, 2022).

3.3. Data collection

The data was collected from World Bank data. The summary of variables is given in the Table 2. The sample covers 44 developing countries with the time range of the 1990-2021 period (Appendix A).

Table 2. Data summary

Variable	Explain	Unit	Data sources
GDP_{it}	Total GDP	USD	World Bank data
K_{it}	Gross fixed capital formation	USD	World Bank data
L_{it}	Total labor force	People	World Bank data
$trade_{it}$	Total export and import values as percent of GDP	%	World Bank data
mob_{it}	Mobile cellular subscriptions	Subscriptions	World Bank data
fb_{it}	Fixed broadband subscriptions	Subscriptions	World Bank data
ft_{it}	Fixed telephone subscriptions	Subscriptions	World Bank data
$inte_{it}$	Internet individual users	People	World Bank data

Source: Compiled by authors

In this paper, 44 countries were chosen as a sample of developing nations. These developing nations' data were collected from the World Bank with a time range from 1990 to 2021. This yearly time range included adequate information of ICT indexes and other economic data of the sample. Also, this period witnessed a rise in ICT development of emerging economies.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Sample descriptive statistics

The results of sample descriptive statistics are given in Table 3. As can be seen from these results, all variables have mean values much higher than standard deviations. The mean value of natural logarithm of the dependent variable is 26.347. Meanwhile, mean values of ICT variables range from about 14 to 17.

Table 3. Sample descriptive statistics results

	ln_gdp	ln_l	ln_k	ln_trade	ln_mob	ln_fbb	ln_ft	ln_inte
Mean	26.347	22.560	25.151	4.275	17.346	14.195	16.095	16.233
Median	26.506	22.699	25.383	4.276	17.976	15.187	16.126	16.749
Maximum	27.288	23.242	26.270	4.388	18.657	16.788	16.423	17.954
Minimum	25.268	21.687	23.879	4.097	13.938	6.908	15.334	12.534
Std. Dev.	0.696	0.524	0.819	0.063	1.383	2.667	0.281	1.476
Sum	27821.98	23823.03	26559.37	4514.12	18317.65	14990.42	16995.89	17142.55
Sum Sq. Dev.	511.454	289.787	707.329	4.208	2017.861	7501.645	83.278	2298.880
Observations	1056	1056	1056	1056	1056	1056	1056	1056

Source: Compiled by authors

4.1.2. Results of unit-root and cointegration tests

Table 4 shows that all variables in the model are stationary at level. Two explanatory variables, labor force and gross fixed capital formation, are stationary with the 5% significance level. Other variables are found to have the 1% significance level. These results suggest that it is suitable to use variables' values at level in models.

Table 4. Unit-root test results

Variable	t-statistic
$\ln gdp_{it}$	-3.125***
$\ln L_{it}$	-1.747**
$\ln K_{it}$	-1.987**
$\ln trade_{it}$	-7.971***
$\ln mob_{it}$	-5.221***
$\ln fbb_{it}$	-33.571***
$\ln ft_{it}$	-21.458***
$\ln inte_{it}$	-13.927***

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%.

Source: Compiled by authors

Results of the Kao test (Table 5) show that all variables in chosen models have cointegration relationships, with the significance level at 1%. All the values off t-statistic are significant at the 1% level.

Table 5. Cointegration test results

Model	t-statistic	Residual variance	HAC variance
1	-29.637***	0.001	0.000
2	-29.080***	0.000	0.000
3	-26.010***	0.001	0.000
4	-28.943***	0.000	0.000

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%.

Source: Compiled by authors

4.1.3. Results of causality test

Results of the Granger test (Table 6) show that, all independent variables have causality relationships with the dependent variable. Therefore, these variables are significant in predicting the dependent variable.

Table 6. Granger causality test results

Causality	F-Statistic
$\ln L_{it} \rightarrow \ln GDP_{it}$	100.737***
$\ln GDP_{it} \rightarrow \ln L_{it}$	151.460***
$\ln K_{it} \rightarrow \ln GDP_{it}$	136.864***
$\ln GDP_{it} \rightarrow \ln K_{it}$	53.984***
$\ln trade_{it} \rightarrow \ln GDP_{it}$	547.566***
$\ln GDP_{it} \rightarrow \ln trade_{it}$	51.627***
$\ln mob_{it} \rightarrow \ln GDP_{it}$	46.175***
$\ln GDP_{it} \rightarrow \ln mob_{it}$	127.414***
$\ln fbb_{it} \rightarrow \ln GDP_{it}$	201.006***
$\ln GDP_{it} \rightarrow \ln fbb_{it}$	355.955***
$\ln ft_{it} \rightarrow \ln GDP_{it}$	105.397***
$\ln GDP_{it} \rightarrow \ln ft_{it}$	37.641***
$\ln inte_{it} \rightarrow \ln GDP_{it}$	47.672***
$\ln GDP_{it} \rightarrow \ln inte_{it}$	27.232***

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%.

Source: Compiled by authors

4.1.4. Estimation results

a) Overall effects of ICT on economic growth

As can be seen in the Table 7, all ICT variables have positive long-run effects on the dependent variable. Among these, fixed telephone has the highest coefficient at 0.144, followed by mobile cellular at 0.048. Meanwhile, fixed broadband has the lowest coefficient at only 0.003. All these effects are statistically significant at the 1% level. Similarly, the group of control variables also has significant contributions to economic growth in long terms.

Table 7. Long-run PMG estimation results, overall

Dependent variable: $\ln GDP_{it}$				
Independent variable	Coefficient			
$\ln L_{it}$	0.291***	0.287***	0.347***	0.221***
	(0.011)	(0.020)	(0.014)	(0.010)
	[26.016]	[14.327]	[25.337]	[21.067]
$\ln K_{it}$	0.632***	0.654***	0.622***	0.681***
	(0.008)	(0.013)	(0.009)	(0.007)
	[81.288]	[48.607]	[66.927]	[93.893]

$\ln trade_{it}$	0.049*** (0.015) [3.308]	0.059*** (0.019) [3.124]	-0.186*** (0.023) [-8.199]	0.030*** (0.015) [2.013]
$\ln mob_{it}$	0.048*** (0.001) [35.527]			
$\ln fbb_{it}$		0.003*** (0.001) [2.815]		
$\ln ft_{it}$			0.144*** (0.005) [31.170]	
$\ln inte_{it}$				0.031*** (0.001) [36.202]
RMSE	0.010	0.012	0.013	0.011
Log likelihood	4266.204	4127.439	2959.127	4051.143

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%. Standard errors are given in parentheses (); t-statistics are given in brackets [].

Source: Compiled by authors

Meanwhile, the overall short-run estimation results (Table 8) show that, only fixed telephone lines are significant to GDP growth in short terms. Although two ICT variables, fixed broadband and Internet have positive short-run coefficients on the dependent variable, these results are insignificant. In addition, among the group of control variables, only labor force has short-run contributions to economies, while effects of gross fixed capital formation and trade openness are insignificant.

Table 8. Short-run PMG estimation results, overall

Independent variable	Dependent variable: $\Delta \ln GDP_{it}$			
	Coefficient			
$\Delta \ln L_{it}$	0.016** (0.007) [2.276]	0.027*** (0.007) [3.744]	0.014* (0.008) [1.648]	0.024*** (0.007) [3.625]
$\Delta \ln K_{it}$	0.014 (0.021) [0.646]	0.021 (0.024) [0.911]	0.015 (0.022) [0.674]	0.010 (0.023) [0.427]
$\Delta \ln trade_{it}$	-0.018 (0.025) [-0.711]	-0.023 (0.028) [-0.823]	-0.015 (0.023) [-0.637]	-0.006 (0.024) [-0.250]
$\Delta \ln mob_{it}$	-0.004 (0.009) [-0.419]			
$\Delta \ln fbb_{it}$		0.002 (0.004) [0.483]		

$\Delta \ln ft_{it}$	0.013*	
	(0.007)	
	[1.870]	
$\Delta \ln inte_{it}$		0.006
		(0.007)
		[0.872]

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%. Standard errors are given in parentheses (); t-statistics are given in brackets [].

Source: Compiled by authors

b) Effects of ICT on economic growth by regions and countries

When examining the effects of ICT on different regions, it was found that all ICT variables have positive long-run coefficients on all regions: Africa, Asia-Pacific, Europe, and America-Latin (Table 9). Results show that among ICT factors, mobile cellular and Internet have largest long-run effects on economic growth with coefficients at about 0.1. All the coefficients are statistically significant.

However, regarding short-run effects, it is noticeable that ICT factors have different results on different countries. In the group of African nations, for example, mobile cellular has negative coefficients on 5 African economies (Angola, Ghana, Ivory Coast, Namibia, Nigeria) and insignificant effects on 2 countries (Botswana, Tunisia), and Morocco is the only one to have positive coefficients of all ICT variables, three of which are statistically significant. By contrast, Nigeria witnesses short-run negative effects of all ICT variables on economic growth. Regarding short-run effects of ICT on Asian-Pacific countries, only Indonesia and India that witness positive and significant coefficients of all ICT variables, while others still see negative and/or insignificant effects of some ICT factors on economic growth. Groups of European and American-Latin also witness the similar results of ICT factors' short-run contributions to economic growth. The results of ICT's short-run effects on countries are given in the Appendix B.

Table 9. Long-run effects of ICT on economic growth, by regions

Dependent variable: $\ln GDP_{it}$				
	$\ln mob_{it}$	$\ln fbb_{it}$	$\ln ft_{it}$	$\ln inte_{it}$
Africa	0.104***	0.033***	0.086***	0.101***
	(0.020)	(0.009)	(0.020)	(0.019)
	[5.161]	[3.885]	[4.223]	[5.246]
Asia-Pacific	0.121***	0.022**	0.029*	0.097***
	(0.026)	(0.010)	(0.017)	(0.021)
	[4.640]	[2.296]	[1.738]	[4.687]
Europe	0.174***	0.032**	0.132***	0.107***
	(0.032)	(0.013)	(0.030)	(0.028)
	[5.410]	[2.470]	[4.419]	[3.837]
America-Latin	0.160***	0.018*	0.044***	0.102***
	(0.024)	(0.010)	(0.017)	(0.020)
	[6.687]	[1.865]	[2.631]	[5.216]

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%. Standard errors are given in parentheses (); t-statistics are given in brackets [].

Source: Compiled by authors

c) *Effects of ICT on economic growth by income levels*

Results (Table 10) show that, the group of upper-middle-income countries witness significant long-run contributions of two ICT variables: Mobile cellular and Internet, which have positive coefficients at 0.029 and 0.026 respectively. However, fixed broadband and fixed telephone do not have significant effects on economic growth. About short-run effects, only mobile cellular has significant coefficients on upper-middle economies. Meanwhile, the group of lower-middle-income nations finds no significant effects of ICT factors in long and short terms. This can be explained by the fact that nations with low-income levels have barriers in applying ICT aspects due to lacks of investment sources as well as human resource problems.

Table 10. Effects of ICT on economic growth, by income groups

Variable	Long-run effects	
	Upper-middle-income	Lower-middle-income
$\ln mob_{it}$	0.029***	-0.015
	(0.011)	(0.013)
	[2.694]	[-1.217]
$\ln fbb_{it}$	-0.019*	0.011
	(0.011)	(0.020)
	[-1.660]	[0.553]
$\ln ft_{it}$	-0.109	0.025
	(0.069)	(0.060)
	[-1.572]	[0.425]
$\ln inte_{it}$	0.026**	-0.002
	(0.012)	(0.014)
	[2.173]	[-0.123]
Short-run effects		
Variable	Upper-middle-income	Lower-middle-income
$\Delta \ln mob_{it}$	-0.031***	0.008
	(0.009)	(0.008)
	[-3.472]	[1.013]
$\Delta \ln fbb_{it}$	0.001	-0.042
	(0.015)	(0.017)
	[0.049]	[-2.530]
$\Delta \ln ft_{it}$	-0.111	-0.017
	(0.162)	(0.033)
	[-0.686]	[-0.520]
$\Delta \ln inte_{it}$	-0.005	-0.002
	(0.009)	(0.007)
	[-0.556]	[-0.358]

Note: *** is significant at 1%; ** is significant at 5%; * is significant at 10%. Standard errors are given in parentheses (); t-statistics are given in brackets [].

Source: Compiled by authors

4.2. Discussion

As mentioned in the estimation results, all ICT variables: Mobile cellular, Fixed broadband, Fixed telephone, and Internet have positive and significant long-run effects on economic growth, both in the sample overall and in sub-groups of Africa, Asia, Europe and America and Latin. These results are contrary to previous studies that only showed long-run effects of some ICT infrastructure factors on developing

countries (Albiman and Sulong, 2017; Cheng et al., 2021), but consistent with the study by Hussain et al. (2021) which also claimed the long-run effects of all ICT variables on economies. In addition, as technological inputs, ICT factors affect supplies which makes production more economical then increase productivity. However, this also leads to higher demands in human resources and investments in digital education and training (Quah, 2002).

Meanwhile, the short-run effects of ICT on economic growth are found insignificant in this paper. These findings imply that due to lacks of ICT policies formulation and unequal penetration of infrastructure, developing nations find barriers in adopting effects of ICT in short terms. Moreover, it can be explained by the fact that ICT infrastructure needs long periods to be effective as well as ICT is not the only one that significantly improve economic growth. As shown in the results, the effects of ICT factors are considerably lower than other inputs such as labor force and gross fixed capital formation. These also suggests that only development of infrastructure is not enough to significantly contribute to economies, but it is necessary to consider sectors, organizations and consumers' ICT using and spending. Another possible reason is that because of low income levels, some nations do not have enough resources to invest and develop digital economies as well as improve human resources, which lead to ineffectiveness of ICT in the short-run.

Regarding effects of ICT factors on sub-groups of different regions, all sub-groups of African, Asian-Pacific, European, and American-Latin nations see significant effects of ICT on economic growth in long terms, but there are very little short-run effects. For example, the group of African developing nations witness long-run contributions of ICT to economic growth, while there are no significant short-run impacts. These findings are consistent with previous studies on the sub-regions of Africa (Albiman and Sulong, 2017; Adeleye and Eboagu, 2019). The same results are also found in the sub-groups of Asian-Pacific, European, and American-Latin countries, which again support the assumptions that developing countries need long-enough periods to effectively adopt ICT development in economies. However, it is noticeable that short-run cross-nation effects of ICT on some countries are still significant, while those of others are not. This can be explained by differences in infrastructure conditions, investments, development policies and even quality of human resources that lead to different effects of ICT aspects on nations. Among ICT variables, fixed telephone is the only one to have short-run contributions to economic growth, but only seen in the groups of Asia-Pacific an America-Latin. These suggest that in these two regions, development of fixed telephone infrastructure and services is more effective than others, which significantly affect developing economies.

About results of ICT on countries by income groups, lower-middle-income nations see no significant effects of ICT variables on economic growth. One possible explanation is due to economic barriers, countries do not have enough resources for ICT investment and development, which leads to ineffectiveness of ICT. Furthermore, lacks of resources for human development, especially in educating and training ICT aspects can prevent the development of digital economies. Meanwhile, upper-middle-income countries see positive long-run effects of mobile cellular and Internet, but there are not any significant short-run contributions of ICT to economic growth. This implies that countries with higher income levels have advantages in investing and developing aspects of mobile phones and Internet infrastructure, which possibly encourages people to consume ICT products and promotes economic growth in the long-run.

5. CONCLUSION

This paper examines contributions of ICT development to developing economies in both short and long terms. To measure ICT development, the authors chose 4 indicators: Mobile cellular, fixed broadband subscriptions, fixed telephone subscriptions, and Internet users. By using the log-log model and the PMG

estimator, the authors investigated effects of ICT variables on 44 developing countries during the 1990-2021 period. Results show that all ICT factors (Mobile cellular, fixed broadband subscriptions, fixed telephone subscriptions, and Internet users) have long-run effects on economic growth but there are no significant short-run effects on the overall sample. Meanwhile, when analyzing the cross-section short-run effects of ICT factors, there are different results between countries and/or sub-regions, which can be explained by differences in ICT development policies, unequal penetration and investments between nations. Beside ICT factors, developing economies are significantly improved by labor force, gross fixed capital formation, and trade openness.

The paper built growth models with a vector of ICT variables (Mobile cellular, fixed broadband subscriptions, fixed telephone subscriptions, and Internet users). In addition, when employing the PMG estimator, it is possible to evaluate overall long-run effects of independent variables while short-run effects vary between countries. Theoretically, this also suggests that beside the long-run effects of ICT on the whole sample, it is important to evaluate and compare effects of this factor between nations and/or regions due to institutional and regional differences. Also, empirical evidence in developing countries were provided, which showed different results of ICT variables' effects on economies.

The paper also implied policy recommendations for developing nations to boost their ICT development as well as make ICT an important part in economies. As ICT factors have little short-run effects on developing economies, governments and authorities need to be patient and consistent with ICT development strategies and objectives. Also, to develop ICT and get effectiveness in the long-run, our research model implies that there needs to be investment in ICT infrastructure (mobile cellular, fixed broadband, fixed telephone, Internet) as well as promote markets of ICT and digital products and services. Furthermore, it is important to have suitable policies in educating and training ICT human resources. In addition, there are two-way relationships between ICT development and economies, by the results showing that upper-middle-income countries are more effective than lower-middle-income countries in developing ICT. This means that not only ICT promotes economic growth but economic growth also creates conditions for ICT development through favorable markets and advanced human resources.

Future researches can be improved if they can solve these limitations. First, in recent years, there have been different shocks such as the pandemic of COVID-19, African diseases or the Russia-Ukraine conflict, which may affect trends of digital transformation and ICT development as well as the global and regional economies. Therefore, these events should be considered when examining effects of factors on economic growth. Second, this research only analyzed the effects of ICT factors on economic growth, while in return, economic growth or income levels may affect ICT development in countries, as mentioned in the causality results. This means that there should be further studies that use advanced two-way vector analysis techniques to evaluate relationships between ICT and economic growth and even other factors. Third, it is suggested that the growth models should include more aspects of ICT such as ICT capital/investments or ICT human factors.

APPENDIX

Appendix A. Sample summary

No	Region	Country	Income
1	Europe	Albania	Upper-middle
2	Africa	Algeria	Lower-middle
3	Africa	Angola	Lower-middle
4	Europe	Armenia	Upper-middle

No	Region	Country	Income
5	Europe	Azerbaijan	Upper-middle
6	Asia	Bangladesh	Lower-middle
7	Latin America and the Caribbean	Belize	Upper-middle
8	Asia	Bhutan	Lower-middle
9	Latin America and the Caribbean	Bolivia	Lower-middle
10	Europe	Bosnia and Herzegovina	Upper-middle
11	Africa	Botswana	Upper-middle
12	Latin America and the Caribbean	Brazil	Upper-middle
13	Asia	China	Upper-middle
14	Latin America and the Caribbean	Colombia	Upper-middle
15	Latin America and the Caribbean	Cuba	Upper-middle
16	Latin America and the Caribbean	Dominican Republic	Upper-middle
17	Latin America and the Caribbean	Ecuador	Upper-middle
18	Africa	Egypt	Upper-middle
19	Latin America and the Caribbean	El Salvador	Lower-middle
20	Africa	Gabon	Upper-middle
21	Africa	Ghana	Lower-middle
22	Latin America and the Caribbean	Guatemala	Upper-middle
23	Latin America and the Caribbean	Honduras	Lower-middle
24	Asia	India	Lower-middle
25	Asia	Indonesia	Lower-middle
26	Asia	Iran	Lower-middle
27	Asia	Iraq	Upper-middle
28	Africa	Ivory Coast	Lower-middle
29	Asia	Lebanon	Lower-middle
30	Latin America and the Caribbean	Mexico	Upper-middle
31	Asia	Mongolia	Lower-middle
32	Africa	Morocco	Lower-middle
33	Africa	Namibia	Upper-middle
34	Africa	Nigeria	Lower-middle
35	Europe	North Macedonia	Upper-middle
36	Latin America and the Caribbean	Paraguay	Upper-middle
37	Latin America and the Caribbean	Peru	Upper-middle
38	Asia	Philippines	Lower-middle
39	Africa	South Africa	Upper-middle
40	Asia	Sri Lanka	Lower-middle
41	Asia	Thailand	Upper-middle
42	Africa	Tunisia	Lower-middle
43	Europe	Ukraine	Lower-middle
44	Asia	Vietnam	Lower-middle

Appendix B. Short-run effects of ICT on economic growth, by countries

Short-run PMG				
Dependent variable: $\Delta \ln GDP_{it}$				
	$\Delta \ln mob_{it}$	$\Delta \ln fbb_{it}$	$\Delta \ln ft_{it}$	$\Delta \ln inte_{it}$
Algeria	0.070*** (0.003) [20.564]	-0.001* (0.000) [-2.877]	-0.068*** (0.002) [-29.214]	0.073*** (0.002) [42.295]
Angola	-0.088*** (0.002) [-56.907]	-0.017*** (0.000) [-67.019]	0.049*** (0.002) [21.035]	-0.039*** (0.002) [-21.176]
Botswana	0.001 (0.001) [0.433]	0.001*** (0.000) [6.280]	0.001 (0.000) [1.681]	-0.006** (0.001) [-5.141]
Egypt	0.004 (0.002) [1.723]	0.017*** (0.000) [80.779]	-0.016*** (0.001) [-11.449]	0.046*** (0.002) [28.317]
Gabon	0.043*** (0.001) [30.803]	0.009*** (0.000) [31.178]	-0.057*** (0.001) [-47.255]	0.046*** (0.001) [50.293]
Ghana	-0.065*** (0.003) [-22.140]	0.017*** (0.001) [21.707]	0.034*** (0.002) [16.353]	0.029*** (0.003) [10.474]
Ivory Coast	-0.014*** (0.002) [-6.416]	-0.030*** (0.000) [-87.361]	0.010*** (0.001) [8.309]	-0.059*** (0.003) [-22.124]
Morocco	0.020*** (0.003) [7.968]	0.023*** (0.000) [62.280]	0.001 (0.001) [1.175]	0.056*** (0.002) [32.901]
Namibia	-0.057*** (0.002) [-26.510]	0.035*** (0.001) [36.085]	0.143*** (0.003) [45.486]	0.042*** (0.004) [11.385]
Nigeria	-0.059*** (0.002) [-39.048]	-0.027*** (0.000) [-198.534]	-0.006** (0.001) [-5.880]	-0.060*** (0.001) [-77.594]
South Africa	0.006** (0.002) [3.850]	0.014*** (0.000) [46.888]	-0.016*** (0.001) [-14.845]	0.062*** (0.002) [30.469]
Tunisia	0.006 (0.003) [1.976]	-0.015*** (0.000) [-81.167]	-0.051*** (0.001) [-68.154]	-0.026*** (0.001) [-19.370]
Bangladesh	-0.053*** (0.002) [-29.598]	0.002*** (0.000) [9.002]	-0.008*** (0.000) [-23.972]	-0.041*** (0.001) [-52.394]
Bhutan	-0.060*** (0.005) [-12.449]	0.005*** (0.000) [17.890]	0.004** (0.001) [4.924]	-0.029*** (0.001) [-25.133]

Short-run PMG				
<i>Dependent variable: $\Delta \ln GDP_{it}$</i>				
	$\Delta \ln mob_{it}$	$\Delta \ln fbb_{it}$	$\Delta \ln ft_{it}$	$\Delta \ln inte_{it}$
China	-0.008**	0.012***	0.014***	-0.041***
	(0.002)	(0.000)	(0.001)	(0.002)
	[-3.872]	[46.362]	[12.614]	[-18.861]
India	0.053***	0.003**	0.070***	0.025***
	(0.004)	(0.001)	(0.002)	(0.002)
	[12.677]	[3.872]	[34.980]	[12.824]
Indonesia	0.071***	0.046***	0.084***	0.030***
	(0.003)	(0.000)	(0.002)	(0.002)
	[27.036]	[146.182]	[34.255]	[16.283]
Iran	0.015***	-0.004***	-0.025***	0.002
	(0.003)	(0.000)	(0.001)	(0.001)
	[4.733]	[-19.059]	[-41.737]	[1.777]
Iraq	-0.142***	-0.007***	0.057***	-0.033***
	(0.007)	(0.001)	(0.001)	(0.004)
	[-21.104]	[-8.619]	[75.369]	[-7.902]
Lebanon	0.199***	-0.048***	-0.011***	-0.085***
	(0.015)	(0.001)	(0.001)	(0.003)
	[13.541]	[-88.413]	[-7.824]	[-33.046]
Mongolia	-0.004	0.015***	0.033***	0.085***
	(0.004)	(0.001)	(0.002)	(0.003)
	[-1.007]	[21.165]	[18.174]	[32.755]
Philippines	-0.045***	0.007***	-0.041***	0.063***
	(0.004)	(0.001)	(0.001)	(0.002)
	[-11.023]	[13.201]	[-39.716]	[35.187]
Sri Lanka	-0.034***	0.005***	0.026***	0.020***
	(0.001)	(0.000)	(0.000)	(0.001)
	[-26.613]	[42.393]	[63.760]	[28.029]
Thailand	-0.042***	-0.018***	0.097***	0.105***
	(0.006)	(0.001)	(0.002)	(0.003)
	[-6.826]	[-23.026]	[41.807]	[33.440]
Vietnam	-0.056***	0.001**	-0.031***	0.050***
	(0.003)	(0.000)	(0.001)	(0.002)
	[-20.815]	[3.637]	[-44.755]	[25.963]
Albania	0.029***	0.000	0.124***	0.010***
	(0.003)	(0.000)	(0.002)	(0.002)
	[9.280]	[1.880]	[51.975]	[6.322]
Armenia	0.089***	0.006***	-0.038***	-0.013***
	(0.003)	(0.000)	(0.001)	(0.002)
	[31.777]	[13.295]	[-26.502]	[-7.851]
Azerbaijan	-0.030***	-0.018***	0.021***	-0.047***
	(0.003)	(0.001)	(0.001)	(0.002)
	[-8.643]	[-17.825]	[14.386]	[-29.775]

Short-run PMG				
<i>Dependent variable: $\Delta \ln GDP_{it}$</i>				
	$\Delta \ln mob_{it}$	$\Delta \ln fbb_{it}$	$\Delta \ln ft_{it}$	$\Delta \ln inte_{it}$
Bosnia and Herzegovina	0.014	-0.045***	0.084***	-0.001
	(0.007)	(0.001)	(0.004)	(0.006)
	[2.201]	[-48.856]	[22.155]	[-0.109]
North Macedonia	-0.048***	-0.018***	0.006**	-0.047***
	(0.003)	(0.000)	(0.001)	(0.001)
	[-18.594]	[-80.419]	[4.286]	[-31.420]
Ukraine	0.059***	0.015***	-0.019***	0.033***
	(0.004)	(0.000)	(0.002)	(0.002)
	[16.405]	[38.112]	[-8.871]	[18.237]
Belize	-0.035***	-0.018***	0.028***	0.005*
	(0.002)	(0.000)	(0.001)	(0.002)
	[-16.066]	[-50.203]	[25.496]	[2.725]
Bolivia	0.000	0.012***	-0.017***	-0.003
	(0.003)	(0.000)	(0.001)	(0.002)
	[-0.195]	[36.975]	[-13.665]	[-1.536]
Brazil	-0.022***	0.044***	-0.005***	0.023***
	(0.003)	(0.000)	(0.001)	(0.002)
	[-8.739]	[97.987]	[-6.365]	[11.585]
Colombia	-0.062***	0.056***	0.031***	0.060***
	(0.006)	(0.001)	(0.001)	(0.004)
	[-10.218]	[71.459]	[29.947]	[16.117]
Cuba	-0.059***	-0.014***	-0.010***	-0.065***
	(0.002)	(0.000)	(0.001)	(0.002)
	[-31.435]	[-67.000]	[-11.598]	[-41.576]
Dominican Republic	0.068***	-0.006***	0.041***	0.041***
	(0.003)	(0.000)	(0.001)	(0.001)
	[22.129]	[-13.974]	[41.829]	[28.807]
Ecuador	0.022***	0.059***	0.046***	0.053***
	(0.001)	(0.000)	(0.003)	(0.001)
	[19.822]	[200.448]	[15.970]	[49.330]
El Salvador	-0.003	0.006***	0.019***	-0.020***
	(0.002)	(0.000)	(0.001)	(0.001)
	[-1.152]	[28.241]	[24.976]	[-16.303]
Guatemala	-0.038***	-0.037***	0.017**	-0.032***
	(0.004)	(0.000)	(0.004)	(0.001)
	[-10.784]	[-188.549]	[3.800]	[-25.333]
Honduras	0.043***	0.040***	0.030***	0.047***
	(0.003)	(0.000)	(0.003)	(0.002)
	[16.468]	[94.176]	[11.700]	[21.181]
Mexico	0.019***	0.004***	0.010**	0.051***
	(0.003)	(0.000)	(0.003)	(0.002)
	[6.732]	[13.357]	[3.574]	[33.523]

Short-run PMG				
<i>Dependent variable: $\Delta \ln GDP_{it}$</i>				
	$\Delta \ln mob_{it}$	$\Delta \ln fbb_{it}$	$\Delta \ln ft_{it}$	$\Delta \ln inte_{it}$
Paraguay	0.020***	-0.002***	0.016***	-0.020***
	(0.002)	(0.000)	(0.002)	(0.001)
	[12.737]	[-11.595]	[8.108]	[-20.663]
Peru	0.015*	-0.047***	-0.088***	-0.110***
	(0.005)	(0.000)	(0.002)	(0.001)
	[2.886]	[-389.540]	[-50.249]	[-81.708]

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GREEN LOGISTICS IN LAST-MILE DELIVERY IN HANOI: AN APPROACH FROM THE CUSTOMERS' SIDE

Author: Le Nguyen Quynh Trang¹

Mentor: Assoc.Prof.PhD Trinh Thi Thu Huong², PhD. Nguyen Thi Yen²

ABSTRACT : "Green logistics" refers to logistical activities that minimize environmental problems. With the rise of e-commerce, the need for logistics services (shipping, packaging, etc.) is expanding, particularly in metropolises such as Hanoi and Ho Chi Minh City. As a result, logistical operations have a greater detrimental impact on the environment. Moving toward green logistics is the only approach to achieve the goal of sustainable development. Green logistics operations, on the other hand, need customers' acceptance in order to share the cost burden borne by LSPs when implementing green last-mile delivery. This study uses a multivariate analysis technique to assess the variables affecting customers' acceptance of green logistics in last-mile delivery in Ha Noi. The research result from 341 respondents shows that there are 04 factors positively affecting customers' acceptance, including (1) economic factors, (2) environmental concerns, (3) the usefulness of green logistics services and (4) knowledge of green logistics. Importantly, the effect of an economic factor on customer acceptance is by far the most significant. The study has also went into some currently effective policies and regulations of the Government and Hanoi People's Committee on green economic development and green logistics, as well as difficulties of Logistics service providers (LSPs) in controlling the aforementioned elements to achieve customers' acceptance. Therefore, implications for the state and LSPs have been proposed to strengthen customers' acceptance of green logistics in last-mile delivery field.

Keywords: Customers' acceptance, green logistics, last-mile delivery.

1. INTRODUCTION

Despite accounting for only 8.2% of Vietnam's population, Hanoi accounts for 30% of the country's e-commerce transaction value (VECOM, 2022). To support the growth of e-commerce, last-mile delivery in the city has witnessed a significant upward trend, accompanied by negative environmental impacts such as increased traffic congestion and accidents, air and noise pollution, and increased carbon emissions. Every day, a metropolis like Hanoi releases about 80 tons of plastic waste into the environment, but only a very small percentage of it is recycled (Vietnam Logistics Report, 2022).

In order to minimize these impacts, logistics service providers (LSPs) have implemented green logistics initiatives in last-mile delivery in many forms such as: delivering goods by electric vehicles, packing goods with biodegradable packages, delivering goods at centralized pick-up points, using smart lockers to deliver and collect items,... The aforementioned green logistics solutions all require certain investments that businesses call "green logistics costs". These costs can be paid by green logistics enterprises, or can be partly transferred to end users. However, in Vietnam, to the best of the author's knowledge, there is still no study to prove if customers truly accept the green services that firms provide. As a result, not all organizations can turn green logistics into their core competences.

With the aim of assessing the factors affecting the customers' acceptance of green logistics in last-mile delivery in Hanoi, thereby making some suggestions and recommendations for concerned parties, the author has used multivariate analysis technique. Sample survey was built and completed after collecting opinions from 6 customers (pilot test). After 26 days, the author received 341 valid responses for the research purposes.

¹ Foreign Trade University, Email: tranglnq.chv@gmail.com -

² Foreign Trade University.

2. THEORETICAL FRAMEWORK AND PROPOSED RESEARCH MODEL

2.1. Theoretical framework

2.1.1. *Green logistics model in last mile delivery*

Jazairy (2020) and Arkadiusz (2019) pointed out that green logistics in last-mile delivery included 5 aspects: (1) greening transportation, (2) greening packaging, (3) greening warehousing, (4) greening distribution and (5) reverse logistics.

❖ **Green transportation:**

Some basic criteria to evaluate the implementation of green transportation are green fuels used in transportation activities; efficiency in management of green transport routes; efficiency of means of transport; efficiency of the shipment arrangement.

❖ **Green packaging:**

Products with green packaging were created for the convenience and safe of products as well as the safe for human's health and safe for the living environment. Consumers choose green packaging in order to demonstrate their responsibility for the general survival of humankind.

Green packaging is also an opportunity for businesses to promote their business ethics as well as enhance their eco-friendly image in the eyes of customers.

❖ **Green warehousing:**

The term "green warehousing" refers to the energy utilized in the warehouse as well as environmentally friendly equipment. First of all, multifunctional software and robotics are used by businesses to manage and maintain warehousing processes.

Secondly, renewable energy may be defined as solar, geothermal, wind, biomass, hydroelectricity, and so on. In addition to this, reducing the amount of documentation employed in warehouse operations also helps to lessen the number of chopped-down trees, contributing to environmental protection.

❖ **Green distribution:**

Typically, distribution networks are designed to allow customers to receive/send goods at some easily accessible locations, such as newsstands, shopping malls, gas station, grocery store. Customers pay lower costs at these places compared to last-mile home delivery services; however, it does not enhance consumers' happiness owing to limited opening hours. Another solution to the problem of time delivery is a smart locker, where consumers can pick up and send items at any time of day or night.

❖ **Reverse logistics:**

The rate of product bounces in e-commerce is about 20-30%, doubling that figure of traditional retail (about more than 9%) (Pierce L, 2017). Goods purchased on E-commerce Exchange is often returned because it did not meet the buyer's expectations or had some functional mistakes. The policy of e-commerce platforms allows customers to return products without giving too specific reasons (Arkadiusz, 2019). This situation makes the process of reverse logistics very costly and emit a lot of CO₂ gases into the environment.

2.1.2. *Theoretical framework of customers' acceptance*

According to Schmidt (2017), "Customer acceptance describes the provisional consent, persuasion of the customers to buy, rent, or use a product, service, or a system of product - service. The acceptance can be quantified on a continuous (non-binary) scale¹ and depends on some aspects that increase or decrease the level of customer acceptance".

¹ Totally accept or totally refuse

It is necessary to distinguish “acceptance” of customers from some related concepts such as “satisfaction”, “perceived value”, “loyalty” and “preference” of customers. In it, “the satisfaction” is a term that seems very close to “acceptance”. However, the satisfaction is only considered after the customer consumes the good or service. Therefore, it ignores the factor of adoption or agreement of a new product or service (Schmidt, 2017), or factors that occur before customers use the product or service. Research on customer satisfaction can bring many benefits to businesses in terms of sales or profits, but focusing only on customer satisfaction will exert ignorance of factors affecting customers’ acceptance, especially when the business offers innovations or new products that customers never used before.

2.1.3. Theoretical framework of customers’ acceptance of green logistics in last-mile delivery

The research of Sajid *et al* (2021) indicated that customers accept green logistics through behaviors such as: (1) accepting to pay extra costs to get green logistics services; (2) accepting the use of green logistics services (green packaging, green means of transportation, centralized pick-up station, smart lockers, reverse logistics,...) even though there are inconvenience for them. Customers’ acceptance will ensure they have positive response to green logistics, thus reducing the risk of any negative impact on customer demand or satisfaction (e.g., customers have may not agree to pay more or agree to switch to green consumption behaviors).

The research of Brahme and Shafighi (2022) indicated that the customers’ acceptance of green logistics is reflected in the way they accept green methods of delivery.

2.2. Proposed research model

2.2.1. Proposed research model

After analyzing previous studies, the author synthesize the main factors that affect customers’ acceptance of green logistics as follows:

Table 1. Factors affecting customers’ acceptance of green logistics

No.	Factors	References
1	Economic factors	Sajid et al. (2021); Wang et al. (2019)
2	Environmental concerns	Sajid et al. (2021); Zhang et al. (2018); Koshta et al. (2022)
3	Understanding of green logistics	Brahme & Shafighi (2022)
4	Perception of the usefulness of green logistics services	Brahme & Shafighi (2022); Kaoy et al. (2020); Khan et al. (2019)
5	Subjective norms	Sajid et al. (2021); Koshta et al. (2022)

Source: The compilation of the author

The research model with research hypotheses is as follows:

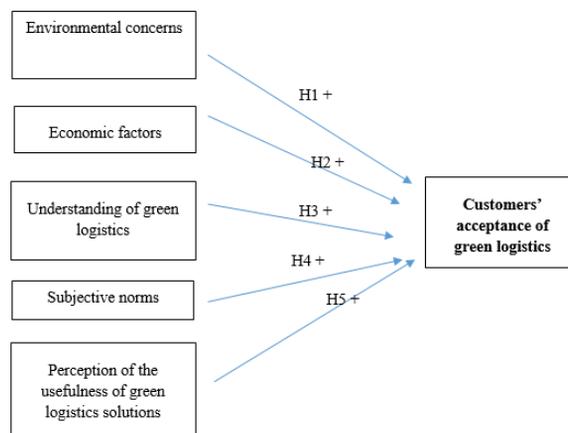


Figure 1. Proposed resreach model

Source: Proposed by the author

2.2.2. Research hypotheses

❖ Environmental concerns

Environmental concerns are one's concerns about air quality, quality of soil, water resources, ... and harmful impacts of humans' activities on the environment as well as their attitudes towards solutions to improve environmental issues (Hopwood et al., 2005; Schuitema et al., 2013).

The study of Nnorom et al. (2009) provided evidence of a direct influence of environmental concerns on consumers' intention to recycle products. For the willingness to pay for green services, Wei et al (2018) suggested that people who lack environmental concerns are less likely to pay for green services. Similarly, Konuk (2018) indicated that people with a strong interest in environmental issues will happy to pay a higher price for green products/services. Research hypothesis

The research hypothesis is given as follows:

H1: Environmental concerns have a positive impact on customers' acceptance of green logistics

❖ Economic factors

Economic factors consider the income level of customers and their evaluation of whether green logistics solution worth paying the higher price? The research hypothesis is given as follows:

H2: Economic factors have a positive impact on customers' acceptance of green logistics

❖ Understanding of green logistics

Understanding green logistics is the information and facts that a person has about green logistics through learning, hearing or experiencing. It can be knowledge of the regulations or about the green logistics model.

The research hypothesis is given as follows:

H3: Understanding green logistics has a positive impact on customers' acceptance of green logistics

❖ Usefulness of green logistics services

The perception of usefulness of green logistics services will consider the convenience, ease of use , safety of green logistics services, and customer reviews of whether or not these green solutions help them.

The research hypothesis is given as follows:

H4: The usefulness of green logistics services has a positive impact on customers' acceptance of green logistics.

❖ Subjective norms

Subjective norms are understood as the social pressure placed on an individual when he or she exhibits a specific behavior (Ajzen & Fishbein, 1980). Subjective norms reflect perceptions of an individual about the attitudes of others (people who are important to him or her) for green logistics, while compliance motivation motivates individuals to listen to opinions of people who are important to us about adopting or not adopting green logistics (Sajid et al., 2021).

The research hypothesis is given as follows:

H5: Subjective norms have a positive impact on customers' acceptance of green logistics.

3. RESEARCH METHOD

3.1. Development of questionnaires and research scales

The author has developed a questionnaire, then surveyed 06 customers who used last-mile delivery services (table 3.1). The official questionnaire is conducted from 16th November to 11th December, 2022. The author use a 5-point Likert scale to measure observed variables. Other classification variables such

as: gender, age, income, frequency of online purchases, and understanding of green logistics services are measured using nominal scales, which depend on the form of data reflecting them.

Table 2. Questionnaire

CODE	Description	References
MT	Environmental concerns	
MT1	I'm someone who cares about environmental issues	Sajid & et al. (2021), Zhang & et al. (2018); Hao & et al. (2019), Wang & et al. (2019); Koshta & et al. (2022)
MT2	I'm worried that plastic waste, electronic waste will harm the environment	
MT3	I'm worried that vehicles that do not meet emission standards will pollute the environment	
MT4	I think environmental problems (air pollution, noise pollution, water pollution, excessive use of fossil fuels such as gasoline, oil, etc.) will negatively affect my health	
KT	Economic factors	
KT1	I believe that the pricing of green logistics services is in line with the benefits it brings to us	Proposed by the author
KT2	My income allows me to spend more on using green logistics services	Hao & et al. (2019); Sajid & et al. (2021)
KT3	To develop green logistics, I think businesses can charge more fees	
HB	Understanding of green logistics	
HB1	I know that green logistics includes: Green transportation, green packaging, green energy, and green distribution	Brahme & Shafighi, (2022)
HB2	I know that green logistics uses green transport vehicles (electric vehicles, low-emission engines, E5 biogasoline vehicles, ...) to reduce noise, carbon emissions, and environmental emissions	
HB3	I know that green logistics uses green packaging (recycled/reusable packaging, biodegradable packaging, ...) to limit the harmful effects of plastic waste on the environment	Sajid & et al. (2021)
HB4	I know that green logistics uses centralized pick-up points, smart lockers to reduce the burden of delivery, reduce traffic congestion and carbon emissions	Proposed by the author
HB5	I know that green logistics encourages consumers to return e-waste to limit the negative impact of this type of waste on land and water sources	Sajid & et al. (2021)
HB6	I know that the Government already has regulations to encourage green logistics	Brahme & Shafighi (2022)
HU	Usefulness of green logistics services	
HU1	Green logistics services (smart lockers, centralized pickup points, Click&Collect) allow me to be flexible in terms of receiving time	Klein & et al. (2018) và Sajid & et al. (2021)
HU2	Green logistics system is arranged in convenient locations for me to use (There are centralized pick-up points, smart lockers, electronic waste collection points, ... near where I live/work)	
HU3	The quality of goods delivered through the green logistics system (packed in green packaging, delivered by green means of transport such as electric vehicles, delivered at lockers, delivered at centralized pick-up points, ...) met my expectations	
HU4	Recycled/eco-friendly packaging allows me to use it repeatedly for different purposes	
QC	Subjective norms	
QC1	The community where I live helps me understand green logistics	Sajid & et al. (2021); Zhang & et al. (2018); Wang & et al. (2019); Koshta & et al. (2022)
QC2	People around me embracing green logistics services	
QC3	If my friends use green logistics services, I will do the same	Proposed by the author
QC4	If I don't accept green logistics services, I will be seen as backward and unconcerned about the environment	
CN	Customers' acceptance of green logistics	
CN1	Since I am the ultimate beneficiary of green logistics services, I agree to pay more for green logistics services (green packaging, green transport, reverse logistics for defective product recovery, ...)	Sajid & et al. (2021); Brahme& Shafighi (2022)
CN2	I will pick up the goods at smart lockers, public pickup points	
CN3	If there are recycling instructions on the package, I will take the time to dispose of the packaging according to the instructions	
CN4	I will return defective products, electronic waste (television, phone,...) at collection points / according to the collection campaign	
CN5	I support businesses to include green logistics in their development strategies	

Source: Proposed by the author

3.2. Study sample size and data collection methods

The population of this study is defined as customers in Hanoi who have used the last mile delivery service. However, it is not possible to determine the size and approach of the whole population. Therefore, the author applied a convenience sampling technique.

In the world, there are many disagreed views on the sample size to ensure credibility reliance of research. Tabachnick and Fidell (2006) came up with a formula for determining sample size, which is $n \geq 8m + 50$ (n is the sample size, m is the number of independent variables in the research model). Some other researchers gave a sample size according to the rule of multiplication 5 (Bollen, 1989), i.e. 5 times the number of variables will produce a minimum sample size that ensures the reliability of the study. In this research, the author determined the sample size to be 300, satisfying Tabachnick and Fitell's (2006) rule ($8*5+50 = 90 < 300$), while also satisfying the multiplication rule ($26*5 = 130 < 300$).

The author collected the data using an online survey. Questionnaire was sent to students of Foreign Trade University, Hanoi University of Science and Technology, Hanoi Medical University,...; Vietinbank Nam Thang Long branch; Technical Center Viettel Hoa Lac,... At the same time, the inhabitants in the neighborhood and acquaintances of the author are also a reliable source of data.

After 26 days, the authors received 341 valid responses. Survey data is processed using the Excel and SPSS 20 programe (Statistical Package for the Social Sciences) version 20.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Demographics of respondents

Table 3. Demographics of respondents

Traits	Number	Percentage
Sex		
Female	196	57,48%
Male	145	42,52%
Age		
18 - 25	118	34,60%
26 - 35	94	27,57%
36 – 45	97	28,45%
45 tuổi	32	9,38%
Monthly income		
Under 3 million dongs	59	17,30%
3 - under 7 million dongs	97	28,45%
7 – under 15 million dongs	88	25,80%
15 - under 30 million dongs	81	23,75%
Over 30 million dongs	16	4,7%

Source: Data processing results using SPSS 20 software

Of the 341 valid responses, in terms of gender, the number of female customers accounted for 57.48%. The highest age concentration was in the 18-25 age group, with 118 votes (34.60%). People at the age of over 45 accounted for 9,38%. When it comes to monthly income level, the most popular surveyed response is from 3 to less than 7 million VND, accounting for 28.45%.

Table 4. The frequency of online shopping of customers

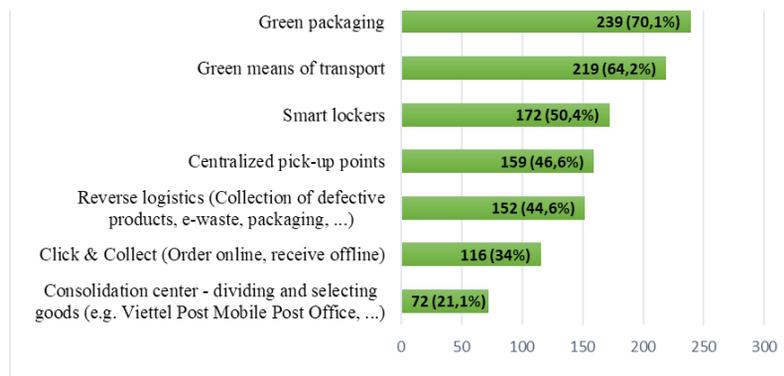
Frequency of online shopping	Number	Percentage
More than 1 time/week	35	10,26%
1 time/week	132	38,71%
1 time/month	95	27,86%
1 time/quarter	54	15,84%
1 time/year	9	2,64%
Rarely	16	4,69%

Source: Data processing results using SPSS 20 software

4.1.2. Results on the status of customer's acceptance of green logistics in last-mile delivery

The author conducted a survey on the percentage of customers who know about the above green delivery solutions provided by logistics service providers. The survey results are shown in Figure 2.

Figure 2. Percentage of customers who know about the green delivery solutions

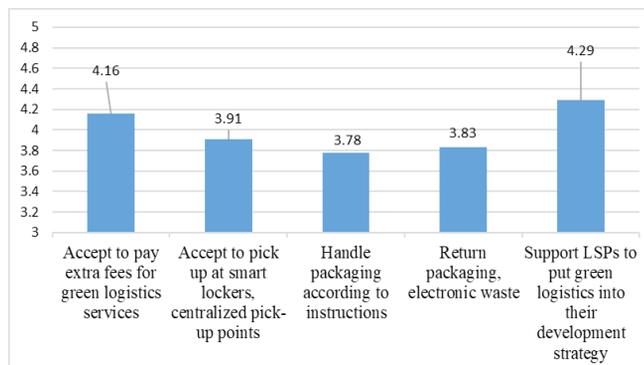


Source: Author's survey

According to the study results, green last mile delivery solutions are accessible to clients in Hanoi. Green packaging is the most well-known solution among clients, with 70.1% opting for it. Green transportation comes in second with 64.2%. Customers have also shown a strong interest in cutting-edge solutions such as smart lockers and centralized pick-up points. 44.6% of consumers are aware of the reverse logistics of collecting electronic garbage. Only the consolidation center - division of items is oriented towards the supply side of last-mile delivery process, thus it has the fewest customers (with only 21.1%).

Following that, the author conducted a survey on the types of green logistics acceptability in customer last mile delivery, receiving the findings given in figure 3 below:

Figure 3. Customers' acceptance of green logistics in last-mile delivery



Source: Author's survey

The most acceptable kind of customers' acceptance (with 4.29 out of 5 points) is supporting LSPs to put green logistics into their development plan. The acceptance of additional payments for green logistics services (4.16 points) comes next. However, when it comes to more specific actions that require more time and effort, such as receiving goods in a public place, recycling and reusing packaging, or returning e-waste, etc., this number tends to decrease, particularly in terms of handling packaging according to instructions, which only received 3.78 points.

4.1.3. Cronbach's Alpha Analysis

All observed variables are eligible to be included in EFA analysis because the variable-total correlation coefficient is greater than 0.3 and Cronbach's Alpha value is greater than 0.6. The results of Cronbach's Alpha analysis are shown in Table 5.

Table 5. Cronbach's Alpha Analysis

Independent Variable	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Environmental concerns (Cronbach's Alpha = 0,778)		
MT1	0,555	0,745
MT2	0,565	0,733
MT3	0,708	0,665
MT4	0,527	0,753
Economic factors (Cronbach's Alpha = 0,779)		
KT1	0,563	0,756
KT2	0,682	0,628
KT3	0,610	0,711
Understanding of green logistics (Cronbach's Alpha = 0,901)		
HB1	0,779	0,875
HB2	0,768	0,877
HB3	0,717	0,885
HB4	0,710	0,887
HB5	0,872	0,865
HB6	0,570	0,907
Usefulness of green logistics services (Cronbach's Alpha = 0,804)		
HU1	0,722	0,703
HU2	0,569	0,777
HU3	0,555	0,783
HU4	0,637	0,747
Subjective norms (Cronbach's Alpha = 0,754)		
QC1	0,536	0,705
QC2	0,492	0,730
QC3	0,595	0,672
QC4	0,585	0,680
Dependent Variable	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Customers' acceptance of green logistics (Cronbach's Alpha = 0,821)		
CN1	0,640	0,780
CN2	0,662	0,770
CN3	0,638	0,778
CN4	0,629	0,781
CN5	0,519	0,812

Source: Data processing results using SPSS 20 software

4.1.4. Exploratory Factor Analysis

Table 6. EFA for the independent variable

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,858
Bartlett's Test of Sphericity	Approx. Chi Square	3906,582
	df	210
	Sig.	0,000
Eigenvalue		1,163
Cumulative of Variance		67,381%

Source: Data processing results using SPSS 20 software

At the end of the KMO and Barlett tests, the measured KMO value is 0.858, ranging from 0.5 to 1. This proves that factor analysis is appropriate. At the same time, the sig value. is less than 0.05, proving that the Barlett test is statistically significant or the observed variables are correlated in the population. With the Principal Component extraction method and Varimax rotation, there are 5 factors extracted with the total extracted variance (the total variation explained by the factors) of 67.381% (greater than 50%), this means 67,381% variability of the data is explained by 5 factors. In addition, the Eigenvalues of the factors are all greater than 1 (the smallest is 1.163), so all 5 factors are kept in the analytical model and the conclusion that using the factor analysis method is perfect fit.

Table 7. Rotated Component Matrix

	Component				
	1	2	3	4	5
HB5	0,878				
HB1	0,837				
HB2	0,829				
HB3	0,763				
HB4	0,681				
HB6	0,634				
MT3		0,850			
MT1		0,749			
MT4		0,699			
MT2		0,604			
KT2			0,781		
KT3			0,760		
HU2			0,633		
KT1			0,501		
QC1				0,774	
QC3				0,694	
QC4				0,692	
QC2				0,682	
HU3					0,777
HU1					0,732
HU4					0,585

Source: Data processing results using SPSS 20 software

Table 8. EFA for the dependent variable

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,826
Bartlett's Test of Sphericity	Approx. Chi Square	555,890
	df	10
	Sig.	0,000

Eigenvalue	2,930
Cumulative of Variance	58,604%
Observed variables	Factor loading
CN1	0,803
CN2	0,784
CN3	0,778
CN4	0,776
CN5	0,680

Source: Data processing results using SPSS 20 software

4.1.5. Pearson Correlation

Next, the author conducted Pearson correlation analysis to evaluate whether there is a correlation between the independent variables and the dependent variable or between the independent variables. The results of the correlation analysis are shown in Table 9.

Table 9. Pearson Correlation

		CN	MT	KT	HB	HU	QC
CN	Pearson Correlation	1	0,601**	0,677**	0,507**	0,616**	0,420**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000
	N	341	341	341	341	341	341
MT	Pearson Correlation	0,601**	1	0,433**	0,461**	0,409**	0,307**
	Sig. (2-tailed)	0,000		0,000	0,000	0,000	0,000
KT	Pearson Correlation	0,677**	0,433**	1	0,403**	0,585**	0,383**
	Sig. (2-tailed)	0,000	0,000		0,000	0,000	0,000
HB	Pearson Correlation	0,507**	0,461**	0,403**	1	0,473**	0,438**
	Sig. (2-tailed)	0,000	0,000	0,000		0,000	0,000
HU	Pearson Correlation	0,616**	0,409**	0,585**	0,473**	1	0,447**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000		0,000
QC	Pearson Correlation	0,420**	0,307**	0,383**	0,438**	0,447**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	

Source: Data processing results using SPSS 20 software

4.1.6. Regression Analysis

Finally, the author proceeded to build a linear regression model to find out the relationship between the independent variables and the dependent variable. The dependent variable built in the model is “Customers’ acceptance of green logistics” (CN) and 5 independent variables are “Environmental concerns” (MT), “Economic factors” (KT), “Understanding of green logistics” (HB), “Usefulness of green logistics services” (HU) and “Subjective norms” (QC).

Table 10. Regression Analysis

R ²		0,627					
Adjusted R ²		0,622					
Std. Error		0,3493170					
Durbin - Watson		1,925					
Sig. (F-Test)		0,000					
Predictor	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	VIF
	β	Sts. Error	β				
(Constant)	0,348	0,164			2,117	0,035	
MT	0,282	0,038	0,294		7,385	0,000	1,421
KT	0,308	0,036	0,366		8,495	0,000	1,669

HB	0,086	0,035	0,102	2,456	0,015	1,557
HU	0,177	0,038	0,211	4,716	0,000	1,794
QC	0,043	0,033	0,051	1,290	0,198	1,386

Source: Data processing results using SPSS 20 software

With adjusted R2 reaching 0.622 (62.2%) means 5 independent variables Environmental concerns; Economical factors; Understanding of green logistics; Usefulness of green logistics services; and Subjective norms explain 62.2% of the change in the dependent variable Customers’ acceptance of green logistics. The remaining 37.8% is explained by random error and other variables that have not been included in the model.

In this model, a Durbin – Watson value $d = 1.925$; for $k' = 5$ and $n = 341$, then $dU = 1,854$. Considering that: $dU = 1.854 < 1,925 < 4 - dU = 2.146$; therefore, no first-order autocorrelation occurs in the research model.

In addition, the significance level sig. (F-test) is 0.000 (lower than 0.05), proving that the linear regression model proposed by the author can be generalized and applied to the population. Finally, the variance exaggeration coefficient VIF of all dependent variables is less than 2, indicating that the model does not have multicollinearity.

Table 11. Research hypothesis test results

Hypothesis	Content	Standardized Coefficients	Sig.	Result
H1	Environmental concerns have a positive impact on customers’ acceptance of green logistics	0,294	0,000	Accepted
H2	Economics factors have a positive impact on customers’ acceptance of green logistics	0,366	0,000	Accepted
H3	Understanding of green logistics have a positive impact on customers’ acceptance of green logistics	0,102	0,015	Accepted
H4	The usefulness of green logistics solutions have a positive impact on customers’ acceptance of green logistics	0,211	0,000	Accepted
H5	Subjective norms have a positive impact on customers’ acceptance of green logistics	0,051	0,198	Rejected

Source: Author

The standardized coefficients of the variables MT, KT, HB, HU all have sig significance. is less than 0.05, and these standardized regression coefficients all have (+) sign, proving that 4 variables MT, KT, HB, HU have a positive impact on the dependent variable, which is the acceptance of green logistics by customers. row. The variable QC has a significance level of the standardized regression coefficient of 0.198 (>0.05), showing that this variable has no impact on the dependent variable.

With the results of the above regression analysis, the linear regression model of the research will be written as follows:

$$CN = 0,294*MT + 0,366*KT + 0,102*HB + 0,211*HU$$

4.2. Discussion

The findings of regression model testing reveal that environmental concerns, economic factor, understanding of green logistics, and the usefulness of green logistics services all have a positive influence on customers’s acceptance of green logistics in last-mile delivery.

Customers’ acceptance of green logistics is mostly influenced by economic factors. This is explained by the fact that customers will question whether the green solutions that businesses provide are truly worth the extra money that they have to pay, because in many cases, “green label” is just an excuse for businesses to collect additional service fees, but the true value the business brings to the environment and consumers is not considerable.

5. RECOMMENDATION

The general recommendations for the Government as well as logistics service providers can be formulated based on quantitative and qualitative bases as follow:

01. Based on the research results, several solutions can be proposed to promote the customers' acceptance of green logistics through affecting 4 factors: (i) Economic factors, (ii) Environmental concerns, (iii) Understanding of green logistics and (iv) The usefulness of green logistics services.

02. General regulations and policies of the Government and Hanoi People's Committee related to green economic development and green logistics should be studied to evaluate the strengths and opportunities of green logistics activities.

03. Some difficulty in controlling the factors affecting the customers' acceptance of green logistics should also be not overlooked to make some feasible recommendations for both state management agency and logistics service providers.

5.1. General regulations and policies of the Government and Hanoi People's Committee on green economic development and green logistics

Most recently, at the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 26), Vietnam pledged to develop and implement measures to reduce greenhouse gas emissions, strong, reaching net emissions of "zero" by 2050 and reducing methane emissions by 30% by 2030. Accordingly, the Prime Minister signed Decision No. 2157/QĐ-TTg on December 21, 2021 and approved the Circular Economy Development Project on June 7, 2022 to implement and implement this commitment of Vietnam.

On July 22, 2020, the City People's Committee also issued the plan 149/KH-UBND on Green Growth Actions in Hanoi until 2025, with orientation to 2030. The main purpose of this plan is to implement the general direction of the Party and the State on sustainable development, green growth, green urban development and implementation of Vietnam's commitments with international friends related to greenhouse gas emissions issues.

As can be seen, the Government and Hanoi People's Committee have released several legislative papers and regulations concerning green economic growth, including green logistics development. This demonstrates the Party's, Government's, and especially the Capital's concern for green economic development; at the same time, it depicts the Party's, Government's, and functional agencies' determination to create a favorable legal corridor for the sustainable development of the economy in general and the development of green logistics activities.

5.2. Difficulty in controlling the factors affecting the customers' acceptance of green logistics

❖ Reasons from state management agencies

Firstly, lack of financial support policies for businesses implementing green logistics:

Current regulations or policies of the state management agencies about green logistics development are lack of financial support policies, such as: tax exemption, supporting the cost of renting warehouse space, smart lockers, etc. This will lead to the limitations related to green logistics operation costs of businesses, forcing them to raise the price of green logistics services and affecting economics factors – the most important factor affecting customers' acceptance.

Secondly, lack of binding regulations and independent organization to inspect and supervise green logistics activities of businesses:

Up to now, Hanoi only has a green urban development policy, not yet any specific policy related to green logistics development and green logistics in last-mile delivery. These specific policies namely: allowing the installation of public smart lockers; guiding and organizing collection campaign for electronic waste, etc. Furthermore, Hanoi lacks standardized criterias for determining the extent of the businesses' implementation of green logistics. In fact, there is no independent organization to inspect and supervise green logistics activities of businesses.

Thirdly, lack of communication coordination of management agencies and associations related to green logistics services to consumers:

It can be noticeable that there is no cooperation between state management authorities and business groups such as the logistics service providers and the E-commerce Association on the development of green logistics and its environmental advantages. As a result, customers lack a complete grasp of green logistics and have yet to comprehend its benefits, making it not widely accepted.

❖ Reasons from LSPs

Firstly, the size and financial capacity of the businesses are not strong, so they has to transferred the financial burden of green logistics costs to customers.

Secondly, green last mile delivery solutions don't really make much sense to customers: Overall, the usefulness and convenience of green last mile delivery solutions does not really mean much to customers compared to traditional last-mile delivery. Pick-up operations at smart lockers or phases of returning damaged items, rubbish gadgets, etc. are still somewhat difficult. As discussed in the limitations section, clients have yet to determine if the cost of green logistics services is worth the value they provide, therefore they will hesitate before adopting.

Table 12. Difficulty in controlling the factors affecting the customers' acceptance of green logistics

Reasons from state management agencies	Reasons from LSPs
Lack of financial support policies for businesses implementing green logistics	The size and financial capacity of the business is not strong →
Lack of binding regulations and independent organization to inspect and supervise green logistics activities of businesses	Has to transferred the financial burden of green logistics costs to customers
Lack of communication coordination of management agencies and associations related to green logistics services to consumers	Green last mile delivery solutions don't really make much sense to customers

Source: Author

5.3. Recommendation

5.3.1. Solutions for logistics service providers

❖ Solutions related to economic factors

Because economic factors have the greatest influence on consumers' acceptance of green logistics, the solutions provided should be aimed at lowering the cost of green logistics services.

Firstly, while the use of green packaging or green transportation may increase operational costs of businesses, leveraging technological advancements such as vehicle routing system can help businesses reduce transportation costs. In addition to this, taking advantage of recycled and reused materials, businesses can completely reduce input costs, therefore, making the price of green logistics services affordable for customers.

Secondly, the cost of green logistics services can be reduced if businesses agree to transfer a portion of corporate profits or government financial support to subsidize customer prices, thereby increasing the acceptance of green logistics and attracting more potential customers.

Thirdly, businesses should have procedures to encourage customers to return packaging, defective items, e-waste, ... through incentives such as discounts, coupons and free products for future orders.

❖ **Solutions related to environmental concerns and understanding of green logistics**

Firstly, propaganda and advertising about the enterprise's green logistics strategy should be put into practice in order to increase consumers' comprehension of green logistics as well as publicly promote the business's environmentally friendly image. Propaganda and advertising can take the form of posters, standees at smart lockers, centralized pick up points, or even delivery vehicles themselves.

Secondly, in order to solve the problem of centralized pick-up points, logistics companies can collaborate with other retail businesses (such as Winmart, Circle K, etc.) to promote cross-green images of each other.

Thirdly, the employment of key opinion leaders (KOLs), celebrities as brand ambassadors is the quickest way to propagate company's green image to customers.

❖ **Solutions related to the usefulness of green logistics services**

The usefulness of green logistics service determines whether customers accept it or not. Therefore, last-mile delivery businesses need some measures to improve the quality of their green services.

Firstly, for green transport activities, businesses need to improve the quality of their fleet existing delivery vehicles, there are plans to equip electric vehicles in the future. In addition, businesses should also increase the application of technology in transportation route management in order to minimize the cost and time of delivery and avoid the status of empty return-side.

Secondly, in order to implement green distribution solutions such as smart lockers and centralized receiving points, businesses must first extend their network of lockers and pick-up points. Only when the density of lockers and centralized pick-up points is dense enough will it completely create the convenience of location and delivery time while also fully meet the expectations of consumers. Furthermore, lockers should be put in secure areas with security cameras so that clients may be confident in picking up products at various times, even when it is dark or in the evening.

Another thing is worth highlighting is that companies who provide lockers or centralized pick-up points for last-mile delivery must maintain the consignee's information strictly secret in order to avoid the situation of leaking customers' information. Finally, the operation of the locker should be simplified so that senior consumers may utilize it as well.

Thirdly, in addition to the economic solutions outlined above, the collecting systems of electronic waste, packaging, and faulty items must be enlarged and put in customers' convenient places. Alternatively, it is conceivable to combine the collection and exchange of faulty items using smart lockers provided by businesses to diversify services and increase consumer convenience.

Fourthly, current packaging of delivered goods, even when constructed from ecologically friendly materials, is packed very securely and sealed with many sticky tapes, making it nearly impossible for customers to reuse the packing after removing the items. As a result, firms should do research on the type or manner of packing so that the packaging remains eco-friendly and reusable after receiving the goods.

5.3.2. Recommendation for state management agencies and related associations

❖ **Building a synchronous legal corridor for green logistics activities**

The government must continue to develop the synchronized legal framework for green logistics activity. In particular, for green transportation, cars that do not satisfy pollution and noise regulations should

not be allowed on the road. Furthermore, in the early phases, incentives should be provided for licenses of green means of transportation. Secondly, there should be standards on the type and the manner of green packaging. More detailed restrictions on rubbish, green waste, and e-waste for manufacturing, business, and commercial enterprises are required for the implementation of reverse logistics.

Without a tight regulatory framework, businesses would frequently prioritize their profit maximization rather than environmentally beneficial.

❖ Establishing an independent inspection organization and the measurement for the development of green logistics

The government must establish an independent inspection organization to verify, monitor, and assess the operations of firms adopting green logistics. This organization's evaluation will ensure that the logistics company's information and statistics regarding green logistics activities are transparent and accurate, so that the interests of consumers are protected.

The Vietnam Logistics Report 2022 also recommended us to use a set of criteria called "green logistics performance index" to evaluate the effectiveness and development of green logistics operations at businesses. (Ministry of Industry and Trade, 2022).

❖ Establishing policies that pave the way for businesses to develop green logistics

The Government and the Hanoi People's Committee should develop more specific policies and regulations to encourage and promote enterprises to develop green logistics through financial support (tax reduce, preferential loan policies, etc.); encourage businesses to use green modes of transportation; encourage the use of green energy in warehousing operations, encouraging green packaging and reverse logistics management. In contrast, logistics companies that harm the environment should face harsh penalties.

❖ Raising awareness of the whole society about green logistics

State management agencies and related associations (Association of Logistics service providers, Logistics Human Resource Development Association, E-commerce Association) need to propagate and educate widely, raising society's awareness of environmental issues and green logistics in general, green logistics in last mile delivery in particular, for consumers to understand, trust and strongly accept to use more green logistics services.

❖ Planning and investing in the development of road transport infrastructure

The government and Hanoi People's Committee must consider designing and constructing a smart city concept. Road transportation infrastructure for last-mile delivery should be modernized, generating ideal circumstances for green transportation. Difficult challenges, such as traffic congestion, poor road surface quality, and flooding during the rainy season, must all be evaluated and addressed, because these issues are the direct root causes of increased logistical costs and time.

6. CONCLUSION

Based on the identification of four factors affecting customers' acceptance of green logistics in last mile delivery, as well as the favorable regulations and difficulties in controlling the four factors mentioned above, the study has proposed solutions for businesses and recommendations for state management agencies to develop green logistics in Hanoi.

According to the findings, economic factors have the biggest impact on customers' acceptance, whereas subjective norms are not relevant within the local scope research of Hanoi.

The immediate development or application of green logistics may trigger increased costs and reduced profits for the business; however, if the business and related parties do not immediately get involved, the impact on the environment will be very severe, and our future generations will spend a lot of money to restore a clean living environment. The best option will be a mixed strategy (a combination of top-down and bottom-up strategies) to establish green logistics. In more detail, the government enforces required restrictions (from the top down) for enterprises to comply with. Businesses and consumers must also actively participate in its implementation (from the bottom up).

The study is currently limited in terms of sample size, but the quantitative research findings will be useful for other geographical locations as well.

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EXPORT TRENDS OF MINERAL PRODUCTS IN GREEN ECONOMY DEVELOPMENT IN VIETNAM

Author: Truong Quang Bao¹, Hoang Dang Thu Hien², Pham Thi Thao Linh², Lam Thi Xuan Mai²

ABSTRACT : In order to conduct the research, a quantitative research method was used, which relied on secondary sources of information collected from various sources covering the period from 2000 to 2021. This approach allowed for the analysis of data that had already been gathered and provided a comprehensive historical perspective. Panel data was utilized to estimate and build three models, namely the Pooled OLS model, fixed effects model (FEM), and random effects model (REM). By selecting the most appropriate model, the study was able to achieve an accurate and reliable analysis of the data, enhancing the validity of the findings. The results of this analysis revealed that the Minerals Law 2010 had an opposite result than expected, with a positive impact on Vietnam's mineral exports rather than a negative one. Interestingly, the degree of free trade of the importing country did not have any impact on Vietnam's mineral exports to that country. However, the GDP factor of the importing country, the world mineral price, and the Minerals Law 2010 were found to have a positive impact on Vietnam's mineral exports. This suggests that economic conditions play a crucial role in determining trade flows. On the other hand, factors such as the geographical distance between Vietnam and the importing country and the Law on Environmental Protection 2014 harmed Vietnam's mineral exports.

Keywords: green economy; mineral exports; Vietnam

1. INTRODUCTION

1.1. Urgency of the topic

Mining has been a vital industry in Vietnam, contributing significantly to the country's economic growth and development. The industry has generated income, provided employment opportunities, and produced essential raw materials for manufacturing various goods. The mining industry is known to consume vast amounts of energy and natural resources, leading to significant greenhouse gas emissions and reduced resource availability. Moreover, mining activities have caused negative impacts on the environment, including land degradation, deforestation, and biodiversity loss. These factors have necessitated regulatory interventions by the Vietnamese government to reduce these adverse effects.

To address these concerns, the Vietnamese government has implemented several policies and regulations in recent years aimed at promoting sustainable and efficient resource exploitation while protecting the environment. For example, the government enacted the Mineral Law 2010 and the Environmental Protection Law 2014, which sets forth specific requirements and standards for responsible mining practices. In addition, the government has issued other relevant policies focusing on sustainable development, such as Sustainable Development Strategy for 2011-2020, and Green Growth Strategy for 2011-2020, and Vision for 2050.

Previous studies on mineral commodities have mainly focused on addressing technical issues and economic efficiency, rather than considering the global and regional economic context of the "greening" trend. Therefore, our research group conducted a study on "Trends in Exporting Mineral Commodities for the Development of Vietnam's Green Economy," which delved deeper into various influencing factors, including the Mineral Law 2010, the Environmental Protection Law 2014, and Vietnam's CO₂ emissions. The study highlights the importance of promoting sustainable and efficient resource exploitation in Vietnam's mining industry, especially regarding environmental protection.

¹ Foreign Trade University, Email: quangbao1308@gmail.com

² Foreign Trade University.

1.2. Research Purposes and Objectives

The goal of this analysis is to examine the factors affecting Vietnam's mineral exports using the gravity model combined with three main input variables: the Mineral Law 2010, the Environmental Protection Law 2014, and CO2 emissions. In this model, the Mineral Law and the Environmental Protection Law are used as control variables, multiplied by the number of CO2 emissions. The gravity model allows us to estimate the quantity of goods exported from Vietnam to other countries over a given period. From the gravity model, we can analyze Vietnam's mineral export situation in the green growth strategy when applying the Mineral Law 2010, and the Environmental Protection Law 2014 combined with CO2 emissions. These factors may limit mining and production activities, increase production costs, and reduce Vietnam's competitiveness in the international market.

2. LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND METHODS

2.1. Literature review

2.1.1. Foreign Research

Dr. Syed Akhtar Hussain Shah's (2018) study "Strategy for Mineral Sector Development in Pakistan" provides insights into the significance of the mineral sector for the economic development of developed countries such as China, Italy, Turkey, Spain, Brazil, and so on. This research emphasizes the need for effective resource policymaking, comprehensive planning, and coordination between stakeholders to achieve sustainable mineral sector development. Similarly, Józef Dubiński's (2013) study "Sustainable Development of Mining Mineral Resources" highlights the importance of mineral resources in the global economy and a country's economic development. Laura Hering and Sandra Poncet's 2014 research examines the impact of domestic environmental regulations on export behavior in China. They found that stricter policies, such as the TCZ (targeting SO2 emissions reduction in highly polluted cities and regions), have a greater negative impact on exports as activity pollution levels increase. Several studies have applied gravity models to analyze the exports of different countries, including South Korea, Iceland, China, Nicaragua, Cameroon, and Pakistan. The results of these studies indicate that GDP per capita, geographical distance, and participation in trade agreements are significant determinants of a country's export volume. Exchange rate fluctuations also play a crucial role in international trade, as demonstrated by Jana Šimáková and Daniel Staváre's (2015) study of Hungary. Their research found that bilateral exchange rate fluctuations had a negative impact on Hungary's international trade, leading to a decline in trade volume. This highlights the importance of exchange rate stability for maintaining healthy trade relations between countries.

2.1.2. Domestic Research

Researchers, such as Do Tri Thai and Bac Xuan Nguyen, have applied the model to explain Vietnam's trading activity with European countries and its export value over a period of 20 years, respectively. The models consider several traditional variables, including GDP, exchange rates, distance, currency depreciation, the income of trading partners, and Vietnam's GDP, to determine their effect on trade flows. According to the studies conducted by Võ Thy Trang and Tran Thanh Long, it has been observed that countries prefer trading with those that have higher economic openness rather than high trade barriers. Additionally, Bui Thi Hong Hanh and Quitting Chen's research on rice exports highlights the impact of the population of the exporting country and export price on Vietnam's rice exports. Furthermore, Lai Van Manh and Nguyen Thang's study demonstrates how resource taxes affect coal exports from Vietnam to significant markets, their research on the mining sector of Vietnam not only reveals the adverse effect of increased resource taxes on coal exports but also sheds light on the underlying causes. The increase in taxes has led to an increase in prices, making Vietnamese coal less competitive in global markets. In addition, the study provides a detailed analysis of the impact of administrative order 02 on mineral ore exports from Vietnam. The issuance of the administrative order has significantly reduced the number of mineral ore exports from Vietnam due to the increased state

management of exploration, exploitation, processing, use, and export of mineral resources. Furthermore, the study suggests that this variable could have long-term implications for the entire mining sector's exports, as it highlights the importance of government policies and regulations in shaping the mining industry in Vietnam.

2.2. Theoretical framework

2.2.1. The concepts

A green economy, as defined by the United Nations Environment Programme, is one that is low in carbon, resource efficient, and socially inclusive. A green economy is required because it produces employment, assures long-term economic growth, and lowers pollution, global warming, resource depletion, and environmental degradation.

Exports are crucial for boosting the overall economy and creating new markets. Vietnam is a nation rich in minerals and natural resources, hence mineral exports are crucial to creating export flows that create foreign currency for the economy. The gravity model is a frequently employed model to interpret observable commercial constructions. Bilateral commerce is the fundamental tenet of the gravitation model, and it is influenced by two variables: the distance between two countries and the size of their economies (as measured by GDP). The formula for Tinbergen's 1962 simple gravity model is as follows:

$$F_{AB} = \frac{M_A \times M_B}{D_{AB}}$$

- F_{AB} is the value of goods exported from country A to country B.
- M_A, M_B is the size of the economies of countries A and B as measured by GDP.
- D_{AB} is the geographical distance between two countries is considered, representing the cost of shipping and the time it takes to deliver the goods.
- M_A, M_B is the size of the respective economies of countries A and B, usually measured in GDP.
- D_{AB} is the geographical distance between two nations is taken into consideration when calculating the cost of shipping and the delivery time for the goods.

In terms of benefits, the gravity model is one of the most well-studied in the field of international economics. According to Estrella Gómez-Herrera (2013), the logarithmic linearization of gravity models has at least two errors. The first is noted by Anderson and van Wincoop (2003) and unrecognized heterogeneity in the commercial data leads to biased estimates due to wrong selection. Second, it is not possible to calculate the logarithm of zero according to Estrella Gómez-Herrera (2013)

2.2.2. Hypotheses and Research Model

Hypothesis 1: Vietnam's mineral exports to the importing nation are positively impacted by that nation's gross domestic product.

The GDP of the importing country has a favorable impact on the consumption of goods and the number of trade goods, according to Pham Kieu Phuong, Le Ngoc Bao Tran (2022), Prasad (2000), M. Faruk Aydin (2004), Usman Haleem et al (2005), Safdari Mehdi and Motiee Reza (2011), and MD. Moniruzzaman (2011). Consequently, it is reasonable to believe that there is a strong connection between them.

Hypothesis 2: Vietnam's mineral exports to the country that is buying them are adversely affected by the distance between the two countries' physical locations.

Specialized insurance is necessary because the majority of Vietnam's mineral exports are raw materials with low value but high transportation risk. This observation is corroborated by research models, including those by Pham Kieu Phuong, Le Ngoc Bao Tran (2022), Nguyen Thi Kim Ngan, and others, which demonstrate an inverse link between geographic distance and export volume. Ghemawat (2001), Quang Huy (2014), and Kristjánsdóttir, H. (2005).

Hypothesis 3: Vietnam's mineral exports to the importing nation are positively impacted by the level of trade liberalization in that nation.

Lower tariffs and non-tariff barriers will give imported goods a chance to compete and advance alongside domestic products and boost the number of goods exported to that nation. Particularly, studies by Ly and Zang (2008), Kang (2014), Genç & Law (2014), and Dao Ngoc Tien (2013) have shown that trade liberalization levels and tariff barriers in general have a direct and positive impact on a commodity's export potential.

Hypothesis 4: Vietnam's resource exports to other nations are positively impacted by global mineral prices, particularly coal prices.

The global market's prices are influenced by the supply and demand of commodities across international borders. The study team, led by Master Nguyen Thang and Master Lai Van Manh's group discovered that the price of minerals on the global market, particularly the price of coal, had an impact on Vietnam's increase in export output.

Hypothesis 5: Vietnam's mineral exports to other nations are negatively impacted by the Law on Environmental Protection 2014.

The deposit for environmental rehabilitation and restoration has started to apply to mineral mining activities as of the Law on Environmental Protection 2014. The Law on Environmental Protection 2014 has therefore given the organization reason to believe that it will have a detrimental effect on Vietnam's mineral export turnover to other nations.

Hypothesis 6: The Minerals Law 2010 has a detrimental effect on Vietnam's exports of minerals to foreign nations.

Incorporating actual CO₂ emissions measurements, this coefficient describes the impact of the passage of the Minerals Law 2010 on Vietnam's mining industry and mineral exports. According to MSc Lai Van Manh's research, the implementation of Directive 02 on strengthening state management over mineral exploration, exploitation, processing, use, and exportation has adversely affected export activities. export of minerals, specifically reducing the output of mineral ores for export. It is conceivable that the Law on Minerals and the environment have a bad relationship.

2.3. Methods

Table 1 - Data collection sources and methods

Variable	Variable name	Explanation	Unit	Sources of data
Dependent variable	EXP _j	Vietnam's mineral exports to country j	USD	UN Comtrade
Independent variables	GDP _{Xj}	Gross domestic GDP of the country importing	Billion USD	World Bank
	DIS _j	Geographical separation between the capitals of country j and Hanoi.	Km	CEPII
	TFD _j	The degree of trade liberalization of country j	Point	HERITAGE
	WPR	World mineral prices (characterized by coal prices)	USD	STATISTA
	EL	An economic tool for environmental protection in mining activities.		Dummy variable
	CO ₂	The total amount of CO ₂ emissions produced by human activity, natural production, and other factors each year	kt	World Bank
	ML	Promote more effective geological investigations		Dummy variable

Source: Compiled by the research team.

In accordance with the global trend of green exports, this study examines the variables affecting Vietnam's mineral exports. Examining how these variables affect export value will help to inform policy recommendations for Vietnam's mining industry. The study employs quantitative analysis by gathering secondary data on factors

from 2000 to 2021 from various information sources. We use the Pooled OLS model, the Fixed Effects Model (FEM), and the Random Effects Model (REM), three common models for panel data. First, several diagnostic tests are performed on the Pooled OLS model, including the White test for variance changes, the VIF test for multicollinearity, the test for multicollinearity of independent variables, and the Wooldridge test to evaluate the model's autocorrelation phenomenon. Second, if the Pooled OLS model is deemed to be inadequate, the team will carry out additional analyses to compare the FEM and REM models using the Hausman test, the Lagrange multiplier test, the test for autocorrelation, and FGLS to rectify REM model faults.

3. RESULTS AND DISCUSSION

3.1. Results

Table 1 displays descriptive statistics for the model's variables which indicates a significant gap between the value of minerals imported from Vietnam and the GDP of those nations. Furthermore, there are quite big discrepancies between nations in terms of trade freedom and distance, indicating that Vietnam has engaged in rather broad commerce in the area and worldwide.

Table 2 - Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
EXP	330	454113.4	607873.9	69.38	3505750
GDPX	330	2.4031	4.450584	.00173	23.32
TFD	330	74.06545	12.21404	19.6	95
DIS	330	4721.939	3780.809	479	13362.15
WPR	330	108.8741	46.71741	39.35	199.94
CO_2	330	166691.8	92274.83	51210	350050
EL14	330	.3181818	.4664778	0	1
ML10	330	.5	.5007593	0	1

Source: Compiled by the research team.

First, Table 2 shows the Pooled OLS regression model of our study model as a baseline with R-squared = 21.76%, which means that the stated factors explain 21.76% of the change in Vietnam's mineral export turnover to the global market. The results in the table above reveal that GDP, the importing country's level of free trade, the distance, and the Law on Environmental Protection 2014 are all statistically significant at the 5% significance level. In which, addition to the distance variable and the Environmental Protection Law 2014, the other two factors have a beneficial influence on Vietnam's mineral exports, which are entirely compatible with the theory given above.

Table 3 - Results from Pooled OLS model

<i>lnEXP</i>	<i>Coefficient</i>	<i>Std. err.</i>	<i>t</i>	<i>P > t </i>	<i>[95% conf. interval]</i>	
lnGDPX	.4157252	.0684668	6.07	0.000	.281028	.5504224
lnTFD	2.819486	.5091381	5.54	0.000	1.81784	3.821131
lnDIS	-1.125035	.1607093	-7.00	0.000	-1.441204	-.8088662
lnWPR	.1448282	.2551656	0.57	0.571	-.3571681	.6468246
EL	-.0594416	.0242083	-2.46	0.015	-.1070674	-.0118158
ML	.0189561	.0261478	0.72	0.469	-.0324853	.0703975
_cons	8.56889	2.49652	3.43	0.001	3.657396	13.48038

Source: Compiled by the research team

The team then ran various tests on this model in which all variables have a variance exaggeration factor VIF of 10 and a mean VIF value of less than 2. As a result, the group concludes that the model currently lacks multicollinearity. Regarding the linear correlation test in the model, the absolute values of the correlation coefficients between pairs of independent variables are less than 0.8. On that basis, the research team concludes that the model does not have multicollinearity between pairs of independent variables. However, when the Pooled OLS model's Test of Autocorrelation and Varied Variance is run, the results demonstrate that the model is ineffective since both autocorrelation and variance error change occurs.

Following that, the author conducted FE and RE regression for Vietnam's mineral exports to 15 key trade partners, even though the FE approach is only used to analyze the influence of variables changing over time, and hence does not provide findings for the fixed variable over time. When we used the fixed effect model in this situation (without the distance variable), we got the following findings. Because the P value for the FE and RE findings is $0.0000 < 0.05$, the research team may infer that the FEM and REM are more appropriate than the Pooled OLS model. The next step is to utilize the Hausman test to select the most appropriate and optimal model among two fixed or random effects models. The Hausman test findings, when run on the software, show that $\text{Prob} > \text{Chibar}^2 = 0.8485 > 0.05$, indicating that the REM model is a better match. As a result, the REM model will be used for regression among the three OLS, FEM, and REM models to examine the variables influencing Vietnam's mineral exports from 2000 to 2021. Evaluating the phenomenon of variable variance using the Lagrange Multiplier Test and autocorrelation demonstrates that the REM model is still insufficient because both phenomena exist.

Table 4 - Results from Fixed effect Model

InEXP	<i>Coefficient</i>	<i>Std. err.</i>	<i>t</i>	<i>P > t </i>	<i>[95% conf. interval]</i>	
InGDPX	.6305106	.2228314	2.83	0.005	.1920573	1.068964
InTFD	.6719944	.469764	1.43	0.154	-.2523348	1.596324
InDIS	0	(omitted)				
InWPR	.1830633	.1909959	0.96	0.339	-.192749	.5588756
EL	-.0543414	.0147906	-3.67	0.000	-.083444	-.0252387
ML	.0218645	.0171606	1.27	0.204	-.0119015	.0556304
_cons	8.5768722	2.285836	3.75	0.000	4.079155	13.07459
sigma_u	2.0176442					
sigma_e	1.0728902					
rho	.77956769	(fraction of variance due to u_i)				
F test that all u_i = 0: F (14, 310) = 52.69			Prob > F = 0.0000			

Source: Compiled by the research team

Table 5 - Results from Random effect Model

InEXP	<i>Coefficient</i>	<i>Std. err.</i>	<i>t</i>	<i>P > t </i>	<i>[95% conf. interval]</i>	
InGDPX	.5390526	.1777521	3.03	0.002	.1906648	.8874404
InTFD	.8171288	.456009	1.79	0.073	-.0766324	1.71089
InDIS	-1.207978	.5534793	-2.18	0.029	-2.292777	-.1231783
InWPR	.2238247	.1780351	1.26	0.209	-.1251177	.572767
EL	-.0534386	.0146763	-3.64	0.000	-.0822036	-.0246736
ML	.0243707	.0166154	1.47	0.142	-.0081948	.0569362
_cons	17.48438	5.362248	3.26	0.001	6.974573	27.9942

sigma_u	1.6183076	
sigma_e	1.0728902	
rho	.69467124	(fraction of variance due to u_i)

Source: Compiled by the research team

Next, we may utilize GLS (Generalized Least Squares) estimation to avoid the phenomena of autocorrelation noise error and variable variance in the model chosen through testing for unbiased and efficient estimate results. Following the Hausman test, here is the REM model. We can see from the results of running the FGLS model to overcome the flaws in the REM model that the independent variables of national GDP, geographical distance, and the Environmental Protection Law 2014 all have significance levels P value 0, 01, indicating that these independent variables included in the model are suitable and have a significance level of 1%. The Minerals Law 2010 has significance > 0.01, that is, when GLS regression is not statistically significant, for the variables of trade liberalization and world mineral prices. The correlation of the independent variables with the dependent variable in the GLS model is comparable to the correlation in the author’s three models of OLS, FEM, and REM.

Table 6 - Results from FGLS model

lnEXP	<i>Coefficient</i>	<i>Std.err.</i>	<i>t</i>	<i>P > t </i>	<i>[95% conf.interval]</i>	
lnGDPX	.3843974	.0832092	4.62	0.000	.2213104	.5474845
lnTFD	.5737801	.406358	1.41	0.158	-.2226668	1.370227
lnDIS	-.7189489	.2241569	-3.21	0.001	-1.158288	-.2796095
lnWPR	.2664904	.1352402	1.97	0.049	.0014245	.5315564
EL	-.0527098	.0157301	-3.35	0.001	-.0835402	-.0218794
ML	.0409503	.0165564	2.47	0.013	.0085004	.0734003
_cons	14.32975	2.516969	5.69	0.000	9.396586	19.26292

Source: Compiled by the research team

Estimation results of the regression model:

$$\ln EXP_i = 14.32975 + 0.3843974 \times \ln GDPX_j - 0.7189489 \times \ln DIS_j + 0.5737801 \times \ln TFD_j + 0.2664904 \times \ln WPR - 0.0527098 \times EL + 0.0409503 \times ML + \epsilon_i$$

3.2. Discussion

For the GDP variable of the importing country, all four models demonstrate that the importing country’s GDP variable is statistically significant at the 5% level and has a favorable influence on Vietnam’s mineral exports. This variable considers the size of the market and the size of the economy, so the findings are consistent with earlier assumptions. Because the stronger the other components, the greater the importing countries’ purchasing power, consuming capacity, and import demand. This is consistent with prior research by Kebede Bekele (2011), Muhammad Taqi (2021), and authors Bui Thi Hong Hanh and Quiting Chen (2017). Furthermore, the FGLS model’s final study results demonstrate that the coefficient of the import nation GDP variable has the biggest magnitude in the model. Countries with the biggest GDPs in the world, such as China, Japan, Korea, and India, always account for a large amount of Vietnam’s mineral imports.

As predicted, the geographical distance component has the opposite effect on export output, which is similar to the previous research. Nguyen Huy (2014) and Kristjánssdóttir, H. (2005) found a negative association between geographical distance and export output in their investigations. This effect can

be explained by the export value of minerals because raw resources are not as valuable as electronic equipment, the difference between nations is wider will raise transportation costs, and delivery time, and harm product quality.

Concerning the mineral importing nation's degree of trade liberalization, the study team lacks sufficient evidence to infer that the variable degree of trade liberalization in the importing country influences Vietnam's mineral exports to that nation. Abidin et al., as well as Ly and Zang (2008), found comparable results. It is also understandable that when trade liberalization is high, trade barriers are low, lowering the cost of two-way customs. However, in the case of mineral goods, some nations are unable to self-regulate production or have limited internal resources, forcing them to rely on other exporting countries. Typically, in India, even though the index of free trade was only around 25/100 in the early 2000s, the average import rate of 5 million USD is similar to the import level of Philip 5.4 million USD in the period 2015-2020, while the index of free trade falls around 80/100. Thus, the organization believes that, in the mining business, the importing nation's level of trade has had minor impact on Vietnam's export turnover to that country.

For the world national mineral price variable, all four models demonstrate that the world national mineral price variable is statistically significant at the 5% level and has a favorable influence on Vietnam's mineral exports. This finding is also compatible with the work of authors Bui Thi Hong Hanh and Quitting Chen (2017), as well as Master Nguyen Thang and Master Lai Van Manh's group demonstrated that global resource prices (particularly coal prices) have an impact on raising Vietnam's export output.

According to the regression results, the Minerals Law 2010 has a beneficial influence on the value of Vietnam's mineral exports. Although this finding deviates from hypothesis and theory, it is clear from the practical execution of the Minerals Law in Vietnam that there are two key causes. The first reason is that the Minerals Law 2010 mandates that the results of the geological study (including investigation and appraisal of mineral potential) have been employed in many businesses: Construction, Industry and Trade, Transportation, Agriculture, etc but there is no regulation in the Minerals Law 2010 on the responsibility of refunding the State's invested funds to organizations and individuals when using geological information and data for construction projects in the above economic sectors. As a result, mineral miners may use information from geological surveys to improve mining efficiency and save time and money on self-investigation. The second reason is that, while there are no direct rules to encourage firms to innovate and invest in advanced and contemporary technologies, the Minerals Law 2010 has merit in creating broad norms to stimulate the development of new technologies effectively using resources, hence providing inspiration for numerous firms that have invested in and improved technology. Mining becomes easier and more convenient when firms are driven to invest in equipment and machinery and comprehend the right mining legislation, as demonstrated by Kendra's research. According to E.Dupuy (2014), many resource-rich countries liberalized their mining laws in the 1980s and 1990s to encourage foreign direct investment, resulting in a "restructuring geographical structure of capital flows in the mining sector" by allowing countries to receive an increasing inflow of mining capital.

Conducting the final test, the study verifies the regression results of the Law on Environmental Protection 2014 and shows that there is a negative impact on the value of mineral exports. Evidence suggests that there is a strong relationship between environmental regulation and export trade (Xu 2000; Dagar et al. 2021; Fang et al., 2019; Kamal et al. 2021). Strict environmental standards can facilitate the transition of developing countries to cleaner production processes (Nielsen, 2011).

4. CONCLUSIONS AND POLICY

This study investigates the export trends of mineral products in green economic growth in VietNam within 22 years between 2000 and 2021. The study uses Quantitative methods applying the gravity model of trade. According to our results, the GDP of the importing nation, the global price of minerals, and the Minerals Law 2010 all have a positive impact on Vietnam's mineral exports, while the distance between Vietnam and the importing nation and the Environmental Protection Law 2014 have a negative effect. Only the Minerals Law 2010 variable has the opposite result, and the degree of free trade of the importing country has no impact on mineral exports from Vietnam to that country. The research team's findings largely support the research hypothesis. Since then, the research team has come to some astounding conclusions regarding the effects of policies, including:

Firstly, the Minerals Law 2010 and the measurement of CO₂ emissions into the environment have had a positive impact on Vietnam's export turnover. The Mineral Law has provided an effective legal framework for the mining industry.

Secondly, the Environmental Protection Law 2014 and the measurement of CO₂ emissions have shown that strict regulations on environmental protection, along with tax rates, have led to a decrease in Vietnam's mineral exports to other countries.

To further elaborate on the actions that need to be taken, first, regulations on the responsibility to return the State's invested funds to individuals and organizations using geological data and information to serve construction work and mineral exploration and exploitation activities should be added. This will ensure that companies are held accountable for the funds they have received and used for mining activities. Moreover, Ministries and agencies should add specific requirements on accounting for environmental restoration costs and supporting the construction and renovation of technical infrastructure works caused by mining activities. This will ensure that companies comply with their commitments to improve and restore the environment during and after mining. It is also important to improve the policy on fees and taxes to avoid the loss of resources and revenue for the State budget. Vietnam's natural resource tax rate is still quite high compared to other countries in the region and the world (Australia stipulates a royalty's tax for ores of 7.5%, concentrates of 5%, metals of 2.5%, while Vietnam's highest tax rate is 20%), leading to dishonest tax declaration and exploitation of reserves in excess of permitted reserves for profit purposes. By lowering the tax rate and enforcing stricter regulations, the mining industry can become more sustainable and contribute to the country's economic growth. In addition, the Mineral Law needs to be supplemented with the basic task of geological investigation, which includes serving, assessing the potential for use, and planning the national long-term reserve. Additional traceability of minerals should be added to distinguish them from illegally exploited minerals. This will ensure that the mining industry operates in a transparent and legal manner. To further promote the growth of the mining industry, the Government should issue regulations on building mineral reserve centers in localities with large mineral resources to process the minerals that are not yet available for deep processing. This will create more jobs and attract more investors to the mining industry. Lastly, mineral planning needs to be organized, and the state needs to provide businesses with extensive information and timely support for problems in the mining process. By implementing these actions, Vietnam's mining industry can become more sustainable and contribute to the country's economic growth.

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IMPACT OF GREEN BARRIERS ON VIETNAMESE AGRICULTURAL EXPORTS TO MAJOR TRADING PARTNERS

Name of authors: Truong Ngoc Dieu An¹, Vo Thi Thien An², Bui Le Nhu Hoa², Tran Thi Thao Nhi²

Supervisor name: Doctor Nguyen Thi Thuy³

ABSTRACT: In recent years, green trade barriers have gradually become an important factor affecting Vietnam's agricultural exports. In this study, we aim to describe the trend of green barriers imposed on Vietnamese agricultural products by our five major markets including the USA, China, South Korea, Japan, and the EU. Also, this study investigates the impact of green trade barriers of five major markets on Vietnam's agricultural export during the period from 2009 to 2021 by using the gravity model. Using hand-collected data on green barriers from WTO, we find that the number of green trade barriers has increased annually, in which organic products and chemical residues are the most concerned aspects among five studied markets. The result also reveals that green barriers restrict the value of the export of Vietnam's agricultural products. Based on the research results, several recommendations are proposed to the Vietnamese government as well as domestic enterprises to improve export efficiency as well as enhance competitiveness on the world map of agricultural products.

Keywords: Green trade barriers, Vietnamese agricultural products, Gravity model

1. INTRODUCTION

1.1. Background

The agriculture sector plays an indispensable role in Vietnam's economy and society and also has contributed to socio-political stability, industrialization and modernization of Vietnam over the past 40 years. In the context of the global wave of agricultural trade emerging, Vietnam is taking advantage of available resources to join that race as a strong competitor with export scale as well as a variety of agricultural products. Thanks to the many Free Trade Agreements (FTAs) signed, the tariff for Vietnam's agricultural product export has been reduced. However, there is an increase in a number of non-tariff barriers, particularly green barriers as people pay more attention to health and the environment, especially after the Covid-19 pandemic.

One of the most essential non-tariff measures, also the main research object in this study, is green trade barriers. The most specific and clear definition is provided by Wei Wei (2019, p.193): "A green trade barrier is one form of non-tariff barriers, also known as ecological barriers. It refers to the imported countries through the strict green technical standards, complex health quarantine system or use of green environmental marks and green subsidies to restrict or prevent imported goods, so as to achieve the purpose of protecting the ecological environment, human and animal and plant health". However, some developed countries and other factors have applied these regulations to control imports from developing countries, where environmental standards are lower. These barriers are also considered as non-tariff ones and there is no international organization or a common policy framework, which is powerful enough to enforce these barriers.

¹ University of Economics - The University of Danang, Email: thienanpct2503@gmail.com

² University of Economics - The University of Danang.

³ University of Economics - The University of Danang, Email: thuytt@due.edu.vn

1.2. Research rationale

Many of the previous research were carried out in countries such as China, Japan, South Korea, etc., however, the findings of earlier research will not be appropriate considering the discrepancies in the state of Vietnamese agriculture now due to difference in natural conditions, in the level of economic development and business capacities, and in the food safety and environmental standards. Therefore, how green trade barriers affect exports of agricultural goods should be conducted in the context of Vietnam. The 2019 signing of the EVFTA has altered the picture of Vietnam's agricultural exports to the EU. Therefore, studies in this literature that study Vietnam mostly examine the export of Vietnamese agricultural products to the EU under the impact of green trade barriers. However, over-concentrating on one market can lead to some risks and missed opportunities in other potential markets. Additionally, Vietnam's government has always set targets for promoting and expanding the export market of agricultural products. Consequently, this research will study the relationship between green barriers and the value of agricultural products exported to not only the EU but also other major importers including the USA, China, Japan, and South Korea.

Furthermore, using hand-collected data, we provide up-to-date trends of green barriers on Vietnam's agricultural products by employing descriptive statistics to determine which particular sectors of Vietnamese agricultural products are most concerned by five markets and each one through their imposing green trade barriers on those sectors.

Based on the analyzed data, it can afterwards make appropriate solutions for the current scenario, specifically for government, industry associations and domestic enterprises to adapt to the requirements of our main trading partners and improve the export situation of Vietnamese agriculture products.

1.3. Research aims and objectives

This paper aims to analyze the impact of green trade barriers on Vietnam's agricultural export, which is exported to five major markets during the period from 2009 to 2021. Accordingly, some recommendations will propose agricultural development to a further step, meeting the requirement related to green barriers from highly demanding markets around the world.

The investigation consisted of four objectives. Firstly, we determine the current situation of Vietnam's agricultural exports and the trend of green barriers for Vietnam's main export markets. Secondly, we find out the relationship between the number of green barriers and Vietnamese agriculture exports via the Gravity model. In addition, another objective of this study is to identify which type of green barrier (TBT or SPS) has a more prominent impact on the export of Vietnamese agricultural products. Finally, some recommendations which develop Vietnam's agriculture situation in the next period will be proposed.

2. LITERATURE REVIEW

2.1. Green trade barriers

2.1.1. Definitions

Green trade barriers' definition has been suggested by many research conducted in this literature, although not exactly the same, there are various similarities. In which, the most specific and clear definition is provided by Wei Wei (2019): A green trade barrier is an ecological non-tariff barrier that restricts or prevents imported goods using strict technical standards, health quarantine systems, environmental marks, and subsidies to protect the environment, human health, and plant and animal life.

Apart from this definition, green trade barriers can also be seen as the tool for developed countries to restrict or forbid the import of foreign goods in the name of safeguarding finite resources, the environment, and public health (Dapeng Ren, 2018); or the restrictions imposed by a country or a group of countries

on imported goods from other countries based on environmental concern (Khoi & Thuy, 2013); or the set of strict market access regulations put in place by industrialized countries with superior technological capabilities (Chen & Xiao, 2023).

2.1.2. Types of green trade barriers

There are four types of green barriers that are usually imposed by importing countries. The first type taken by the nation to safeguard the environment and the health of its population was to adopt green technology legislation and standards based on its unique technological advantages. The second is a green packaging system, which requires ecologically friendly and recyclable or naturally degradable packaging. The third option is the “green environment symbol” received after meeting demanding certification requirements and certification processes. The fourth is the green health and quarantine system which is strictly implemented by the customs (Wei Wei, 2019).

2.1.3. Causes of green trade barriers

(1) Trade protectionism is the first reason. As traditional trade barriers are gradually removed, developed nations are compelled to figure out how to safeguard their trade and economic interests (Dapeng Ren, 2018).

(2) The tendency toward environmental protection as people’s living conditions and understanding of the value of environmental protection rise is the second factor that leads to the establishment and implementation of policies, organizations, and laws to safeguard the environment, human health, and ecological balance on products imported (Dapeng Ren, 2018).

2.2. Effects of green trade barriers on export

2.2.1. Positive effects

Green barriers are said to be a reflection of people’s increased awareness of environmental conservation worldwide, which is encouraging greater environmental protection measures (Dapeng Ren, 2018 and Fang Luo, 2019). Since then, exporting nations have had to focus more on adopting modern, sustainable development strategies for agriculture and eliminating archaic methods or techniques. This encourages employment in associated industries within the exporting nation as well as the export of agricultural products (Wei Wei, 2019).

These green standards help to improve the quality of agricultural exports and advance agricultural research and technology in the direction of sustainable development (Wei Wei, 2019). When a product passes rigorous testing procedures, green packaging standards, green visa requirements, and other restrictions, the significant expenditures can be completely offset by an increase in the cost of high-quality items (Fang Luo, 2019). Customers will soon be able to use goods that are focused on their health and the environment, both at home and around the globe.

Green barriers also help limit production and trade practices that cause ecological damage and environmental pollution (Dapeng Ren, 2018). Wei Wei (2019) also found that green barriers significantly improve the sustainable development plans of exporting nations and uphold a favorable trade-environment equilibrium. In the long run, when other fundamental factors remain constant, research by Chen Gong (2019) demonstrates that green trade barriers can foster technological advancement, nurture an eco-sustainable economy, and enhance the quality of exported products, ultimately weakening export barriers.

2.2.2. Negative effects

Su (2021) claims that green trade barriers will make it more difficult for agricultural products to be exported, restrict the flow of trade between different nations, and decrease the volume of agricultural products traded between two nations because it takes time to develop the export market for agricultural products and optimize its structure. At the same time, when more tests must be conducted, more processes must be improved, more procedures must be followed, etc., the export effectiveness and cost advantages of agricultural products from developing nations decrease (Li & Zhu, 2020).

Wei Wei (2019) raises the issue of enacting green trade barriers as a factor in the escalation of bilateral and multilateral trade tensions between nations if exported goods are routinely rejected due to low quality or failing to meet environmental protection criteria. Developed nations may also raise the ecological dumping fee because they think that developing nations do not have enough environmental awareness or environmental laws (Pang & Wang, 2018).

Due to the aforementioned factors, green barriers are making it more difficult for businesses to expand internationally, tap new markets, and fully utilize their own competitive advantages as well as those of other nations and businesses (Lin, 2012). This has a negative effect on the exporting nation's economic growth.

2.2.3. Empirical research

Le Thi Thu Huong (2015) and Vu Thi Thanh Huyen (2022) used descriptive statistics on Vietnam's major agricultural export value and the number of products being returned by the EU for not complying with their standards and procedures to measure the effects of green trade barriers from the EU, to make conclusions about the challenges in the early stages of Vietnamese agricultural products as well as the increasingly promising future.

Chen Gong (2019) examines China's agricultural exports from 2002 to 2016 to nine different markets and finds that when the first green trade barrier is encountered, both the export value and the competitiveness of Chinese agricultural products fall. But over time, trade restrictions on goods with high environmental impact have helped China's agricultural exports.

By using the total TBT and SPS that various nations report to the WTO as an indicator of green barriers, Su (2021) demonstrates that green trade barriers will temporarily lower agricultural exports due to an increase in regulatory and trade conflicts.

Nguyen Thi Thu Hien et al. (2022) studied the effects of non-tariff measures (NTMs) from the EU by focusing on technical barriers to trade (TBT) and phytosanitary measures (SPS) in addition to research conducted abroad and more in-depth analyses of our nation. According to research findings, Vietnam's agricultural exports are positively impacted by EU's SPS and TBT standards.

Le Thi Viet Nga et al. (2021) conducted another study that examined and evaluated the impact of US non-tariff measures on Vietnam's agricultural and fisheries export flows, concluding that TBT had a significant negative effect while SPS measures had no discernible effect on Vietnamese exports.

3. METHODOLOGY

Due to the prevalence of the gravity model in discovering the relationship between not only green trade barriers but also other factors affecting international trade and the bilateral trade flow in this literature, it is selected to resolve the research question of this study. It is formulated as following:

$$Y_{ij} = \beta_0 X_i^{\beta_1} X_j^{\beta_2} D_{ij}^{\beta_3} \zeta_{ij} \quad (1)$$

and then conduct a log-log transformation, which results in:

$$\ln Y_{ij} = \ln \beta_0 + \beta_1 \ln X_i + \beta_2 \ln X_j + \beta_3 \ln D_{ij} + \ln \zeta_{ij} \quad (2)$$

In which, Y_{ij} is trade from country i to country j , X_i and X_j denote the product of the two countries' economic size (GDP or/and population), and D_{ij} represents a geographical distance between i and j . Subsequently, the parameters β_0 , β_1 , β_2 , and β_3 are identified by Regression Analysis (Krisztin & Fischer, 2015).

Based on the original model and its extended version, we will propose a gravity model that is appropriate to this research. However, the data construction has to be conducted previously.

We consider first our dependent variable - Vietnam's agricultural export value, with the definition of agricultural products provided by WTO, particularly from WTO Agriculture Agreement. Its coverage is a list of HS Chapters, HS Headings and HS Codes related to what products are considered to be agricultural. Then, we measure the agriculture export value by collecting each product's export value based on HS from Trademap and summing them up.

The second variable is an independent one, which we make all effort to study in this research, green trade barriers. It is also considered as trade-related environmental measures that the WTO routinely expresses concern over (Khoi & Thuy, 2013). According to the WTO, two standards-related agreements, the SPS and TBT Agreements, are used to impose green trade barriers (Khatun, 2009). In which, the TBT Measures can take the form of product standards, testing requirements, and other technical requirements including testing, labeling, packaging, marketing, certification, origin marking, and health and safety. And the SPS Measures include all relevant regulations, requirements, and procedures used to ensure the safety of agricultural products for humans, plants, and animals. This comprises processes and production methods; testing, inspection, certification, and approval procedures; quarantine requirements for transporting animals or plants; procedures and methods of risk assessment; and packaging and labeling requirements related to food safety (Office of the United States Trade Representative). Therefore, the number of green trade barriers is estimated as the sum of TBT and SPS which is notified on the WTO Environmental Database.

As the trade restriction, the increase of green trade barriers, or TBT and SPS individually would hinder the export of agricultural products of a nation - a sector closely related to health and environment issues. Thus, it is hypothesized that:

H1: The number of green trade barriers has a negative influence on Vietnamese agriculture export value; H2: The number of TBT has a negative influence on Vietnamese agriculture export value;

H3: The number of SPS has a negative influence on Vietnamese agriculture export value.

Other variables would be included in the model, which are GDP of partner countries and Vietnam (source: World Bank data), population of partner countries and Vietnam (source: World Bank data), geographical distance from partner countries to Vietnam (source: Distance calculator), real exchange rate between the currency of partner countries and USD (source: World Bank data), the openness of importing country, equal to the percentage of their total import value of goods to GDP (source: World Bank data).

Regarding factors affecting Vietnam's agriculture exports which are used in proposed gravity model, it can be written as follows:

$$\ln(X_{ij,t}) = \ln(\beta_1) + \beta_2 \ln(GDP_{j,t}) + \beta_3 \ln(GDP_{i,t}) + \beta_4 \ln(POP_{j,t}) + \beta_5 \ln(POP_{i,t}) + \beta_6(DIST_{ij}) + u_1 RER_{CUR/USD,t} + u_2 OPEN_{j,t} + u_3 GRB_{j,t} + e_{ij,t} \quad (3)$$

In which, $X_{ij,t}$ is Viet Nam's agricultural products exports value to country j in year t ; $GDP_{j,t}$ and $GDP_{i,t}$ represent GDP of country j and i in year t ; $POP_{j,t}$ and $POP_{i,t}$ represent population of country j and i in year t ; $DIST_{ij}$ is geographic distance between Hanoi (Viet Nam's capital) and the capital of country j ; $RER_{CUR/USD,t}$ is the real exchange rate between the currency of country j and USD; $OPEN_{j,t}$ denotes the openness of country j in year t ; $GRB_{j,t}$ is symbolized for the number of green barriers that country j applied on imported agricultural products in year t ; and $e_{ij,t}$ is statistical error, β and u are parameters need to be calculated.

The data is collected among five major export markets of our country - the USA, China, Japan, South Korea, and the EU over 13 years for the period of 2009 - 2021. Because of Vietnam's integration into the WTO in 2009, our nation has been suffering from green trade barriers from the WTO system - TBT and SPS Agreements.

STATA is used throughout the whole data processing process. Firstly, we shall run the gravity model through the OLS method, then conduct Breusch-Pagan test to identify whether the variance is homogenous. If it is not homogenous which means the result from the OLS method cannot be taken to be analyzed, consequently we continue to conduct the model under the Fixed Effects (FE) and Random Effects (RE). After that, we perform the Hausman test to determine the correlation accurately and reasonably between the error term and the independent variables, thereby having a basis to indicate the appropriate explanatory model.

4. ANALYSIS

4.1. Descriptive analysis

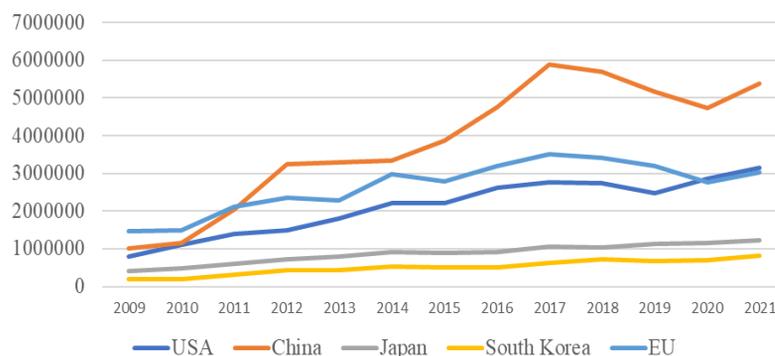


Figure 1. Number of green trade barriers during 2009 - 2021 of five studied markets

After conducting descriptive analysis and classifying green trade barriers based on their imposed object, we have come to the conclusion that currently, the number of green barriers offered from the aforementioned five markets is increasing year by year. In which, the EU and the USA were the two markets that imposed the highest number of green barriers on Vietnam while China was the least demanding market.

Table 1. Classifications of green trade barriers in 2021

	The USA	China	Japan	South Korea	The EU	Total
1. Organic	19	1	10	12	26	68
2. Chemicals	16	5	11	4	65	101
3. Labelling	0	1	1	4	2	8
4. Food	1	0	0	6	9	16
5. Plant	23	2	5	8	8	46
6. Animal	7	2	7	1	7	24
7. LMOs/GMOs	4	2	0	6	6	18
8. Production Process	1	1	0	0	4	6
9. Others	3	1	2	2	5	13

With the chemical field receiving the most attention among 5 markets, Japan, the EU and China had the highest number of green barriers in terms of controlling the amount of use and residues of pesticides in agricultural products. Besides, America was more interested in plants, while the green barriers coming from South Korea were imposed more on organic products.

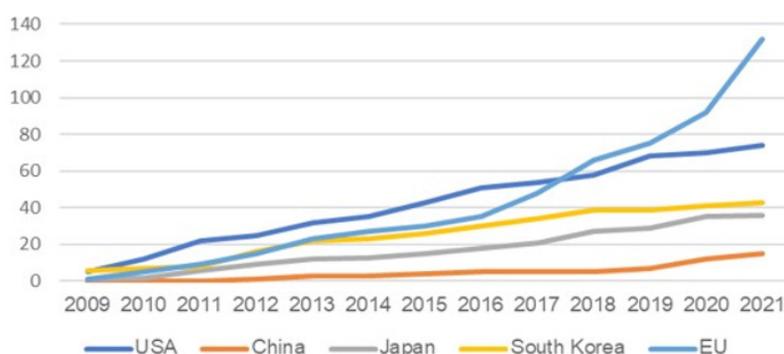


Figure 2. Vietnam's agricultural products export value during 2009 - 2021 based on country (thousand USD)

Simultaneously, the total amount of agricultural exports has fluctuated during the period from 2009 to 2021 (increased in the period 2009 - 2021, but declined in the years 2018 - 2020), but still increased markedly with a growth rate of 350.99%. China has been the largest importer of agricultural products from Vietnam. Among the five import partners studied, Japan and South Korea were the two countries with the lowest import value. However, the value of all imported agricultural products from Vietnam to them has been continuing to rise. By contrast, the value of agricultural exports to the US, the EU, and China fluctuated significantly.

4.2. Impact of green trade barriers on Vietnamese agricultural export value

We run the gravity model for Regression Analysis with OLS, Breuch-Pagan test, then conduct Random Effects, Fixed Effects and Hausman test for the consequently selection: we take the result of Random Effects as the figure truly reflects the effect of green trade barriers and its components on Vietnamese agricultural export value.

Table 2. The result from running the Gravity model by Random effects with the difference in considering the green trade barriers

	Coefficient of (1)	Coefficient of (2)	Coefficient of (3)	Coefficient of (4)
lnGDPp	0.203*	0.258**	0.211	0.279**
lnGDPvn	1.187***	1.086***	1.316***	1.069***
RER	0.0880*	0.0731	0.121**	0.0714
OPEN	0.00635***	0.00857***	0.00445*	0.00916***
lnPOPp	0.490***	0.470***	0.480***	0.462***
lnPOPvn	1.081	1.715	-1.191	1.618
lnDIS	0.122	0.0807	0.0508	0.0577
Green Barriers	-0.00548***			
TBT		-0.00905***		-0.00985***
SPS			-0.00685*	0.00210
Constant	-43.72	-53.97	-3.961	-52.03
R ²	0.9785	0.9799	0.7785	0.9800
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1				

In which, the model (1) is applied to discover the impact of green trade barriers, as the sum of TBT and SPS on export value of Vietnamese agricultural products. The (2) and (3) consider green trade barriers as only TBT and only SPS to find out whether each one affects the dependent variable. Finally, the (4) regards both TBT and SPS in the model but individually.

Based on the result of model (1), it can be implied that the coefficient $R^2 = 0.9785$, indicating that the variables in the model (GDP, population, real exchange rate, proportion of total import value to GDP, distance, and the number of green barriers) account for more than 97% of the variation in the export of the studied observations.

We observe a negative correlation between the quantity of green barriers and the value of agricultural exports from Vietnam, with a coefficient of -0.0055. Vietnam's agricultural exports lose 0.5% of their value for every additional green barrier, which can be considered as a large number with exports' value up to dozens of billions of dollars per year. This maladaptation of the increasing number of green trade barriers can be explained by Vietnam's low output requirements and standards for agricultural products, lax inspection systems, underdeveloped technology and production systems, insufficient nation's agricultural investment in research and development, and lack of a strong environmental protection consciousness.

From the result of the VIF test and correlation matrix, the VIF values of TBT and SPS are 6.34 and 5.91 respectively, both greater than 2, which means that these two variables have signs of multicollinearity. In addition, the correlation coefficient of TBT with SPS is up to 0.8652, showing that these two variables have an intimate, close and inevitable relationship. That is the reason why we include TBT and SPS as two variables in one model to get a more comprehensive result instead of indicating the result from the model in which TBT and SPS are considered in two separate equations.

Thus, the result that will be analyzed is taken from model (4). After running the data according to the gravity model with both TBT and SPS, we get the $R^2 = 0.9800$, that is, the variables included in the model account for 98% of the variation in the exports of the observed observations. With a coefficient of -0.00905, we see a negative relationship between the amount of TBT and the value of Vietnam's agricultural exports. When the amount of TBT that countries impose on agricultural products exported from Vietnam increases by 1, this export value will decrease by 0.9%. This impact is almost twice the influence of green barriers in general. This can be explained by the insufficient level of science and technology as well as the ability of Vietnamese farmers and export companies to apply this knowledge is not high enough to be able to fully

satisfy those technical requirements. This demonstrates that we must carefully and progressively think through the techniques and changes that must be put in place so that Vietnamese agricultural products may overcome these technical trade hurdles and still hold their position in the international market for agricultural exports.

By contrast, in terms of SPS, the coefficient has a positive sign. However, this figure is not statistically significant according to the high p-value, which is over 0.1. In other words, this sample of 65 observations shows that SPS has no effect on the value of agricultural products exported from Vietnam to the five studied markets.

Importantly, realizing the multicollinearity between population and GDP from VIF test, with the aim of verifying the accuracy of the relationship in this model, we run REM of panel data based on Gravity model according with the Robustness test without the “population of Vietnam” variable in the equation (5), and without the “GDP of Vietnam” variable in the equation (6).

Table 3. Robustness test results running from equation (5), (6) by Random Effects

	Coefficient of (5)	Coefficient of (6)
lnGDPp	0.270162***	0.4652825***
lnGDPvn	1.224211***	
RER	0.0829201***	-0.0085327*
OPEN	0.0085852***	0.0146817***
lnPOPp	0.4650449***	0.3776251***
lnPOPvn		10.91396***
lnDIS	0.0490746	-0.0199436*
TBT	-0.0092122***	-0.0132274***
SPS	0.002342	0.0046522*
_cons	-25.13935***	-203.928***
R ²	0.9798	0.9723

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The outcome of equation (5) demonstrates that there is a strongly negative association between the number of TBT and the value of Vietnam’s agricultural exports, with a coefficient of approximately -0.00921 and a p- value of 0.000. Based on the incredibly low p-value, which showed a 0% chance of a wrong result, this finding is reliable.

However, SPS has no effect on the value of agricultural products exported from Vietnam to the five selected markets with p-value = 0.466 > 0.05 despite having a positive sign (+).

Subsequently, the equation (6) with a coefficient of about -0.0132 and p-value of 0.000, we see a significantly negative relationship between the number of TBT and the value of Vietnam’s agricultural exports. This result is trustworthy based on the extremely low p-value, which indicated the 0% probability of a misfigured result.

In the case of SPS, however, this result is not statistically significant (p-value = 0.171 > 0.05) despite having a positive sign (+). In other words, the value of agricultural exports from Vietnam to the five chosen destinations is unaffected by SPS.

To sum up, the finding of how TBT and SPS impact Vietnam’s agricultural export value does not change. Thus, these results once again affirm the correctness and strong persuasion of the impact of TBT and SPS on the value of exported agricultural products of Vietnam.

Next, with another concern of the effect duration of TBT and SPS, we conduct an additional test. Specifically, instead of solely examining the situation at time t as analyzed above, we would delve further into the coefficients and p-values of TBT and SPS at two preceding time points, t-3 and t-5. The underlying reason for this test is that we expect that the green barriers may have long term instead of only immediate effect.

Table 4. Robustness test result of Random-effect model considering the impact of TBT and SPS at 3 different points of time on Vietnamese agricultural export value

Variable	Coefficient	p-value
lnGDPp	0.3007139	0.000
lnGDPvn	0.9954786	0.009
RER	0.0749813	0.003
OPEN	0.0095757	0.000
lnPOPp	0.4496526	0.000
lnPOPvn	2.205266	0.500
lnDIS	0.0298443	0.680
TBT	-0.0093459	0.002
TBT(t-3)	0.0022874	0.816
TBT(t-5)	-0.0086951	0.259
SPS	0.0017556	0.758
SPS(t-3)	0.0053693	0.409
SPS(t-5)	-0.0020021	0.854
_cons	-61.42534	0.248
R-sq = 0.9804		

The results are shown in the above table. At t-3, the coefficient of TBT and SPS shows a positive sign (+), and at t-5, both TBT and SPS coefficients assume negative values, implying a negative impact despite their lacking statistical significance due to a p-value greater than 0.05 (0.816, 0.409, 0.259, 0.854 respectively).

Consequently, the export value of Vietnam at any given time point appears to be less affected by past green trade barriers in comparison to ones of that time point. As a result, it is evident that only TBT has a significant impact on the value of agricultural exports at the studied time point t, while the influence of SPS is negligible.

However, it is necessary to consider conducting the unit root test when the exceptionally high coefficient of determination (R^2) may be due to the spurious regression caused by data containing the unit roots or unstationary data in other words (Damodar & Dawn, 2009). On the other hand, the modest number of panels and time range of this research, which is under the value of 25 panels and 25 points of time, makes the existing possibility of above concern plunge, thus can ensure the reliability of the discovered results only taken from REM without carrying out the unit root test (Kazi, Umar, & Alam, 2018). Moreover, unit root tests tend to be biased and outperformed for the panel data constructed based on gravity model, so the outcome of all the models this research is trustworthy (Jarko, 2009).

5. CONCLUSION

The results of the gravity model show the opposite relationship between the number of green barriers imposed on Vietnamese agricultural products by five main markets in the world, including the US, China, Japan, South Korea and the EU and the export value of Vietnamese ones. These values have been proved to be adversely impacted by TBT but unaffected by SPS—two elements of green trade barriers. From a theoretical perspective, these results have contributed to enhancing the argument in this literature that in developing countries, particularly Vietnam, green trade barriers, as trade restrictions, have a negative impact on the value of agricultural products from Vietnam. Therefore, based on this theoretical contribution, practical problems can be solved by the appropriate solutions conducted by governments, businesses, and even citizens, not only concentrating on overcoming TBT, but also not ignoring SPS due to unexpected SPS in the future. In addition, through descriptive statistical analysis, it is shown that more and more environmental restrictions are placed on agricultural exports from Vietnam; this indicates that Vietnamese

agricultural products are under considerable pressure to adjust to those restrictions in order to facilitate customs clearance in importing nations.

Thus, we provide some suggestions to enhance Vietnam's agricultural product exports and expand the export market for Vietnamese agricultural products in view of the effects of green trade obstacles on Vietnam's agricultural exports that were described above. The government, industry associations and domestic enterprises need to focus on developing policies to improve Vietnam's system of standards and technical regulations in harmony with international standards to a reasonable extent and relatively promoting quality inspection and control systems in order to deal with challenging barriers from challenging markets.

All in all, the study's limitations would be mentioned. Specifically, our gravity model only employs traditional variances such as GDP, distance, population, etc. Future research should add more variances, for example, the index of development and application of science and technology to agriculture, to reflect a broader picture of the issue. Also, to adapt this purpose, we can extend research markets because in fact we trade agricultural products with many countries in the world but not only 5 countries we chose. Moreover, our source data is limited because we only collected data from the WTO database. Meanwhile, many countries impose environmental regulations on their national government's website.

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UNLOCKING THE LINK: UNRAVELING THE INTERPLAY BETWEEN FOREIGN RESERVES AND FOREIGN EXCHANGE RATE - INSIGHTS FROM VIETNAM

Academic advisor: Ph.D. Nguyen Thi Thuy¹

Students: Vo Hoang Lam¹, Vo Nguyen Khoi¹, Nguyen Vuong Thien¹

ABSTRACT: *Given the dearth of prior research on this topic in Vietnam, this thesis provides a comprehensive evaluation of hypotheses using a pool of data from 1995 to 2022. The objectives of this paper are to provide basic definitions of linked variables and to investigate the fundamental relationship between exchange rate and foreign reserves. Specifically, the study aims to determine the impact of foreign exchange reserves on exchange rate volatility in Vietnam. The paper adopts a quantitative research approach and employs econometric methods to analyze the data. The findings reveal a short-term bidirectional impact between the real exchange rate and the foreign reserve, while the foreign exchange rate has a one-way impact on nominal exchange rate. The findings of the study are expected to contribute to the literature on reserve management and exchange rate stability in emerging market economies like Vietnam. The results of the study will provide policymakers with insights into the optimal levels of international reserves that Vietnam should maintain, as well as the appropriate policies to manage exchange rates and external shocks. Overall, this paper aims to pave the path for future expansion studies in this area of research.*

Keywords: *Foreign exchange reserve, real exchange rate, nominal exchange rate, VAR model, CPI, Inflation.*

1. INTRODUCTION

1.1. Research background

1.1.1. Practical background

Numerous studies have examined the relationship between international reserves and foreign exchange rates, highlighting the importance of maintaining financial stability and possessing adequate reserves to support the currency during crises. Developing economies, including Vietnam, face challenges that can destabilize their economies, making effective management of international reserves and foreign currency rates crucial. Previous research has shown that larger foreign reserves and central bank engagement in foreign currency markets are effective in maintaining currency rate stability and withstanding economic shocks. Vietnam's economy has undergone significant transformation, resulting in a dramatic increase in foreign exchange reserves from \$1.5 billion in 1995 to over \$100 billion by 2020. As a result, understanding the variables that contribute to reserve fluctuations and their impact on exchange rates is essential for policymakers to address key economic concerns. Therefore, this research aims to examine the link between Vietnam's foreign exchange reserves and exchange rate fluctuations to provide insights into the effectiveness of reserve management policies for emerging economies.

1.1.1. Theoretical background

The collapse of the Bretton Woods fixed exchange rate system in the early 1970s led to the adoption of the flexible exchange rate system. Despite the theoretical argument that countries under a flexible exchange rate system do not require reserve requirements, most still build up foreign exchange reserves. In particular, emerging economies are a suitable case to examine the relationship between changes in foreign exchange reserves and fluctuations in exchange rates. This research aims to analyze the relationship between changes in international exchange reserves and foreign exchange rate movements in Vietnam as an emerging market in Southeast Asia. The year 2022 witnessed significant global political and economic events that negatively

¹ University of Economics – The University of Danang.

impacted the value of the Vietnamese currency. By studying this relationship, this research seeks to provide insights into the effectiveness of foreign exchange interventions in developing nations and to offer valuable policy implications for monetary authorities.

1.2. Research objective

Analysis of the current state of Vietnam's foreign exchange reserves during the period of time between 1995 and 2022.

This study was set to defining the relationship between the actual foreign exchange reserve ratio and the exchange rate which will help in making the monetary policy decision.

1.3. Research scope:

This research is classified as an applied study that employs various prior literatures to create a model solely focused on analyzing the relationship between international reserves and foreign exchange rates in Vietnam.

This research is conducted in Vietnam, which has not been extensively studied in relation to the relationship between foreign exchange reserves and exchange rate fluctuations. Therefore, this study aims to strengthen the foundation of existing research on this topic and support further studies.

2. LITERATURE REVIEW

2.1. Key definition

2.1.1. Foreign reserve

According to Foreign exchange reserves are the supply of foreign currency held by the central bank of a country, which can be used to cover external payment imbalances, stabilize domestic currency value, and defend against speculative attacks on the foreign exchange market. These reserves are often denominated in various currencies, with the US dollar being the most common. Holding foreign exchange reserves can help a country maintain stability and manage external shocks, but there are potential drawbacks such as opportunity costs and attracting speculative capital flows. The accumulation of foreign exchange reserves has been a trend among developing countries, particularly in Asia, and policymakers must carefully evaluate the costs and benefits of holding reserves to ensure they are being used effectively and efficiently.

2.1.2. Exchange rate

Exchange rate refers to the value of one currency compared to another, and there are two types: nominal and real exchange rates. Nominal exchange rates are determined by market forces of supply and demand and can be affected by various factors, including inflation rates, interest rates, trade balances, and geopolitical events. In contrast, the real exchange rate takes into account inflation rates and provides a more accurate measure of the relative value of currencies over time. Factors that can cause changes in the RER include relative inflation rates, productivity, and terms of trade. Understanding exchange rate dynamics is crucial for policymakers and businesses engaged in international trade and finance.

2.1.3. CPI

The Consumer Price Index (CPI) is a weighted average of prices of goods and services purchased by households, used to measure the general price level in an economy and reflect changes in purchasing power over time. The Bureau of Labor Statistics conducts a monthly survey to determine the market basket of goods and services, which are weighted according to their relative importance in consumer expenditure. The CPI has several uses, including as an economic indicator of inflation and adjusting other economic indicators for price changes. However, limitations include its inability to represent all population groups, not measuring every aspect that affects living standards, and excluding energy costs. Nonetheless, the CPI is an important tool for policymakers in making informed decisions about economic policies.

2.1.4. Inflation

The Consumer Price Index (CPI) is a weighted average of prices of goods and services purchased by households, used to measure the general price level in an economy and reflect changes in purchasing power over time. The Bureau of Labor Statistics conducts a monthly survey to determine the market basket of goods and services, which are weighted according to their relative importance in consumer expenditure. The CPI has several uses, including as an economic indicator of inflation and adjusting other economic indicators for price changes. However, limitations include its inability to represent all population groups, not measuring every aspect that affects living standards, and excluding energy costs. Nonetheless, the CPI is an important tool for policymakers in making informed decisions about economic policies.

2.1.5. Bretton Woods Systems

The Bretton Woods Agreement was established in 1944 by 44 nations to maintain stable exchange rates with the US dollar. The International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD) were created as part of the agreement. The rules of the international monetary system were established, with each nation basing its parity policy on the US dollar, which was valued at \$35 per ounce of gold. The Bretton Woods system was a dollar-based gold standard exchange system where only the US dollar could be exchanged for gold, and other currencies were only exchanged for US dollars. If a country's currency lost value compared to the dollar, its central bank would purchase its own currency, and if it appreciated excessively, the central bank would create more money. The system aimed to prevent trade wars and currency depreciation for the purpose of increasing commerce. However, countries could modify the value of their currency to aid in post-war reconstruction.

2.2. Research demonstrating the relationship between foreign reserve and exchange rate

The relationship between foreign reserves and exchange rates is a subject of significant research in the field of international economics. Understanding this relationship is particularly crucial for countries deeply engaged in global trade and financial transactions. Numerous studies have embarked on the journey of untangling this complex link, bringing forward vital insights and identifying consistent themes.

The accumulation of foreign exchange reserves is closely tied to the dynamics of the international market. When there is a significant demand for a country's home currency, its foreign exchange reserves tend to rise accordingly. Conversely, an increase in the supply of the home currency in the international market leads to a decrease in foreign exchange reserves. Therefore, one can perceive foreign exchange reserves as a residual holding that reflects the balance between currency demand and supply on a country's economic landscape.

Even under a flexible exchange rate system, policymakers often believe that accumulating foreign reserves can serve as a safeguard against potential volatility and uncertainty associated with such a system. This belief is supported by the research of (Obstfeld, Shambaugh, & Taylor, 2010), who highlight the role of reserve accumulation in managing domestic financial instability and exchange rates. They emphasize that factors such as financial openness, financial development, and exchange rate policy play a crucial role in the process of reserve accumulation.

Using a combination of theoretical analysis and empirical evidence, the authors find that higher levels of reserves relative to GDP are linked to a country's financial openness, level of financial development, and chosen exchange rate policy. This underscores the importance of carefully considering these factors to effectively utilize foreign reserves in managing financial instability and fostering sustainable economic growth. Additional support for this perspective comes from the research of (Cheung & Ito, 2009), which shows that countries with larger foreign reserves tend to experience lower exchange rate volatility. This effect is particularly pronounced in economies with liberalized capital accounts. In parallel, the empirical analysis by (Cheung & Ito, 2009) provides further evidence of the stabilizing power of foreign reserves. Their study

concludes that countries with higher foreign reserves tend to experience less exchange rate volatility. The link they identify is even stronger in economies that maintain open capital accounts, reinforcing the critical role foreign reserves can play as a stabilizing mechanism, even within the potentially turbulent setting of a flexible exchange rate system.

(Kalu, Ugwu, Ndubuaku, & Ifeanyi, 2019) investigation into the Nigerian market also supports this view. They discovered a positive and significant correlation between foreign reserves and exchange rates, indicating that increased reserve accumulation often leads to a depreciation of the domestic currency. This further underscores the critical role foreign reserves can play in managing exchange rates and maintaining macroeconomic stability in a flexible exchange rate environment.

While the findings of this study provide support for the strategic accumulation of reserves, it is important to heed the cautionary lessons put forth by (Levy-Yeyati & Sturzenegger, 2007). Their work sheds light on the potential risks associated with excessive reserve accumulation driven by the fear of currency appreciation. Their research underscores the potential drawbacks such as distorted economic incentives, limited flexibility in exchange rate policies, and even the possibility of triggering a currency crisis. Building upon the insights of (Levy-Yeyati & Sturzenegger, 2007), (Siregar & Pontines, 2012) study adds an additional dimension to the “fear of appreciation” or “fear of floating-in-reverse” behavior observed in East Asian currencies. Specifically, their findings reveal a higher degree of aversion to currency appreciation among East Asian currencies, particularly the Philippine peso and the Thailand baht, against the Chinese renminbi compared to the US dollar.

Foreign reserve accumulation serves as a tool to mitigate exchange rate volatility, particularly in developing countries experiencing higher exchange rate fluctuations. Countries with more open capital accounts tend to have a stronger impact of foreign reserves on exchange rates (Calvo & Reinhart, 2002). Additionally, countries with greater equity and bond portfolio inflows can benefit from higher levels of foreign reserves to stabilize their exchange rates. Capital controls also play a crucial role in stabilizing the foreign exchange market, particularly in countries where net equity and bond portfolio flows affect exchange rate volatility. The balance of payments serves as an intermediary to understand the influence of exchange rate changes on foreign reserves, as a current account surplus can enhance foreign reserves through surplus inflows (Nga, 2021). Exchange rate fluctuations can impact investor confidence and capital flows, potentially affecting a country’s foreign reserves (Magud, Reinhart, & Vesperoni, 2014). In economies with less flexible exchange rate regimes, foreign currency bank credit is more significant, indicating a higher likelihood of banks accessing external markets and engaging in foreign currency lending/borrowing during periods of large capital inflows. Consequently, regulatory policies, including reserve requirements on international lending, can mitigate hazardous borrowing and lending practices in foreign currency. In conclusion, foreign reserves play a crucial role in maintaining exchange rate stability and promoting economic growth, with various channels linking them to exchange rates.

2.3. Research demonstrating there are no relationship between international reserve and exchange rate

In addition to the previously mentioned multidimensional correlations between the two components, there are studies that make the opposite assumption, demonstrating the multidimensionality of the study issue. These researches demonstrated no relationship between international reserves and exchange rates.

(Christopher J. Neely, 2007) challenges the assumption that interventions by central banks in the foreign exchange market play a significant influence in setting exchange rate movements, finding no discernable association between global reserves of currency and shifts in exchange rates. The study suggests that conventional intervention practices may not yield the desired results in terms of exchange rate stabilization, calling for a re-examination of the efficacy of central bank intervention strategies and urging policymakers to explore alternative methods of managing exchange rate volatility.

Besides, (Humala & Rodríguez, 2010) research on foreign exchange intervention via international reserves and exchange rate volatility in Peru finds no compelling evidence that central bank interventions through reserves buildup or depletion can impact exchange rate fluctuations. The authors conclude that changes in reserves do not significantly influence exchange rate volatility, nor do exchange rate swings significantly influence the central bank's foreign reserves holdings. The study demonstrates the limitations of reserve-based programs to combat exchange rate volatility and raises doubts on the notion that central bank interventions through changes in reserves may significantly mitigate exchange rate swings. This is one of the research papers that is contrary to popular knowledge, the analysis suggests that international reserves and exchange rate movements in the instance of Peru are not closely related. The results of the study demonstrate the limitations of reserve-based programs to combat exchange rate volatility.

“The dynamic relationship between real exchange rates, real interest rates and foreign exchange reserves: empirical evidence from China” of (Narayan & Smyth, 2006) research on the dynamic relationship between real exchange rates, real interest rates, and foreign exchange reserves in China finds a significant and positive relationship between foreign exchange reserves and real exchange rates over the long term, indicating that China's foreign exchange reserves have a positive effect on the value of its currency. However, the authors discover no substantial association between foreign exchange reserves and real exchange rates in the short term, indicating that the impact of foreign exchange reserves on the value of China's currency is not instantaneous. The study also identifies a negative association between real interest rates and real exchange rates in both the short and long run, suggesting that higher real interest rates result in a depreciation of China's currency. The findings have significant implications for Chinese policymakers attempting to manage their foreign exchange reserves and stabilize their currency in a rapidly changing global economy.

2.4. Research Gaps

Nonetheless, the aforementioned studies still have research gaps; this paper will discuss addressing some of these difficulties.

Limited research on the relationship between international reserves and foreign exchange rates in specific countries, such as Vietnam: Despite the importance of foreign exchange rates and international reserves, there is a lack of research on individual country experiences. Existing studies tend to focus on broad trends that may not capture unique challenges and opportunities.

Lack of empirical analysis on the effectiveness of international reserves in managing exchange rate volatility, particularly in emerging market economies: While international reserves are seen as important for managing exchange rate volatility, there is limited empirical evidence on their effectiveness in emerging markets. This gap may hinder policymaker decisions on the appropriate levels and uses of international reserves.

Limited research on the optimal level of international reserves for specific countries, including Vietnam: There is a lack of research on the optimal level of international reserves for specific countries, which could make it difficult for policymakers to determine appropriate reserve levels for economic growth and stability.

Limited analysis on the impact of global shocks on the relationship between international reserves and foreign exchange rates in emerging market economies: There is limited research on how global shocks affect the relationship between international reserves and exchange rates in emerging markets like Vietnam, making it difficult for policymakers to adjust reserve holdings in response.

Limited research on the role of corruption in the relationship between international reserves and economic growth, and its potential impact on exchange rates: Corruption can affect economic growth and development, but there is limited research on its role in the relationship between international reserves and exchange rates. This gap may make it difficult for policymakers to identify and address corruption-related challenges to effective reserve management.

Lack of analysis on the relationship between capital controls and international reserves accumulation, and their impact on exchange rates: There is a lack of research on how capital controls affect international reserves accumulation and exchange rates, making it difficult for policymakers to determine the appropriate mix of policies to manage exchange rates and external shocks.

Limited research on the effectiveness of different monetary and exchange rate policies in managing international reserves and exchange rates in emerging market economies: There is a lack of research on how different policies work in specific contexts like emerging markets, which may make it difficult for policymakers to identify the most effective policies for managing exchange rates and external shocks.

3. RESEARCH METHODOLOGY

3.1. Research hypothesis

Hypothesis 1: Exchange rate have the significant impact on Foreign Reserve rate

Nominal exchange rate

H0: Nominal exchange rate have the significant impact on Foreign Reserve

H1: Nominal exchange rate does not have the significant impact on Foreign Reserve

Real exchange rate

H0: Real exchange rate have the significant impact on Foreign Reserve rate

H1: Real exchange rate does not have the significant impact on Foreign Reserve

3.2. Data sampling and variables

We collect data through Ceicdata.com. The data is collected and stored in the form of Excel File with data being collected quarterly from the first quarter of 1995 to the third quarter of 2022. There are a total of 111 examples for each variable type. In our report, the collected data variables include the Nominal exchange rate of Vietnam, Foreign reserve of Vietnam and CPI of Vietnam and America in order to calculate real exchange rate by using the following formula (Cuong, Ngoc, Mai, & Linh, 2013):

$$RER_{VND/CUR,t} = e_{VND/CUR,t} \times \frac{CPI_{VND,t}}{CPI_{CUR,t}}$$

Where:

$RER_{VND/CUR,t}$ The real exchange rate between VND and currency of country j in year t

$e_{VND/CUR,t}$ The nominal exchange rate between VND and currency of country j in year t

$CPI_{VND,t}$ The consumer price index of Vietnam in year t

$CPI_{CUR,t}$ The consumer price index of country j in year t

3.3. Data analysis

Using Stata 16, we will do the following data analysis steps: (1) Initially, descriptive statistics were employed to offer an overview of the data; (2) subsequently, an Augmented Dickey-Fuller test was conducted to determine the presence of unit roots. Based on the findings of the unit root test, (3) we will choose the model to run our data, and we discovered that the Johansen model is appropriate for our study, (4) finding the optimal lag length for each scenario and (5) run the Johansen test. The result show that there are no cointegration, so (6) we will use the Vector Autoregressive (VAR) model for the first difference to determine short-term impact of the variables. Finally, (5) we applied the diagnostic test to guarantee the model's reliability.

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THE IMPACTS OF INSTITUTIONS, KNOWLEDGE AND GEOPOLITICAL RISKS ON THE DEVELOPMENT OF RENEWABLE ENERGY

**Author: Nguyen Thanh Huong¹, Vu Thi Van Anh¹, Luu Ngoc Huyen¹, Nguyen Thi Minh Ly¹
Mentor: Chu Khanh Lan¹**

ABSTRACT: Energy security is becoming a pressing problem for both developed and developing countries. Renewable energy can be considered as a potential solution to this problem. However, there are few studies examining differences in the combined impacts of three factors: institutions, knowledge and geopolitical risks on the development of renewable energy in the number of countries. Therefore, this study explores the influence of institutions, knowledge and geopolitical risks on renewable energy in 38 countries (23 high-income countries and 15 middle-income countries) in the period 2002-2020 through the quantile regression estimation method. The results show that institutions, knowledge, geopolitical risks, CO2 emissions, GDP per capita and oil prices have heterogeneous effects on renewable energy across high-income and middle-income countries. Notably, geopolitical risks also have a moderating impact on the influence of institutions and knowledge on renewable energy.

Key words: renewable energy, institutions, knowledge, geopolitical risks, high-income countries, middle-income countries.

1. INTRODUCTION

To solve the problem of environmental pollution, many treaties and regulations have been made and signed to reduce the amount of pollutant emissions, such as the United Nations Framework Convention on Climate Change, the Kyoto Protocol,... However, rapid population growth with an increasing demand for energy, has made it more challenging to limit energy consumption to reduce pollution. In order to solve these issues, governments have turned to renewable energy, which is said to be more abundant and environmentally friendly than traditional energy. Moreover, it also meets energy demand when political conflicts take place in the world.

To measure the development of renewable energy, the production index is considered the most popular, because it represents the status of these sources in the most accurate and clearest way. According to statistics from BP Statistical Review of World Energy, the past 20 years have witnessed a sudden increase in renewable energy production, especially in 2020 when this figure has exceeded 30 Exajun (EJ). Reports also show that the scarcity of clean energy has become more intense than ever. The group of high-income countries has always dominated in renewable energy because of the advantages of stable and developed economies. However, by 2010, a significant increase in gross output helped middle-income countries surpass the economic powers.

Solving the problem of energy security of countries is not simple because there are many factors that directly affect it. Some previous studies have mentioned the factors influencing clean energy consumption and generation such as Bourcet (2020), Can Şener et al (2018) and Darmani et al (2014) introducing the economic, environmental, energy, regulatory and demographic factors. However, the macro-environmental factors such as institutions, knowledge, especially geopolitical threats are quite new factors and are rarely mentioned when researching on this issue. Especially in the current context of geopolitical risks and fluctuations in world oil prices, these macro factors have a great influence on the participation of countries in the development of renewable energy. In general, the group of high-income countries possesses higher indicators of institutions, knowledge and geopolitical risks than the group of middle-income countries.

1 Banking Academy.

Regarding institutions, high-income countries often have better institutions, however, their quality is on a downward trend while institutions in middle-income countries are gradually improving. In terms of knowledge, despite the higher economic complexity index of the high-income group, the gap between these two groups is narrowing when the middle-income group experiences an incredible growth in this index and contribution to the renewable sector also increases significantly. Regarding geopolitical risks, although high-income countries have a higher level of instability than middle-income countries, the common point in both groups is that this index tends to decrease. The overview shows that high-income countries have a better institutional environment, higher levels of economic complexity, but are subject to more geopolitical risks. In addition, middle-income countries are making great efforts in both institutional policy and technological research to close the gap and transform themselves to the top. As a result, studying the impact of factors: institutions, knowledge and geopolitical risks on the development of renewable energy will help provide a scientific basis for theory and practice, thereby, provide highly reliable assessments of impacts as well as recommendations to promote further development. The results of the study are expected to add to the ongoing research on the influence of three factors including institutions, knowledge and geopolitical risks on renewable energy development, which is the basis to make appropriate policies for high and middle-income countries. The contents below are structured as follows: (2) theoretical framework, (3) research method, (4) results and discussion, (5) conclusion.

2. THEORETICAL FRAMEWORK

During the past two decades, there have been a number of studies examining the influence of factors on renewable energy using different models, measurements and estimation methods. Some common economic factors in the studies can be mentioned as: economic growth (Zboli et al, 2010), income (Omri et al, 2022; Shafiei and Salim, 2014), economic complexity index (Ahmad et al, 2021), FDI (Sarker et al, 2016). Besides, three factors related to macro-environment like institutions, knowledge and geopolitical risks have also been shown to have a significant impact on renewable energy in a number of studies.

Institution and renewable energy. “Institution can be what forms the orderly framework for human relations, locates the enforcement mechanism and limits the relationships between the interacting parties. It is also the common will of the social community in setting orders, rules, constraints, and shared norms and values” (World Economic Forum-WEF). Institutions have direct and indirect influences on the development of renewable energy through the promulgation of regulations and policies; tax reduction and discount; policies to promote international integration and attract investment. According to Oluoch et al (2021), institutions play an important role in making the renewable energy market more attractive. Omri et al (2022) also argue that institutions help to formulate appropriate policies to encourage the development of renewable energy. Similarly, Wang et al (2022) concluded that “institutional quality and geopolitical risks have a significant impact on renewable energy consumption”. In addition, the study also shows that policies to support investment in renewable energy are also a vital factor to increase renewable energy consumption in these countries. Saidi et al (2018) argue that “MENA countries with better institutional quality tend to use renewable energy to a greater extent and have better economic growth”. Moreover, Filimonova et al (2021) also demonstrated that institutions are an important factor in raising the renewable energy consumption in Europe.

Knowledge and renewable energy. The Economic Complexity Index (ECI) represents a country’s qualitative productivity based on research and development to produce more sophisticated and advanced outputs, using energy efficiently and dependent on less polluting technologies. In particular, knowledge can explain the differences in development between countries (Mealy et al, 2018). Factors of economic complexity in a country including “knowledge, skills, knowledge diversity and popularity” have different effects on clean energy deployment. Theoretically, it is expected that the diffusion of environmentally related technologies will promote clean energy (Chu, 2022; Khan et al, 2021; Wang and Wei, 2020; Wang

et al, 2022). Many researches have affirmed the essential role of research and development in stimulating innovation (Bointner, 2014). In addition, Subtil Lacerda and van den Bergh (2020) have shown a significant positive influence of external knowledge in both solar and wind energy. Irandoust (2018) finds that among the four Nordic countries, technological innovation impulses renewable energy consumption in Denmark and Norway, while in Sweden and Finland, the level of renewable energy consumption drives innovation in technology. On the other hand, modern technology-based products may not increase, or even reduce the level of renewable energy development. This is explained by the “recovery effect”-a phenomenon when energy efficiency increases can lead to less energy savings than expected (Gillingham et al, 2016; Gu et al, 2019; Lin and Liu, 2012).

Geopolitical risks and renewable energy. The geopolitical risks index reflects the risks associated with terrorist attacks, wars and tensions between countries that affect their international relations Caldara and Iacoviello (2022). This index was built based on a monthly geopolitical risks history index of countries dating back to 1900. We found that available literature on the relationship between geopolitical risks and renewable energy is still quite scarce. Sweidan (2021a, b) argues that geopolitical risks persuade countries to be more independent on fossil fuels. Sarker et al (2023) explore the asymmetric effects of geopolitical risks, crude oil prices and climate policy level uncertainty on the volatility and returns of clean energy prices in the United States. As a result, geopolitical risks have a crucial effect on clean energy prices in the long and short term. Similarly, Alsagr and van Hemmen (2021) also find a positive effect of geopolitical risks on renewables. Recently, Zhang et al (2023) showed that there is a temporal heterogeneity between geopolitical uncertainty and funds devoted to clean energy development. However, Flouros et al (2022) argue that geopolitical risks have a negative impact on renewable energy production regardless of the estimator used.

Research gaps. Nowadays, a lot of researches examine the influence of factors on renewable energy. However, there are few studies that consider the relationship between the three factors including institution, knowledge, geopolitical uncertainty and renewable energy. Those studies have little agreement on how these factors influence the development of renewable energy. This is due to differences in research methods and sampling methods. In terms of sampling, some studies examine renewable energy development on a global basis while others focus on regions or groups of countries. Regarding research methods, the authors choose different indicators to represent the influencing factors and apply many different methods to obtain similar and different results. These controversial results spread across all factors. Literature review reveals that there are no previous studies that have examined the combination of important explanatory factors such as institutions, knowledge and geopolitical risks when control variables are present in a model. This paper will provide important insights into how these variables impact renewable energy. We also compare the effect of each factor on renewable energy in both high and middle-income countries at the same time. Methodologically, quantile regression estimation analysis is a valuable to the literature because the previous literature mainly applied mean-based evaluation. It can show the impact of each variable on the renewable energy variable at different percentiles of the renewable energy variable rather than just based on the mean. This method is useful because it helps to clarify the influence of important factors on renewable energy.

3. RESEARCH METHOD

3.1. Research method

The study uses quantitative research methods based on quantile regression introduced by Powell (2022). The study builds two equations as follows:

Model (1) includes independent variables: institutions, knowledge, geopolitical risks; together with three control variables: CO2 emissions, income, oil price.

$$RENC_{i,t} = \alpha_0 + \alpha_1 \cdot INS_{i,t} + \alpha_2 \cdot ECI_{i,t} + \alpha_3 \cdot GPR_{i,t} + \alpha_4 \cdot CO2_{i,t} + \alpha_5 \cdot GDP_{i,t} + \alpha_6 \cdot OP_{i,t} + \varepsilon_{i,t} \quad (1)$$

Model (2) is expanded with two new variables, we use to examine the regulatory impact of geopolitical risk on the relationship of institutions, knowledge and renewable energy.

$$RENC_{i,t} = \alpha_0 + \alpha_1 \cdot INS_{i,t} + \alpha_2 \cdot ECI_{i,t} + \alpha_3 \cdot GPR_{i,t} + \alpha_4 \cdot GPR_{i,t} \cdot INS_{i,t} + \alpha_5 \cdot GPR_{i,t} \cdot ECI_{i,t} + \alpha_6 \cdot CO2_{i,t} + \alpha_7 \cdot GDP_{i,t} + \alpha_8 \cdot OP_{i,t} + \varepsilon_{i,t} \quad (2)$$

In which, $RENC_{i,t}$ is the output of renewable energy produced by country i at time t ; $CO2_{i,t}$ is the norm of $CO2$ emissions from energy of country i at time t ; $GDP_{i,t}$ is the per capita income of country i in year t ; $OP_{i,t}$ is the oil price of country i at time t ; $ECI_{i,t}$ is the economic complexity of country i in year t ; $GPR_{i,t}$ is the geopolitical risk of country i at the time t ; $INS_{i,t}$ is the institutional average of country i in year t . Some of the fixed-effects variables that control the model we used include: $CO2$ emissions, GDP per capita and crude oil prices. Besides, i is the unobserved country-specific effect and $\varepsilon_{i,t}$ is the residual.

Table 1. Expected signs of variables built in the model.

Variable	Symbol	Expectation sign	Research supports
Geopolitical risk index	GPR	+/-	Alsagr and Hemmen (2021), Cai and Wu (2021), Khan et al (2021), Sweidan (2021a, b), Sarker et al (2023), Strunz et al (2016), Wang et al (2022)
Economic complexity index	ECI	+	Bointner (2014), Hille et al (2020), Li and Shao (2021), Lin and Chen (2019), Lin and Zhu (2019), Nicolli and Vona (2016), Lacerda and Bergh (2020)
Institutional average	INS	+/-	Filimonova et al (2021), Oluoch et al (2021), Omri et al (2022), Rahman and Sultana (2022), Wang et al (2022)
Moderation of geopolitical risks to institutions	GPR.INS	+/-	
Moderation of geopolitical risk to economic complexity	GPR.ECI	+/-	

3.2. Research data

This study focuses on assessing the institutional, intellectual, and geopolitical risks affecting renewable energy development in 38 countries. Based on the availability of data, the study used secondary data of 23 high-income countries and 15 middle-income countries for the period 2002-2020.

4. RESULTS AND DISCUSSION

4.1. Preliminary test results

Cross-sectional dependence test

The results from Appendix 3 show that the cross-sectional dependence test has enough evidence to strongly reject the null hypothesis that there is no interdependence between countries in the data series (except for the ECI variable in middle-income countries). This result requires tests for the stationarity of the data.

Unit Root Test

The second-generation unit root test developed by Pesaran (2007) is applied. Appendix 4 shows that while the problem of unit roots persists among variables at the level (except for GPR), the first difference conversion makes these variables stop.

Co-integration Test

Results from co-integration tests by Kao and Pedroni (1999, 2004), Westerlund (2005) are shown in Appendix 5. The results of Kao and Pedroni test (1999, 2004) confirm the cointegration between variables. Similarly, the results of the Westerlund test (2005) confirm the long-run relationship of the variables. The

finding acknowledges that INS, ECI, GPR and other control variables maintain a cointegration relationship on RENC in the study countries.

4.2. Main results and discussion

This section discusses the panel quantiles regression results of Powell’s data analysis (2022). To comprehensively investigate the impact of institutions, knowledge, geopolitical risks and other important aspects on the development of renewable energy, we use nine percentiles (10th-90th). The results obtained are related to equation (2) and equation. (3) are presented in **Tables 2 and 3** respectively.

The results of **Table 2** show the various effects of variables on the renewable energy’s consumption generated in high and middle-income countries.

Table 2. Quantile Regression Analysis-In the absence of a moderator.

Panel A. High-income countries									
	10 th	20 th	30 th	40 th	50 th	60 th	70 th	80 th	90 th
INS	6,223*** (0,132)	4,944*** (0,235)	4,658*** (0,148)	4,452*** (0,120)	3,702*** (0,685)	2,234*** (0,402)	1,394 (1,030)	-0,454*** (0,138)	-1,105*** (0,141)
ECI	0,612*** (0,032)	0,745*** (0,056)	0,985*** (0,090)	1,209*** (0,217)	0,978*** (0,197)	0,701*** (0,174)	0,566*** (0,143)	0,592*** (0,093)	0,619*** (0,052)
GPR	0,241*** (0,081)	-0,007 (0,177)	-0,064 (0,279)	-0,234 (0,451)	-0,033 (0,751)	0,131 (0,382)	0,388 (0,564)	0,025 (0,301)	-0,079 (0,080)
CO2	1,080*** (0,021)	1,083*** (0,057)	0,974*** (0,093)	0,888*** (0,087)	0,791*** (0,119)	0,669*** (0,059)	0,577*** (0,045)	0,533*** (0,049)	0,499*** (0,017)
GDP	0,122 (0,118)	0,337 (0,514)	0,059 (0,472)	1,596 (1,821)	0,753 (2,093)	0,492 (1,018)	0,211 (1,530)	1,773*** (0,453)	2,066*** (0,137)
OP	0,921*** (0,043)	0,917*** (0,128)	0,998*** (0,092)	0,719*** (0,241)	0,762*** (0,286)	0,665*** (0,150)	0,641*** (0,236)	0,326*** (0,120)	0,372*** (0,048)
Constant	-20,013*** (1,221)	-20,949*** (5,042)	-17,253*** (5,281)	-31,494* (18,794)	-21,157 (21,038)	-15,552 (10,107)	-10,874 (14,670)	-24,046*** (4,499)	-26,340*** (1,337)
No. Obs	393	393	393	393	393	393	393	393	393
Panel B. Middle-income countries									
	10 th	20 th	30 th	40 th	50 th	60 th	70 th	80 th	90 th
INS	1,512*** (0,172)	1,511*** (0,157)	-0,008 (0,858)	0,432 (0,631)	0,557 (0,482)	0,357* (0,204)	0,613 (0,421)	0,364* (0,193)	0,596*** (0,093)
ECI	0,437*** (0,100)	0,489*** (0,097)	-0,549 (0,867)	-0,052 (0,586)	0,206 (0,468)	0,117 (0,195)	0,265 (0,169)	0,210*** (0,049)	0,183*** (0,030)
GPR	4,084*** (0,587)	0,646 (0,776)	-7,627 (6,695)	-4,379 (4,322)	-3,332 (2,978)	-4,319*** (1,141)	-2,278 (2,085)	-3,305*** (1,125)	-1,393*** (0,468)
CO2	-0,089* (0,040)	0,386*** (0,053)	1,322* (0,799)	0,900* (0,503)	0,784** (0,369)	0,932*** (0,134)	0,792*** (0,145)	0,991*** (0,090)	0,990*** (0,045)
GDP	-1,648*** (0,097)	-1,587*** (0,169)	1,491 (2,519)	0,107 (1,594)	-0,277 (1,237)	1,157 (0,465)	-0,436 (0,722)	0,106 (0,288)	-0,303*** (0,091)
OP	1,788*** (0,061)	1,705*** (0,076)	1,119** (0,450)	1,148*** (0,355)	1,042*** (0,290)	0,786*** (0,166)	0,773*** (0,143)	0,541*** (0,175)	0,315*** (0,048)
Constant	3,548*** (1,095)	1,840 (1,653)	-28,758 (25,758)	-13,409 (15,892)	-8,557 (12,160)	-11,916*** (4,374)	-5,357 (7,137)	-10,047*** (3,485)	-4,810*** (1,018)
No. Obs	319	319	319	319	319	319	319	319	319

Note: ***, **, * indicate statistical significance at 1%, 5%, and 10% respectively.

Source: Calculations of the research team from Stata 15 software.

Institutions. In the group of high-income countries, the estimated coefficient of institutions is statistically significant at all percentiles. Institution has a positive effect on renewable energy in the 10 to 70 percentile,

but shows a negative effect in the upper quartile (groups 80 and 90). As institutional quality improves, the government will focus its resources on promoting renewable energy development (Oluoch et al, 2021; Omri et al, 2022; Wang et al, 2022). However, when countries reach a stage where renewable energy production and consumption is high, institutions have an adverse effect. In the group of middle-income countries, the estimated coefficients are generally low, significantly smaller than in the group of high-income countries, indicating that the institution has little impact on renewable energy in the group of middle-income countries.

Knowledge. In the context of high-income countries, the estimated coefficient of knowledge (ECI) is obtained as positive and statistically significant at the 1% level in all percentiles, with increasing influence from subgroups. position 10 to 40, then gradually decrease from the 50 to 90 percentiles. The results show that knowledge has a positive effect on helping countries have more opportunities to develop renewable energy. Research by Elia et al (2021), Khezri et al (2021) agrees with this finding. In the group of middle-income countries, there is an inconsistent relationship between knowledge progress and renewables. The affection of economic complexity on renewables is not large and unfavorable, and varies across percentiles. The upgrade in economic complexity reduces renewables in the 30th and 40th quantiles but promotes renewables in the remaining quantiles. The estimated coefficient is significant only at the 10th, 20th, 80th and 90th percentiles.

Geopolitical risks. Geopolitical instability has both positive and negative associations with renewable energy expansion in both groups of countries. However, in the group of high-income countries, the effect is quite small across the percentiles. Although it remains the main driver of green energy expansion in middle-income countries, its effect gradually becomes negative in the following quintiles. The negative effect of geopolitical instability is most pronounced at the 60th percentile, then gradually decreases at the 80th and 90th percentiles. In countries that are in the early stages of renewable energy development, geopolitical risks make a positive and significant effect on clean energy expansion, but the effect turns negative as countries reach a high level of renewable energy development. This finding is consistent with the results of Flouros et al (2022) who say that geopolitical risks have an adverse effect on renewable energy production regardless of the estimator used.

CO₂. The results demonstrate that the level of CO₂ emissions has a positive impact on the development of renewables in both groups. In the group of high-income countries, the coefficient is statistically significant and positive in all percentiles. Thus, when the environmental quality worsens, air pollution will promote the evolution of renewables. For the group of middle-income countries, except for the 10th percentile, the remaining percentiles are positive and statistically significant. When environmental pollution occurs, middle-income countries are forced to develop renewable energy or use traditional energy, despite the deterioration of environmental quality. This result is consistent with the conclusion of Apergis and Payne (2014), Sadorsky (2009) that CO₂ emission is a contributing factor to enhance the evolution of renewable energy in G7 and OECD countries.

Income per capita. GDP has a different effect on the development of renewables, the impact of which is meaningfully greater in high-income countries than in middle-income countries. In the group of high-income countries, increasing income promotes renewable energy extension in all quintiles, but discourages renewable energy in more than half of the percentiles in the middle-income group. The fact that renewable energy benefits when average income increases has been found by many authors (Abanda et al., 2012; Apergis and Payne, 2014; Przychodzen and Przychodzen, 2020; Vural, 2021). For middle-income countries that have not yet developed renewable energy, when energy demand increases due to economic growth, renewable energy cannot be developed in time to meet the needs of more traditional energy use.

Oil prices. The coefficients calculated show a favorable correlation between oil prices and renewables. Oil and renewable energy are two substitute goods, so when the price of one good increases, it will stimulate people to use the other good. This is clarified in the papers of Bamati and Raoofi (2020), Brini et al (2017),

Gozgor et al (2020). Rising oil prices also make renewables more commercially viable, stimulating renewable energy investment, production and use (Chu, 2022). In addition, the correlation coefficient between the oil price and renewable energy in the two groups of countries gradually decreases towards the higher quantiles, indicating that the more renewable energy and energy infrastructure develop, the less sensitive developed countries become to oil price fluctuations.

Table 3 shows the effect of variables on renewables consumption in the case of a geopolitical risk moderator on the relationship of institutions, knowledge and renewable energy.

Table 3. Quantile regression model results-In case of moderator variable.

Panel A. High-income countries									
	10 th	20 th	30 th	40 th	50 th	60 th	70 th	80 th	90 th
INS	5.933*** (0,193)	2.905*** (0,352)	0,479 (0,380)	-0,718 (0,884)	-1,378* (0,756)	-1,884*** (0,309)	-2,790*** (0,323)	-3,119*** (0,179)	-2,865*** (0,088)
ECI	0,473*** (0,031)	0,767*** (0,108)	0,565*** (0,115)	0,665*** (0,128)	0,659*** (0,127)	0,539*** (0,112)	0,536*** (0,086)	0,594*** (0,046)	0,579*** (0,032)
GPR	-2,690*** (0,452)	-7,432*** (1,656)	-16,919*** (1,170)	-18,490*** (1,959)	-20,242*** (2,729)	-20,516*** (1,483)	-19,285*** (1,358)	-17,056*** (1,002)	-12,443*** (0,598)
GPR.INS	2,458*** (0,712)	10,745*** (1,803)	18,634*** (1,102)	19,949*** (2,586)	23,013*** (2,338)	24,674*** (1,090)	23,764*** (1,462)	22,453*** (1,239)	15,698*** (0,360)
GPR.ECI	0,990** (0,393)	-1,237 (1,083)	1,896* (0,986)	2,444** (1,193)	2,201 (1,389)	1,316 (1,150)	0,473 (0,987)	-0,634 (0,572)	-0,007 (0,405)
CO2	1,049*** (0,063)	0,952*** (0,061)	0,741*** (0,154)	0,616*** (0,061)	0,416*** (0,041)	0,358*** (0,038)	0,352*** (0,033)	0,349*** (0,015)	0,406*** (0,005)
GDP	0,122 (0,118)	0,337 (0,514)	0,059 (0,472)	1,596 (1,821)	0,753 (2,093)	0,492 (1,018)	0,211 (1,530)	1,773*** (0,453)	2,066*** (0,137)
OP	0,921*** (0,130)	0,917*** (0,109)	0,998*** (0,101)	0,719*** (0,128)	0,762*** (0,091)	0,665*** (0,072)	0,641*** (0,049)	0,326*** (0,022)	0,372*** (0,018)
Constant	-18,320*** (4,400)	-16,463*** (4,227)	-18,057* (9,834)	-22,986*** (7,510)	-17,938** (7,040)	-15,809*** (5,653)	-27,270*** (3,928)	-23,453*** (1,182)	-22,488*** (0,947)
No. Obs	393	393	393	393	393	393	393	393	393
Panel B. Middle-income countries									
	10 th	20 th	30 th	40 th	50 th	60 th	70 th	80 th	90 th
INS	0,818*** (0,163)	1,012*** (0,241)	0,815*** (0,206)	0,651*** (0,284)	0,285*** (0,142)	0,017 (0,219)	0,268 (0,362)	-0,363** (0,144)	-0,321*** (0,104)
ECI	-0,273 (0,178)	0,163 (0,170)	0,140** (0,064)	-0,018 (0,157)	-0,205*** (0,055)	-0,186* (0,099)	0,001 (0,032)	-0,072 (0,068)	-0,515*** (0,066)
GPR	1,675* (0,928)	1,885 (1,224)	1,226 (1,503)	0,480 (1,524)	-0,892 (0,907)	-1,325 (1,643)	0,639 (0,849)	-1,959*** (0,507)	-3,679*** (0,678)
GPR.INS	0,807** (0,331)	1,593** (0,641)	2,390*** (0,537)	2,468*** (0,666)	2,769*** (0,651)	3,553*** (0,399)	3,678*** (0,928)	3,767*** (0,292)	2,800*** (0,281)
GPR.ECI	6,802*** (1,542)	4,930*** (0,554)	5,197*** (0,689)	6,464*** (0,632)	6,923*** (0,602)	5,620*** (1,085)	5,471*** (0,761)	5,929*** (0,491)	5,150*** (0,411)
CO2	-0,008 (0,028)	0,270*** (0,086)	0,378*** (0,118)	0,433*** (0,144)	0,565*** (0,067)	0,728*** (0,215)	0,567*** (0,114)	0,727*** (0,032)	0,912*** (0,038)
GDP	-0,409 (0,372)	-1,541*** (0,242)	-1,255*** (0,355)	-1,029** (0,491)	-0,446** (0,217)	0,124 (0,583)	-0,738 (0,590)	-0,029 (0,144)	0,293*** (0,085)
OP	1,503*** (0,120)	1,747*** (0,121)	1,601*** (0,079)	1,424*** (0,084)	1,093*** (0,085)	0,847*** (0,152)	0,806*** (0,071)	0,582*** (0,051)	0,035 (0,034)
Constant	-7,284** (3,149)	1,734 (2,172)	-0,429 (3,559)	-1,791 (4,979)	-6,150** (1,975)	-10,992*** (5,898)	-1,714 (6,271)	-7,830*** (1,345)	-8,705*** (0,099)
No. Obs	319	319	319	319	319	319	319	319	319

Note: ***, **, * indicate statistical significance at 1%, 5%, and 10% respectively.

Source: Calculations of the research team from Stata 15 software.

The interaction effect between geopolitical risks and institutions to renewable energy. The estimated results demonstrate that in terms of geopolitical uncertainty, institutions have a positive effect on the development of renewables, but the effect is much larger in middle-income countries. The estimated coefficients are positive and meaningful at all percentiles. Geopolitical risks have a moderating effect on the role of institutions in renewables development. When there are geopolitical events, institutional improvement will play a very essential role in the development of renewables. This result is parallel to the conclusion of Filimonova et al (2021), they demonstrate that institutional factors are important in promoting renewable energy consumption in Europe. Khan et al. (2019) also analyzed legal and regulatory frameworks in 10 developing countries and found that lack of policy stability, poor regulation, and lack of financial support are among major challenges for renewable energy development in these countries.

The interaction effect between geopolitical risks and knowledge to renewable energy. In the case of geopolitical risks, knowledge has a different effect on the development of renewables, the effect of which is appreciably greater in middle-income countries. In the group of high-income countries, geopolitical risks that moderate the influence of knowledge on renewables are in the early stages of clean energy development. For countries that have reached a high level of renewable energy development, geopolitical risks no longer amplify the role of knowledge, but instead reduce its negative impact. This can be explained by Gillingham et al (2016); Gu et al (2019); Lin and Liu (2012), advanced technologies may not increase, or even reduce, the development of renewable energy because of the “recovery effect”. In the group of middle-income countries, the coefficients of the geopolitical risk modifier to knowledge are positive and significant at all percentiles. Geopolitical risks have a moderating effect on the impact of knowledge on renewable energy. The impact increases progressively from the 10-50 percentile and gradually decreases at the 60-90 percentile. Geopolitical risks have the effect of amplifying the influence of knowledge on renewable energy development. As geopolitical risks cause fluctuations in oil prices and disrupt fossil fuel supplies, the role of knowledge becomes important in the expansion of clean energy as knowledge advances help innovate modern technology to create renewable energy sources. Bointner (2014) also confirmed the role of research and development in renewable energy innovation.

5. CONCLUSION

In conclusion, the results show heterogeneity between the two groups of countries. Institutional influence on renewable energy in high-income countries is positive at the early stages of renewable energy development and negative when reaching a high level of development. For middle-income countries, the institutional impact on renewables is positive at all stages. Our research also shows interesting evidence of the influence of knowledge on renewable energy. Regarding high-income countries, the effect is the most widespread at the initial stage, then recovers and finally declines as higher levels of renewable energy development are reached. The impact on middle-income countries is the highest when it starts renewable energy generation, but it drops when reaching the two highest levels of development. With respect to geopolitical instability, in some high-income countries, it has a positive influence on the use of renewable energy while it is negative in most middle-income countries. Besides, geopolitical instability also has an indirect impact on renewable energy through institutions and knowledge. Firstly, geopolitical risks amplify the institutional influence on renewable energy expansion in high-income countries. However, for the group of middle-income countries, this amplification is not large and clear. Moreover, geopolitical risks also have the effect of amplifying the role of knowledge. When there is geopolitical instability, besides institutional quality, intellectual progress also plays an important role in renewable energy development in high-income nations. With middle-income countries, the amplifying impact of geopolitical risks on knowledge on renewable energy generation and consumption is much larger than in high-income countries.

The results suggest that both developed and emerging economies need to improve institutional quality and raise level of knowledge and control geopolitical risks. The following policies may be adopted.

i) Groups of countries need to actively improve institutions, implement incentive policies, prioritize clean energy, build a clear stable legal system and transparent investment environment to encourage investors to invest in renewable energy.

ii) All countries in two groups should expand knowledge and promote technological progress to develop clean energy. Additionally, nations dealing with high geopolitical risks should increase investment in renewable energy.

iii) In the context of geopolitical risks, the role of institutions becomes more important in diversifying renewable energy sources in high-income countries. Therefore, these countries should focus on improving the quality of institutions to facilitate renewable energy deployment. In contrast, knowledge is a strong driver for renewable energy in middle-income countries. Consequently, these countries should concentrate on expanding knowledge to create new renewable energy devices in the face of geopolitical instability.

This research also has some limitations. Firstly, limited data makes it impossible to capture the whole world picture. Second, previous research and this research mainly analyzed the macroscopic view that ignored the context and special factors of the cases. In the energy sector, future topics may shed light on the following directions. First, there is a need to extend the approach to the data sample worldwide. Second, a micro-level analysis that investigates each country’s clean energy structure and its drivers or a cross-country analysis of several types of renewable energy is important. Third, explore the long-term and short-term impacts of institutions, knowledge, and geopolitical risks on specific energy sources such as solar, wind, and hydroelectricity. In addition, it is also necessary to expand on elements such as culture, technology, finance and population.

APPENDIX

Appendix A. Country list

Sample	Country
High-income countries	Australia, Belgium, Canada, Chile, Denmark, France, Finland, Germany, Hungary, Italy, Israel, Japan, Netherlands, Norway, Poland, Portugal, Saudi Arabia, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States
Middle-income countries	Brazil, China, Columbia, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Russia, South Africa, Thailand, Turkey, Ukraine, Egypt

APPENDIX B. RESULTS OF TESTS

B.1. Descriptive statistics

Variable	High-income					Middle-income				
	No Obs.	Mean	Std. Deviation	Minimum	Maximum	No Obs.	Mean	Std. Deviation	Minimum	Maximum
RENC	399	0,417	0,856	0	6,651	323	0,290	0,876	0	8,523
INS	399	1,225	0,531	-0,487	1,947	323	-0,157	0,494	-0,950	1,218
ECI	399	1,266	0,700	-0,869	2,775	323	0,432	0,586	-0,843	1,714
GPR	399	0,308	0,627	0	4,680	323	0,149	0,207	0	1,150
CO2	399	566,195	1.116	26,830	5.884	323	850,083	1.887	24,298	9.974
GDP	399	40.639	11.191	11.804	72.033	323	13.527	6.662	2.285	33.514
OP	399	66,797	30,533	19,020	122,465	323	72,924	38,929	9,835	188,526

B.2. Results of cross-sectional dependence test

Variable	High-income			Middle-income		
	CD-test	mean p	mean abs(p)	CD-test	mean p	mean abs(p)
RENC	58.50***	0.942	0.942	45.20***	0.889	0.889
INS	3.74***	0.059	0.378	-1.75*	-0.034	0.509

ECI	14.66***	0.232	0.497	-1.54	-0.030	0.484
GPR	17.82***	0.282	0.329	4.09***	0.081	0.322
CO2	23.42***	0.371	0.617	23.72***	0.467	0.786
GDP	58.05***	0.919	0.919	49.40***	0.972	0.972
OP	62.92***	0.996	0.996	49.32***	0.970	0.970

Note: ***, **, * indicate statistical significance at 1%, 5%, and 10% respectively.

Source: Calculations of the research team from Stata 15 software.

B3. Results of second-generation unit root test

Panel A: High-income countries								
Variable	Level				First difference			
	Without trend		With trend		Without trend		With trend	
	Lag (0)	Lag (1)	Lag (0)	Lag (1)	Lag (0)	Lag (1)	Lag (0)	Lag (1)
RENC	1,356	0,849	3,785	2,602	-6,025***	-1,312*	-4,872***	-0,442
INS	-0,078	2,343	-0,568	2,708	-11,186***	-4,830***	-9,767***	-4,274***
ECI	-0,365	0,156	-1,419*	0,937	-13,888***	-5,142***	-11,633***	-2,708***
GPR	-6,444***	-4,988***	-5,848***	-3,597***	-15,050***	-9,091***	-12,415*	-6,771***
CO2	0,584	0,054	0,474	-0,331	-8,670***	-7,487***	-6,828***	-5,308***
GDP	-0,223	-0,633	0,279	0,508	-7,788***	-3,442***	-5,627***	-1,159
OP	4,341	3,752	0,092	-1,502*	-4,859***	-4,705***	-3,386***	-2,751***

Panel B: Middle-income countries

Variable	Level				First difference			
	Without trend		With trend		Without trend		With trend	
	Lag (0)	Lag (1)	Lag (0)	Lag (1)	Lag (0)	Lag (1)	Lag (0)	Lag (1)
RENC	-0,969	0,119	0,149	0,241	-5,803***	-2,641***	-5,046***	-3,037***
INS	3,422	2,097	0,490	-1,735**	-7,483***	-4,199***	-6,232***	-2,489***
ECI	-1,574*	-0,664	-1,337*	-0,027	-10,968***	-5,185***	-10,204***	-4,794***
GPR	-4,901***	-3,567***	-3,550***	-2,115**	-12,981***	-6,602***	-10,987***	-4,565***
CO2	-3,270***	-3,135***	-0,834	0,222	-8,130***	-3,236***	-6,358***	-0,072
GDP	0,646	1,667	-1,011	0,501	-7,376***	-3,582***	-5,594***	-1,712**
OP	4,570	2,781	-0,663	-4,306***	-3,980***	-4,944***	-2,282**	-2,811***

Note: ***, **, * indicate statistical significance at 1%, 5%, and 10% respectively.

Source: Calculations of the research team from Stata 15 software.

B4. Results of co-integration test

Test	High-income countries	Middle-income countries
Kao		
Modified Dickey-Fuller t	-0,2561	0,3318
Dickey-Fuller t	-1,2567	-0,6773
Augmented Dickey-Fuller t	-2,5167***	-1,4965*
Unadjusted modified Dickey-Fuller t	-1,6866**	-0,0218
Unadjusted Dickey-Fuller t	-2,1668**	-0,9390
Pedroni (1994, 2004)		
H1: hệ số AR chung (trong thứ nguyên)		
Modified variance ratio	-3,7465***	-5,6885***
Modified Phillips-Perron t	4,9536***	4,6371***
Phillips-Perron t	-2,8250***	-1,4703*
Dickey-Fuller t	-2,2103**	-0,6831
H1: các hệ số AR riêng lẻ (giữa các thứ nguyên)		
Modified Phillips-Perron t	6,7438***	5,8329***

Phillips-Perron t	-2,1488**	-2,3485***
Augmented Dickey-Fuller t	-1,0886	-1,3461*
Westerlund (2005)		
Variance ratio (some panels)	3,7227***	3,490***
Variance ratio (all panels)	2,3159**	4,6852***

Note: ***, **, * indicate statistical significance at 1%, 5%, and 10% respectively.

Source: Calculations of the research team from Stata 15 software.

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EVALUATING THE IMPACT OF THE IUU YELLOW CARD ON VIETNAM'S FISHERY EXPORT TO THE EU

**Author : Nguyen Tan Thinh¹, Nguyen Lan Anh¹, Nguyen Thi Mai Hien¹,
Doan Thanh Nam¹, Nguyen Thanh Trung¹
Mentor: An Nhu Hung¹**

ABSTRACT: *The Illegal, Unreported, and Unregulated Fishing (IUU) is a set of regulations enacted by the European Union (EU) to punish trade with countries that do not comply with the to prevent resource depletion. Vietnam got the IUU yellow card in October 2017 and it can lead to huge economic losses. The Vietnamese government immediately took specific guidelines and actions to remove the yellow card. And for the government to make decisions closer to reality, the article will provide perspectives on how the yellow card affects Vietnam's seafood exports. The objective of this study is to quantify the impact of the IUU yellow card on seafood exports to Europe after being tagged. With the above goal, we compared the difference between the two cases: the total export value to the EU of Vietnam in reality (with being yellow-carded) and Vietnam's counterfactual (without being yellow-carded). We use the Synthetic control method to build Vietnam's counterfactual. The results of the study indicate that: in the period from 2018 to 2021, Vietnam's fishing industry suffered about \$220 million in damage and about \$27 million in aquaculture losses compared to the case of Vietnam's counterfactual. This is the first research paper in the world to evaluate the impact of the IUU yellow card on export turnover to the EU.*

Keywords: *Seafood export, IUU yellow card, EU, Synthetic control method.*

1. INTRODUCTION

The fisheries sector is one of the important components of the Vietnamese economy. Starting from a natural economic activity, Vietnam's fisheries have risen to become an industrial-oriented activity with remarkable achievements. Vietnam's seafood export value has increased to 11 billion USD by 2022, accounting for 10% of total export revenue. Vietnam ranks 3rd among major seafood exporting countries in the world. Not only playing an important role in economic development, Vietnam's seafood industry also actively contributes to social security, helping to eliminate hunger and reduce poverty; creating more jobs for people. According to the General Statistics Office (2023), as of the fourth quarter of 2022, the number of employed workers in the agriculture - forestry - fishery sector is up to 14.1 million people, of which, the number of employees in the fisheries sector is more than 4 million.

The European Union market is considered an important market, always ranked second among the five major export markets for Vietnam's seafood industry. Vietnam's seafood industry has suffered negative impacts from the IUU yellow card since October 2017 due to illegal, unreported and unregulated (IUU) fishing. After the yellow card was imposed, this market immediately dropped to the 4th place, and at the same time, the export value of Vietnamese seafood to the EU market decreased. In 2019 - after two years of being yellow-carded, the total amount of seafood export value from Vietnam to the EU decreased by 14.7%, of which, the export value of the caught seafood group decreased by 17.86%. The yellow card also has a strong impact on Vietnam's seafood export activities: 100% of fishing vessels have to be traced, and border clearance is delayed... The removal of the IUU yellow card has therefore received serious attention and involvement from all levels of government from central to local.

Quantifying the impact of the IUU yellow card is of utmost importance for all seafood export countries in general and Vietnam in particular. There are currently only very few studies conducted in this direction, and only one study concerns the case of Vietnam.

¹ Banking Academy of Vietnam.

Rogers (2021) investigates the impact of the yellow card on Panamanian exports. The author concludes that the impact of the IUU yellow card on Panama's seafood trade is negligible since Spain and Portugal do not effectively restrict imports from Panama. They also cannot conclude that being tagged with the IUU will prevent Panama from fishing illegally. He believes that future studies with different research methods would estimate more clearly the impacts of IUU yellow cards on countries tagged by the EU.

Sumaila (2019) also finds the impact of the IUU regulation applied by the EU to the world is negligible, but if both the US and Japan impose the same measure, the impact of this regulation will be no small. If a country is red-carded, at the same time, as the EU is not their main export market, then that country does not necessarily continue to violate EU's requirements. If this is true, the EU's anti-IUU regulations may not induce severe reductions in that country's seafood export.

Focusing exclusively on Vietnam, Nam *et al.* (2021) assessed the impacts of the IUU yellow card on Vietnam's seafood industry through case studies such as yellow card in the case of Thailand, and red card in Sri Lanka. The report also highlights the importance of implementing management measures to improve maritime environmental sustainability and economic efficiency in the fishing industry.

All of the studies above have the same limitation when simply analyzing the impact of IUU yellow card by comparing export volume *before and after* the country is penalized, thus cannot exclude the differences in the economic context between the two periods. To assure that the causal impact of the IUU yellow card on a country's seafood exports can be assessed, in principle, it is necessary to compare that country's seafood exports in case of being yellow-carded with that without being yellow-carded. This study was carried out in the above direction to evaluate the causal impact of the IUU yellow card on seafood export in Vietnam.

The objective of this study is to empirically evaluate the impact of the IUU yellow card on the seafood export revenue of Vietnam from 2017 to the present. To assess the causal impact of the IUU yellow card, the Synthetic Control method was used to create a *counterfactual seafood export* for Vietnam if not yellow-carded, thereby comparing it with *the actual seafood export* of Vietnam to estimate the real impact caused by the yellow card. This is the first impact evaluation study related to the above topic to date. Our estimated results are expected to provide some new perspectives on policies to help management agencies make more comprehensive and accurate decisions regarding the sustainable development of the fisheries sector.

The remainder of this article is organized as follows. Section 2 provides a theoretical framework of the impact of IUU yellow cards on seafood exports. We will then present the research methodology used to estimate IUU yellow card damage in section 3. Based on the identified research methods, direct and indirect damage to Vietnam's seafood exports will be presented in section 4, from which practical policy implications could be drawn in section 5.

2. THEORETICAL FRAMEWORK

The EU applies a penalty system for countries with illegal fishing practices. The penalty system includes 3 levels: red card (highest penalty), yellow card (warning penalty) and green card (no penalty). Vietnam is being imposed a yellow card due to inadequate efforts to conform with IUU regulations. This yellow card could affect Vietnam's seafood exports through two main channels.

Direct impact

Since IUU regulations' goal is to completely ban illegally caught fisheries in the EU market, intuitively, the yellow card will have a direct impact on capture fishery importing to the EU. This impact is driven by the requirement that 100% containers of seafood exported to the EU from the country that is being subjected to the yellow card will be detained for originality inspection. This means that all exported seafood containers have to stay longer at the ports, which would incur higher time and financial costs for exporting companies, as well as inevitable seafood-quality deterioration. Thus, the yellow card directly

decreases Vietnam's export of captured fisheries. Lower revenue from fishery export makes life of hundreds of thousands of fishermen much harder, and also directly curtails the Government budget, not only in terms of export revenue losses but also in terms of yellow card removing costs.

Indirect impact

Beside the direct impact, the IUU yellow card indirectly affects the image, brand and reputation of Vietnam's seafood in the international market. In this sense, Vietnam's aquaculture products will also be affected. Statistics show that Vietnam's aquaculture exports have actually experienced a sharp fluctuation since the end of 2017 (Nam *et al.*, 2021). The main cause, however, may be due to factors other than the IUU yellow card alone, such as volatile market demand or seasonality.

The EU is a large and influential fisheries market globally, thus when the EU imposes a yellow card on Vietnamese seafood, other markets will also have a certain vigilance towards fisheries imported from Vietnam. To complicate the matter further, other markets might apply the same IUU regulation in order to strictly control the quality of imported fisheries, typically two important export markets of Vietnam, namely the US (from 2018) and Japan (from 2022). Vietnam's fisheries export to the US and Japan might face the same difficulties as the EU market.

The yellow card might also indirectly hamper Vietnam's foreign relations with the world. First, it might affect the relations between Vietnam and the EU, then it might negatively affect the expansion of Vietnam's relations with the world. The IUU yellow card prevents Vietnam's fisheries export from receiving all the tax cuts related to the EVFTA agreement.

3. METHODOLOGY

Estimation methods

This study aims at quantifying the impact of the IUU yellow card on Vietnam's seafood export revenue from 2017 to the present. To this end, the latest impact evaluation method called Synthetic Control Method (SCM) is employed here.

Synthetic Control Method (SCM) is an econometric tool developed by Abadie & Gardeazabal (2003) and later extended and popularized by Abadie *et al.* (2010), Abadie (2021). SCM seeks to create a synthetic control unit (i.e. the counterfactual, from all objects in the control group) for the object being affected by the event (or treatment unit), so that the difference in outcomes between the two groups could be estimated. The SCM counterfactual generating process is based on the similarity between the synthetic control unit and the treatment unit for a long period of time before the event occurs. This is done by taking the weighted average of the outcome of each individual object within the control group, as well as the weighted average of every variable affecting the outcome. As the counterfactual is not the outcome of only one control unit but is derived from all objects within the control group (thus "synthetic"), the method is named as Synthetic Control Method. Once the synthetic unit is formed, the actual outcome of the treatment unit is then compared with the simulated outcome of the counterfactual unit for the period after the occurrence of the event, and the difference between the two is interpreted as the causal effect of the event on the treatment unit.

This section quickly summarizes the idea of the SCM, based on the presentation of Abadie (2021).

Assume that there are $J+1$ objects and that the first object ($j=1$) is the one that receives the effect of the event (treatment unit) and the remaining J objects ($j = 2, \dots, j+1$) is the control group. Objects are observed in the time interval $t = 1, \dots, T$.

Denote:

$+ Y_{jt}^I$ as the outcome (for example, some economic results) of object j in time t in case the event under consideration has never happened, for object $j=1, \dots, J+1$, and $t=1, \dots, T$.

+ T_0 is the time at which the event occurs, T_0 is somewhere between 1 and T . Then, Y_{1t}^I will be the counterfactual outcome for object $j = I$ for time $t > T_0$.

+ Y_{1t}^I is the observed outcome for object $j = 1$ at time t .

+ During the period before the event ($t \leq T_0$), the event does not affect the economic outcome during this time, thus $Y_{1t}^I = Y_{1t}^N$ for all $t \leq T_0$.

+ After the event occurs ($t > T_0$), the event's impact on object $j = 1$ in year t is determined as follows:

$$\tau_{1t} = Y_{1t}^I - Y_{1t}^N \tag{1}$$

Since Y_{1t}^I is the outcome observed in reality, to calculate τ_{1t} , the counterfactual Y_{1t}^N needs to be estimated. To estimate Y_{1t}^N , Abadie et al. (2010) estimate the linear regression equation as follows:

$$Y_{jt}^N = \delta_t + \theta_t Z_j + \lambda_t \mu_j + \varepsilon_{jt} \tag{2}$$

In which δ_t is the time-invariant fixed effects, Z_j and μ_j are vectors of observed factors (and event-unaffected) and unobserved factors, respectively, and ε_{jt} is the error term.

Abadie et al. (2010) determine the vector ($J \times I$) of weights:

$$W = (w_2, \dots, w_{J+1}) \text{ with the condition that } w_j \text{ is non-negative} \tag{3}$$

$$\text{and } \sum w_j = 1 \text{ for } j=2, \dots, j+1$$

Each particular set of values of $W = (w_2, \dots, w_{J+1})$ creates a counterfactual value for the treatment unit. Outcomes for the synthetic control unit would be:

$$\sum_{j=2}^{J+1} w_j Y_{j1} = \delta_t + \theta_t \sum_{j=2}^{J+1} w_j Z_j + \lambda_t \sum_{j=2}^{J+1} w_j \mu_j + \sum_{j=2}^{J+1} w_j \varepsilon_{jt} \tag{4}$$

Assuming there exists a $W^* = (w_2^*, \dots, w_{J+1}^*)$ such that:

$$\begin{aligned} \sum_{j=2}^{J+1} w_j^* Y_{j1} &= Y_{11}; \\ \sum_{j=2}^{J+1} w_j^* Y_{j2} &= Y_{12}, \dots, \sum_{j=2}^{J+1} w_j^* Y_{jT_0} = Y_{1T_0}; \\ \sum_{j=2}^{J+1} w_j^* Z_j &= Z_1 \end{aligned} \tag{5}$$

Then the following value can be used as proxy for the impact of the event on the object $j = 1$:

$$\hat{\tau}_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt} \tag{6}$$

In fact, it will be extremely difficult to find such vector $W^* = (w_2^*, \dots, w_{J+1}^*)$ that strictly satisfies all the conditions in equation (5) and (6). Instead, W^* are chosen so that all these conditions are partly satisfied by minimizing the following expression:

$$\min \|X_1 - X_0 W\|_v$$

$$\text{In which } \|X_1 - X_0 W\| = \left(\sum_{h=1}^k v_h (X_{h1} - w_2 X_{h2} - \dots - w_{J+1} X_{hJ+1})^2 \right)^{1/2} \tag{7}$$

Where k is the number of explanatory variables Z in Equation (2). X_1 is the vector of the explanatory variables Z combined with a linear combination of Y_{jt} ($j = 2, 3, \dots, j+1$) for the main object (the treatment unit), X_0 is the analogous vector for the objects within the control group. The non-negative vector $V = (v_1, v_2, \dots, v_k)$ acts as the coefficient of X_1, \dots, X_k .

Minimizing $\|X_1 - X_0W\|$ also means that the Root Mean Squared Percentage Error (RMSPE) is minimized.

$$\sum_{t=1}^{T_0} (Y_{1t} - w_2(V)Y_{2t} - \dots - w_{j+1}(V)Y_{j+1t})^2 \quad (8)$$

The expression to calculate the deviation ratio is expressed together as follows:

$$\frac{\text{RMSPE}}{Y_{1t}}; t=1, \dots, T_0 \quad (9)$$

Application to the case of Vietnam

The procedure explained above is then applied to our specific case as follows.

Suppose that there are $J + 1$ countries which exports fishery products (either captured or farmed) to the EU market, in which only $j = 1$ refers to Vietnam, the only country that is being imposed a yellow card from the EU. Vietnam acts as the treatment unit. The remaining J countries form the control group. Our time period spans from 2005 to 2021, and the year 2017 marks the occurrence of the event (i.e. $T_0 = 2017$, this is the year the EU's yellow card was first imposed on Vietnam captured fisheries).

The outcome in this case is countries' fishery export revenue to the EU market. Since the IUU yellow card may induce both direct and indirect impact on fishery exports, we decompose fishery export into two parts corresponding to the two impacts as follows:

Y_1 - Total value of captured fishery exports to the EU market.

Y_2 - Total value of aquaculture exports to the EU market.

The main explanatory variables (i.e. Z variables in Equation 3.2) are selected on the basis of the structural gravity model prevailing in international trade literature, including:

- + Country's total fishery export revenue (from exporting to the whole world), representing its export capacity.

- + The EU's total fishery import value, representing its import demand;

- + Geographic distance from the exporting country to the EU; proxy for the bilateral trade cost between them;

- + Import duties imposed by the EU on imported fishery (%), also proxy for the bilateral trade cost between the exporting country and the EU.

Our sample includes firstly all countries that export fishery to the EU market. From this initial sample we then select countries whose fishery exports to the EU tend to rise over time, similar to the trend observed in the case of our treatment unit. Most importantly, to be included in the control group, these countries must not be imposed yellow cards by the EU before and after 2017. Our final sample consists of 20 countries.

Data for exporters' total value of captured fishery exports (Y_1) and aquaculture (Y_2) to the EU market, exporters' total fishery exports, the EU's total fishery imports are compiled and calculated from raw trade data extracted from the International Trade Center (ITC). In many cases data is extracted from the United Nations Commodity Trade Statistics Database (UN Comtrade) instead of ITC due to data unavailability. Geographic distances (in terms of km) were extracted from the Gravity dataset developed by the Center d'Études Prospectives et d'Informations Internationales (CEPII). Import tariffs on fishery products are compiled based on the Tariff Analysis Online tool provided by the World

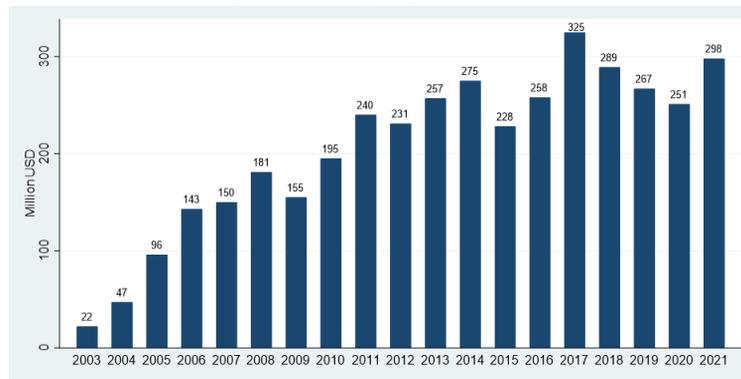
Trade Organization (WTO).

4. ESTIMATION RESULTS

Vietnam’s fishery exports to the EU

With suitable geographical and climatic conditions, Vietnam has become one of the major fishery producing countries in the world with a total fishery production of 8.73 million tons in 2021. Currently Vietnam is the third largest fishery exporter worldwide. Major import destinations of Vietnam fisheries are the EU, the US, Japan and China.

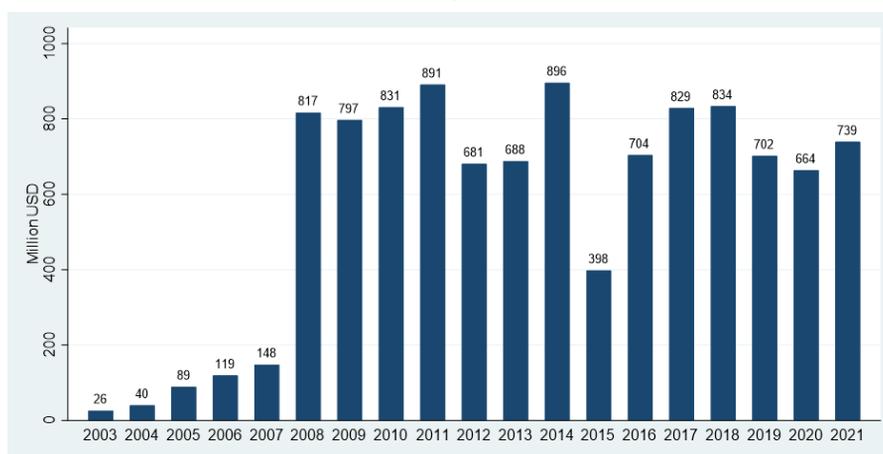
Figure 1. Vietnam’s total captured fishery export to the EU 2003 - 2021 (million USD)



Source: authors’ calculation

The IUU yellow card seems to have no direct impact on aquaculture exports. The total value of aquaculture exports still increased from 829 million USD in 2017 to 834 million USD in 2018. This value decreased slightly since then, to 702 million USD in 2019 and to 664 million USD in 2020. The decreasing trend was reversed in 2021 when aquaculture exports bounced back to 739 million USD.

Figure 2. Vietnam’s total aquaculture fishery export to the EU 2003 - 2021 (million USD)



Source: authors’ calculation

Impact of the IUU yellow card on Vietnam’s fishery export to the EU

This section reports estimation results for the impact of the IUU yellow card on Vietnam’s fishery export to the EU based on the Synthetic Control Method.

Regarding captured fisheries

Figure 3 and 4 show the output results after implementing the SCM method with our input data relating to the captured fishery exports.

Figure 3. SCM weights for countries (for captured fisheries)

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	21692.72
-------	----------

Unit Weights:

Co.No	Unit_Weight
Argentina	0
Belgium	.12
Chile	0
China	0
Denmark	0
Ecuador	0
France	0
India	.427
Indonesia	0
Ireland	0
Italy	.021
Norocco	0
Norwicia	0
Netherland	.09
Norway	0
Portugal	.019
Spain	.26
USA	0
United Kingdom	.063

Source: authors' calculation

$$\begin{aligned}
 &Y_1(\text{VietNam Synthetic}) \\
 &= 0.12 \times Y_1(\text{Belgium}) + 0.427 \times Y_1(\text{India}) + 0.021 \times Y_1(\text{Italy}) + 0.09 \times Y_1(\text{Netherlands}) \\
 &+ 0.019 \times Y_1(\text{Portugal}) + 0.26 \times Y_1(\text{Spain}) + 0.063 \times Y_1(\text{UK})
 \end{aligned}
 \tag{10}$$

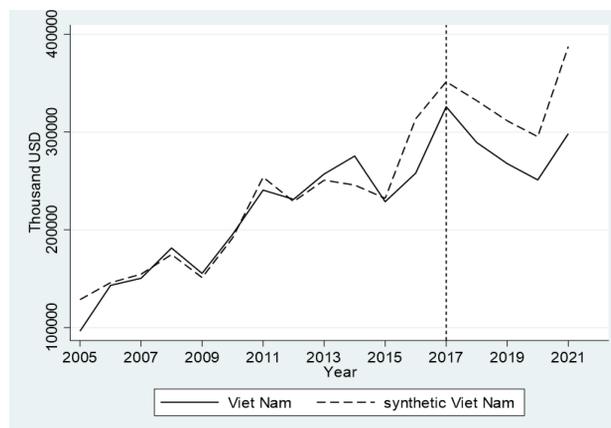
RMSPE = 21692.72 means that the original mean squared prediction error, or more simply the average deviation from Vietnam’s counterfactual total export value of the captured fishery to the EU to that of actual Vietnam is about 21 million USD over the period 2005 - 2017. This also means that our model accuracy ratio is about 90%.

From the above weights, we come up with the main result shown in Figure 4. The results show that the negative impact of the IUU yellow card on the export of caught seafood is quite significant.

Vietnam’s counterfactual export revenue (to the EU) for captured fisheries tends to fluctuate quite similarly to the actual one before 2017. These two series almost completely coincide in terms of value for the whole period from 2006 to 2013. They only fluctuated differently at one point in time, which was in 2014, when the actual value of captured fisheries export from Vietnam to the EU 27 tended to increase while the simulated one tended to go in an opposite direction.

Figure 4. Vietnam’s actual and counterfactual captured fishery export revenue to the EU

(in thousand USD)



Source: authors' calculation

All the above statistics confirm that our model could fairly reliably quantify the impact of the IUU yellow card on captured fisheries export to the EU from Vietnam, by taking the difference between the actual Vietnam’s captured fishery export revenue and Vietnam’s counterfactual. Figure 5 and Table 1 report this results.

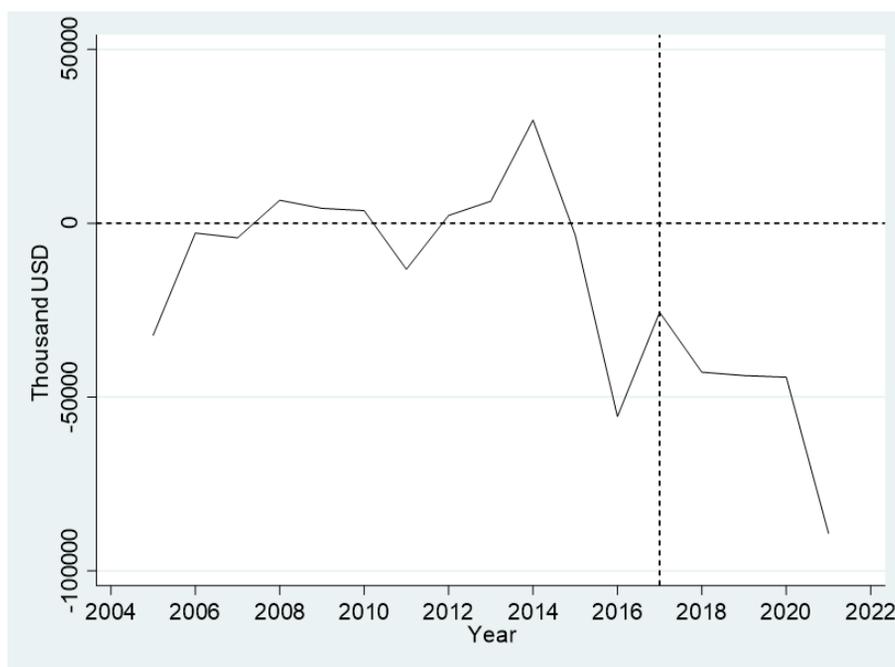


Figure 5. The difference between the actual and counterfactual Vietnam’s captured fishery export revenue (in thousand USD)

Source: authors’ calculation

Table 1. The difference between the actual and counterfactual Vietnam’s captured fishery export revenue 2018-2021 (in thousand USD)

Year	Vietnam’s exploited seafood	Vietnam’s counterfactual caught seafood	Difference	The accuracy rate of estimation	RMSPE
2018	289404	332223	-42819	90%	21692.72
2019	267789	311594	-43805		
2020	251100	295377	-44277		
2021	298410	387603	-89193		

Source: authors’ calculation

Conclusion: The IUU yellow card has caused quite significant damage to Vietnam’s exports of caught seafood to the EU. The accumulated total loss from 2018 to the end of 2021 is about 220 million USD, which accounts for nearly 20% of the whole of Vietnam’s captured fishery export to the EU 27 during this period.

Regarding aquaculture products

First the weights attaching to each country are estimated. Figure 6 reports the results.

Figure 6. SCM weights for countries (for aquaculture products)

RMSPE	221013.4
-------	----------

Unit Weights:	
Co_No	Unit_Weight
Argentina	0
Belgium	0
Chile	0
China	.299
Denmark	0
Ecuador	.701
France	0
India	0
Indonesia	0
Ireland	0
Italy	0
Morocco	0
Namibia	0
Netherland	0
Norway	0
Portugal	0
Spain	0
USA	0
United Kingdom	0

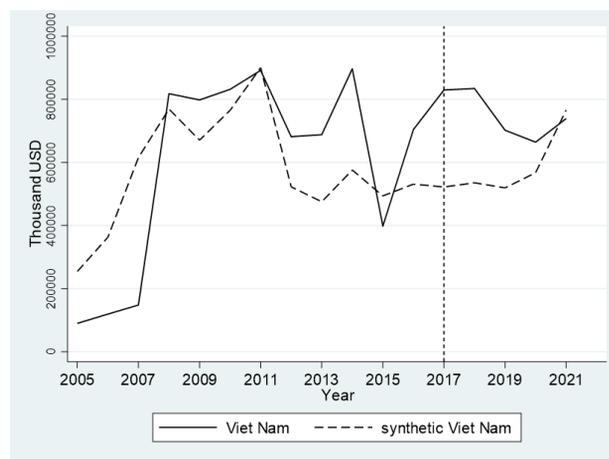
Source: authors' calculation

$$Y_2(\text{VietNam Synthetic}) = 0.299 \times Y_2(\text{China}) + 0.701 \times Y_2(\text{Ecuador}) \tag{11}$$

RMSPE = 221013.44 shows that the difference between Vietnam’s counterfactual’s total export value of aquaculture products to the EU compared with the actual one during the period 2005 - 2017 is about 221 million USD.

From those weights, we estimate the counterfactual for Vietnam aquaculture exports to the EU 2005-2021 and display them along with the corresponding actual value in Figure 7

Figure 7. Vietnam’s actual and counterfactual aquaculture export revenue to the EU (in thousand USD)

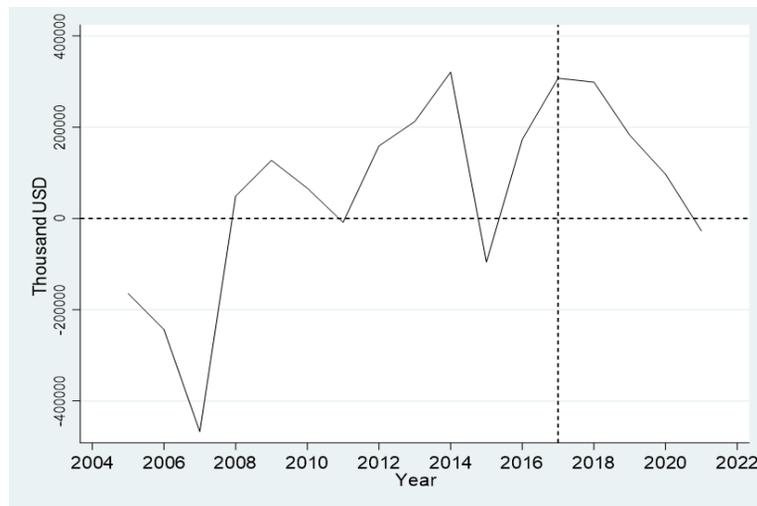


Source: authors' calculation

As can be seen from Figure 7, the simulated numbers (synthetic Vietnam) resemble quite closely to the actual figures. However, the overlapping degree between these two series during the period 2005-2017 was not very high since there are very few countries that show many similarities to Vietnam regarding aquaculture exports to the EU, both in terms of value and fluctuation tendency.

Difference between counterfactual and real export value:

Figure 8. The difference between the actual and counterfactual Vietnam’s aquaculture fishery export revenue (in thousand USD)



Source: authors’ calculation

Figure 8 shows the difference between Vietnam’s actual and counterfactual aquaculture fishery export to the EU for the period 2005-2021.

With an RMSPE of around 221013, we could calculate a deviation rate of 36% or a similarity rate of reasonably high at 64%. With the above accuracy, we quantify the impact of the IUU yellow card on Vietnam’s aquaculture exports as the difference between the actual Vietnam’s aquaculture exports revenue to the EU and its counterfactual over the 201-2021 period. The results are shown in Table 2.

Table 2. The difference between the actual and counterfactual Vietnam’s aquaculture export revenue 2018-2021 (in thousand USD)

Year	Vietnam’s farmed seafood	Vietnam’s counterfactual farmed seafood	Difference	The accuracy rate of estimation	RMSPE
2018	834382	535512	298870	64%	221013.44
2019	702016	519370	182646		
2020	664263	567337	96926		
2021	739063	766021	-26958		

Source: authors’ calculation

Conclusion: The IUU yellow card does not seem to cause an obvious loss to Vietnam’s aquaculture exports to the EU, and as a matter of fact, it may even have an indirect positive impact. This positive impact lasted over three years (2018-2020) and only began to reverse in 2021. The total damage caused by the IUU yellow card to aquaculture exports is only about 27 million USD and this value only accounts for about 4% of the total export value of the group of farmed seafood to the EU 27 Vietnam achieved this year.

5. Policy implications

This study aims at quantifying the impact of the IUU yellow card on Vietnam’s seafood export revenue from 2017 to the present. Using the SCM framework for 20 fishery exporters over the 2005-2021 period, our findings could be summarized as follows: The IUU yellow card really has a negative impact on Vietnam’s captured fishery exports. From 2018 to the present, the cumulative loss in Vietnam’s captured fishery exports revenue brought about by the IUU yellow card amounted to around 220 million USD. Nonetheless, over the same period, aquaculture export has enjoyed indirect benefits from the IUU yellow card. The total

gain from higher aquaculture export value is up to 551.5 million USD over the last 5 years. The gain from the indirect impact however tends to decrease year by year and turns to negative in 2021.

Our results have particular implications, starting from the question: “*From an economic perspective, should Vietnam continue to take drastic measures to accomplish the goal of removing the IUU yellow card or not - when the costs of this campaign over the past five years have been enormous*”. Based on the results collected from the research, and the current world economic situation, the group makes some comments to help regulators find the right direction suitable for the development of Vietnam’s seafood industry.

The cost of economic loss caused by the IUU yellow card including economic loss and card removal resources is too much.

After Vietnam was hit with an IUU yellow card by the EU in 2017, Vietnam launched a series of policies with the determination of government at all levels to step in. The Fisheries Law was issued in November 2017 - right after the IUU yellow card penalty for Vietnam was announced by the EC. Based on this law, Vietnam has taken certain actions such as: Stepping up the monitoring and management of fishing vessels; Building a database, and registering and issuing fishing licenses for fishing vessels. The installation of cruise monitoring equipment on fishing vessels is strictly monitored... It can be seen that the cost of removing the card in recent years plus the economic damage caused by the yellow card is too great while IUU yellow card has not been removed yet.

The EU economy is on the verge of a recession leading to a decrease in the demand for seafood.

The war between Russia and Ukraine broke out, causing inflation in the European Union to rise sharply. High and inflation for a long time forced the European Central Bank to tighten monetary policy and sharply increase operating interest rates. From 7/2022 until now, the ECB has raised the operating interest rate 7 times in a row. Interest rates and inflation are expected to remain high, making the outlook for economies in Europe bleaker than ever, and fears of a prolonged recession are growing. The EU’s largest economy, Germany, GDP recorded a decline of 0.5% in Q4/2022 and continued to decline by 0.3% in Q1/2023. It leads to a decrease in European purchasing power and may lead to Europe restricting seafood imports further. Vietnam maybe consider other alternative markets such as Japan, China, and the US.

If Vietnam does not improve its fishing activities according to IUU requirements, the worst case scenario is that Vietnam may be warned of a red card, which means that it is not allowed to export our caught seafood to the EU.

The IUU red card will cause negative impacts on Vietnam’s seafood industry. All of Vietnam’s fishery catches with a scale of hundreds of millions of USD per year will not be allowed to be exported to the EU market and the incentives from the EVFTA will not be able to be promoted effectively. This not only causes great economic damage, but also causes painful problems for social security, when millions of fishermen will be unemployed.

The IUU red card will also have a serious impact on the reputation and image of Vietnam’s seafood in the international arena, in the context that the issue of “environmental protection” is being raised by countries around the world. Especially highlighted in recent times. In the future, other countries around the world will probably introduce similar IUU regulations for seafood exported to these countries.

The application of a red card will entail a series of consequences in the future, not only in the EU market, Vietnamese brand also has a bad reputation globally, making the seafood industry worse.

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THE EFFECT OF MACRO FACTORS ON ENERGY EFFICIENCY INPUTS: A STUDY OF CPTPP COUNTRIES

Nguyen Thi Thanh Binh¹, Le Thu Hien¹, Vu Hien Lan¹, Phung Thi Due Nhi¹, Ta Thi Thanh Xuan¹
Mentor: Tran Ngoc Mai¹

ABSTRACT: *The article focuses on studying the impact of macro factors - Industrial structure, Urbanization level, Energy consumption structure, Merchandise trade, Per capita GDP, and Tourism income on the main inputs of energy efficiency including Labour, Capital stock, and Energy consumption in ten countries that signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) over 16 years (2000-2015), using Stochastic frontier analysis (SFA). The study results are expected to be helpful to governments in assessing the impact of energy use on CPTPP countries, thereby supporting the development of appropriate strategies and regulations to improve energy use and towards harmonized cooperation and sustainable economic development.*

Keywords: *CPTPP, SFA, energy, efficiency, factors, Vietnam.*

1. INTRODUCTION

Energy efficiency is a topic that is receiving more and more attention, especially in the context of rapidly growing populations and industries requiring more energy. The impact of energy consumption on global climate change is becoming increasingly evident. The group of studies on energy efficiency can be divided according to geographic perspective, such as the case study of a particular country China (Lei et al., 2022), Japan (Honma & Hu, 2014) or of a particular region (Assi et al., 2021), (Sun et al., 2019), (Zhang & Chen, 2022). In addition, some researchers approach the topic of energy efficiency from the industry perspective, such as the construction industry (Ouyang et al., 2021), the aviation industry (Cui & Arjomandi, 2021), the textile industry garment industry (Zhao & Lin, 2019), transportation industry (Feng & Wang, 2018). Typical studies indicate factors affecting energy efficiency, including environmental technology (Paramati et al., 2022), exports (He & Huang, 2021), FDI (Pan et al., 2020), human capital and innovation (Borozan, 2018), and GDP (Hu et al., 2019). The current state of research into energy efficiency and the factors impacting it is rather limited (Dunlop, 2019). Studies have focused on individual countries or groups lacking a more diverse and widespread regional and international pool of participants. There is no general consensus on the factors affecting energy consumption efficiency, as research papers contain disjointed and differing views.

Many different methods have been applied to determine energy efficiency, of which the two most popular methods include Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA). DEA is a non-parametric method with a flexible approach, so it is widely used to build performance indicators in different fields of energy and environment to determine production possibility frontier and assess environmental and energy performance at the sectoral or economic level (Chen & Jia, 2017; Honma & Hu, 2009; Jebali et al., 2017). Stochastic frontier analysis (SFA) is a representative of parametric methods, which is one of the basic methods for handling multi-input single-output models and is considered superior and more accurate than DEA, especially in the case of relatively high measurement error (Oh & Shin, 2015). On the other hand, SFA is a parametric approach that describes sources of statistical noise from measurement errors and other random factors at the industry level and economy levels (Boyd, 2008).

¹ Banking Academy, Vietnam.

Many studies have used SFA to analyze energy data from different countries and regions, proving that SFA is an effective tool for calculating and analyzing energy efficiency. Sun et al. (2019); Zhang & Chen (2022) applied SFA to analyze 25 years of energy data from 71 economies, and their results show that green innovation and institutional quality significantly positively affect energy efficiency in these countries. Similarly, Honma & Hu (2014) applied SFA to investigate the energy efficiency and influencing factors of 41 administrative regions in Japan from 1996-2008 and found that most regions have very low energy efficiency. Hu et al. (2019) utilized SFA to analyze the provincial energy efficiency and urban energy in China from 2002 to 2015, showing that GDP has a positive short-term impact on total SO₂ emissions, but achieving a higher level of energy efficiency has an overall negative impact on emissions in the long run.

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a trade agreement among eleven countries predominantly located in the Asia-Pacific region. The member countries, which include Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam, are collectively interested in improving energy efficiency to boost their economic growth, reduce greenhouse gas emissions, and increase environmental sustainability. Collectively, the CPTPP countries represent a significant portion of the world economy, contributing approximately 13.4% of global GDP. Hence, insights gained from the study of these countries could have substantial relevance for global energy efficiency trends.

The dynamic relationship between energy efficiency and the socio-economic parameters that govern it is an area of profound importance and increasing attention. Energy efficiency studies to date have often been geographically or industry-specific, leaving room for an in-depth, cross-regional analysis. This study is an exploration into the interaction of *Industrial structure*, *Urbanization level*, *Energy consumption structure*, *Merchandise trade*, *Per capita GDP*, and *Tourism income*, with primary inputs of energy efficiency - *Labour*, *Capital stock*, and *Energy consumption*. Our analysis focuses on ten countries that have signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) over a span of 16 years, from 2000 to 2015. We have employed Stochastic Frontier Analysis (SFA), a method proven superior in situations with relatively high measurement errors, to aid our investigation. Through our research, we hope to contribute significantly to the ongoing discourse on energy efficiency, supporting the evolution of energy use strategies and regulations in CPTPP countries. The goal is to harmonize cooperation and facilitate sustainable economic development amidst an era marked by the urgent need for efficient and responsible energy consumption.

2. THEORETICAL FRAMEWORK

An overview of the research situation on factors affecting energy efficiency has pointed to diverse factors such as technical progress (Li & Lin, 2018; Wang & Wang, 2020; Zhu et al., 2019), industry structure (Xiong et al., 2019; B. Zhu et al., 2019), energy prices (Antonietti & Fontini, 2019; Barkhordar et al., 2018), economic level (Sener & Karakas, 2019), market openness (Imbruno & Ketterer, 2018; Montalbano & Nenci, 2019; Pan et al., 2020), degree of urbanization (That et al., 2018; J. Wang et al., 2019), human resources (Borozan, 2018), policy mechanisms (Du et al., 2018)... However, the results of the impact of the factors on the energy efficiency use in different countries and groups of countries are different. Moreover, the research topic is still discovering the influencing factors, so subsequent studies always need to add new factors to discover the new effects of synthetic significance. Within the scope of this study, the authors choose to study the impact of factors in the external business environment, including *Industrial structure*, *Urbanization level*, *Energy consumption structure*, *Merchandise trade*, *Per capita GDP*, and *Tourism income*.

(i) *Industrial structure*

According to Atikian (2013), the economic structure is divided into three main sectors: agriculture, industry and services. Production has been established, increasing input resources such as capital, labour and energy consumption. The industrial restructuring will affect the proportions of three major industries,

having a greater impact on energy consumption (Zhang & Chen, 2022). The industry accounts for a large proportion of the three, industrial restructuring can promote production growth, but at the same time, it can put pressure on existing resources by disrupting production patterns. According to the analysis results of Yu (2020), the most effective way to improve overall energy efficiency is to promote industrial restructuring and technological innovation. Therefore, the research hypothesis put forward is as follows:

H1: Industrial structure has a negative impact on energy efficiency.

(ii) Urbanization level

Urbanization is the migration process from rural to urban areas, resulting in higher population densities and more complex infrastructure. This leads to an increase in energy consumption as more and more people need electricity and other forms of energy. Shang et al. (2020) shows that urbanization significantly increases actual energy consumption but reduces energy efficiency. In addition, the link between energy inefficiency and urbanization increases as a country's per capita GDP increases (Li et al., 2018). This implies that rapid urbanization has trade-offs, with increased energy consumption and reduced efficiency. Therefore, the research hypothesis put forward is as follows:

H2: Urbanization level has a negative impact on energy efficiency.

(iii) Energy consumption structure

Energy consumption structure refers to the percentage of fossil energy used in an energy system or process. In general, higher rates of fossil energy consumption will lead to lower levels of energy efficiency and increased environmental impacts such as carbon dioxide emissions. Therefore, reducing fossil fuel consumption by deploying renewable energy sources or efficient technologies can help increase energy efficiency and reduce environmental impact. Wang et al., (2019), Yu et al. (2019), Zhao et al., (2019) have shown the negative impact of energy consumption structure on energy efficiency. Therefore, the research hypothesis put forward is as follows:

H3: Energy consumption structure has a negative impact on energy efficiency.

(iv) Merchandise trade

Commodity trade is the exchange of goods and products between countries and is one of the important factors of global economic activity. Trade in goods significantly affects energy efficiency, as it determines the amount of energy used in the production, transportation and exchange of goods. With the current trend of international free trade, free trade in goods is booming to satisfy consumers' global needs. The higher demand for goods, especially when goods move to geographical areas far from the place of production, will make the production and distribution of products consume more energy. Therefore, the research hypothesis put forward is as follows:

H4: Merchandise trade has a negative impact on energy efficiency.

(v) Per capita GDP

Per capita GDP ratio and energy efficiency are positively related. When per capita GDP increases, it means the country's development and people's living standards are improved. This leads to a higher rate of savings (investment) than consumption growth, creating an accumulation of surplus funds in economies that can be invested in energy-efficient projects. In addition, developed countries with high GDP value have full capabilities and resources to develop high-tech, more energy-efficient industries. Research by Sineviciene et al, (2017) argues that per capita GDP is one of the most important factors in increasing energy efficiency for post-communist countries. A 1% increase in per capita GDP will increase energy efficiency by 0.53%, which means that the wealthier a society, the higher the level of efficiency that can be achieved. Research by Zhang & Chen (2022) shows that per capita GDP and energy efficiency are positively correlated. Therefore, the research hypothesis put forward is as follows:

H5: Per capita GDP has a positive effect on energy efficiency.

(vi) Tourism income

Recent studies have shown a negative correlation between the number of tourists and the efficiency of energy consumption because the tourism industry is highly dependent on transportation - the cause of the consumption of inorganic energy. Environmental damage due to increased tourism has also been reported in the literature of Nepal et al. (2019), Scott et al. (2010) and Tovar & Lockwood (2008) because tourism is associated with travel and fossil fuel use in motor vehicles, thereby increasing greenhouse gas emissions and reducing the efficiency of energy consumption. In the study of Khan et al. (2019), a 1% increase in tourism would result in a GHG increase of 0.055% in Asia but a 0.084 % decrease in GHG in Europe due to the adoption of low-carbon economic policies and eco-friendly tourism policies environment such as using bicycles instead of fossil fuel vehicles such as cars, motorbikes... Gössling & Peeters (2007) argues that tourism increases air pollution from transcontinental transport and aviation. Therefore, the research hypothesis put forward is as follows:

H6: Tourism income has a negative effect on energy efficiency.

1. Research method

Stochastic frontier analysis (SFA) is based on a parametric approach and uses econometric models to estimate technical efficiency, technological-technical progress, and environmental efficiency. SFA assumes a functional relationship between outputs and inputs and uses statistical techniques to estimate parameters for the production function Coelli & Battese (1995). The stochastic production limit function that represents the correlation between inputs and outputs has the following general equation:

$$Y_i = f(X_i, Z_i, b, a, d) \exp(v_i - u_i)$$

In which: β, α, δ are the parameters to be estimated of the model; v_i and u_i are independent random errors; Y are common inputs factors such as labor, capital, energy; Z are macro factors.

The Cobb-Douglas function will be used to measure the impact of macro-environmental variables on the input variables of energy efficiency (Reinhard et al., 2000). We have the following equations:

$$\text{LnLabour} = \text{LnIndustrial} + \text{LnUrbanization} + \text{LnEStructure} + \text{LnMerchandise} + \text{LnGDP} + \text{LnTourism} \tag{1}$$

$$\text{LnCapital} = \text{LnIndustrial} + \text{LnUrbanization} + \text{LnEStructure} + \text{LnMerchandise} + \text{LnGDP} + \text{LnTourism} \tag{2}$$

$$\text{Ln Energy} = \text{LnIndustrial} + \text{LnUrbanization} + \text{LnEStructure} + \text{LnMerchandise} + \text{LnGDP} + \text{LnTourism} \tag{3}$$

Where: LnLabour, LnCapital and LnEnergy are the natural logarithms of the common input factors; LnIndustrial, LnUrbanization, LnEStructure, LnMerchandise, LnGDP, LnTourism are the natural logarithm of macro factors, respectively Industrial structure, Urbanization level, Energy consumption structure, Merchandise trade, Per capita GDP, Tourism income.

3. RESULTS AND DISCUSSION

Table 1. Descriptive statistics

Element	Number of observations	Medium	Standard deviation	Smallest value	The greatest value
LnLabour	160	16.72	0.97	14.59	18.02
LnCapital	160	6.55	1.19	4.79	8.99
LnEnergy	160	1.15	1.11	-0.63	3.11
LnIndustrial	160	3.41	0.19	3.01	3.88

LnUrbanization	160	4.3	0.33	3.19	4.6
LnEStructure	160	4.38	0.17	3.83	4.59
LnMerchandise	160	4.16	0.74	2.84	5.84
LnPercapita	160	9.47	1.25	5.97	11.13
LnTourism	160	2.19	1.29	0.05	6.80

Source: Author's calculation

The value of the variables has a large difference, which proves that the input and output factors in the energy consumption efficiency of the CPTPP countries are unevenly distributed. The difference in mean values between variables is mainly due to differences due to country-specific factors. Of the 10 CPTPP countries, there are 5 countries with developed economies, including Australia, Canada, Japan, New Zealand, and Singapore and 5 countries with developing economies, including Chile, Malaysia, Mexico, Peru, and Vietnam.

Table 2. Results of SFA model analysis

	Capital stock (Model 1)	Labour (Model 2)	Energy consumption (Model 3)
LnIndustrial	-0.5130852***	-0.3919856***	-0.2557785*
LnUrbanization	-0.6862571**	-0.3414905***	0.3538464
LnEStructure	0.6762235***	-0.3142296**	0.7608478***
LnMerchandise	0.0948392	0.1065847***	-0.063447
LnPercapita	0.4589227***	0.2538185***	0.3270156***
LnTourism	0.004009	-0.0174988***	-0.0073595
/in	1.997529***	-2.887562	0.7751796
σ^2	1.253692	5.923052	1.811571
γ	0.9939758***	0.9996965***	0.9957416***
Log-likelihood	125.54171	235.64459	125.57018

Note: *, ** and *** represent significance at 10%, 5% and 1%, respectively.

Source: Statistics by the author team

The results of the Likelihood Ratio (LR) test are all smaller than the chi-square value of 12,483, which means that hypothesis H0 is accepted, showing that the SFA model with the Cobb-Douglas function is more suitable for estimation (Kodde & Palm, 1986), so it can be concluded that the independent variables affect energy consumption. Specifically, all the external environmental variables pass the 1%, 5%, and 10% significance levels when testing the SFA model, proving that the selected environmental variables significantly influence the dependent variable. Depending on the input, if the regression coefficient is positive, it means that an increase in external environmental variables brings more input redundancy, leading to a decrease in energy efficiency. If the coefficient is negative, it indicates that an increase in external environmental variables promotes a reduction in input redundancy, which is beneficial for energy efficiency.

Sigma2 (σ^2) shows the total variance of the model. Gamma (γ) shows the percentage of variance due to the constant effect over time (intra-group variance). This value shows that the Gamma Factor (γ) in all 3 models is close to 1, indicating that 99% of the variance of the 1,2,3 model can be explained by time-constant efficiency or most of The variation in efficiency is due to uncontrollable factors and the model exists for technical inefficiencies (Battese & Corra, 1977), energy efficiency is affected by factors such as: on socio-economic.

(i) Industrial structure: Industrial structure has a negative correlation coefficient with all 3 input variables: Labor, Capital stock and Energy consumption. This shows that, as industrialization increases, countries often shift from labor-based industries to more capital-intensive and high-tech industries. New

technology can reduce capital and labour requirements in production, helping to increase labor productivity and capital efficiency. In fact, from 2000-2015, many CPTPP countries shifted from industrial production based on capital and labour to service and high-tech industries. This can also lead to a negative correlation between industrialization and capital and labour. Besides, industrialization and energy also have a negative correlation, showing that many countries in the CPTPP have taken measures to reduce energy consumption in industrial production to reduce CO₂ emissions and negative environmental impact. Energy-saving technologies can help reduce energy consumption while maintaining or even increasing production.

(ii) Urbanization level: The strong urbanization process is negatively correlated with *Capital stock*, *Labour* and positively correlated with *Energy consumption*. This result can be explained as follows: First, when a country undergoes urbanization, there is a tendency to move labour and capital from rural to urban areas. As a result, the agricultural industry - a major consumer of capital and labor - often declines. At the same time, service and high-tech industries often develop, but these industries often use less capital and labour than agriculture. Second, when urbanizing, the energy demand often increases to support the activities of industries and services and meet the living needs of the urban population. Transportation, construction, and urban utilities often consume large amounts of energy. Besides, providing stable and continuous energy for urban activities also requires primary energy. This can lead to a positive correlation between urbanization and primary energy consumption.

(iii) Energy consumption structure: has a positive correlation coefficient for *Capital stock* and *Energy consumption* and a negative correlation for *Labour*. When the energy consumption structure changes, this is often related to a change in the economic structure, where high-tech industries and higher energy consumption become more common. This requires a large amount of capital to invest in infrastructure and technology, leading to a positive correlation with capital capacity. At the same time, primary energy consumption also increases to meet the production needs of these industries. In addition, when fossil energy consumption increases, it may be because fossil fuels are used to operate industrial machinery, reducing the need for labor due to automation and improvement in the industry.

(iv) Merchandise trade: positively correlated with *Capital stock*, *Labour* and negatively correlated with *Energy consumption*. Increasing trade in goods often requires large amounts of capital and labour. Capital is used to build infrastructure, purchase equipment, and invest in technology to increase production capacity. Labour is used in the production, transportation, and distribution of goods. Thus, as trade in goods increases, capital and labour capacities generally increase, leading to a positive correlation. In addition, in the period 2000-2015, many CPTPP countries have taken measures to improve energy efficiency and reduce the amount of primary energy consumed in producing and transporting goods. This may explain the negative correlation between commodity trade and primary energy consumption.

(v) Per capita GDP: positively correlated with all three input variables. This result is explained as follows: Per GDP capita usually increases when a country has economic growth, and this is often accompanied by increased use of *Capital stock and Labour*. Capital is invested in economic sectors to create products and services, while labor is used to produce. Thus, capital and labor capacities generally increase when per capita GDP increases, leading to a positive correlation. Besides, when a country develops and per capita GDP increases, the energy demand usually increases to support economic activity and supply energy to the population. This can lead to a positive correlation between per capita GDP and *Energy consumption*.

(vi) Tourism income: positively correlated with *Capital stock* and negatively correlated with *Labour* and *Energy consumption*. As tourism income increases, so does the demand for tourism-related services such as hotels, restaurants, and recreational activities. This requires large capital to invest in infrastructure and services, leading to a positive correlation between tourist numbers and capital capacity. Besides, the growth of the tourism industry can reduce labor in other sectors, such as industry and agriculture, causing a negative correlation with labor. At the same time, the tourism industry may not consume as much primary energy as other sectors, primarily as CPTPP countries work to reduce the environmental impact of the tourism industry, which could lead to a negative correlation between the number of tourists and primary energy consumption.

4. CONCLUSION

As a new generation free trade agreement, the CPTPP has commitments to protect the environment so that the process of opening up, liberalizing trade and attracting investment is done in a more environmentally friendly direction; helping sustainable economic development is also a goal that member countries always aim for. Consumption of energy economically and efficiently is an issue placed at the heart of the decisions of countries in general and countries that are members of the CPTPP agreement in particular. This study aims to analyze the impact of some external macro-environmental factors such as *Industrial structure, Urbanization level, Energy consumption structure, Merchandise trade, Per capita GDP and Tourism income* up to 3 inputs of energy efficiency of CPTPP member countries, including *Capital, Labour and Energy*. The study uses data from the World Bank (World Bank), the central French research institute for international economics (CEPII) from 2000-2015.

Based on the research results, the authors propose the following policy recommendations to improve the energy consumption efficiency of CPTPP countries. *First*, to countries in industrialization, consideration should be given to shifting from labour-based industries to more capital-intensive and high-tech industries. Applying new technology will help reduce capital and labour requirements in production and increase labour productivity and capital efficiency. Moreover, focusing on energy-saving measures in industrial production will help reduce CO₂ emissions and negatively affect the environment. *Second*, urbanization should go hand in hand with increased investment in services and high-tech industries, which help create jobs and reduce dependence on agriculture. However, the process must also consider enhanced energy management, including improving energy efficiency and reducing primary energy consumption. *Third*, renewal of the energy consumption structure should be recommended to switch from fossil energy consumption to renewable energy. This also requires increased investment in energy-related technology and infrastructure. *Fourth*, increased trade in goods should go hand in hand with improved energy efficiency in the production and transportation of goods. This can help reduce primary energy consumption and emissions. *Fifth*, efforts to increase economic growth and per capita GDP also need to consider reducing environmental impact and dependence on primary energy.

We suggest future studies may be conducted in the following areas. *Firstly*, when choosing unwanted outputs, this article only considers CO₂ emissions, future studies can take into account SO₂, NO_x and other unwanted outputs. *Secondly*, it is necessary to expand on the important factors that affect energy efficiency. *Thirdly*, more new methods can be applied to measure energy efficiency, such as the DEA related models.

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THE SPILLOVERS EFFECT OF US, EU AND CHINA MONETARY POLICY ON VIETNAM'S FOREX MARKET

Author: Hoang Minh Ngoc¹, Luu Minh Hang¹, Tran Ngoc Bach¹

Mentor: Pham Thi Hoang Anh¹

ABSTRACT: *This paper assesses the global spillovers from identified the world monetary policy shocks in a global VAR model. US, ECB and China monetary policy generates sizable output spillovers to the rest of Vietnam. The magnitude of spillovers depends on the interest rate of the world, Vietnam's trade balance, exchange rate regime and consumer price. Furthermore, using event-study techniques we investigate the presence and the magnitude of spillovers from the US's standard monetary policies on the forex market in Vietnam. The results of this paper suggest that policymakers could mitigate their economies' vulnerability to the world monetary policy by providing timely policy responses, increasing the flexibility of exchange rates, and reducing illegal activity.*

Keyword: *VAR, monetary policy, spillovers effect, event-study, exchange rate.*

1. INTRODUCTION

Monetary policy (MP) is a macroeconomic management tool controlled by the central bank in the form of monetary adjustment measures and appropriate interest rates. Therefore, in any context, MP aims to achieve the common goals of macroeconomic stability and economic growth. During the implementation process, the US Federal Reserve (FED) has established six basic objectives of MP: economic growth, price stability, high job creation, interest rate stability, foreign exchange market stability, and financial market stability. These goals encompass the fundamental principles of money, which impact macroeconomic stability and economic development.

Despite the fluctuations experienced in the financial-monetary markets and changes in the economic situation, including the significant change of the collapse of the Bretton Woods system, the ultimate goal of MP has remained fundamentally unchanged. The effectiveness of the central bank's MP management is reflected in the level of achievement of stable goals and economic growth, such as curbing inflation, maintaining interest rate stability, and fostering economic growth.

Numerous studies have highlighted the influence of various factors on the effectiveness of MP, such as money supply and demand, average profit margins, budget overspending, exchange rates, government interest rates, unemployment rate, price levels, and economic growth rate (GDP). Recognizing that Vietnam is a small and open economy, it is inevitable for the country to be affected by shocks in world MP. Particularly in the context of a potential economic downturn, high inflation risks, and adverse impacts from the complicated developments of the global economy on the domestic market, the government and the State Bank must choose a suitable MP that considers both domestic and foreign economies to mitigate the negative impacts from external objective factors.

Therefore, it is necessary to clarify certain issues: the spillover effect of world MP on the Vietnamese market, identify the channels through which this effect occurs, and analyze the current situation of spillover effects from the MP of major economies to Vietnam. This analysis will enable appropriate responses to the complex economic and political developments of today. Hence, we have chosen the topic "The spillover effect of world monetary policy on Vietnam's foreign exchange market" to address research gaps.

¹ Banking Academy.

2. LITERATURE REVIEW

Akinci and Queralto (2018) studied the spillover effects from US monetary policy shocks and found that using monetary policy to stabilize exchange rates is ineffective because monetary policy can exacerbate exchange rate fluctuations in the short term. Similarly, this result from their theoretical model is consistent with the empirical evidence documented by Hnatkovska et al. (2016), who find that emerging market economy currencies tend to depreciate against the US dollar when domestic rates increase relative to the U.S rates, in contrast to advanced-economy currencies.

The news of the United States conducting foreign exchange interventions has triggered capital outflows from ASEAN, posing challenges for small businesses in particular and the financial sector in general. It has also led to currency depreciation (Thorbecke, 2016). While all ASEAN-4 currencies have depreciated against the US Dollar, in actual effective terms, the Indonesian Rupiah and Malaysian Ringgit have experienced a 20% depreciation between mid-2013 and 2015, whereas the Philippine Peso and Thai Baht did not depreciate. Chen et al. (2014) examined how Fed policy news affected emerging market asset prices both during the tapering period and before. They decomposed Fed policy news into “signal shocks” that affect expectations of future short-term policy rates and “market shocks” that affect longer-term rates through other channels. Estimating a panel regression model for 21 emerging market economies, they reported that news of contractionary policy measured either way during the tapering period lowered stock returns, raised bond yields, and depreciated exchange rates in emerging markets.

Georgiadis (2016) estimates spillover effects from US monetary policy to a large set of countries using a GVAR approach. He finds that spillover effects on output are stronger in countries which are less financially developed, less open to trade and which have less flexible exchange rates and labor markets. Another set of papers examines the transmission of common Euro area monetary policy shocks across member states of the monetary union (Barigozzi et al., 2014). A common finding of these studies is that Euro area monetary policy transmits rather homogeneously to output in different member states, but that there remain asymmetries in the responses of prices and unemployment. In contrast, monetary policy spillovers to European countries outside of the Euro area have also received attention in the literature. Mumtaz and Surico (2009) use a FAVAR approach to estimate the effects of an international monetary policy shock on the UK and find that, after a foreign monetary expansion, UK output increases despite an appreciation of the exchange rate.

Bowman et al. (2014) analyzed the impact of US unconventional monetary policy on stock prices, government bond yields, and exchange rates in emerging market economies. They found that the announcement of unusual Federal Reserve (Fed) monetary policy had a significant impact, particularly on domestic currency bond yields, although the magnitude and duration of the effects varied across countries. They also observed that the economic weakness of a country fundamentally increased its vulnerability to changes in the Fed’s normalization process. Tillmann (2014) finds that Fed’s QE policies had strong effects on financial conditions in emerging markets and played an important role in explaining capital inflows, equity price and exchange rate movements in these economies.

According to Gopinath (2016) and Ozcan (2020), the view suggests that monetary policy easing could weaken a country’s currency enough to bring about long-term improvements in its trade balance. Moreover, in line with theoretical predictions, during periods of non-traditional monetary policy, a currency shock related to increasing stock prices, decreasing interest rates, and a strengthening domestic currency was observed in developing Asian markets (Tran et al., 2020). These findings confirm the existence of spillover effects from the US to partner countries through transmission channels, including exchange rate channel, portfolio rebalancing channel, and liquidity channel.

Aizenman et al. (2014) evaluate the impact of the Fed’s tapering announcements from 2013 on financial markets in emerging economies and conclude that countries with stronger fundamentals face a

larger depreciation of exchange rate, fall in stock prices and increase of CDS spreads than countries with weaker fundamentals. Eichengreen and Gupta (2014) show that countries with larger and deeper financial markets experienced more pressure on exchange rates, foreign reserves and equity prices following the Fed's tapering announcement from May 2013 as investors could better rebalancing their portfolios in a country with relatively large and liquid financial markets.

Based on previous research related to exchange rate reactions, the findings of Geun-Young Kim; Park and Tillmann (2019) indicate that for Brazil, Chile, the Czech Republic, Hungary, Indonesia, Malaysia, and Mexico, the loosening of US monetary policy has a greater impact than tightening. However, for South Korea and Poland, the authors found the opposite result, as tightening US monetary policy leads to a larger depreciation of the domestic currency. Furthermore, Lee et al. (2017) provided further insights by highlighting that interest rate changes in the US have a consistent effect on Asian countries with fixed exchange rate regimes. Conversely, interest rate fluctuations in the US have an insignificant impact on Asian countries with floating exchange rate regimes.

In addition, Pham and Nguyen (2019) evaluate the spillover effect of UMP from the US on the monetary policies in Asian countries by a Bayesian vector autoregressive model. To address such an issue, this research considers how policy rates in Asian countries respond to the shock to the Fed policy rate. The empirical results indicate a co-movement between policy rates in Asian economies and the US with a lag of one quarter. Concerning the size of responses, Asian developing countries characterized by pegged rate regimes significantly respond to innovations in the Fed rate, while the developed ones are less likely to be affected by the UMP shocks. Therefore, in the context of conventional foreign exchange interventions, the ECB appears to be the main foreign central bank for the Central and Eastern European (CEE) economies. Building on these findings, Zhiwei et al. (2020) investigated the spillover effects of US foreign exchange interventions on the exchange rates of 11 emerging markets and 12 advanced economies during the pre-Covid-19 period using the VAR model with country-specific structural specifications.

Similarly, this paper is also related to the literature on the spillovers from US monetary policy to global financial markets (see Craine and Martin, 2008; Walerych and Wesołowski, 2021; Georgiadis, 2016; Rogers et al., 2014). These papers study the effects of US monetary policy shocks on other countries' equity and bond markets, capital flows and exchange rates, typically at high frequency. This literature finds that financial spillovers are large, and it establishes that country characteristics referring to financial market structure and integration explain a substantial fraction of the cross-country heterogeneities. The papers in this literature investigate different dimensions of US monetary policy, such as conventional and unconventional policies, surprises to the federal funds rate target and to its future path as well as announcements and asset purchases. However, in contrast to this paper this literature does not examine the global output spillovers from US monetary policy and their determinants. Moreover, these papers do not account for the multilateral nature of spillovers. Specifically, Rogers et al. (2014) observe that there are important cross-country spillovers from unconventional monetary policies in the US, the UK, the euro area and Japan among these advanced economies. They find such monetary policy spillovers to be asymmetric, as the effects of the monetary policy shocks in the US economy on asset prices in the other three economies are larger than the spillovers from these countries' policies on the US.

Kucharèuková et al. (2016) assess the impact of ECB monetary policy on macroeconomic developments in the euro area as well as in six non-euro area EU countries. They construct a monetary conditions index, which they decompose into conventional and unconventional monetary policy measures. They estimate individual-country VAR models to examine if the effects of conventional and unconventional tools differ. Their results suggest that the reaction of industrial production to the unconventional monetary policy shock is weaker and less significant than the reaction of industrial production to a conventional policy shock. In addition, their results suggest that the response of prices to unconventional monetary policy is much quicker in comparison to the response to conventional monetary policy. Additionally, their results find only

limited evidence for international spillovers from unconventional ECB monetary policy. Output responds to the unconventional monetary policy shock only in selected non-euro area EU countries. In addition, the response of price is insignificant in non-euro area EU countries. They also find that exchange rates react quickly with a peak within a few months and that the exchange rates depreciate after monetary tightening in a majority of countries. Hajek and Horvath (2015) apply GVAR models to analyze the transmission of Euro area interest rate shocks to a large set of non-Euro area countries and find symmetric responses of output in most non-Euro area countries, with small economies reacting even stronger than the Euro area.

Falagiarda et al. (2015) study the effects of the ECB's non-standard policy measures on financial variables from non-euro area EU countries in Central and Eastern Europe (CEE). Using an event-study analysis they find that ECB UMP measures spilled over to CEE countries. In particular, sovereign bond yields were affected by ECB announcements of UMP measures. They find no impact on exchange rates vis-à-vis the euro, equity prices and CDS spreads. Furthermore, their results suggest that spillovers from SMP announcements were the most pronounced. The spillover effects of both OMT and PSPP on financial assets from CEE countries was limited. Furthermore, Korus (2019) examined the spillover effect of unique unconventional foreign exchange interventions (UFEI) by the ECB on advanced open and small economies. The author found that the CDS spreads in Denmark and interbank exchange rates in Norway were influenced by the ECB's announcements regarding non-standard policy measures, respectively. The findings of the study also indicate that bilateral exchange rates and standard stock market indices were not affected by the ECB's announcements.

In contrast to previous studies, our research focuses on the spillover effects of major global monetary policies on the foreign exchange market in Vietnam. Specifically, we pay special attention to two important periods: the Covid-19 pandemic phase and the recent monetary tightening phase. Additionally, our study employs the Vector Autoregression (VAR) model and event study methodology to analyze and evaluate the spillover effects of global monetary policies on Vietnam's foreign exchange market.

3. RESEARCH METHOD

3.1. The Methodology

3.1.1. Selection of VAR model

The research utilizes a VAR (Vector Autoregression) model to assess the effectiveness of the spillover effects of world monetary policy on the financial market through the channels of exchange rates, asset prices, and interest rates. We choose the VAR model because it helps identify independent shocks that the VAR model itself cannot distinguish. As a multivariate linear model of observed vectors and their own lags, VAR is used by economists to recover economic shocks from observed entities by imposing minimal assumptions consistent with a large class of models (Hakan Yilmazkuday, 2020; Elbourne, 2008). This model encompasses multiple variables, with all variables in the model playing equal roles and being endogenous variables. Therefore, the Structural Vector Autoregression (VAR) model is an important quantitative tool in economics and widely applied to issues related to aggregate economic variables.

The reduced-form VAR model takes the following form:

$$y_t = A_1 Y_{t-1} + \dots + A_p Y_{t-p} + B_o x_t + \dots + B_q x_{t-q} + CD_t + u_t \quad (1)$$

Which:

$y_t = (y_{1t}, \dots, y_{kt})$ is a K vector of observed endogenous variables.

$x_t = (x_{1t}, \dots, x_{Mt})$ is an M vector of observed exogenous variables.

D_t : contains deterministic variables such as constants, linear trends, dummy seasonal variables as well as other dummy variables.

u_t : is the process of white noise K-dimensional with expectation 0.

3.1.2. Selecting an Event model

The research model is established to assess the impact of the spillover effects of world monetary policy on the Vietnamese financial market by examining the exchange rate (USD/VND), stock market index, and interest rates in Vietnam under the influence of announcement events. In reality, the exchange rate (USD/VND) and stock market index often exhibit fluctuations even in the absence of the research events. In this model, the study utilizes the estimation window before and after the event to determine the relationship between the Vietnamese financial market and world monetary policy shocks through regression analysis. Based on the regression coefficients, the spillover effects of world monetary policy can be predicted, and the research team can propose specific solutions accordingly. The model is described by the following formula:

$$\Delta y_{it} = \alpha + \Delta x_{i(t-k)} - \Delta x'_{i(t+k)} + u_t \quad (2)$$

Which:

Δx_{it} : dependent variable of day i in t-k period

$\Delta x'_{it}$: dependent variable of day i in t+k period

t: time from window length $\forall t \in [-T; +T]$

k: window length include [10; 15; 20]

After calculation, the value of Y_{it} for each dependent variable i at each time t within the event window reflects the positive impact ($y_{it} > 0$) or negative impact ($y_{it} < 0$) of the event on the financial market in Vietnam.

3.2. Data

3.2.1. Dependent variables

The research group selected two variables as representatives of the foreign exchange market to test their consistency. The selection of representative exchange rate variables is an important part of the research process, aiming to analyze and evaluate the spillover effects of global macroeconomic and financial factors on the foreign exchange market in Vietnam.

Official USD/VND exchange rate: used as a representative variable in the regression model, with data collected from the State Bank of Vietnam (SBV).

Parallel USD/VND exchange rate (HNX): used as a representative variable in the regression model, with exchange rate data collected from the database of the Hanoi Stock Exchange.

3.2.2. Independent variables

The US Dollar Volatility Index (USDindex): a measure of the value of the US dollar against a basket of other currencies in the international market. It is widely used by investors and financial experts. The data on the USD Index volatility is primarily collected from the US Federal Reserve.

Trade balance: represents the difference between a country's exports and imports over a specific period. It is one of the important economic indicators used to measure the health of an economy and the trade activities of a country. Monthly trade balance data is collected from the General Statistics Office.

CPI (Consumer Price Index): an economic indicator used to measure the changes in prices of goods and services consumed within a specific country. In essence, CPI can be understood as a fundamental index that reflects the relative fluctuations in consumer prices over time, and its calculation is expressed as a percentage. Typically, CPI is computed by comparing the average value of a basket of goods and services purchased by consumers during a specific period to the value of the same basket in a previous period.

Consequently, CPI data is collected by the Central Statistics Office for statistical analysis and assessment..

Vietnam Policy Interest Rate (Refinancing Rate): the interest rate applied by the State Bank of Vietnam (SBV) to the loans extended to credit institutions for refinancing their business activities. Consequently, the refinancing rate is regarded as the cost that credit institutions have to pay to the SBV for obtaining refinancing funds. The refinancing rate is a significant factor in interest rate management and the conduct of monetary policy by the SBV. It influences other interest rates in the economy, including deposit rates, lending rates, and bond yields. The refinancing rate is also an important economic indicator for evaluating the financial condition of credit institutions and the overall economy. In this study, we will use this interest rate as a representative variable in our regression model, with data collected from the State Bank of Vietnam.

The FEDERAL Funds Rate: represents the rate at which banks lend to each other on an overnight basis as regulated by the Federal Reserve (FED). When member banks fail to meet the required reserve ratio before a scheduled FED examination, they are obligated to borrow funds at this interest rate. It is considered a key tool for controlling the US economy and serves as a benchmark for credit interest rates, collateral rates, and other borrowings at member banks. Based on data collected from the US Federal Reserve, we have decided to incorporate it as a representative variable in our regression model.

ECB interest rate (MRO): the interest rate for main refinancing operations conducted by the European Central Bank (ECB) to provide a significant portion of liquidity to the banking system. It represents the interest rate at which banks borrow money from the ECB for a week. The ECB refinancing rate is a tool used by the European Central Bank to adjust based on inflation rates, unemployment rates, and overall economic development. In the research, this interest rate will be used as a representative variable in the regression model, with the primary data collected from the official sources of the European Central Bank.

China Interest Rate (LPR): a type of interest rate that commercial banks in China offer to their important customers and serves as a benchmark for other loan interest rates. The LPR is based on the loan interest rates of 18 designated commercial banks determined and reported by the People's Bank of China (PBC) on a monthly basis. In the research, this interest rate will be used as a representative variable in the regression model, with data collected from the official website of the People's Bank of China.

These variables of the model have been collected on a monthly basis over the period from January 2015 to December 2022. They include indicators reflecting the dynamics of the Vietnamese economy and major economies around the world throughout the months. This enables a clear understanding of the impact of changes in the global economy on Vietnam.

Table 3.1: Definition of Variables and Data Sources

Variable symbol	Explanation	Measured	Source	Expectancy mark
Dependent variable				
DELTAER1	Official USD/VND exchange rate	The fluctuation of the official USD/VND exchange rate	SBV(2023)	(+)
DELTAER3	Parallel USD/VND exchange rate	The fluctuation of the parallel USD/VND exchange rate	HNN(2023)	(+)
Independent variable				
IRFED	The shock of US Monetary policy	US Executive Rate by Month	FED (2023)	
IRECB	The shock of Europe Monetary policy	Europe's operating interest rate in monthly terms	ECB (2023)	
IRCNY	The shock of China Monetary policy	China's operating interest rate in monthly terms	PBC (2023)	
USDindex	USD Volatility Index	The value of the dollar against other currencies on the international market	FED (2023)	

CPI	The Vietnam Consumer Price Index.	Changes in the prices of consumer goods and services compared to the same period last year	GSO(2023)	
TB	Balance trade	The difference between export turnover and import turnover	GSO(2023)	
POLICY RATEVN	Vietnam's operating interest rate	Vietnam refinancing interest rate on a monthly basis	SBV(2023)	

Source: Author's calculation

3.3. Descriptive Statistics

The collected data is processed and calculated in Excel. Because the study sample time is relatively long and new from 2015 to 2022, the data are inevitably flawed. The research team conducted data cleaning, data testing and remediation. Then, the team selected Eviews software to obtain the results according to the model shown in Table 3.2.

Table 3.2: Descriptive Statistics of variables in the VAR model

	DIRFED	DIRECB	IRCNY	USDindex	CPI	TB	DPOLICYRATEVN	DELTAER3	DELTAER1
Mean	0.045699	0.026344	4.18387	0.004301	2.68978	622.6989	-0.005376	0.111222	0.103228
Median	0.000000	0.000000	4.35000	0.000000	2.65000	347.0000	0.000000	0.000000	0.049037
Maximum	0.750000	0.750000	5.35000	1.340000	6.43000	4985.000	1.000000	4.462810	1.252137
Minimum	-1.500000	-0.05000	3.65000	-1.25000	-0.9700	-2105.000	-1.000000	-4.671211	-0.361384
Std. Dev.	0.247120	0.130341	0.36394	0.401980	1.35597	1441.331	0.211678	1.056671	0.253743
Skewness	-1.525992	4.779429	0.72988	0.184268	0.04966	0.487318	0.040619	0.212984	2.019854
Kurtosis	20.08872	24.71612	4.14984	4.509739	3.06002	3.217745	21.93377	9.755972	9.197714
Jarque-Bera	1167.688	2181.476	13.3805	9.358635	0.05219	3.864646	1.389.166	177.5703	212.0822
Probability	0.000000	0.000000	0.00124	0.009285	0.97423	0.144811	0.000000	0.000000	0.000000
Sum	4.250000	2.450000	389.100	0.400000	250.150	57911.00	0.500000	10.34361	9.600160
Sum Sq. Dev.	5.618280	1.562957	12.1858	14.86608	169.158	1.91E+08	4.122312	102.7229	5.923460
Observations	93	93	93	93	93	93	93	93	93

Source: Author's calculation

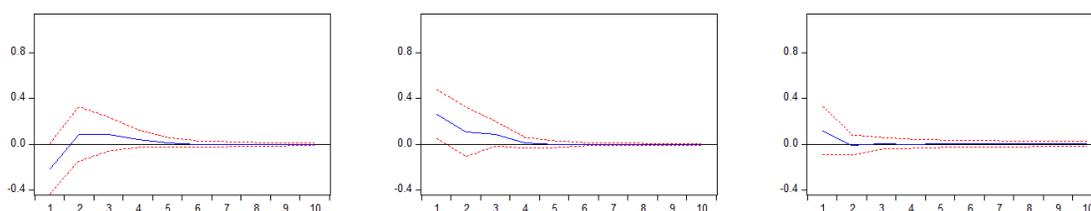
4. RESULTS AND DISCUSSION

4.1. Monetary policy spillovers to Vietnam's forex market by VAR model

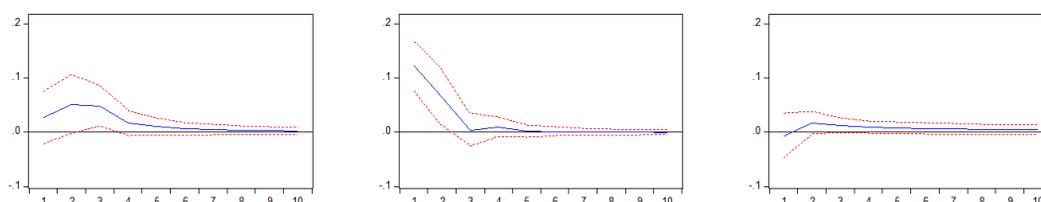
The impact of interest rate changes in major economies such as the US, Europe, and China on the exchange rate in Vietnam through the Hanoi free market is partially explained in Figure 4.1. It sheds light on the influence of the exchange rate channel.

Figure 4.1: The impact of FED, ECB, PBC monetary policy shock on USD/VND exchange rate

(a) The impact of FED, ECB, PBC monetary policy shock on official USD/VND exchange rate



(b) The impact of FED, ECB, PBC monetary policy shock on parallel USD/VND exchange rate



Source: Author's calculation

Looking at the reaction function graph, we can draw some conclusions about the global impact of the world interest rate on the central USD/VND exchange rate as follows:

Firstly, the central USD/VND exchange rate does not strongly react to changes in the world interest rate when the exchange rate fluctuation range is very narrow at around $\pm 0.1\%$ for 7 months after the US financial crisis. Specifically, when the US interest rate increases by 1%, the central exchange rate does not have a significant impact in the first month, but it increases by 0.07% in the second month and reaches a saturated state, ceasing its reaction in the fifth month after the shock. The main reasons for this phenomenon may include:

(i) Stability of the State Bank's foreign exchange market intervention: Exchange rate stability is one of the main objectives of the State Bank's management of the foreign exchange market in Vietnam. This means that the State Bank of Vietnam can use various measures to maintain the stability of the VND exchange rate, even when external factors such as the increase in the US interest rate may affect it. Therefore, as soon as the US interest rate increases, the State Bank intervenes immediately to prevent the increase of the central USD/VND exchange rate in the first month. In theory, to cope with such fluctuations, central banks will implement some measures to stabilize the foreign exchange market, such as direct intervention in the market by selling foreign exchange reserves to increase the supply of foreign currency or adjusting the central exchange rate or fluctuation range¹. However, initially, the State Bank still holds a large amount of foreign exchange reserves, so the central USD/VND exchange rate may not decrease or change significantly. But after a period of time, the State Bank cannot sell more foreign exchange reserves due to the intervention of speculators². Therefore, due to the strong pressure on the exchange rate from the impact of eight consecutive increases in the US interest rate, the State Bank was forced to increase the central exchange rate.³

(ii) The mechanism of the foreign exchange market: The central exchange rate is considered an important reference point for the foreign exchange market, causing other exchange rates to fluctuate accordingly and being regulated by the State Bank. Therefore, in the short term, when the US interest rate increases, the exchange rate in the free market will rise, but the central exchange rate will not have a significant impact and the reaction will be delayed.⁴

Conversely, when China increases its interest rate by 1%, the central USD/VND exchange rate does

¹ Indeed, in reality, the State Bank of Vietnam (SBV) has made efforts to reduce the USD/VND exchange rate using all three tools mentioned. Specifically, the SBV has continuously sold foreign exchange reserves. This action has led to a decrease in foreign exchange reserves from a record level of 111.5 billion USD to around 87.6 billion USD by the end of the third quarter of 2022. The figure continued to decline in the fourth quarter due to market tensions.

² The SBV cannot sell excessive amounts of foreign exchange reserves because speculators could take advantage of this to drive down the value of the Vietnamese currency, seeking to profit by buying Vietnamese currency and then waiting for it to appreciate. If the SBV sells too many foreign exchange reserves, the supply of foreign currency in the market will increase, leading to a sharp depreciation of the Vietnamese currency and providing an opportunity for speculators to profit.

³ On October 17, 2022, the exchange rate of USD/VND increased from 23,568 to 23,637, with an expanded fluctuation band from 3% to 5%.

⁴ In reality, the exchange rate difference between the official market and the free market reached 4.6%.

not have a significant reaction, only a small increase of 0.01%. The main reason for this impact is the economic correlation between Vietnam and China. China is not the largest export partner of Vietnam, although it is the largest import partner. This means that the economic impact of China on Vietnam may not be as significant as expected. Additionally, Vietnam has strengthened the diversification of its economic and trade relationships with other countries, reducing dependence on China.

Unlike the central exchange rate, when the Fed increases its interest rate by 1%, the USD/VND exchange rate in the free foreign exchange market in Hanoi immediately increases from 0.027% to 0.052% in the second month, and gradually decreases, ceasing its reaction in the fifth month after the shock. According to theory, when the Fed tightens monetary policy through interest rate hikes, including Vietnam's interest rate, it will be pushed up but not significantly. This development will increase the interest rate differential between domestic and foreign currencies, leading people to have a greater demand for US dollars in the free foreign exchange market, thereby pushing up the value of the USD against the VND and causing a slight increase in the USD/VND exchange rate. This phenomenon is attributed to the following reasons:

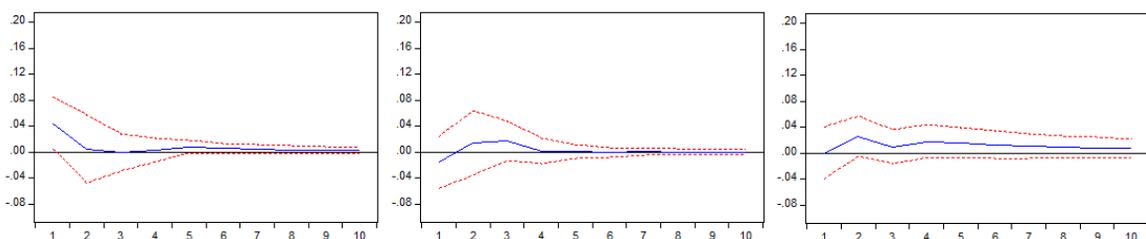
Firstly, when interest rates are higher in the US, the USD becomes more attractive to investors, especially international investors. Therefore, in the case of an interest rate increase in the US, the USD becomes more appealing to investors, leading to an increased demand for US dollars in the international market. As a result, the value of the USD will rise against the currencies of other countries, including Vietnam. Additionally, the increase in interest rates in Vietnam is not sufficient to outweigh the attractiveness of the USD in the international market, leading Vietnamese people to have a tendency to buy more US dollars for investment or currency reserves. This will increase the supply of USD in the market, and the USD/VND exchange rate in the free foreign exchange market in Hanoi will also fluctuate upward.

Secondly, the volatility of the USD/VND exchange rate in the free foreign exchange market depends heavily on exchange rate expectations. This reflects the herd mentality of the Vietnamese people. When the exchange rate increases, people tend to rush to buy foreign currency out of fear that the exchange rate will continue to rise in the future. In addition, the free foreign exchange market is more preferred than official channels or through commercial banks because it is simpler and does not require extensive legal procedures.¹ This further contributes to a stronger exchange rate increase as supply and demand in the free market are greatly influenced by customer behavior and market expectations.

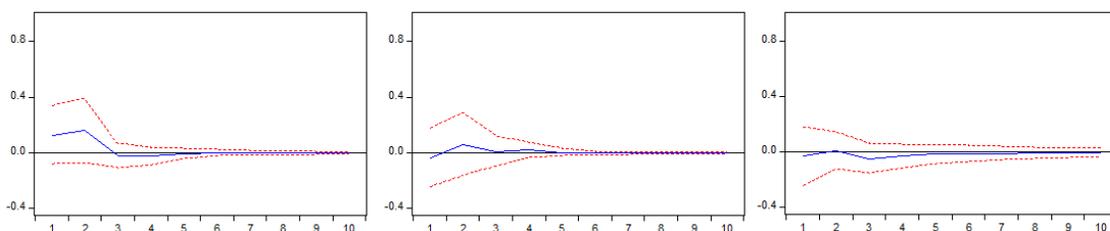
When the ECB interest rate increases by 1%, the USD/VND exchange rate in the free foreign exchange market in Hanoi increases by 0.12% in the first month and reaches a new equilibrium of 0.002% in the fifth month after the shock. This observation is consistent with the evidence of the increasing influence of the US, Europe, and China on exchange rate fluctuations in countries with open economies like Vietnam (Willem Thorbecke, 2016; Sin Yee Lee et al., 2022; Małgorzata Walerych, 2021).

Furthermore, the changes in interest rates, monetary policy, and inflation in Vietnam have also influenced the USD/VND central exchange rate and the free market exchange rate, as shown in Figure 4.2.

Figure 4.2: Reaction of the USD/VND central exchange rate and the USD/VND exchange rate in the free market in Hanoi to the volatility of interest rates, monetary policy, and inflation in Vietnam



¹ To carry out important transactions such as current account transactions, it is necessary to provide documentation and proof of purchase. These documents typically include invoices, contracts, receipts, and other relevant paperwork that demonstrate the purpose and nature of the transaction.



Source: Author's calculation

When the State Bank of Vietnam (SBV) tightens monetary policy by raising the refinancing interest rate, it causes both the USD/VND central exchange rate and the USD/VND exchange rate in the free market in Hanoi to initially increase sharply in the first month, followed by a gradual decrease and eventually reaching a stable level by the fifth month after the shock. This conclusion seems to contradict theory, as when the SBV implements contractionary monetary policy by raising the refinancing interest rate, it pushes up the overall interest rate level, including the deposit interest rate. This development widens the interest rate differential between domestic and foreign currencies, prompting investors to sell foreign currency and buy domestic currency to pursue higher returns. As a result, the domestic currency appreciates against the foreign currency, leading to a decrease in the USD/VND exchange rate. The reasons for this phenomenon are as follows:

(i) When the SBV raises the refinancing interest rate (implementing contractionary monetary policy), it increases the market interest rate level, including borrowing costs, causing the production costs of domestic firms to rise. Higher production costs contribute to an overall increase in prices, leading to inflation and a depreciation of the VND against the USD.¹ In another explanation, when overall prices rise, it reduces Vietnam's international trade competitiveness, leading to an increase in import value. The higher import value affects the demand for foreign currency, causing the USD/VND exchange rate to increase, which is equivalent to the devaluation of VND.

(ii) The decision to raise the refinancing interest rate by the SBV typically occurs when the economy is under significant inflationary pressure. In this context, Vietnamese people have a habit and psychological inclination to hoard gold and USD. Therefore, even though the increase in refinancing interest rates raises the market interest rate level, including deposit rates, the shift in asset allocation from foreign currency to domestic currency tends to be slow due to concerns about inflation. This is a common trend in countries with high inflation rates and a high degree of dollarization in their economies.

On the other hand, the impulse response function derived from the VAR model shows that the trade balance in Vietnam has a strong and inverse impact on the USD/VND exchange rate in Vietnam during the period of 2015-2022. This can be explained as follows: when there is a surplus in the trade balance in Vietnam, the supply of foreign currency in the market increases, leading to a decrease in the exchange rate. This creates downward pressure on the USD/VND exchange rate, meaning that the Vietnamese dong is valued higher against the USD. Additionally, when there is a surplus in the trade balance, it indicates the strength and competitiveness of domestic export industries, instilling confidence and attracting foreign investors. This can increase the demand for foreign currency and decrease the USD/VND exchange rate. Furthermore, the impulse response function also shows a relatively weak impact of inflation on the USD/VND exchange rate in Vietnam. Specifically, if inflation increases, it may be expected that the State Bank of Vietnam (SBV) will implement tighter contractionary policies to curb inflation. This expectation can reduce the impact of inflation on the USD/VND exchange rate before policy measures are actually implemented.

In conclusion, the stability of the contractionary monetary policy and the mechanism of the foreign exchange market may be the main factors leading to the USD/VND exchange rate not showing significant

¹ The theory of purchasing power parity states that the level of exchange rate fluctuations depends on the difference in inflation rates between the domestic and foreign countries. According to the equation $E = P + P^*$, when domestic inflation increases, the exchange rate increases, meaning that the foreign currency appreciates, while the domestic currency depreciates.

reactions to global interest rate shocks. However, these factors have contributed to reducing volatility and increasing the stability of the central USD/VND exchange rate and the exchange rate in the free market over the years. Therefore, the SBV must consider and have an appropriate strategic plan to adjust the exchange rate reasonably, but without excessive measures to avoid negative impacts on the market.

4.2. Research Results Based on Event Study Model

To further clarify the spillover effects of global monetary tightening through transmission channels, the research team employed the event study method to explain the spillover effects of monetary tightening shocks in 2022. This method was used similarly to previous studies (Lucca & Moench, 2015; Park et al., 2018). The results from the event study, where dependent variables were modeled according to equation (2), are presented in tables 4.1.

Table 4.1: The measurement results of the transmission channels around the event of US monetary policy shocks based on the Signtest method (measuring the sign) are as follows

Variables Event windows	DELTAER1			DELTAER3		
	10 days	15 days	20 days	10 days	15 days	20 days
16/3/2022	(+)	(+)	(+)	-	(+)	-
15/6/2022	(+)	(+)	-	(+)	(+)	-
27/7/2022	-	-	-	-	-	-
28/7/2022	-	-	-	-	-	-
21/9/2022	-	(+)	-	-	(+)	-
2/11/2022	(+)	(+)	(+)	(+)	(+)	(+)
3/11/2022	-	(+)	(+)	(+)	(+)	(+)

Source: Author's calculation

(+), (-) represent the increase and decrease of the dependent variable, respectively

The central exchange rate of USD/VND and the USD/VND exchange rate in the Hanoi free market have a significant and positive impact on the shock of the Federal Reserve (FED). If the FED increases interest rates by 1%, the State Bank of Vietnam (SBV) also increases the USD/VND exchange rate announced by the SBV and in the Hanoi free market within a 15-day period following the shock. This indicates that the SBV appears to demonstrate good orientation towards the USD/VND exchange rate because in the first 10 days, there is not much impact on the foreign exchange market, but the spillover effect of the US monetary policy shock becomes more evident after 15 days. This phenomenon is due to the impact of domestic and international factors on the Vietnamese foreign exchange market.

In the first 10 days, the SBV did not take many measures to stabilize the USD/VND exchange rate but only strengthened monitoring and market information gathering. However, in the context of global impact from the Covid-19 pandemic and the difficulties and fluctuations faced by the global economy, the US implemented stimulus measures, including increasing interest rates and enhancing public spending, leading to a shift in capital flows from other countries to the US. This has affected the foreign exchange markets of many countries, including Vietnam. These fluctuations have influenced the USD/VND exchange rate, but thanks to the intervention of the SBV, including buying VND and adjusting interest rates within a 15-day period, the Vietnamese foreign exchange market has been more stable compared to many other countries. This conclusion accurately reflects the theory and is relatively consistent with the findings of previous research (Sebnem, 2020; Xu et al., 2020).

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The spillover effects of the monetary policies implemented by US, EU, and China on Vietnam's foreign exchange market have been significant and multifaceted. Firstly, the US monetary policy, characterized by changes

in interest rates and quantitative easing measures, has been a major driver of forex market fluctuations in Vietnam. The Federal Reserve's decisions have influenced capital flows and investor sentiment, resulting in exchange rate volatility and impacting Vietnam's export competitiveness and import costs. The US dollar's strength or weakness has had direct implications for Vietnam's exchange rate stability and trade balance. Secondly, the monetary policies of the EU, particularly ECB measures to stimulate the Eurozone economy, have also affected Vietnam's forex market. Thirdly, China's monetary policy, primarily through its management of the interest rate, has had notable spillover effects on Vietnam's forex market. As Vietnam's largest trading partner, fluctuations in the interest have impacted the competitiveness of Vietnamese exports in the Chinese market and influenced the cost of imports. Moreover, China's monetary policy actions have influenced investor sentiment and capital flows, which have ripple effects on Vietnam's forex market stability. Hence, Vietnamese policymakers need to be prepared to mitigate potential risks and take advantage of opportunities arising from such spillovers.

5.2. Recommendation

(1) *The State Bank of Vietnam (SBV) needs to closely monitor long-term fluctuations in global monetary policies, particularly those related to the US and Europe, and respond promptly to global monetary shocks.* In order to ensure stability in the foreign exchange and currency markets, the Forecasting and Statistics Department of the SBV should study and measure potential shocks that may occur, especially those related to the US and Europe.¹ At the same time, the SBV needs to forecast accurately and closely monitor global monetary shocks in order to implement timely policies to mitigate negative impacts on interest rates and the currency market. Preventive measures and risk mitigation should also be implemented to protect Vietnam's currency market.² Additionally, the SBV should develop feasible and potential scenarios for global monetary shocks to ensure flexibility and better response capabilities.

(2) *The SBV can convey messages to increase public trust in its operations.* The Communications Department of the SBV should disseminate messages about maintaining stable exchange rates, controlling inflation, and enhancing public trust in the operations of the SBV and the banking system. The SBV should take actions to regulate the economy in a positive direction to gain trust from the public. Providing information about the activities of the banking system is crucial for the public to have a clear understanding of the necessary knowledge.

(3) *The SBV needs to implement measures to cope with market volatility by increasing foreign exchange reserves.* When there are significant fluctuations in the domestic market, the SBV should be prepared with sufficient resources to meet foreign currency demand and intervene to ensure market liquidity, thereby contributing to macroeconomic stability and inflation control.

(4) *The SBV should take measures to reduce illicit activities.* The risk of speculation and hoarding increases when exchange rates rise, so the SBV needs to take action to prevent such activities. It is also important to raise awareness about the risks of speculation and hoarding and illicit foreign exchange transactions so that people can be cautious. Furthermore, the SBV should enhance management and supervision of foreign exchange trading activities in the market. This includes ensuring strict compliance with regulations and rules related to foreign exchange trading and establishing an effective monitoring system to detect and prevent illicit foreign exchange transactions.

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¹ Since the beginning of 2022 until now, there have been a total of 340 interest rate hikes globally. Among them, many central banks have rapidly and significantly increased their policy rates, such as the Federal Reserve (7 consecutive interest rate hikes to a range of 4.25-4.5%) and the European Central Bank (3 interest rate hikes at rates of 0.5%, 0.75% per year, and 0.75% per year).

² In 2022, global inflation remained at high levels: 7.7% in the United States and 10.7% in the Eurozone.

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THE IMPACT OF FINANCIAL DEVELOPMENT AND PETROLEUM PRICE ON TRADE OPENNESS: THE CASE OF ASEAN+ COUNTRIES

**Author: Phan Thi Ngoc Anh¹, Nguyen Vu Hien Thuong¹, Nguyen Hoang Minh¹
Mentor: Nguyen Thi Lam Anh¹**

Abstract: This paper investigated the impact of macroeconomic determinants, including financial development and petroleum price, on trade openness in the context of ASEAN+5 countries from 2010 to 2022. The data were analysed using the GMM method. Regarding financial development, the results affirmed the positive impact of domestic credit to the private sector and the negative impact of the consumer price index on trade openness. Additionally, the petroleum price positively affected the trade openness for the ASEAN+ countries. The paper also found significant influences on trade openness of other control variables, including economic development, human capital, and the real effective exchange rate. Furthermore, some recommendations enhancing the trade openness for ASEAN+5, specifically Vietnam, were also discussed for further international integration, boosting economic growth.

Keywords: financial development, trade openness, petroleum price, ASEAN+5

1. INTRODUCTION

Trade openness is vital in creating new market opportunities for domestic firms, more substantial productivity, and innovation through competition between countries. According to OECD (2023), increased trading activities resulted in governments opening markets. Traditionally, trade and market openness correlate with improved economic performance in nations at all stages of growth, offering intriguing opportunities for consumers, businesses, and workers worldwide and helping to reduce poverty levels. Some countries, particularly the developing, have always been concerned about the Trade Openness (Zahonogo, 2016), which significantly impacts competitiveness, technology, prices of intermediate and final goods, and over time, even factor endowments and social institutions. Therefore, predicting how trade liberalisation would affect certain groups of people is difficult.

On the other hand, open economies typically experience faster economic growth than closed economies (Grossman & Helpman, 1994; Edwards, 1989). Better local technology and the capacity to increase production efficiency lead to higher productivity. As a result, many countries usually place high importance on trade openness while attempting to boost economic growth. Trade openness, however, is only sometimes as successful as expected (Singh, 2010). In particular, if macroeconomic steadiness and a favourable investment climate are absent, it is difficult to increase the contribution of Trade Openness to enhancing Economic Growth (Newfarmer & Sztajerowska, 2012). In light of the Covid epidemic, which has seriously disrupted international trade, the year 2020 witnessed the steepest fall in global trade by 8.9% since the crisis in 2008 (Dickinson & Zemaityte, 2021). Hence, having an in-depth view of trade openness in terms of its impact on the countries' factors is essential in this era.

In terms of the petroleum price, which also has a connection to trade openness, it is argued that the volatility of the oil price (or gasoline price) can significantly impact the nation's trade openness when it is related to whether the nation imports or exports oil (Pan et al., 2022) the more increase in oil price consequence in reducing the trade openness level in terms of oil import countries.

Financial Development is a fascinating subject that many empirical studies believe to be significant. It is related to "factors of the production process" because of the beneficial effects of accumulation and

¹ Banking Academy.

capital on long-term economic development. Thus, financial development significantly enhances business activities through adequate resource allocations, reduction of transaction costs, savings mobilisation, and addressing the information asymmetry issue.

According to Khatun and Bist (2019); Kyophilavong et al. (2016), economic efficiency and growth are ultimately boosted by attaining economies of scale. The financial development analysis brings researchers a full grasp of the possibilities for financial institutions to offer financial services to other economic entities (Bui, 2020). Effective resource allocation is also made feasible by the financial advancement (Cherif & Dreger, 2016). As a result, promoting financial growth is crucial for promoting economic growth (Camba, 2020; Tran & Nguyen, 2020). According to Esso (2010), countries with higher levels of financial development also have more mature banking and stock markets, which results in better financial services and faster economic growth than countries with lower levels of financial development. In the commercial process, the stability of the domestic financial development can create an opportunity to increase trade openness without concern about the crowding-out effect caused by trade openness (Silajdzic & Mehic, 2017). Moreover, financial development also stimulates trade openness when ensuring the market supply for export and controlling the CPI to absorb the country's import value inadequately (Sonnenshein, 2022). From this standpoint, not only maintaining the trade value (importing and exporting) but also stimulating it significantly affect the trade openness level of countries.

Previous research mostly focused on the effects of financial development or petroleum price on trade openness, but some contributed to the idea of factors that affect trade openness outside the ASEAN+ area. Trade openness helps developing nations expand their internal markets and boost productivity and creativity through global competition (Deb et al., 2021). In ASEAN+, most countries buy oil, although some export it, albeit unequally. China, India, Vietnam, Brunei, and Malaysia export tiny amounts of oil, while the others import it. According to Berument et al. (2010), rising oil prices are favorable for exporters but bad for importers. Oil prices affect economic activity through demand and supply channels (Rotemberg & Woodford, 1996). ASEAN+ countries used bank-based financial systems, save China and Vietnam (Ha, 2019). Hence, the bank is crucial to ASEAN+ financial development, particularly domestic financing to private sectors. According to World Bank statistics, developed and developing countries have high ratios, whereas least developed countries have low ratios.

Therefore, this paper aims to investigate the impact of Financial Development, Petroleum Prices on Trade Openness, specifically identifying this relationship in the ASEAN+ area from 2010 through 2022. From this standpoint, the paper has valuable recommendations for countries in the Trade Openness process, specifically Vietnam. The literature review is the next section, and a brief discussion of the methodology is provided in Section 3. Section 4 discusses the empirical results, and Section 5 presents the conclusion and recommendations.

2. LITERATURE REVIEW

2.1. Financial Development and Trade Openness

Previous empirical evidence signifies the undeniable connections of trade openness and financial development levels with economic performance across nations (Beck, 2002; Sachs *et al.*, 1995). Some papers indicate a positive relationship between financial growth and trade openness, while others show the opposite. However, the relationship is not direct and depends on various factors.

Many studies show that financial development affects trade openness. International commerce positively affects financial development (Kim et al., 2010). Beck (2002) found that better financial systems lead to higher trade balances and export proportions using manufactured goods data and the GMM approach. Wolde-Rufael (2009) uses VAR to show that financial development boosts imports and exports in Kenya. Svaleryd and Vlachos (2002) found from 20 OECD nations' research that countries with relatively high

financial growth encourage export businesses predominantly depending on finance. Feeney and Hillman (2004) demonstrate how asset market incompleteness affects trade policy in a positive theory of trade liberalisation. Their idea is that financial development will diversify investment risk, reducing the need for protectionist lobbying by specific interest groups and promoting freer trade. This paradigm links financial development to trade liberalisation.

Another group of research discovered the short-term adverse effects of financial development on trade openness, including the study of Kim et al. (2010), Daniel and Jones (2007), Minshkin (2007), and Stiglitz (2000). The authors argue that financial liberalisation tends to reduce monopolies in the banking sector, leading to lending booms and investment shifting to worse projects, eventually increasing financial fragility and financial crisis. Hence, financial development can generate more risks in the short run and adversely affect international trade in the shorter term. However, in the longer term, the studies mentioned earlier all find a positive influence of financial development on trade openness.

There are also many discussions about the impact of trade openness on financial development. Rajan and Zingales (2003) indicate that one way that trade openness can enhance financial development is through facilitating both foreign direct and portfolio investments. Do and Levchenko (2008) discovered that trade openness influences demand for external financing sources. Specifically, increased trade openness might trigger interest in innovative financial products, resulting in a higher supply of sophisticated financial instruments. Consequently, financial institutions would have more opportunities to expand to offer sufficient insurance and risk diversification in such environments.

Similarly, according to Rajan and Zingales (2001), trade liberalisation might spur the growth of finances in the country that aid agents in spreading the additional risks. This study empirically investigates the causal association between the two factors and concludes positive and economically significant relationships between them. Rajan and Zingales (2001) explain that trade openness may lead to increased risks as domestic economies have greater exposure to external shocks and global competition, which in turn spur the demand for financial instruments to diversify risk and assist businesses to withstand transient cash flow issues or unfavourable shocks.

2.2. Petroleum Price and Trade Openness

It can be said that the impact of gasoline prices on trade openness based on studies needs to be clarified when this also depends on the type of country, whether import oil or export oil country (Babuga & Naseem, 2022). However, increasing oil prices can indirectly negatively impact countries' trade openness.

Oil price changes are anticipated to impact the economy's trade performance and the value of its currency. For nations that export oil, changes in oil prices cause exchange rates to increase. In contrast, for nations that import oil, fluctuations in oil prices are anticipated to cause currency values to decline (Beckmann et al., 2020). Svensson (1982) investigates an oil-importing country with a small open economy and concludes that a temporary spike in oil prices would help increase savings and decrease investment, which benefits the current trade balance. Taghizadeh-Hesary *et al.* (2019) investigated whether swings in oil prices account for a sizable portion of the variability of trade balances and their non-oil and oil components. Åkerström and Ljungqvist (2016) evaluated the impact of oil price shocks on the overall trade and non-oil trade balances of ten oil-importing eurozone countries using a VAR model from Q1 1980 to Q4 2014. The results showed that the non-oil trade balances of the euro area nations reacted to oil price shocks similarly. Allegret, Mignon and Sallenave (2015) attempted to evaluate the association between oil price shocks and global imbalances using a model including trade and financial interdependencies from 1980 to 2011. The study indicates that the impact mechanism of oil price shocks on global imbalances depends on whether the shocks are from the supply or demand sides, and the primary adjustment mechanism for oil price shocks is the commerce channel. Following the veins, Hassan (2017) found that the volatility of the

oil price hurts Pakistan’s export earnings because an increase in the price of oil leads to increases in the prices of each item in the commodity basket and inflation, which causes the aggregate demand to decline and lowers output level. Rising import costs result from rising oil prices, adversely affecting Pakistan’s current account balances and output levels.

3. DATA AND METHOD

This research analyses the data of ASEAN+ (Vietnam, Japan, China, Korea, India, Pakistan, Brunei, Cambodia, Laos, Indonesia, Malaysia, Myanmar, Philippines, Singapore, and Thailand). There are many similarities between these nations, including their recent impressive rates of Financial Development (FD), Petroleum Price (PP), and Trade Openness (TO). The research data were gathered from the World Bank between 2010 and 2022. Given the length of the period, we expect to thoroughly examine the connection between FD, PP, and TO.

3.1. Model specification

In examining the impact of FD and PP on TP, we estimate our baseline empirical model as follows:

$$\ln\text{TOP} = \mathbf{b0} + \mathbf{b1}\ln\text{DCPS} + \mathbf{b2}\ln\text{CPI} + \mathbf{b3}\ln\text{PP} + \mathbf{b4}\ln\text{GDPPC} + \mathbf{b5}\ln\text{REER} + \mathbf{b6}\ln\text{GEE} + \boldsymbol{\mu1} \quad (1)$$

We adopt this model from the research of Honey (2021). Honey (2021) used three models with various variables to investigate factors impacting trade openness and concluded that financial development, petroleum prices, human capital, real effective exchange rate, and economic growth inevitably influence trade openness. Table 1 presents a detailed variable description.

Table 1: Variable description

Variables	Description	Measurements
lnTOP	Trade Openness	Ln (Import + Exports)/GDP
lnDCPS	Financial Development	Ln (Domestic Credit to the Private Sector)
lnCPI	Financial Development	Ln (Consumer Price Index)
lnPP	Petroleum Price	Ln (Petroleum price)
lnGDPPC	Economic Growth	Ln (GDP Per Capita)
lnREER	Exchange Rate	Ln (Real Effective Exchange Rate)
lnGEE	Human Capital	Ln (Government Expenditure on Education)

Firstly, lnTOP, the dependent variable, is the log result of the sum of imports and exports divided by GDP and it is a proxy for Trade Openness (TO) (Honey, 2021).

Financial Development (FD), an independent variable, is proxied by two variables: Domestic Credit to the Private Sector (*b1lnDCPS*) and Consumer Price Index (*b2lnCPI*). DCPS measure is employed vastly in literature to proxy for FD. According to Honey’s research (2021), DCPS represents the government’s allocation of money for research in Pakistan to encourage investment and stimulate business activity. In prior research, Beck (2002) employed DCPS as a proxy variable for financial progress. Besides, an additional indication of domestic macroeconomic health that can have a significant bearing on financial development is the Consumer Price Index (CPI) (Naceur et al., 2014). Reduced credit demand, insolvency, and investment restraints stem from a higher index and stunt the economy’s progress (Boyd et al., 2001). If inflation impacts the growth of the financial system, it will have substantial consequences in the long run (Ibrahim et al., 2022). At the same time, the CPI is used to gauge inflation’s pace.

b3lnPP is a variable proxied for Petroleum Price (PP), which has long been seen as a sign of economic stability, mainly because of how heavily dependent the world is on oil goods. Furthermore, because oil is the most widely traded good on the worldwide market in terms of both volume and value, the price of oil significantly impacts the current global economy (Olajedo, 2020). Additionally, the price of products and

services that use much energy is correlated with the price of energy, which is dominated by the price of oil or gasoline. Finally, the price of other fuels is partially tied to gasoline (even though oil cannot entirely substitute for electricity, coal, and natural gas, especially in the Industry of Transport). For these reasons, sudden fluctuations in gasoline prices have far-reaching consequences for both oil importers and exporters. Hence, this study uses the price of petrol as a stand-in for the cost of petroleum in 15 nations.

Based on prior research and Yanikkaya's (2003) empirical investigation, we employ GDP per capita ($b4\ln\text{GDPPC}$) as a proxy for economic growth in the role of a control variable. EG is a variable being reviewed by many previous research. In detail, it was defined as the process of increasing the sizes of national economies, the macro-economic indications, especially the GDP per capita, in an ascendant but not necessarily linear direction, with positive effects on the economic-social sector (Haller, 2012).

The Real Effective Exchange Rate Changes are a control variable in this investigation ($b5\ln\text{REER}$). This shows "the change in the value of the domestic currency compared to the weighted average of other traders from the same country" (Hassan et al., 2017, p.18).

As more government spending on education is associated with higher literacy rates, which increases the economy's human capital, it is also used as a control variable in estimating gross domestic product (GDP) growth. Specifically, this variable is employed for nations in the ASEAN+ group, where government spending on education is a priority (Deger, 1985).

3.2. Estimation method

In this study, we use the Generalized-method-of-moments (GMM) estimators for dynamic panel data to determine how these data work. We use the recent generalised method of moments (GMM) dynamic panel data techniques to find and test for these possible regions. These techniques can deal with the fact that FD, PP, and TO may all happen simultaneously, allowing us to focus on the effect of the exogenous component of FD and PP on TO. As discussed thoroughly in the literature review, there is a high probability that the model will have simultaneity bias as 2-way causal relationships between the main independent and dependent variables were found. Additionally, using panel data also lets us control for effects that are unique to each country and include information from each country over time. The model is also estimated by GLS (Generalized Least Squares), FEM (Fixed Effects Model), and REM (Random Effects Model), which are all sub-methods. These are used to test the consensus on the direction of the impact of FD and PP on TO.

GLS weights observations to address variance differences (Tasker & Stedinger, 1989), it calculates these weights using the independent variable covariance matrix and error covariance matrix. FEM preserves unit fixed effects (Cooper & Hedges, 1993). but it cannot model insignificant fixed effects since it requires units to differ. According to Hedges (1983), REM solves unit random effects by considering them as random variables and not matching units. REM believes these random effects are regularly distributed and affect unit attributes. GMM (Generalized Method of Moments) calculates regression model parameters without data distribution assumptions or mismatched models (Stock & Wright, 2000). GMM criteria ensure that the parameters are best estimated from the independent variables.

The GMM estimators are well-designed to fix the problems with earlier estimation methods, such as the fact that they were used simultaneously and left out bias. The system-GMM (SGMM) estimator was made by Arellano and Bover (1995) and Blundell and Bond (1998). It helps improve efficiency because it gives more accurate and less biased predictions. Since the two-step SGMM provides reliable predictions and is less affected by heteroscedasticity and autocorrelation than the one-step estimator, it was chosen for this research. The endogeneity problem is also taken into account by the SGMM estimate. Since the validity of the instruments is so crucial to the consistency of the SGMM estimator, the study uses the Sargan test of overidentifying limits to see if the instruments are valid or not. This test assumes that if the null hypothesis about the validity of the instruments is not rejected, the instruments are valid.

In the same way, the Arellano-Bond autocorrelation test is used to check for serial correlations of a higher order than the first in the first-differenced errors. This is because it is presumed there will be no autocorrelation of the disturbance terms at the second level. If it is not shown that the disturbance term is correlated, then the SGMM estimator is consistent.

First, we define v_t as a set of random variables, and then we define $f(.)$ as a set of functions, where θ_0 is the genuine unknown vector parameter that needs to be estimated. Then, we have the following form of a population moment condition:

$$E\{f(v_t, \theta_0)\} = 0, \quad t \in T \quad (2)$$

Oftentimes, $f(.)$ will only contain linear functions, at which point the problem reduces to a straightforward case of linear regression. Non-linear regression arises when $f(.)$ is a product of errors and a function of the observed variables.

4. EMPIRICAL RESULTS ANALYSIS

4.1. Data description

Table 2: Descriptive statistics

Variables	Obs.	Mean	Median	Std. Dev	Kurtosis	Min	Max
DP (Domestic credit to the Private sector)	165	82.2787	79.9	51.1133	-1.3164	5.1	193.5
CPI (Consumer Price Index)	190	124.0628	115.15	24.5525	1.7559	98.4	219.1
PP (Pump Price for petroleum) (US\$ per litre)	189	1.0493	1.03	0.3794	0.4847	0.32	2.18
EG (Economic Growth) – GDP per capita (current US\$)	192	13498.9821	3681.1	17709.0053	1.0809	40.458	72794
ER (Real effective exchange Rate)	182	111.4491	107.245	18.7671	0.1224	60.8	163.05
HC (Human Capital) –Government expenditure on education	166	281.7742	10.835	3486.3839	165.9986	1.7	44930
TO (Trade Openness) – (Imports + Exports)/GDP	184	1.0672	0.6275	2.3721	144.0483	0.07	31.2

Descriptive statistics are shown in Table 2, indicating that most variables have mean values greater than their standard deviation, including DP, CPI, PP, and ER. The standard deviation of EG (Economic growth) is significantly larger than the rest of the variables because it is expressed as GDP per capita (current US\$) spanning from least developed countries, developing countries, and developed countries in Asia. Table 2 indicates that the kurtosis of most variables, including DP, CPI, PP, EG, and ER is lower than 3. Therefore, they have a platykurtic distribution with thin tails (fewer outliers). From Table 2, a right-skewed distribution was detected as the mean values are higher than the median values for all variables.

Table 3: Correlation Matrix

	DP	CPI	PP	EG	ER	HC	TO
DP	1						
CPI	-0.2118	1					
PP	0.4208	-0.1872	1				
EG	0.4105	-0.4136	0.4155	1			
ER	-0.0075	0.3388	0.0188	-0.0912	1		
HC	0.4696	-0.4080	0.0275	-0.0315	0.0364	1	
TO	0.2290	-0.5410	-0.1161	0.3964	0.0024	-0.0433	1

The correlation matrix was calculated to determine whether the variables had substantial impacts on the dependent variable named TO (Trade openness) and to detect the possible multicollinearity issue of the model. The EG and DP (used as a proxy of FD) have a statistically significant beneficial impact on the

TO, whereas the ER has a marginally significant positive impact. Additionally, the PP and CPI (used as a proxy for the FD variable) adversely affect TO variable, while the HC has a weakly negative effect on TO. Therefore, this statistic's significant associations are within a tolerable range, enabling an investigation of the interaction between independent and dependent factors. Additionally, the model is logical regression because there is no multi-correlation problem among the explanatory variables, allowing the remaining diagnostic tests to be run.

4.2. Empirical result

This study examined the relationship between Financial development, Economic growth, Petroleum price, Real effective exchange rate, and Human capital on Trade Openness in the context of ASEAN+ countries from 2010-2022. The study employed the GMM method to estimate the relationship between variables. The result indicates the relationship between the variables in ASEAN+ countries.

Table 4: Model results

Variables	GLS	FEM	REM	GMM
	Trade Openness	Trade Openness	Trade Openness	Trade Openness
DP (Domestic credit to the Private sector)	0.192** (2.11)	0.142* (1.97)	0.163** (2.31)	0.312** (2.29)
CPI (Consumer Price Index)	-0.308 (-0.78)	-0.281* (-1.92)	-0.315** (2.12)	-0.635* (-2.31)
PP (Petroleum Price)	0.115 (0.78)	-0.244*** (-3.61)	-0.235*** (-3.42)	-0.169** (-2.37)
EG (Economic Growth)	0.0999** (2.17)	0.00373 (0.16)	0.00852 (0.36)	0.0121 (1.58)
REER (Real effective exchange Rate)	0.0580 (0.15)	-0.507** (-2.45)	-0.468** (-2.24)	-1.055* (-2.36)
HC (Human Capital)	0.351** (7.14)	0.00887 (0.52)	0.0139 (0.79)	-0.00569* (-2.47)
TO (Trade Openness)				0.456 (0.74)
_cons	-1.618 (-0.71)	2.717** (2.56)	2.554** (2.36)	
N	137	137	137	107
R-sq		0.264		

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

4.2.1. The Impact of Financial Development on Trade Openness

The results presented in Table 4, based on the GMM model, show that financial development significantly impacts trade openness when using domestic lending to the private sector as a proxy for that development. The findings imply that trade openness might rise to 0.312% with a 5% increase in domestic lending to the private sector. This suggests that a rise in financial growth, such as an increase in domestic credit to the private sector, may promote trade openness. This may be because when countries have high levels of domestic credit to the private sector, it indicates stability in the financial field by reducing reliance

on foreign capital and the risk of external shock (Asongu & Odhiambo, 2020). The increase in domestic credit to the private sector helps to reduce effectively the crowding-out effect of trade openness, according to the study by Nguyen et al. (2018).

This finding is in the vein with the study of Beck (2002), which suggests that private credit significantly influences trade openness, including the share of trade balance, manufactured exports, and total merchandise exports of manufactured goods in GDP. Private credit has a more significant impact on exports than imports, even though it also enters considerably positively in regressions of manufactured imports as a percentage of GDP.

However, according to Table 4, financial development negatively impacts trade openness when considering the consumer price index as the proxy variable. This is because the consumer price index increase indicates inflation which can cause a decrease in the export when foreigners are no longer interested in the export product due to its high price (Beck, 2002). On the other hand, a deflation phenomenon leads to a decrease in the prices of goods and services, resulting in an increase in a country's currency increases relative to other currencies (Sonnenshein, 2022). Eventually, exports would become more expensive, and their demand could be reduced.

4.2.2. Petroleum Price Has an inverse impact on Trade Openness

Regarding the price of petroleum on trade openness, Table 4 demonstrates that the price of gasoline, used as a stand-in for the PP variable, has an enormously positive impact on the trade openness variable. In the case of ASEAN+ nations, which mainly import petroleum from nations outside of OPEC. Therefore, a drop in the price of gasoline may increase the trade openness of these nations when it presents a chance to lower the shipping costs associated with export and import processes. This result is consistent with earlier research, which stressed that the type of country—whether it imports or exports petroleum—has a beneficial impact on trade openness (Bala et., 2019; Delatte & López-Villavicencio, 2012).

On the other hand, due to the characteristics of nations that import petroleum, an increase in the price of gasoline may decrease trade opportunities. Oil import countries experience an oil shortage during the trade process due to rising oil prices. The trading openness will therefore be restricted in terms of import and export. Additionally, countries' demand and supply curves are also heavily impacted.

4.2.3. Economic Growth Enhances Trade Openness

The results from Table 4 confirm previous empirical results on economic growth and trade openness. Since economic conditions improve, so do living standards, and people are increasingly choosing high-quality products from other countries. From this angle, it motivates people to spend more on imported goods and support the economy. Investment opportunities can increase output and enable the export of excess goods. The study by Honey (2021), which also highlighted the beneficial influence of economic growth on trade openness, supports this conclusion. On the other hand, it is noteworthy that the level of trade openness has also decreased due to the slowdown in economic growth.

4.2.4. Real Effective Exchange Rate Adversely Impacts Trade Openness

According to the data in Table 4, the Real effective exchange rate and Trade openness have a negative relationship. Specifically, an increase in the Real effective exchange rate of countries indicates that its exports are becoming more expensive and that country's imports are becoming cheaper. This tendency may cause a decrease in the export rate and import demand when the cost to conduct the trading process is expensive for a developing country (Balázs & Amina, 2003).

4.2.5. Human Capital Has a negative impact on Trade Openness

According to the result of the GMM estimation, trade openness is negatively affected by the human capital variable measured by the government expenditure on education as a percentage of GDP. This finding

contrasts with the study of Benarroch and Pandey (2012), which states that higher human capital leads to better levels of trade openness. However, this finding is consistent with the context of emerging economies examined in this paper. As explained by Meschi et al. (2008), one driver of trade openness is the demand for cheaper unskilled labour, as in the case of ASEAN+ countries compared to developed ones.

5. CONCLUSION

This article has examined the relationship between Financial development, Petroleum price, and Trade openness in the context of ASEAN+ countries. Besides, Real effective exchange rate, Economic growth, and Human capital were contributed as the control variable. To reach the goal of this paper, the GMM panel data model was used to examine the link between variables in a panel of ASEAN+ countries over 13 years from 2010 to 2022, where petroleum price, financial development, and economic growth have a significant and positive impact on trade openness, while the Human Capital and Real Effective Exchange Rate have negative impacts on this dependent variable.

5.1. Recommendations

5.1.1. Recommendations for ASEAN+ countries

Although the main findings of this study are similar to those of other studies in the literature, it is noteworthy to consider some recommendations based on this result for the policy of some countries in ASEAN+ for the further period after the Covid pandemic and the inflation problem.

Firstly, regarding financial development, it is necessary to ensure and create the stability of the domestic credit to the private sector by quality institutions when the country aims to increase the level of trade openness. This is considered a challenging task facing governments in ASEAN+ countries: modernising their financial sectors, particularly their banking systems and other financial institutions, to encourage the growth of the private sector. In addition, governments should control the inflation rate considerably to ensure the Consumer Price Index, thereby facilitating the export and import process.

Secondly, according to the relationship results of Petroleum Price and Trade Openness, it can be seen that the reduction in petroleum prices has a positive impact on the major gasoline-importing countries in ASEAN+. Therefore, if an increase in oil prices could create challenging effects for these countries, the policymakers should consider the different policy and trade openness degree to react immediately before the petroleum price fluctuation. Moreover, the diplomatic relationship with OPEC countries is essential in increasing petroleum prices.

Thirdly, as regards Real Effective Exchange Rate, when one country's inflation rises relative to another country's (i.e. there is an inflation differential), the purchasing power of the domestic currency decreases relative to the foreign currency, the value of the domestic currency decreases (Other things being held constant), hence, the exchange rate of the foreign currency against the domestic currency increases (or the exchange rate of the domestic currency against the foreign currency decreases) and vice versa. The State Bank's currency rate adjustment in the current context is appropriate, avoiding the drawbacks of previous exchange rate operations. However, the adverse effects of the exchange rate adjustment are not slight. As a result, in addition to introducing a new exchange rate strategy, the government must simultaneously implement other measures to restore macroeconomic stability and take economic action to reduce any adverse consequences of the government. This strategy is equivalent to raising prices by taking advantage of an increase in the currency rate, which is unfavourable for the economy.

5.1.2. Recommendation for Vietnam

According to the data collected from Worldbank, the Financial development specifically is the domestic credit to private sectors ratios of Vietnam during 2010-2022 are generally higher than the average ASEAN+

countries and tend to increase in the last period. According to the result, this tendency creates opportunities for increased trade openness in the Vietnam context. In detail, to enhance the domestic credit to the private sector, policymakers can reduce the interest rate to stimulate borrowing and investment in the private sector, especially during the financial crisis during these years. Hence, it also increases the market liquidity of Vietnam. From this standpoint, it strengthens a domestic country's financial sector, preventing the crowding effect in the trade openness process. However, this solution can cause inflation in the short term and consequently lower the country's GDP growth (Muhammad, 2022), which policymakers should consider.

In terms of the consumer price index, the result shows that the decrease in CPI can stimulate trade openness. In Vietnam, the CPI has a rising tendency due to increased crude materials and production costs. To reduce the CPI, the Vietnamese government can reduce the import tariff because it contributes to the cost of goods and services, leading to higher inflation (Hong et al., 2022). Hence, this solution not only reduces the CPI but also stimulates the import value of Vietnam.

Regarding the petroleum price solution for oil-importing countries such as Vietnam in the oil price increasing context, the government can use the diplomatic channel to negotiate with OPEC countries, which helps Vietnam secure access to oil reserves. On the other hand, policies that lessen the reliance on oil imports in response to rising oil prices can be considered, such as finding renewable energy sources to ensure the trading process is completed on time.

5.2. Limitations

This research paper still needs to be revised when it only analyses the impact of financial development and petroleum price factors on trade openness in the environment of ASEAN countries and some other countries located in Asia. In addition, there needs to be more data when it is thoroughly searched, which may cause shortcomings in the research process. On the other hand, the proxy variable of financial development has yet to be thoroughly mentioned in this study, in which there is a lack of assessment of the banking system of each country. Finally, the data we collect in this study has shortcomings because financial information in ASEAN+ countries is public until the end of 2022. Therefore, these limitations could be overcome in our further research.

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REMITTANCES AND ITS IMPACT ON ASEAN ECONOMIC GROWTH

**Author: Nguyen Ngoc Quynh Anh¹, Ho Phan Khanh Linh¹,
Cao Thi Mai Phuong¹, Tran Ngoc Mai¹, Pham Viet Nga¹
Mentor: Ngo Thi Hang¹**

ABSTRACT: Remittances play an important role in the economy, especially in developing countries, as the remittances help to increase the national savings and ease the dependence on foreign exchange reserves and balance of payments, while simultaneously contributing to poverty reduction in receiving nations and communities, increasing investment in health, education and business. However, remittances can also increase the severity of the brain drain as well as erode the labor incentive of the remittance-receiving families. In this regard, this paper focuses on clarifying the impact of remittances on economic growth in ASEAN countries in the period 2000-2020. Using the fixed effects and random effects models, the research results indicate that remittances in ASEAN countries, with a relatively limited scale, may not be large enough to significantly drive the economic growth of ASEAN countries, which calls for feasible solutions to boost the scale of remittances, enabling ASEAN economies to benefit from remittances.

Keywords: remittances; economic growth; ASEAN; panel data.

1. INTRODUCTION

In essence, a savings account is a part of an employee's personal income that they have not yet put into consumption, and is a special form of accumulating money instead of storing gold, goods and services. Therefore, these countries need to consider the following measures to use remittances more effectively and remittance can be an important source of capital for the economy: International migration has become an issue of concern for the world community, especially for countries with high numbers of immigrants and migrants. Remittances sent home by migrants from developing countries remained stable and tended to increase markedly from 1990 to 2021, reaching \$554.9 billion in 2021 compared to \$27.0 billion in 1990 (Table 1). Remittances are more than double official aid and nearly two-thirds of foreign direct investment flows to developing countries.

Every year, migrant workers send significant amounts of remittances home, which is an important source of economic development. Remittances are highly valued in the economy, helping to increase national savings, reduce foreign exchange-related constraints and balance of payments, and also contribute to the development budget. Migration and remittances reduce poverty in communities of origin and lead to increased investment in health, education and business.

However, this type of outbound migration can also harm development as the host country loses highly educated and skilled workers, which is known as brain drain. Thus, lost in human capital can negatively affect economic growth as reflected in neoclassical growth theory. In addition, remittances can hinder economic growth by increasing the exchange rate, thereby making domestic goods less competitive in international market. In addition, the amount of remittances can also adversely affect the labor supply decision of families receiving remittances. Increasing remittances can be seen as increasing non-labor income, this procedure makes the recipient's families dependent on remittances and keeps them away from productive activities. Most of the time, this money is used for consumption rather than investment in production.

¹ Banking Academy.

Table 1. Remittances to regions around the world, the period 1990-2021

Region	Year	Remittance value (USD billion)					Global Remittance Market Share (%)				
		1990	2000	2010	2018	2021	1990	2000	2010	2018	2021
Low income		2,4	2,8	14,4	27,1	21,4	3,5	2,3	3,4	4,3	2,9
Lower Middle Income		15,7	39,2	180,5	288	372,7	23,0	32,2	43,1	46,1	50,7
Middle Income		27	71,4	287,8	452,2	554,9	39,5	58,7	68,8	72,4	75,5
Upper Middle Income		11,3	32,2	107,2	164,3	182,2	16,5	26,5	25,6	26,3	24,8
East Asia and Pacific		8,7	18,7	68,8	115,3	117,5	12,6	15,4	16,4	18,5	15,9
Central Asia and Europe		3,2	8,7	37,9	55	204,8	4,7	7,2	9,1	8,8	27,8
Latin America and the Caribbean		5,7	19,8	57	89,9	131,6	8,4	16,3	13,6	14,4	17,8
Middle East and North Africa		10,5	11,6	38,2	59,7	66,3	15,3	9,5	9,1	9,6	9
South Asia		5,6	17,2	82	131,1	157	8,1	14,1	19,6	21,0	21,3
Sub-Saharan Africa		2,4	4,8	31,6	46,7	48,3	3,5	3,9	7,5	7,5	6,5
World		68,4	121,6	418,5	624,5	735,2	100	100	100	100	100

Source: World Bank, World Development Indicators 2023 Database,

The two-sided impact of remittances on economic growth has become an issue, requiring objective studies to provide solid foundations and policy orientations to enhance the positive impact of remittances, while at the same time reducing the potential risks of economic stagnation and the degree of dependence on remittances of the receiving economy.

On that basis, this article provides a quantitative, objective, and comprehensive view of the impact of remittances on GDP growth in ASEAN countries. The paper seeks to assess the possibility of remittances becoming an effective tool to combat poverty, and even if remittances are not conducive to GDP growth, these cash flows could raise household incomes above the poverty line, allowing for more investment in human capital and possibly loosening credit restrictions. This is extremely important for the countries of Southeast Asia - a territory that is even less economically developed than other regions and continents.

2. LITERATURE REVIEW

Scientists and economists in many countries around the world have conducted many studies to assess the impact of remittances on economic growth, both in developed and developing countries. However, these studies have not reached consensus on the effect of remittances on economic development.

Among studies of developing countries, the Central European region, Meyer et al, (2020) with the use of panel data and a fixed impact model, studied the relationship between remittances and economic growth of Albania, Bulgaria, Macedonia, Moldova, Romania and Bosnia Herzegovina between 1999-2013 and showed that remittances have a positive effect on economic stability and growth. The study suggests that the influx of remittances causes households to increase their spending and spend part of their capital on investment, which in turn increases demand for products and domestic investment.

Also studying this area and using the same research method as Mayer et al., Kajtazi et al, (2022) continue to affirm that remittances have a positive impact on economic growth when studying the cases of 10 regional developing countries in the Central European region in the period from 2009-2019. In particular, the research paper emphasizes that the contribution of remittances to macroeconomic development in these developing countries is stable and important through investment and consumption. In addition, the results of Comes et al, (2018) also show the similarity of 7 Central and Western European countries in the EU: Romania, Bulgaria, Croatia, Czech Republic, Hungary, Slovakia, Slovenia in the years from 2010-2016,

Remittances not only affect through increasing consumer demand, thereby indirectly increasing GDP, but also have a positive impact on the health and education sectors when remittances flow directly into these areas, contributing to improving people's quality of life.

In assessing the impact of remittances on economic growth in the world's leading remittance-earning countries, Rao and Hassan (2011) demonstrated the positive effect of remittances on the economies of the 40 countries with the largest remittances globally using the Solow growth model. The Solow-Swan growth model, or exogenous growth model, is an economic model of long-term economic growth that is explained by three basic sources for calculating GDP: capital, labor, and productivity. Through this model, the authors have shown that through different capital channels, remittances are indirectly positive to the financial sector, which has the greatest influence on market volatility. A simple simulation that doubles remittances from 5 percentage points to 10 percentage points shows that the growth rate can be permanently increased by about 0,3 percentage points.

Sutradhar (2020) continues to confirm this view when studying 4 countries: Bangladesh, India, Pakistan and Sri Lanka between 1977-2016, Islam (2021) points out the positive relationship between remittances and economic development when studying the cases of the three countries of India, Pakistan and Bangladesh in the period 1986-2019 by using the general smallest average method (gls) and long-term impact estimation (FMOLS). The results of both of these methods show that remittances have a positive impact on long-term economic growth.

In another study by Sarkar et al, (2018) on the developing economy - Bangladesh - also showed the positive impact of remittances on the Bangladeshi economy in the period 1995-2016. The results of the study show that remittances from overseas workers have a positive impact on the country's economy through boosting consumption in domestic households as well as gross domestic investment and total capital accumulation, thereby indirectly increasing GDP growth.

Orrennius et al, (2010) when studying the countries of the Americas region, namely Mexico showed that remittances have an important influence on the economic growth of this country, in the period 2003-2007. Research indicates that higher remittances correlate with reduced unemployment in states with high migration rates, although remittances do not significantly increase employment. In addition, remittances help push up average wages in the case of states with high rates of overseas workers, Moslares et al, (2020) continue to affirm this view when studying data on 21 Latin American countries, which has shown a positive correlation of remittances and growth of the economy in the short and long term in 1980-2018. The results show that, in the long run, remittances positively affect the economies of most of the countries in question. Remittances affect economic development through many different channels, such as acting as a stable income for households, thereby reducing credit restrictions for the poor and financing capital shortages. In addition, remittances also increase total domestic savings, minimize restrictions related to exchange rates as well as lower borrowing costs, thereby promoting business activities of enterprises, increasing the GDP of the receiving country.

Africa is also an area of research attention with remittances, Olayungbo et al, (2010) studied the relationship between remittances, financial development, and economic growth in 20 selected countries in sub-Saharan Africa. They used both MG and PMG/ARDL models with VAR Granger exogenous/causal testing. After establishing cointegration between variables, the results indicate that remittances have a significant positive impact on economic growth both in the short and long term and become one of the important sources of capital for the development of the domestic economy. However, the study also shows that there is no relationship between remittance volume and the development of financial markets due to the influx of remittances mainly through informal markets and reflecting the limited financial markets of SSA countries.

It can be seen that remittances have a positive impact on many aspects of the financial economy. However, the amount of remittances in and out of countries is also inevitable to cause negative effects, not even contributing positively to economic growth but some previous studies have shown.

Specifically, Anetor (2019) studied the amount of remittances in Nigeria that had a negative impact on the economy. Remittances are not boosting economic growth because a large portion of them are used for excessive spending instead of productive investment to generate profits, Maune and Matanda (2022) point out that remittances remitted to individuals in the long term are negative during the research period and do not significantly affect economic growth. This study also shows that Zimbabwe's economy is no more developed than in Dollarization. Similar research results were found in the study by Naidu et al, (2017) when assessing the impact of the scale of remittances on Japanese economic growth. The Japanese government has a policy of encouraging the search for qualified workers, skills and knowledge to become part of the Japanese workforce so the number of immigrants will be less than that of the United States. Meanwhile, the amount of remittances sent by migrant workers in the United States to Japan is less than the amount of remittances sent by migrant workers in Japan to their home countries. In addition, Chowhury (2015) also pointed out that remittances do not have a significant impact on economic growth in low-income countries. This is explained by the fact that the amount of remittances is mainly used for consumption purposes to improve the quality of life, so the amount of capital for investment and savings is not large enough to make an impact on economic development.

In summary, it can be seen from previous studies that the adverse effects of remittances on economic growth are found in different economies through many indirect factors such as the impact of domestic aggregate demand through increasing the level of household spending, contributing capital to investment and development, increasing total domestic savings and increasing investment in the fields of education and health. Developing countries in Western Europe, Latin America, sub-Saharan Africa and Africa have experienced a positive relationship between remittances and economic growth. In Japan, Nigeria, and Zimbabwe, by contrast, remittance flows negatively affect the economic development.

Thus, it is necessary to conduct a research that specifically assess and even quantify the impact of remittances on the economic growth of countries and national groups, thereby creating a basis and premise for the development of feasible and appropriate policies towards emphasizing the positive contribution of remittances to the economic growth and improving living standards of receivers.

Currently, no studies have been conducted on ASEAN countries, except for Jintan et al, (2020), which focused on factors affecting the flow of remittances to ASEAN countries and left the impact of remittances on economic growth unstudied and unanswered. Therefore, this article not only contributes an additional, new study to the research field of the ASEAN remittance, but also will provide a detailed and objective assessment of the contribution of remittances to the economic development of the ASEAN region, thereby helping to orient policies to enhance the positive impact of remittances on economic growth.

3. RESEARCH METHODOLOGY AND DATA

The study uses econometric models for panel data including Fixed Effects Model (FEM) and Random Effects Model (REM). The model estimates the impact of remittances on the economic growth of countries built on the basis of reference and inherited research from Meyer et al, (2020); Olayungbo et al, (2010); Islam (2021); Chowhury (2015) with different independent variables described in Table 2.

3.1. The Fixed Effects Model (FEM)

FEM, also known as Fixed Effects Model, is one of the popular types of panel data model besides the random effects model (REM). This model analyzes the correlation between the residuals of each observation with the independent variable thereby separating the effect of individual (unchanged over time) characteristics from the independent variables. From there, the FEM model is used to assess the impact of explanatory variables on dependent variables within the country with the assumption that each country with different characteristics is not affected by other countries. According to Abd. Majid and Maulana (2012),

the FEM would be an appropriate approach in the case where the correlation between the individual specific intercept and regressors is anticipated. However, the FEM has a disadvantage as it could lead to a smaller degree of freedom and in turn reduce the parameter efficiency. This shortage can be overcome by using the error term variable through the application of the REM.

The regression equation of the fixed effect model is as follows:

$$\text{GDP Growth} = \beta_1 \cdot \text{REMi,t} + \beta_2 \cdot \text{FDIi,t} + \beta_3 \cdot \text{POPi,t} + \beta_4 \cdot \text{INFti,t} + \beta_5 \cdot \text{EXCHI,t} + \beta_6 \cdot \text{CONSUMi,t} + \beta_7 \cdot \text{GCFti,t} + \beta_8 \cdot \text{TRADEi,t} + \alpha_i + u_{i,t}$$

Where β_1, \dots, β_8 are the coefficients of the corresponding independent variables, i is the i th country, $u_{i,t}$: white noise, α_i : is the intercept by object (country) i

3.2. The Random Effects Model (REM)

The difference between the random effects model and the fixed effect model can occur in the variation between units. In the REM model, variables between subjects are assumed to be random and not correlated with independent predictions or variables in the model. If the REM is applied, panel data would be estimated by considering the error term which could be timely and individually related to one another. In explaining the fixed effect, it is assumed that each country has its own and different intercept. However, in the REM, it is assumed that the intercepts are random or stochastic.

The regression equation of the random effect model is as follows:

$$\text{GDP Growth} = \beta_1 \cdot \text{REMi,t} + \beta_2 \cdot \text{FDIi,t} + \beta_3 \cdot \text{POPi,t} + \beta_4 \cdot \text{INFti,t} + \beta_5 \cdot \text{EXCHI,t} + \beta_6 \cdot \text{CONSUMi,t} + \beta_7 \cdot \text{GCFti,t} + \beta_8 \cdot \text{TRADEi,t} + \alpha_i + \epsilon \epsilon_{i,t} + u_{i,t}$$

Where β_1, \dots, β_8 are the coefficients of the corresponding independent variables,

i : the nation i th

$u_{i,t}$: white noise

α_i : represents all unobserved factors that differ between countries but do not change over time,

$\epsilon \epsilon_{i,t}$: represents all unobserved elements that change over time but do not differ between objects

The data used in the study is a panel dataset of ASEAN countries taken from the World Bank Development Indicators database over a 21-year period from 2000 to 2020. Detailed information and specific calculations of independent variables in the research model are presented in Table 2.

In the process of estimating the parameters of the model, to ensure the data is balanced, the authors have reduced the sample from 11 ASEAN countries and 6 countries including: Vietnam, Cambodia, Indonesia, Malaysia, Thailand, Philippines due to limitations on database of World Bank and records of some countries in the region.

Table 2: Statistical table of variables of the research model

Variable	Definition	Symbol	Expected sign	References
Independent variable				
Remittance	Remittances received as a percentage of GDP	REM	+	Meyer et al, (2020); Sutradhar (2020); Rao and Hassan (2011); Olayungbo et al, (2010); Moslares et al, (2020); Orrenius et al, (2010); Chowdhury (2015); Hamma (2018); Islam (2021); Maune and Matanda (2022); Comes et al, (2017); Naidu et al, (2017)
Gross fixed capital formation	Gross fixed capital formation as a percentage of GDP	GCF	+	Rao and Hassan (2011); Anetor (2019); Kajtazi et al, (2022); Sutradhar (2020); Sarkar et al, (2018); Chowdhury (2015)

Foreign Direct Investment	Foreign direct investment net flow as a percentage of GDP	FDI	+	Olayungbo et al, (2010); Chowdhury (2015)
Population growth	Percentage (%) of annual population growth	POP	+/-	Meyer et al, (2020)
Inflation	Annual percentage inflation based on CPI	INF	-	Olayungbo et al, (2010); Md Chowdhury (2015); Anetor (2019);
Official exchange rate	Logarithm of the official exchange rate of the USD/ local currency	EXCH	+/-	Sutradhar (2020); Kajtazi et al, (2022); Meyer et al, (2020)
Trade openness	Export and import of goods and services as a percentage of GDP	TRADE	+	Olayungbo et al, (2010); Chowdhury (2015); Hamma (2018); Islam (2021)
Household Final Consumption	Household final consumption as % of GDP	CONSUM	+	Meyer et al, (2020)
Dependent variable				
Economic growth	Percentage (%) increase in GDP annually	GDPGrowth		Olayungbo et al, (2010); Hamma (2018); Anetor (2019); Kaltrina et al, (2022); Sarkar et al, (2018); Naidu et al, (2017)

4. RESULTS DISCUSSION

4.1. Data description

Summary table of data set is presented in Table 3. Through the Table 3, the average annual GDP growth of 6 countries: Vietnam, Cambodia, Indonesia, Malaysia, Thailand, Philippines is 3,8163% and recorded negative growth in most countries during the economic crisis in 2008 and 2019, with the lowest growth rate of -9,5183% in Philippines. Besides, the amount of remittances accounts for a relatively small proportion of the gross domestic product, averaging nearly 3,7857%, with the lowest of 0,3650% in Malaysia and the highest of 12,7840% in Philippines. Standard deviation of all variables are remarkably high, it can be clear that there are big differences between these 6 ASEAN countries.

Table 3: Descriptive statistics

Variable	Average	Standard deviation	Minimum	Maximum
EXCH	6,0215	3,2604	1,1184	10,0523
REM	3,7857	3,5943	0,3650	12,7840
FDI	3,7770	3,4159	-2,7574	14,1457
POP	1,3516	0,5096	0,2352	2,5701
CONSUM	62,7430	11,1695	43,7544	88,8080
GCF	24,4954	4,9223	15,8289	35,1597
TRADE	112,2823	43,1378	32,9756	220,4068
INF	4,0242	4,0072	-1,7103	24,0969
GDPGrowth	5,2309	3,0619	-9,5183	13,2500

Source: Compiled by Stata 17.0

4.2. Necessary tests

Before conducting linear regression models, the authors used variance inflation factor (VIF) to detect multicollinearity between independent variables in the model with the results shown in Table 4, With VIF value of all variables less than 5, it can be confirmed that the variables used do not exist multicollinearity.

Table 4: Variance Inflation factor (VIF) of variables in the research model

Variable	VIF	1/VIF
REM	1,89	0,5278
FDI	1,87	0,5357
POP	1,57	0,6367
INF	1,22	0,8177
EXCH	3,21	0,3117
CONSUM	4,82	0,2074
TRADE	2,04	0,4902
GCF	2,77	0,3613

Source: Compiled by Stata 17.0

4.3. Model Selection

With the results of the two regression models FEM and REM presented in Table 5, the Hausman test (Wooldridge, 2002) is used to determine the correlation of independent variables with hypothetical pairs (with a significance level of 5%) and thereby to select a suitable model.

H0: REM is preferred

H1: FEM is preferred

The results of the Hausman model (Table 5) show that $\text{Prob} > \text{Chi}^2 = 0,7724$ and there is no basis for rejecting H0, and imply that the REM model is a more optimal model than FEM in this study. It means variables between subjects are assumed to be random and not correlated with independent predictions or variables in the model. Therefore, the results of the model (2) in Table 5 are used for the conclusion of the study.

Table 5: Estimates with FEM and REM models

Dependent variable: GDP growth	FEM Model (1)	REM model (2)
REM	-0,163 (-0,41)	-0,0827 (-1,52)
FDI	0,124 (0,42)	0,0240 (0,13)
POP	3,454 (2,32)	1,610*** (6,65)
INF	0,0292 (0,73)	0,0520 (0,9)
EXCH	-1,548 (-0,78)	0,199*** (3,29)
CONSUM	0,100 (0,95)	0,0918 (1,51)

TRADE	0,0174 (1,12)	0,0189 (2,37)
GCF	0,164 (1,59)	0,110* (2,35)
Observations	126	126
Hausman test results: $\chi^2(8) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 4,86$ Prob > $\chi^2 = 0,7724$		

* p<0,1, ** p<0,05, *** p<0,01

Source: Compiled by Stata 17.0

4.4. Empirical Result

After the random effects model was designated as the optimal quantitative model, the authors performed the necessary tests to ensure the stability of the estimated results as well as the objectivity and reliability of the interpretations derived from the research results. The results of tests with p-values are more than 5%, implying that there is not enough basis to reject the hypothesis H0, or in other words: (i) the model does not state heteroscedasticity (Table 6); (ii) the model does not exist serial correlation problem (Table 7).

Table 6: Result of heteroscedasticity tests

H0: Models with autocorrelation	VAR	SD = sqrt(Var)
GDPGrowth	9,750	3,0619
e	7,4765	2,7343
u	0	0
Pro > chibar2	1,0000	

Source: Compiled by Stata 17.0

Table 7: Results of testing of autocorrelation

F(1,5)	3,481
Prob > F	0,1211

Source: Compiled by Stata 17.0

According to the estimation results from Table 5 column (2), the estimation value of the REM variable is not statistically significant at the 1%, 5% and 10% significance levels. Thus, there are not enough evidences to conclude that the amount of remittances impacted on the economic growth of these countries in the period from 2000 to 2020. This conclusion is similar to the results of Chowdhury (2015). In particular, Chowdhury (2015) explains that when a country has a low income level, the amount of remittances is mainly used for household consumption to improve the quality of daily life and therefore the remittance for investment and savings accounts for tiny percentage, and so the level of contribution to economic growth is not significant.

In addition, the research results (Table 5, column (2)) also show that economic growth is not correlated with trade openness and inflation rate. The amount of foreign direct investment has also had no significant impact on economic growth. However, population growth has a significant and positive effect on economic growth in the six ASEAN countries, with estimates that for every 1% increase in population, GDP will increase to 1,610%. In addition, total gross fixed capital and GDP growth are also positively associated, for every 1% increase in total gross fixed capital, the economy grows by 0,11%. In addition, the exchange rate affected positively GDP growth with an estimated every 1 % increase in the exchange rate making the economy grow by 0,1199%. These findings can be explained by these following reasons:

Firstly, in Southeast Asian countries with a low average income per capita and poor financial knowledge, the amount of remittance received is mainly used for household consumption, then the amount

of capital for investment in the field of production and business and savings is considered insignificant for economic growth.

Secondly, these ASEAN countries do not have a complete legal framework on receiving remittances, so official transaction costs are high, the operation of the banking system has several limitations, so there is a large part of remittance transferred through informal channels, not through commercial banks. Remittance only affects positively economic growth if it is transferred through banks, thereby promoting savings and improving households' access to official loans.

Thirdly, the proportion of remittances received in the six countries studied is very low compared to GDP, averaging only 3,7857% (Table 3). The volume of this remittance flow is not much as expected to affect the activities of the economy.

5. CONCLUSION

The findings of the study show that the amount of remittances received by the six ASEAN countries doesn't associate with the economic growth. This means that the exploitation of remittances has not been effective in the six ASEAN countries in the period 2000-2020 and the scale of remittances is not big enough to make a direct impact on economic growth, similar to the result of Chowhury (2015). Therefore, these countries need to consider the following measures to use remittances more effectively and remittance can be an important source of capital for the economy:

Firstly, policymakers need to publish an official legal framework and a network of transparent information, tax incentives and procedures, continue to stabilize the macro economy, change the investment model in a positive way, eliminate distortions of the market.

Secondly, encourage the establishment of remittance funds such as those in China, with the aim of supporting small and medium - sized enterprises or supporting overseas Vietnamese to invest in the country, focusing capital on investment and savings. For instance, experience in China indicates that in order to attract and direct the flow of remittances into the manufacturing sector, TVEs capital (Township and Village Enterprises) were established (Hoang Viet Ha, 2019) since the late 1970s when many families with relatives abroad gather remittances and send them home. Remittances are used to directly support small and medium - sized enterprises which have difficulties in accessing bank loans.

Thirdly, financial institutions need to promote cooperation and diversify forms of money transfer in potential markets, to minimize transaction costs, create ideal conditions for remittances to be circulated through the banking sector, and help remittance recipients gain access to financial services.

Lastly, in order for an economic resource to be used effectively, it requires the cooperation and management of people. The government should put more emphasis to human resource training and adopt policies to encourage organizations and individuals to improve their professional capacity in receiving and transferring remittances appropriately. The population growth can be considered an advantage of the region, so these countries need to take advantages of this to train high quality human resources to make effective use of remittances received.

6. RESEARCH LIMITATIONS

Besides the research results obtained, there are still some limitations that can be developed in further studies. Specifically, due to the limitation of dataset, the study was narrowed down in 6 countries across 11 ASEAN countries, leading to the results of the study may not cover all ASEAN countries. In addition, the study also did not analyze the remittance policy of each country because each country has its own regulations, legal framework, culture, different factors affecting the remittance policy.

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LONG TERM ECONOMIC CRITERIA FOR FOREIGN LOANS: THE CASE OF VIETNAM

Author: Nguyen Thi Ha Vi¹, Dinh Thu Giang¹, Nguyen Thi Anh Duong¹,
Le Thi Hai Yen¹, Tran Thi Thanh Diem¹
Mentor: An Nhu Hung¹

ABSTRACT: *This study evaluates the long-term impact of a foreign loan on the net savings derived from investing that fund on the Vietnamese economy. To this end, a simulation model is constructed to describe the aggregate net savings from foreign loans. Then, scenarios are simulated to clearly determine under which economic conditions can an investment from foreign loans Vietnam yield positive net benefits. There are extremely rare studies delving into this topic; or if so, it mentions only one side of the loan terms and conditions, while ignoring the more important domestic absorption capacity of how these loans are used. Our study thus is the first one that systematically touches this issue. Our simulation results shows that in most cases, a foreign loan would be detrimental for Vietnam due to low absorption capacity in all fronts including the savings rate, the depreciation rate, ICOR, the interest rate, the gestation lag, and the persistent problem of refinancing, capital waste and loss.*

Key words: *Absorption capacity, economic criteria, foreign loans.*

1. INTRODUCTION

Receiving foreign loan is inevitable for all developing countries. The thirst for investment to trigger higher economic growth entails large flows of foreign loans given their conditions of meager capital stock, technology level, and productive capabilities. On the flip side, large inflow of foreign loans may result in the external debt accumulation that induces immense pressure on public and private investment. Thus, to avoid insolvency or national default, effective use of foreign loans is critical.

Previous studies often focus on the question of whether external debt induce a positive or negative impact on national economies, such as Krumm (1985), Agenor & Montiel (1996), and Sachs (1989). Beside the fact that empirical results on this matter still scatter, one limitation shared by all these studies is that they often focus on the optimum loan size that is expected to create the best positive scenarios for the economy, but largely overlook how the loans are put into productive projects to generate

The branch of research on how loans are used to generate productive output is extremely rare. The pioneer of this line is Qayum (1966) or, more recently, Bao & Quang (2014). These two studies build a model of Harrod-Domar type that integrates the terms of a loan (including the number of years the loan is fully repaid, the interest rate) and the domestic absorption conditions of the recipient country (including ICOR and marginal propensity to consume) to come up with simulation scenarios. The authors conclude that in order to be able to reap long-term benefits, expressed in total net savings, then the conditions of the loan such as the payment lag, the repayment period, the interest rate all need to be favorable. Both studies also suggest that all foreign loans have a direct or indirect impact on the formation of capital accumulation. But in reality, only certain part of a foreign loan actually transform into capital stock due to the practice of refinancing, or there are loss and waste incurred during the investment process. Other important factors of the loan need to be mentioned include the payment lag, the gestation lag, the capital depreciation rate, , the debt swaps and fund drain channels. This is an untapped research gap that we can exploit.

¹ Banking Academy

Thus our chosen research topic is: “*Long-term economic criteria of foreign loans: The case of Vietnam*”. This study evaluates the long-term impact of a foreign debt on the net savings derived from investing that fund on the Vietnamese economy. More specifically, we determine in which combination of external and internal factors could the aggregate net savings from a foreign loan be beneficial for the recipient country, which in our case is Vietnam.

The remainder of this studies is structured as follows. Section 2 briefly introduce our model, which is a massive extension from Qayum (1966). In section 3, we evaluate all the variables used in the simulation model based on the current situation of foreign loans and public investment in Vietnam. Based on that model and inputs for the model, the simulation results is presented and discussed in Section 4. Main policy implications derived from our empirical results are discussed in Section 5, and Section 6 concludes.

2. THE MODELS

We build a model to assess the long-term economic impact of a foreign loan by comparing the aggregate net savings generated by the loan and the total debt liability charges. Any foreign loan if effectively used will increase domestic capital formation, thus increasing domestic output, then consumption and saving, then this increased saving leads to further increase in capital formation, so on and so forth. However, foreign loan is not free and have to be repaid, with interest. Thus, to determine whether a loan is beneficial or detrimental, it is necessary to look at both sides of the picture: (i) the absorbtion capacities and capabilities of the recipient country, and (ii) debt repayments according to the loans’ terms and conditions.

Assumptions

Every loan carries terms and conditions which differ across countries and projects. For the sake of simplicity, a general treatment like Qayum (1966) will be deployed here. Our assumptions are as follows.

(1) There are no other ties associated with the loans except for principal repayment and interest fees. An equal amount of principal repayment is paid every year.

(2) There exists payment lag, or “*period-of-grace*”. Until the end of this period, the recipient country does not have to repay the principal.

(3) Only a fraction of a loan will contribute to the capital formation. There are two reasons for this decision. First, a considerable amount of foreign loans was and will be in the form of debt swaps that are not going to produce any output. Second, there is a fund drain in the form of waste and loss, since loans are often allocated to state-owned-enterprises (SOEs) where corruption and bad fund management are pervasive.

(4) There exists *gestation lag*. Projects often incur initial installments before putting into operation, and therefore only start producing output after a certain period of time.

(5) A Harrod-Domar style production function is used, in which: (i) output is determined by the capital stock, (ii) the ICOR coefficient remains constant, and (iii) constant economies of scale.

(6) Capital depreciation exists. Intuitively, a loan, if used effectively, contributes to the stock of productive capital, which yields additional output, that output generates savings, and those savings are in turn mobilized to add more to the capital stock, which in turn leads to more output and savings, so on and so forth. The problem is that there is depreciation in the capital stock over time. According to Bao & Quan (2014), the average depreciation rate of Vietnamese firms is around 10%, which is large enough to be ignored.

The baseline model

We start with a model resembling Qayum’s, then some modifications will be made.

Annual repayment

Suppose that there is no gestation lag and payment lag. This means that output is produced, and liability charges are paid from the very first year of the loan. Denote r is the effective interest rate, and t is the loan's duration. For simplicity, the annual principal repayment is assumed to be the same over the loan's duration. Suppose that a new loan of $K_m K_m$ is borrowed. Then, the borrower has to pay a fixed principal of $\frac{K_m}{t}$ for every year during loan's duration. The repayments each year are as follows:

In the first year, the total repayment on the loan is $K_m \cdot r + \frac{K_m}{t}$, where the first component is the interest charge on the outstanding amount (now it is $K_m K_m$) and the second component is principal repayment.

In the second year the outstanding loan is $K_m \left(1 - \frac{1}{t}\right)$, thus the interest charge is $K_m r \left(1 - \frac{1}{t}\right)$. The total repayment is $K_m r \left(1 - \frac{1}{t}\right) + \frac{K_m}{t}$.

By the same token, in the year n ($n = 1, 2, \dots, t$), the total repayment is:

$$K_m r \left(1 - \frac{n-1}{t}\right) + \frac{K_m}{t} \quad (1)$$

Annual net saving

Denote a constant capital-output ratio $\sigma = K/Y$.

Let $\alpha\alpha$ capture the total effect of debt swap and fund drain, $\alpha\alpha$ satisfies the constraint that $0 \leq \alpha \leq 1$. With a new loan of K_m , the real increase in capital formation is αK_m . This incremental capital generates an annual output of $\alpha K_m / \sigma$. A smaller amount of debt swap and drain implies a higher value of $\alpha\alpha$ and higher incremental output, which is desirable from the recipient country's perspective. It is believed that the debt swap effect is more trackable compares to the fund drain channel, because it leads to a one-time-decrease in capital formation, then no further affects the output created by the original output $\alpha K_m / \sigma$. For simplicity, the effect of $\alpha\alpha$ is treated in the manner of a debt swap only.

Let ss be the gross domestic savings rate, then the resulting saving from the incremental output above is $\alpha K_m s / \sigma$. Combine the two sides yields the net saving in year n is:

$$S_n = \alpha K_m s \frac{1}{\sigma} - K_m r \left(1 - \frac{n-1}{t}\right) - \frac{K_m}{t} \quad (2)$$

In Eq.(2), S_n could be negative or positive. This net saving then is invested in the following years and yields additional savings till the end of the repayment period. So far, our approach is relatively the same as Qayum's (1966), except for a slight adjustment of $\alpha\alpha$ and the saving rate s on the output side. Now more modifications will be introduced, focusing on the multiplier term and the depreciation rate.

Adjustment in the multiplier term

The multiplier term is defined as the increase in the total savings generated by net savings in one year after a certain period of time. Qayum's treatment of the total savings resulting from the net saving in year n (S_n) was not fully accounted for all sources of saving. In Qayum's logic, S_n will be invested in the year $(n+1)$, which yields an additional saving of $S_n \cdot \frac{s}{\sigma}$; then this additional saving will lead to an additional (of additional) saving equal to $S_n \cdot \left(\frac{s}{\sigma}\right)^2$ in the year $(n+2)$, and so on. According to this logic, the savings created next year are only created from the savings of the very previous year.

The problem is, in the year $(n+2)$, not only does the additional saving in the year $(n+1)$ generates output and more saving; but also the net saving $S_n S_n$ in year n , which undoubtedly still stays in the capital stock, does the same job. Therefore, additional savings in any year must be accrued to all sources of savings created before. Table 1 illustrates this point. Thus, after $t - n$ years total savings has increased $\left[1 + \frac{s}{\sigma}\right]^{t-n}$ times the initial net savings S_n . The multiplier term related to net savings S_n of year n after $t - n$ years should

be $\left[1 + \frac{s}{\sigma}\right]^{t-n}$, not $\left[\frac{s}{\sigma}\right]^{t-n}$ as Qayum (1966) suggested.

Table 1. Adjusted multiplier term

Year	Existing saving	Incremental saving	Total saving = Existing saving + Incremental Saving
n+1	S_n	$S_n \frac{s}{\sigma}$	$S_n + S_n \frac{s}{\sigma} = S_n \left[1 + \frac{s}{\sigma}\right]$
n+2	$S_n \left[1 + \frac{s}{\sigma}\right]$	$S_n \left[1 + \frac{s}{\sigma}\right] \cdot \frac{s}{\sigma}$	$S_n \left[1 + \frac{s}{\sigma}\right] + S_n \left[1 + \frac{s}{\sigma}\right] \cdot \frac{s}{\sigma}$ $= S_n \left[1 + \frac{s}{\sigma}\right]^2$
n+3	$S_n \left[1 + \frac{s}{\sigma}\right]^2$	$S_n \left[1 + \frac{s}{\sigma}\right]^2 \cdot \frac{s}{\sigma}$	$S_n \left[1 + \frac{s}{\sigma}\right]^2 + S_n \left[1 + \frac{s}{\sigma}\right]^2 \cdot \frac{s}{\sigma}$ $= S_n \left[1 + \frac{s}{\sigma}\right]^3$
...
t	$S_n \left[1 + \frac{s}{\sigma}\right]^{t-n-1}$	$S_n \left[1 + \frac{s}{\sigma}\right]^{t-n-1} \cdot \frac{s}{\sigma}$	$S_n \left[1 + \frac{s}{\sigma}\right]^{t-n-1} + S_n \left[1 + \frac{s}{\sigma}\right]^{t-n-1} \cdot \frac{s}{\sigma}$ $= S_n \left[1 + \frac{s}{\sigma}\right]^{t-n}$

Source: author's calculation

Adjustment for the depreciation rate

Suppose that a constant average rate of depreciation is δ (%), i.e. after each year, the existing capital stock decreases by δ (%). The multiplier term, as well as S_n now must also account for δ . Again, we start with S_n (then a modification of S_n will be made latter on).

+ In year n the net saving from the foreign loan is, as before, S_n .

+ In year $(n+1)$, S_n generates an additional saving equals to $S_n \cdot s/\sigma$.

+ In year $(n+2)$, there are two sources that generate additional saving.

(i) Net saving S_n from year n now depreciates for one year, so the remaining value is $S_n(1 - \delta)$, which leads to an additional saving equals to:

$$S_n(1 - \delta) \frac{s}{\sigma} \quad (3)$$

(ii) The saving $S_n \cdot \frac{s}{\sigma}$ in year $(n+1)$ is new and not subject to depreciation, thus inducing an additional saving equals to:

$$S_n \cdot \frac{s}{\sigma} \cdot \frac{s}{\sigma} = S_n \left(\frac{s}{\sigma}\right)^2 \quad (4)$$

The total additional saving in year $(n+2)$ is (3) + (4):

$$= S_n(1 - \delta) \frac{s}{\sigma} + S_n \left(\frac{s}{\sigma}\right)^2 = S_n \frac{s}{\sigma} \left[1 - \delta + \frac{s}{\sigma}\right] \quad (5)$$

+ In year $(n+3)$, there are three sources that generate additional saving.

(i) Net saving S_n from year n now depreciates for two year, so the remaining value is $S_n(1 - \delta)^2$, which leads to an additional saving equals to:

$$S_n(1 - \delta)^2 \frac{S}{\sigma} \quad (6)$$

(ii) The saving $S_n \frac{S}{\sigma}$ in year $(n+1)$ depreciates for one year, so the remaining value is $S_n(1 - \delta) \frac{S}{\sigma}$, which leads to an additional saving equals to:

$$S_n(1 - \delta) \frac{S}{\sigma} \cdot \frac{S}{\sigma} = S_n(1 - \delta) \left(\frac{S}{\sigma}\right)^2 \quad (7)$$

(iii) The saving $S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right]$ in year $(n+2)$ is new and not subject to depreciation, thus leading to an additional saving equals to:

$$S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right] \cdot \frac{S}{\sigma} = S_n \left(\frac{S}{\sigma}\right)^2 \left[1 - \delta + \frac{S}{\sigma}\right] \quad (8)$$

The total additional saving in year $(n+3)$ is (6) + (7) + (8):

$$\begin{aligned} &= S_n(1 - \delta)^2 \frac{S}{\sigma} + S_n(1 - \delta) \left(\frac{S}{\sigma}\right)^2 + S_n \left(\frac{S}{\sigma}\right)^2 \left[1 - \delta + \frac{S}{\sigma}\right] \\ &= S_n(1 - \delta)^2 \frac{S}{\sigma} + S_n(1 - \delta) \left(\frac{S}{\sigma}\right)^2 + S_n \left(\frac{S}{\sigma}\right)^2 \left[1 - \delta + \frac{S}{\sigma}\right]. \end{aligned} \quad (9)$$

+ Similarly, the total additional saving created in year t is:

$$S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right]^{t-n-1} \quad (10)$$

Adding up all the net savings resulting from $S_n S_n$ at the end of year t , including $S_n S_n$, yields:

$$S_n + S_n \frac{S}{\sigma} + S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right] + S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right]^2 + S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right]^3 + \dots + S_n \frac{S}{\sigma} \left[1 - \delta + \frac{S}{\sigma}\right]^{t-n-1} \quad (11)$$

Denote $\left[1 - \delta + \frac{S}{\sigma}\right] = a \left[1 - \delta + \frac{S}{\sigma}\right] = a$

If $a=1$, the Eq.(11) becomes:

$$S_n + (t - n)S_n \frac{S}{\sigma} = S_n \left[1 + (t - n) \frac{S}{\sigma}\right] \quad (12)$$

If $a \neq 1$, the Eq.(11) would be simply shortened down as follows:

$$S_n + S_n \frac{S}{\sigma} + S_n \frac{S}{\sigma} a + S_n \frac{S}{\sigma} a^2 + \dots + S_n \frac{S}{\sigma} a^{t-n-1} = S_n + S_n \frac{S}{\sigma} \cdot \frac{1 - a^{t-n}}{1 - a} \quad (13)$$

S_n will also be adjusted with depreciation. The liability charges stay the same, as depreciation only affects output side. In year n , the (real) initial investment αK_m depreciates $(n-1)$ years, so the remaining value is $\alpha K_m (1 - \delta)^{n-1}$, which leads to additional saving $\alpha K_m (1 - \delta)^{n-1} \frac{S}{\sigma}$. Thus the net saving S_n is:

$$S_n = \alpha K_m (1 - \delta)^{n-1} \frac{S}{\sigma} - K_m r \left(1 - \frac{n-1}{t}\right) - \frac{K_m}{t} \quad (14)$$

Combining all those adjustments above yields net aggregate savings from investment of foreign capital at the end of year t , including the investment of $K_m K_m$ in year 0, is:

$$S^* = \sum_{n=1}^t \left[\frac{\alpha K_m S (1 - \delta)^{n-1}}{\sigma} - K_m r \left(1 - \frac{n-1}{t}\right) - \frac{K_m}{t} \right] \left[1 + \frac{S}{\sigma} \cdot \frac{1 - a^{t-n}}{1 - a}\right] + K_m \quad (15)$$

If $a = \left[1 - \delta + \frac{1-c}{\sigma}\right] \neq 1$; and:

$$S^* = \sum_{n=1}^t \left[\frac{\alpha K_m s (1 - \delta)^{n-1}}{\sigma} - K_m r \left(1 - \frac{n-1}{t} \right) - \frac{K_m}{t} \right] \left[1 + (t-n) \frac{s}{\sigma} \right] + K_m \quad (16)$$

$$\text{If } \alpha = \left[1 - \delta + \frac{1-c}{\sigma} \right] = 1.$$

The long term economic criteria of the loan will be: If $S^* > 0$, the foreign loan is beneficial to the recipient country. If $S^* < 0$ the loan is in fact harmful, in the sense that it decrease the capital stock in the long run. If $S^* = 0$ then it is just indifferent taking the loan.

Adjustment for the gestation lag and the payment lag

Our next step is to relieve the assumption of gestation lag and payment lag. Using the same notation as Qayum (1966), let the gestation period be g and the payment lag is h . Since the principal is started to be paid from year h , the terminal period now is $(t+h)$. Although it depends on specific contracts and projects, it would be safe to assume that $h > g$ first. Now we have three phases where the annual net saving S_n will be treated differently.

First in the case that $a \neq 1$.

In the first phase from year 1 to year g : no output is produced, only interest payments are made. The net saving each year resulting from the investment of foreign capital is $S_n = -K_m r$ for $n = 1, 2, \dots, g$; and the cumulative effects from all those S_n with the multiplier term from Eq.(13), adjusted for the new terminal year $t + h$, is:

$$S_1^* = - \sum_{n=1}^g K_m r \left[1 + \frac{s}{\sigma} \cdot \frac{1 - a^{t+h-n}}{1 - a} \right] \quad (17)$$

In the second phase from year $(g+1)$ to yeah h : output starts to be produced, interest payments are still made.

In year $(g+1)$, the initial capital αK_m produces additional saving equals to $\alpha K_m s / \sigma$

In year $(g+2)$, the remaning capital is $\alpha K_m (1 - \delta)$ due to depreciation, and the additional saving is $\frac{\alpha K_m s}{\sigma} (1 - \delta)$.

Similarly, in year n ($g+1 < n < h$), the remaining capital $\alpha K_m (1 - \delta)^{n-g-1}$ which produces additional saving of $\frac{\alpha K_m s}{\sigma} (1 - \delta)^{n-g-1}$.

The net saving S_n is: $S_n = \frac{\alpha K_m s}{\sigma} (1 - \delta)^{n-g-1} - K_m r$

So, the cumulative effects for this phase is:

$$S_2^* = \sum_{n=g+1}^h \left[\frac{\alpha K_m s}{\sigma} (1 - \delta)^{n-g-1} - K_m r \right] \left[1 + \frac{s}{\sigma} \cdot \frac{1 - a^{t+h-n}}{1 - a} \right] \quad (18)$$

In the third phase from year $(h+1)$ to the terminal year $(t+h)$: output is still produced, now principal repayments start to be made.

The output side is the same as the second phase where the additional saving for year n ($h+1 \leq n \leq t+h$) is $\frac{\alpha K_m s}{\sigma} (1 - \delta)^{n-g-1}$.

The liability side is now treated as the case when there is no gestation lag and payment lag with the only $S_n = \frac{\alpha K_m s}{\sigma} (1 - \delta)^{n-g-1} - K_m r \left(1 - \frac{n-h-1}{t} \right) - \frac{K_m}{t}$

which leads to the cumulative effects for the third phase is:

$$S_3^* = \sum_{n=h+1}^{t+h} \left[\frac{\alpha K_m s}{\sigma} (1 - \delta)^{n-g-1} - K_m r \left(1 - \frac{n-h-1}{t} \right) - \frac{K_m}{t} \right] \cdot \left[1 + \frac{s}{\sigma} \cdot \frac{1 - a^{t+h-n}}{1-a} \right] \quad (19)$$

The net aggregate savings thus equals to the combination of Eqs.(17), (18), (19) and K_m .
 $S^* = S_1^* + S_2^* + S_3^* + K_m$

Similar to the simple model, the long term criteria of a foreign loan is: If $S^* > 0$, the foreign loan is beneficial to the recipient country; if $S^* < 0$ the loan hampers recipient country's capital stock in the long run; and if $S^* = 0$ then it is just indifferent taking the loan.

In the special case when $a = 1$, the only difference is in the multiplier term which is now taken from Eq.(12).

$$S_1^* = - \sum_{n=1}^g K_m r \left[1 + (t+h-n) \frac{s}{\sigma} \right]$$

$$S_2^* = \sum_{n=g+1}^h \left[\frac{\alpha K_m (1-c)}{\sigma} (1 - \delta)^{n-g-1} - K_m r \right] \left[1 + (t+h-n) \frac{s}{\sigma} \right]$$

$$S_3^* = \sum_{n=h+1}^{t+h} \left[\frac{\alpha K_m (1-c)}{\sigma} (1 - \delta)^{n-g-1} - K_m r \left(1 - \frac{n-h-1}{t} \right) - \frac{K_m}{t} \right] \cdot \left[1 + (t+h-n) \frac{s}{\sigma} \right]$$

3. VARIABLES ASSESSMENT

Our model consists of two sets of variables: (i) loan terms including effective interest rate (r), the payment lag (h), and the loan duration (t); (ii) recipient country's absorption capacity including: the depreciation rate (δ), ICOR (σ), gross domestic savings ratio (s), the effect of debt swaps and fund drain (α), and the gestation lag (g).

Detailed official reports on foreign loans are often not available to the public. The most accessible source is the Foreign Loan Bulletin published by the Ministry of Finance (MoF), unfortunately the most recent update was already from 2011. Foreign loans were later reported in the Public Debt Bulletin, also provided by the MoF, but in much less detailed this time. To the best of our knowledge based on the latest Foreign Loan Bulletin, a large proportion of Vietnam's foreign loans are now in the form of Official Development Assistance (ODA) and other concessional loans, with the period of grace (h) ranging from 5 to 10 years and the payment period is prolonged up to 30 years. The average interest rate (r) currently charged is also low at less than 3%. However, some previous concessional loans in Vietnam have switched to commercial ones with higher interest rates and stricter conditions. Taking into account this trend for simulation purposes, suitable loan terms are selected as follows: the payment lag is about 5-10 years, the duration of a loan is about 20 to 40 years, and the average interest rate ranges from 1.5% to 3.5 %.

Previous researchs often assume the average depreciation rate of 6% for Vietnam (Anh *et al.*, 2013; Anh & Thuy, 2015). This number is similar to the estimate of 7% by Bu (2006) for South East Asia developing countries, or 6% found by McQuinn & Whelan (2007) for developing countries. These results suggest that the average rate of depreciation would be somewhere between 6% and 8%.

The gross domestic savings rate is straightforward as a matter of accounting only. The savings rate was very low at the start of "Doi Moi" in the late 1980s, then steadily increases to around 25% in 2001, and stabilizes at over 30% recently, which is relatively higher than world average. From the official statistics, we decide to use the minimum, the average, and the maximum savings rate over the last 20-year period for

simulation practice, which are 23.5%, 30.8%, and 36.1% respectively.

Regarding ICOR, there is rather lack of sound evidence to identify its true value. Bao & Quan (2014) estimate this ratio to be 3.632 for the whole economy, and around 4 to 5 for SOEs. There is a clear trend of persistent increase in Vietnam's ICOR in the last 20 years, indicating inefficient capital-use for the economy as a whole, and for the state sector in particular. Vietnam's ICOR coefficient is relatively high compared to other countries at the same stage of development, for example China 6.4, Indonesia 4.6, or Philippines 5.1. Actual data indicates that Vietnam's ICOR would be in the range of 5 to 9. We decide to take 3 values for simulation: ICOR = 5, 7, and 9

Table 1. Variable assessment results

Variables	Our method	Results
Loan duration (t)	We collect information from the Foreign Loan Bulletin issued by the MoF and from the terms and conditions of Japanese ODA loans published by JICA.	20-40 years
ICOR	We collect from Vietnam's General Statistics Office database and World Development Indicators (WDI) database.	5,7 and 9
Interest rate (r)	Option 1: We observe actual data for the 2002 – 2010 and 2017 – 2021 period. Option 2: We calculate the average r for the period 2004 - 2022 with the following formula: $r = \frac{\text{Total interest payment}}{\text{Total outstanding debt}} \times 100$ Data is collected from the Foreign Debt Bulletins and Public Debt Bulletins published by the MoF.	1.5-3.5%
Savings rate (s)	Data from the WDI.	23.5% to 36.1%
Payment lag (h)	There is no information about the time to complete the project, we can only rely on regulations and laws. We also check for the terms and conditions of Japanese ODA loans.	5-10 years
Depreciation rate (δ)	Based on data from the Penn World Table version 10.0.	4.38%-6.32%
Gestation lag (g)	No official data. We infer from the Law on Public Investment.	3, 5, and 7 years
The proportion of borrowed capital actually put into investment (excluding debt swaps, loss and waste) (α)	We have no official data, nor any clue. We just guest.	From 0% to 100% or 0-1

Source: authors' calculation

Finally, there is no official data for the gestation lag, thus the best we can do is to rely on the Law. According to the provisions of Article 52 of the Law on Public Investment, programs and projects must ensure that the time for capital allocation for implementation of group A projects does not exceed 06 years, and that of group B and C does not exceed 04 years and 03 years respectively. There is no official data for the gestation lag, thus the best we can do is to rely on the Law. g is chosen to be 3, 5, and 7 years.

Table 1 summarizes the values of all variables used to simulate the aggregate net savings, how we figure out them, and their possible values.

4. SCENARIO SIMULATION RESULTS

In this section, several simulation scenarios will be proceeded based on our model developed in Section 2 and the variables justification discussed in Section 3. Our input data for scenario calculation are estimated based on the most recent and reliable data available from previous studies, official statistics, or most reasonable calculations based on the limited information available. Thus, while these figures may not perfectly capture Vietnam's current and future economic conditions, they provide a picture that is close enough to our case. This ensures that our simulation results and the practical implications derived from these results are relevant and reliable.

This simulation practice focuses on the recipient country’s domestic conditions, including the savings rate, depreciation rate, ICOR, the rate of debt swap and fund drain, and the gestation lag. In addition, loan terms will also be covered, including payment lag and effective interest rates. For simplification, the loan K_m is pre-given and equals 1. The results are reported in table form, in which a number in each cell represents the net aggregate savings ($S^* = S_1^* + S_2^* + S_3^* + K_m$) for one combination of our variables. A positive number implies $S^* > 0$, which is desirable for the recipient country from our standpoint, and vice versa.

In the case that there are no debt swaps, no waste, and loss

The first scenario assumes that all the funds borrowed are effectively utilized to contribute to the capital stock. It means, there are no debt swaps, no waste, and no loss in the construction phase (or $\alpha = 1$). While one might argue that this setting is unrealistic given the fact of our specific case, it serves as a basic start for further exploration. Table 2 reports the result in which $g = 3, h = 5, t = 20$, and $\alpha = 1$.

Table 2. Simulation result for $g = 3, h = 5, t = 20, \alpha = 1$

s	σ	δ r	5%			6%			8%		
			1.5%	2.5%	3.5%	1.5%	2.5%	3.5%	1.5%	2.5%	3.5%
23.5%	5		0.164	-0.102	-0.369	0.105	-0.153	-0.411	0.010	-0.232	-0.475
23.5%	7		-0.005	-0.231	-0.457	-0.039	-0.260	-0.481	-0.094	-0.305	-0.517
23.5%	9		-0.076	-0.283	-0.490	-0.100	-0.303	-0.506	-0.137	-0.334	-0.531
30.8%	5		0.425	0.105	-0.216	0.327	0.021	-0.286	0.172	-0.112	-0.395
30.8%	7		0.121	-0.136	-0.392	0.068	-0.181	-0.429	-0.016	-0.251	-0.486
30.8%	9		0.002	-0.226	-0.454	-0.033	-0.256	-0.478	-0.089	-0.302	-0.515
36.1%	5		0.681	0.313	-0.055	0.546	0.196	-0.154	0.331	0.012	-0.308
36.1%	7		0.236	-0.046	-0.328	0.166	-0.106	-0.378	0.055	-0.200	-0.454
36.1%	9		0.070	-0.175	-0.419	0.025	-0.213	-0.451	-0.048	-0.274	-0.500

Source: authors' calculation

Several patterns can be identified from the above results.

First, a higher interest rate undoubtedly decreases S^* . This is intuitively obvious as higher interest rate means higher payment burden and lower net savings from the loans. If the loans were contracted at a 2.5% of interest rate or higher, then nearly all S^*S^* turn to negative, unless ICOR falls to 5 and the savings rate is 30% GDP or higher. An interest rate of 1.5% is likely to produce favorable long-term outcomes, but as long as all three of the following are not concurrent: (i) the depreciation rate is too high, (ii) the ICOR coefficient is too high, (iii) savings rate is too low.

Second, the faster the capital stock depreciates, the smaller the value of S^* . The depreciation rate could affect S^* in two competing ways. First, lower δ increases capital formation, output, and net savings each year S_n . Second, lower δ increases the multiplier term, and in the case when S_n is negative, it will exaggerate this negative effect. As Table 2 suggests, the former effect seems to offset the latter. When the depreciation rate climbs to 8%, there is no possible way to gain from foreign loans if the saving rate is less than 30%.

Third, when the savings rate (s) rises, S^* rises dramatically, especially at a lower level of interest rate and ICOR. For example, if interest rate falls to only 1.5% and the ICOR is just 5, net aggregate savings $S^* = 0.164$ when the savings rate is 23.5%, but increases to 0.425 if the savings rate rises to 30.8% and even 0.681 if the savings rate reaches 36.1%.

Fourth, the reverse is true for the ICOR, as ICOR increases, S^* falls. More efficient utilization of

capital stock, or lower value of ICOR, leads to higher output, and total net savings from a loan can well compensate for its payments. If the SOE's ICOR is really as high as 9, then the net aggregate savings S^* will almost be negative, unless the savings rate can be leveled up to 36.1%, and the depreciation and interest rate are all kept low. Combined with the fact that the depreciation rate is actually higher than 7%/year, the results are alarming as all $S^* < 0$, no matter how high the savings rate or how low the interest rate.

So even in an ideal situation with no waste, no loss, and all the funds are used for the right purpose, a foreign loan is only appealed under very strict conditions.

In the case that there are debt swaps, no waste, and loss

Now let the effect of debt swap and fund drain comes into play. Table 3 shows simulation results when $\alpha = 0.8$. All other variables are held constant as in Table 2 for comparison.

A clear trend is observed when α falls, the net aggregate savings resulting from a foreign loan also declines. This result is well expected since the more serious the debt swap and fund drain issue is (or the lower the value of α), the less a foreign loan could contribute to the capital stock, and the less output could be produced and saved for reinvestment. The total effect is the fall in S^* . Our main interest however is not the trend itself, but the result this trend induces. As S^* decreases, in many cases, it means that the neutral threshold could be broken. It also means that in order to benefit from a foreign loan, stricter conditions must be fulfilled.

Now if the savings rate is just 23.5%, S^* is negative for all scenarios. Even when the savings rate rises to 30.8%, mostly all of S^* are still negative, and there will be only one positive case where all the best conditions could be met, i.e. the interest rate is just 1.5%, the depreciation rate is lower than 6%. In the extreme case where all the variables are at the upper bound of their range (i.e. the variables take their maximum possible value), i.e. $\sigma = 9$, $\delta = 8\%$, and $r = 3.5\%$, the net aggregate savings will always be less than zero, the investment from a foreign loan will not bring about a positive result in terms of net savings for the economy.

Table 3. Simulation result for $g = 3, h = 5, t = 20, \alpha = 0.8$

s	σ	δ r	5%			6%			8%		
			1.5%	2.5%	3.5%	1.5%	2.5%	3.5%	1.5%	2.5%	3.5%
23.5%	5		-0.036	-0.303	-0.569	-0.076	-0.334	-0.591	-0.138	-0.381	-0.624
23.5%	7		-0.130	-0.356	-0.582	-0.152	-0.373	-0.594	-0.188	-0.399	-0.611
23.5%	9		-0.166	-0.373	-0.580	-0.181	-0.385	-0.588	-0.206	-0.402	-0.599
30.8%	5		0.118	-0.202	-0.523	0.052	-0.255	-0.562	-0.053	-0.336	-0.620
30.8%	7		-0.061	-0.317	-0.574	-0.096	-0.345	-0.594	-0.151	-0.387	-0.622
30.8%	9		-0.126	-0.354	-0.582	-0.149	-0.372	-0.594	-0.186	-0.399	-0.612
36.1%	5		0.277	-0.091	-0.459	0.184	-0.166	-0.516	0.038	-0.281	-0.601
36.1%	7		0.005	-0.277	-0.559	-0.042	-0.314	-0.586	-0.116	-0.370	-0.625
36.1%	9		-0.089	-0.334	-0.579	-0.120	-0.357	-0.595	-0.167	-0.393	-0.619

Source: authors' calculation

Changing the gestation lag

So far, the gestation lag (g) has been ignored. g was previously assigned an arbitrary number of 3 years and was assumed to be smaller than the payment lag (h). It is however no guarantee that the gestation lag is smaller than the payment lag, nor should be so. Obviously from the recipient countries' standpoint, they want to finish the construction phases and start producing some output before paying back the loans. Unfortunately, in reality, they may not be allowed, or not capable to win that privilege.

For commensurable purposes, h is kept unchanged at $h = 5$ years so the terminal year will be the same as that in Table 2 and Table 3. Simulation results are reported in Table 4 where g is taken as $g = h$ and $\alpha = 0.8$.

The effect of a small increase in g on the net aggregate savings seems to be no small. At first glance, it is easily recognized that S^* is decreasing. This result is well anticipated. A delay in production means some outputs are lost, and while all the interest and principal payments remain the same, it also means that the recipient country will benefit less from the loan with a lower S^* . The more important feature is that S^* decreases fast enough to make the results in Table 4 similar to those where the α coefficient falls to 0.7. The difference is only in the magnitude of S^* , not the signs.

And if we take one step further to let $g = 7$ (though this number is highly hypothetical), the simulation results are just desperate (*results not reported here¹*). Net aggregate savings S^* is highly negative in all scenarios, amounting to more than - 0.5 if the depreciation rate is higher than 6%. This means that, with a foreign loan, net aggregate savings accumulated is negative up to about half of the loan. If we convert this to monetary terms, a \$100 billion loan finally results in a negative net aggregate savings of up to \$50 billion.

Table 4. Simulation result for $g = 5, h = 5, t = 20, \alpha = 0.8$

		δ	5%			6%			8%		
s	σ	r	1.5%	2.5%	3.5%	1.5%	2.5%	3.5%	1.5%	2.5%	3.5%
23.5%	5		-0.107	-0.374	-0.640	-0.134	-0.391	-0.649	-0.176	-0.419	-0.661
23.5%	7		-0.168	-0.394	-0.620	-0.183	-0.404	-0.625	-0.208	-0.419	-0.631
23.5%	9		-0.191	-0.399	-0.606	-0.202	-0.405	-0.609	-0.219	-0.416	-0.612
30.8%	5		-0.006	-0.327	-0.647	-0.050	-0.357	-0.664	-0.120	-0.404	-0.687
30.8%	7		-0.123	-0.380	-0.636	-0.147	-0.396	-0.644	-0.185	-0.420	-0.655
30.8%	9		-0.166	-0.394	-0.622	-0.181	-0.404	-0.626	-0.207	-0.420	-0.633
36.1%	5		0.096	-0.272	-0.640	0.036	-0.314	-0.664	-0.060	-0.380	-0.699
36.1%	7		-0.080	-0.362	-0.644	-0.111	-0.383	-0.655	-0.161	-0.416	-0.670
36.1%	9		-0.142	-0.386	-0.631	-0.162	-0.400	-0.638	-0.194	-0.420	-0.646

Source: authors' calculation

Changing the duration of the loan

Next, we analyze the change in net aggregate savings S^* as the loan duration changes.

From section 3, the loan duration ranges from 20 to 40 years. We keep the gestation lag and the payment lag the same as in the baseline case at $g = 3$ and $h = 5$, while keeping the savings rate and interest rate fixed at a level close to the latest figures of Vietnam with $s = 36.1\%$, $r = 2.5\%$. It should be reminded that the high savings rate recently is quite abnormal considering the historical rate has been only around 30%, and it may be difficult to sustain that level in the near future in the face of the risk of recession spreading from world major economies. The results are shown in Table 5.

Two opposite trends could be observed. If debt swaps and fund drain exist (*i.e.* $\alpha < 1$), the longer the duration of the loan, surprisingly, the lower the net aggregate savings. A similar situation can be observed if the depreciation rate δ is higher than 5%. This is quite contrary to the conventional wisdom that extending the repayment time would help the recipient country to repay less principal in each period, which in turn lead to higher net savings each year, and higher net cumulative savings. Only when $\delta = 5\%$ and there is no debt swaps and fund drain ($\alpha = 1$), does extending the loan duration benefit the borrower. More specifically, when the duration is increased from 20 to 30, and 40 years, S^* increases rapidly from 0.212 to 0.330 and 0.402.

¹ The simulation results are available upon request.

Table 5. Simulation result for $g = 3, h = 5, s = 36.1\%, r = 2.5\%$

α	σ	δ t	5%			6%			8%		
			20	30	40	20	30	40	20	30	40
1.0	5		0.212	0.330	0.402	0.126	0.104	-0.018	-0.023	-0.210	-0.515
1.0	7		-0.080	-0.205	-0.416	-0.130	-0.302	-0.557	-0.211	-0.436	-0.719
1.0	9		-0.192	-0.358	-0.588	-0.226	-0.415	-0.659	-0.280	-0.492	-0.738
0.9	5		0.010	-0.002	-0.091	-0.055	-0.176	-0.411	-0.169	-0.416	-0.774
0.9	7		-0.196	-0.374	-0.639	-0.234	-0.447	-0.740	-0.297	-0.545	-0.847
0.9	9		-0.272	-0.469	-0.726	-0.298	-0.510	-0.774	-0.339	-0.565	-0.821
0.8	5		-0.192	-0.333	-0.583	-0.236	-0.457	-0.804	-0.315	-0.621	-1.034
0.8	7		-0.311	-0.543	-0.863	-0.338	-0.592	-0.923	-0.382	-0.654	-0.974
0.8	9		-0.352	-0.579	-0.865	-0.370	-0.606	-0.889	-0.399	-0.638	-0.903

Source: authors' calculation

5. DISCUSSION, POLICY IMPLICATIONS AND LIMITATIONS

This study analyzes the long-term economic criteria for foreign loans of Vietnam. Based on our self-built models and scenarios simulation practice, our results show that a foreign loan will only be beneficial for the recipient country if the domestic economic conditions must be in great shape: the savings rate must be high; while the depreciation rate, the ICOR, the interest rate, the gestation lag must be low; also the phenomenon of debt swaps and fund drain are is minor or even does not exist.

These results may surprise many in the sense that the common expectations stress the importance and irreplaceability of foreign loans, at least at some certain stages of development. However, this is not a surprising result compared to previous studies. Sakurai (2020) shows that foreign loans have an unclear impact on Vietnam's economic growth, and loans from Japan in particular have no obvious positive impact. The reason pointed out by the author is that the loans often used for infrastructure construction which do not directly affect output generation and labor productivity improvement. Doucouliagos & Paldam (2006) and Rajan & Subramanian (2008) also concludes that the positive impact of external debt on investment, if any, is extremely small, but its negative impact on domestic savings is quite pervasive, even under the conditions of a better policy environment, more favorable geographical location, or whatever the types of the loan is, non-refundable aid or concessional loan.

Several policy implications can be drawn from our findings as follows:

First, savings should be encouraged in the long run. This recommendation is directly related to our results in particular, and is also an essential policy objective for every economy in general. Savings play an important role in each economy, both at the household level and at the national level. For many countries, savings act as an important driver of long-term prosperity and stability of their economies by initiating economic growth, stabilizing financial markets, shrinking foreign debt, and giving countries more resources to invest in other areas (Oxford Economics, 2014).

Second, the depreciation rate should be reduced. Vietnam's depreciation rate is quite high compared to other developing countries. To reduce the depreciation rate, Vietnam needs to tighten management in the construction phase to ensure higher quality of works, as well as tighten management in the procurement of machinery, equipment and materials to ensure longer asset life, and lastly Vietnam should have an investment strategy for intangible assets such as software, licenses, copyrights, and trademarks.

Third, Vietnam should enhance capital efficiency and reduce ICOR. To improve investment efficiency, especially public investment, the Government has had many solutions such as promulgating the Law on

Public Investment, the Law on State Budget, the Law on Public Debt Management and many other in recent years. The Government should also continue to strengthen the management of public investment so that investment is not scattered over many small projects.

Fourth, refinancing or debt swaps should be limited. The government should clearly define the purpose of using all the loans.

Fifth, waste and loss during the investment process must be counterd. In order to mitigate this situation, it is necessary to tighten discipline in the state apparatus and sanctions have to be strengthened to incentivize the responsibilities of those participating in public investment activities.

Sixth, the gestation lag should be reduced. The longer the gestation lag, the longer the investment time is, and the lower the profit of the project being invested.

Seventh, the Government must carefully consider the duration of the loans. If country's absorption capacity and capabilities are not good enough, prolonging the repayment period only exacerbate the total negative net savings.

Lastly, the national credit rating should be improved. The upgrade of credit rating will bring positive impacts by attracting foreign investment capital in the future. Upgrading credit ratings also helps borrowing countries to borrow at lower interest rates. Currently, Vietnam's sovereign credit rating is at Ba2 and has a stable outlook assessed by Moody's Investors Service

Despite countless efforts, our study still has some limitations. First, the assumption of constant economics at scale is quite obsolete and unreasonable. Second, a constant ICOR is also questionable. Assuming a constant ICOR over such a long time span means that the economy has no change in investment structure and capital efficiency. But in fact, this is very unlikely, there will be a discrepancy in ICOR from year to year. Third, the assumption that there are no other ties or obligations associated with the loans except for the repayment of principal and interest remains inadequate. Finally, detailed official reports on foreign loans are often not available to the public, therefore, it is difficult to ensure absolute reliability in our input data.

6. CONCLUDING REMARKS

These unpleasant outcomes poses serious challenges for borrowing country like Vietnam. While the interest rate and other loan terms may be excluded from consideration as they are generally uncontrollable from the recipient country perspective, the problem lies in Vietnam's absorption capacity. If only one or two capacity variables are not in preferable condition, from the simulation results one might expect that Vietnam can still manage to be in good positions with foreign loans. The harsh fact is, currently, Vietnam is weak on all fronts: the loans are directed to inefficient use by SOEs with high ICOR, the depreciation rate is too high, too much waste and loss, and the savings rate is still not stable. Under these severe conditions, we have evidence to state that in the long run, a foreign loan is economically harmful for Vietnam. Unless and until reactions are made to win back in some fronts, foreign loans may be one of the biggest misery tales for Vietnam's economy.

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STUDY ON THE IMPACT OF INFLATION ON THE BUSINESS PERFORMANCE OF LISTED STEEL ENTERPRISES IN VIETNAM

**Author: Tran Van Thuc¹, Nguyen Thu Trang, Duong Kieu Phuong, Mai Phuong Thao, Phan Linh Chi
Mentor: Nguyen Thanh Dat**

ABSTRACT: The business performance of an enterprise depends not only on the internal capacity of the enterprise but also on the many impacts of the macroeconomic environment. To earn profits, achieve better business performance, and stand firm in the market, economists and businesses must quickly approach and grasp the problems of the new economy in the excitement and fierce competition of the market. One of the most important macroeconomic factors is inflation. The study focused on analyzing the impact of inflation on the business performance of 9 listed steel companies in the period from 2016 to 2021. The research has clarified the general issues of inflation and business performance; the reality of the impact of inflation on the business performance of 9 enterprises in the industry; and finally offers solutions to improve the business performance of these enterprises in the context of inflation.

Keywords: the business performance; listed steel industry; the impact of inflation; solutions.

1. INTRODUCTION

In an active market economy and fierce competition to gain profits, achieve business performance and stand firm in the market, economists as well as businesses must quickly approach and grasp catch the problems of the new economy. Developing business activities as well as increasing business performance, in addition to the internal resources of enterprises, also depends greatly on the macroeconomic environment. One of the most important macroeconomic factors is inflation. Like some other countries in the world in recent years, Vietnam has had an explosive inflation rate with a high rate. Especially since the conflict between Russia and Ukraine has been going on since February 2022.

According to the results of interviews with experts at the company, there are many reasons for reducing the business performance of the enterprise, besides some weaknesses inside the company, external environmental factors also affect the business performance, especially the macroeconomic situation, including inflation.

The high inflation rate and instability in recent years, making the economy difficult, directly affecting the social life and income of workers, this affects the business activities of the economy. production and business of all enterprises in general and of the steel industry in particular.

The steel industry is directly affected in terms of consumption volume by many factors such as the pressure of raw material price fluctuations, inflation risks, the policy of controlling real estate credit, and high steel inventories. The main reason leading to the decline of domestic steel production comes from the high selling price of construction materials, causing construction works to tend to wait for the price to decrease. That reduces the need for construction significantly. At the same time, inflation also directly affects the production costs of domestic steel enterprises when 60-70% of raw materials depend on imports.

So how to deal with high inflation and stand firm in the economy requires managers to come up with specific and effective solutions, but to do that is not enough. must be easy for the company's leadership as well as for all businesses today.

¹ Academy of Finance.

Inflation that exists in the economy is inevitable. Limiting and curbing the effects of inflation is essential. Therefore, it is necessary to have researches to help businesses solve some of the difficulties encountered during the inflationary period.

2. THEORETICAL FRAMEWORK

2.1. General theory about inflation

2.1.1. Inflation

Inflation is the phenomenon of paper money flooding the circulation channels, surpassing the demand of goods circulation, leading to the devaluation of the currency and the redistribution of national income. (K.Marx, 1842)

Inflation is a condition in which there is general excess demand, i.e. the amount of money in the economy is too much to pursue a quantity of goods. limited.” And: “Inflation is always and everywhere a monetary phenomenon... and it can only occur when the quantity of money grows faster than output. (M. Friedman, 1968)

Core inflation occurs on the long-run growth trajectory of the economy provided that this trajectory is not affected by shocks and markets (commodities, money, labor) in the long-run equilibrium. (Eckstein, 1984)

2.1.2. Causes of inflation

Demand-pull inflation is inflation caused by an increase in aggregate demand (AD - Aggregate Demand), which exceeds the society's supply of goods, leading to upward pressure on prices.

Cost-push inflation is a price-raising pressure that results from an increase in the cost of production that exceeds the increase in labor productivity and reduces the society's supply of goods.

The quantity demanded of one good decreases while the quantity demanded of other goods increases, if the market has a monopoly and the price in the market increases but not decreases, then the good for which the quantity demanded decreases will remain. keep the same price. Meanwhile, the commodity for which the quantity demanded increases will increase in price, leading to an increase in the general price level in the market, causing inflation.

Structural inflation occurs when businesses are inefficient, but to ensure expected profits, businesses are forced to increase product costs.

The increase in exports causes an increase in the quantity of products for export activities, and at the same time, the supply of products for the domestic market decreases, leading to a lower total supply than the total demand. The imbalance between aggregate supply and aggregate demand is one of the causes of inflation.

When the price of imported goods and services increases, the consumption costs of domestic imported products also increase. This puts the general price level of other domestic products and services under pressure to increase prices, leading to inflation.

The Central Bank's supply of domestic currency to the market to buy foreign currency to keep the domestic currency from depreciating against the foreign currency will increase the amount of domestic currency circulating in the market, which leads to inflation.

2.2. General theory of the business performance of enterprises.

2.2.1. The business performance of the enterprise

Production efficiency occurs when society cannot increase the output of one set of goods without reducing the output of another. efficient economy lies above its production possibilities limit. (P. Samerelson and W. Nordhaus, 1948)

Efficiency means using the economy's resources most effectively to satisfy human needs and desires. (Paul A. Samuelson, 1948)

2.2.2. Business performance metric

Return On Sales (ROS) is a measure of how efficiently a company turns sales into profits

Profit before tax on business capital is a measure that looks at a company's profits before the company has to pay income tax on business capital.

Return on Assets (ROA) refers to a financial ratio that indicates how profitable a company is in relation to its total assets.

Return on Equity (ROE) is the measure of a company's net income divided by its shareholders' equity.

Basic Earning Power ratio (BEP) is Earnings Before Interest and Taxes (EBIT) divided by Total Assets.

Earnings Per Share (EPS) is a company's net profit divided by the number of common shares it has outstanding.

3. RESEARCH METHOD

3.1. Qualitative research

3.1.1. Impact of inflation on the economy

Inflation increased

Rising inflation causes the nominal interest rate to rise. High inflation also adversely affects the international balance of payments and competitiveness in the international arena. When inflation increases, but nominal income does not change, the real income of workers decreases. When inflation increases, the value of money decreases, and borrowers will benefit from borrowing capital to speculate for profit. High inflation makes the government benefit from income taxes levied on people, but foreign debts will become worse.

Low inflation

Low inflation is an important foundation to confirm macroeconomic stability in a more sustainable way for the economy. When inflation is low, nominal GDP is also lower. At that time, a series of important macroeconomic indicators of the economy, such as the ratio of public debt/GDP, overspending/GDP, etc., may not achieve the operating target but will be pushed up to a higher level. Low inflation that persists for a while develops only a few aspects that can counter deflation. Low inflation has led to a slowdown in purchasing power, economic activity has also stalled, and consumers have postponed spending to wait for a deeper drop in prices.

3.1.2. Impact of inflation on the business performance of enterprises

Low inflation

Low inflation causes export production to stagnate. The low inflation rate makes the money supply in the economy small, which means that the lending capital of banks is narrowed. Meanwhile, it causes real interest rates to rise, making it difficult for export-producing enterprises to access loans, thus making it difficult to expand production investment.

Inertial inflation

Inertial inflation is a catalyst for economic growth for economic activities to take place effectively. When an economy has inertial inflation, export-producing enterprises have many opportunities to expand production investment, so export turnover increases. The above analysis also shows that inertial inflation gives export products competitive advantages over trading partners. Therefore, it can be affirmed that inertial inflation increases the business performance of enterprises.

High inflation

The increase in the cost of raw materials: When the price of raw materials increases, many businesses raise prices to offset the increased costs.

Supply chain disruption: When supply chains are disrupted, businesses cannot get enough inputs when needed, and the lack of supply causes prices to rise.

Increase inventory cost: Rising rents, utilities, and employee wages increase the overall cost of a business.

The reduction in purchasing power of consumers: As prices rise, people shop less, and the overall effect of a decrease in consumer demand spreads throughout the economy.

Higher interest rates: For businesses, higher interest rates lead to higher costs of working capital and investing in the business's future.

Investment is hindered: As the cost of borrowing increases in times of inflation, it can sometimes become more difficult to invest in the future of a business, especially if high inflation leads to a recession.

Forex effect: Inflation varies from country to country, countries with higher inflation will see the value of their currencies fall relative to the currencies of countries with lower inflation (excluding other factors).

Unemployment rate: When the unemployment rate decreases, people's wages are higher, which causes spending to increase. Because of that, commodity prices and inflation also increased.

Increased prices of goods and services: Many businesses are forced to raise prices to offset increased costs.

3.2. Quantitative research

3.2.1. Research models

$ROE_{it} = \alpha + f(\text{Variable related to corporate financial characteristics}) + f(\text{Variable related to inflation}) + f(\text{Variable related to monetary policy of the State}) + \epsilon_{it}$

3.2.2. Regression result

The model results show that the variables gp ; TG ; $PPIs$; DWC ; MS ; Cg has a negative correlation - negative volatility compared to ROE. Remaining variables D/E ; Htx ; $LogTS$ have a positive correlation - volatility in the same direction compared to ROE. The variables gp , TG , D/E , DWC , $LogTS$, and Htx are statistically significantly correlated with the ROE variable at a 5% significance level; PPI , MS , and Cg variables are not meaningful with the ROE variable.

4. RESULTS AND DISCUSSION

4.1. General assessment of the impact of inflation on the business performance of listed steel industry enterprises from 2016 to 2021

4.1.1. Positive

Most businesses have strong growth in assets such as Hoa Phat, Pomina, etc.

In recent years, Vietnam's steel industry has been transformed. When the demand for steel shows signs of increasing, Vietnamese enterprises have conditions to expand their production, business and investment activities in depth in projects to meet the highest economic development of the country. Therefore, a number of large-scale steel production projects with modern equipment, in-depth and self-contained investment have been formed and put into operation, attracting attention from other key industries such as mechanical engineering, construction, defense,.... Vietnam's steel manufacturing enterprises, which emerging is Hoa Phat Group, are very "expensive" when continuously investing tens of thousands of billions of dong to build large iron and steel production complexes, develop iron and steel production complexes. quality steel products, which are not only favored by domestic and international markets but also help Vietnam become more self-reliant in steel products, replacing imported goods. In the 2000s, Vietnam's steel industry was still very young, with outdated technology, small and scattered, but so far, it has made great strides in terms of scale, output and technology equivalent to world-class standards. Enterprises have been able to

independently produce hot-rolled coils, high-quality specialized steels, wire-drawn steels, cored steels for welding rods, prestressed steels, etc. to replace imported goods. This shows that the superiority of technology and equipment line system of domestic steel enterprises is now more advanced, catching up with the world level, helping to optimize added value for enterprises. , at the same time well control environmental issues.

Total assets tend to increase thanks to exploitation and investment in facilities, goods quality, thereby improving productivity, helping most businesses have development prospects as well as increasing competitiveness in the market. The general market as well as the listed steel industry in particular. Hoa Phat Group invested VND 52,000 billion to build Hoa Phat iron and steel production complex in Dung Quat Economic Zone (Quang Ngai) applying closed blast furnace technology, with modern production equipment. This is an important project of strategic significance, helping the company secure its position as a leading steel producer not only in Vietnam but also in Southeast Asia. Hoa Sen Group invests in a new production line at Hoa Sen Binh Dinh Steel Pipe Factory. With steel pipes, Hoa Sen is a direct competitor of Hoa Phat Steel with the second largest market share and increasing over the years.

The company's operations and business results are quite sensitive to changes in domestic and foreign markets. Although the transformation to adapt to changes has not been as expected, it has really demonstrated the development as well as the efforts of the entire listed steel industry. The majority of enterprises' business results tend to develop in a positive direction, increasing production and export; especially was able to meet a large number of steel needs of some world powers such as the US, China... Some enterprises have established a strong foothold in the market, which is a stepping stone for small and medium enterprises when the capital structure and asset structure of these enterprises have not yet met the general development needs.

4.1.2. Limitations

In general, the average business capital scale of listed steel enterprises has increased, but sustainability is not high. Investment speed along with the increase in fixed assets is still quite slow, not making a strong breakthrough. Many businesses in the industry choose short-term loans to invest in long-term assets, which not only unbalances the financial resources, but also the payment pressure on enterprises is huge, especially in the long term. context when the domestic steel market is having excess production capacity. Most businesses focus on processing and rolling steel, so the scale of long-term asset investment is only limited.

Domestic enterprises often focus on steel processing and rolling, so they have to use billets and scrap steel imported from abroad. But the price of raw materials often fluctuates abnormally, causing enterprises to spend a lot of money and not be proactive in production. The production costs of steel enterprises account for a very large proportion, mainly the cost of raw materials (iron ore, coke) and electricity because the enterprises mainly use old technology, and the equipment line is still old. outdated, consuming a lot of materials and low productivity. Enterprises in the industry are still witnessing a decrease in domestic and foreign revenue when they have not taken any really reasonable steps.

Although sensitive to fluctuations, the transition to market development of enterprises is still relatively slow and even has a negative direction when some enterprises have unreal business results. expectation fulfillment.

4.1.3. Causes

Listed steel companies mainly choose to use loans to meet growth goals, not due to internal capital. The mobilized loan capital of enterprises has not really met the production and asset investment needs as expected, besides, the current debt ratio of many enterprises is still quite high.

The exchange rate has been somewhat stable in the period 2016 - 2021 but is still at a high level, causing many listed steel companies to suffer quite heavy impacts, causing many disadvantages for import and export businesses. steel abroad. Along with unpredictable developments, fluctuations in the production and sale stages are also an important requirement to circulate when many listed steel companies have not

promoted sales activities compared to their competitors. This has caused a sizable drop in revenue. In addition, the demand for steel in the market is very small compared to the total supply of the entire listed steel industry at present.

The domestic steel market so far has been mainly consumed by real estate projects and public investment. However, the instability of the real estate market may also reduce the domestic demand for steel products. With more than 90% of domestic steel consumption coming from the construction industry, the construction market is struggling to reduce steel demand. According to VSA, steel price has continuously increased over time, mainly because the import price of input materials for steel products such as coal, iron ore, scrap steel, hot rolled coil... is still increasing. Steel enterprises are still heavily dependent on input materials. The selling price of finished steel increased slower than the rate of input materials, so the business performance of construction steel companies was still low. The “fever” of steel prices comes from the main reason being the sudden increase in the price of imported input materials such as iron ore, scrap steel, steel billet, etc. In addition to the high price of input materials, in a recent report, the General Statistics Office said that steel prices have been affected by China’s scrap import policy, affecting the global scrap market. It is forecasted that iron and steel prices will continue to increase in the coming time, when the supply of iron ore is tight, while demand still tends to increase. Contrary to the increase in input material prices, domestic steel manufacturers are facing a series of difficulties when global and domestic construction demand decreases, input material prices fall. increase and oversupply. A slowing Chinese economy could negatively affect steel demand in the world’s largest manufacturing companies and have an indirect impact on domestic steel prices in Vietnam.

While the steel industry is facing difficulties due to excess supply, fierce competition from imported steel, etc., many foreign steel enterprises are tending to move, investing in steel factories in Vietnam makes it even more difficult. More and more difficulties piled up, the risk of being adversely affected by the steel industry is becoming more and more obvious. Recently, many steel exports from Vietnam have been “blocked” by the imposition of anti-dumping and anti-subsidy taxes in many countries. Along with fierce competitive pressure against imported iron and steel products when the majority of imported steel in the country comes from China, it has caused fierce competition with domestic products, exported Vietnamese iron and steel products. are also facing challenges from trade remedies from export markets.

Inflation in recent years has always been a hot topic discussed by every business, not only the listed steel industry. With the erratic fluctuations as well as the control of inflation in Vietnam in a period that is still quite weak, especially when there is still a period of high domestic inflation, high raw material prices also lead to the high price of raw materials. loss of some businesses.

4.2. Solutions

4.2.1. Business

Increase product price

As the cost of other goods increases, the price of the firm’s product must also increase. Look at competitors; if their prices are higher than their own, the price increase may not drive customers away, especially for essentials. It is easier to accept a gradual price increase over a long period of time rather than a sudden increase, which can make it easier for consumers to adjust, so it is important to plan ahead for price increases.

Restructuring the workforce

As costs rise, many businesses are forced to lay off employees, reduce full-time employees to part-timers, and pay more for remaining employees. This helps increase workforce productivity while building employee loyalty and upskilling the workforce. Promotional incentives can keep your workforce competitive

and forego the ramp-up time to train new employees to reach their peak. Likewise, a prepared business may see wages rising and be prepared to take action while competitors try to cut some short-term costs - something that other businesses cannot afford to lose, can be used to its advantage to attract the best workers.

Re-evaluate the product list

Just as the goal of workforce restructuring is higher labor productivity, the goal of product restructuring is higher profit margin efficiency. The goal here is to identify low-margin products that the business can afford so that it can focus on higher-margin items. If rising costs cause a product to barely break even, consider removing that product from the portfolio and focusing on items that can more easily handle the cost increase. Productivity and efficiency are the factors that help an economy emerge stronger after inflation, and the same goes for individual businesses in the economy.

Borrow money earlier with a fixed interest rate

As banks raise interest rates to offset inflation, consider converting adjustable-rate loans into fixed-rate loans. As money depreciates, fixed-rate loans will cost less than it does now over time, but the cost of adjustable-rate loans can increase with inflation. If a business has plans to expand in the near future, it's a good idea to borrow money early to support those plans during the inflation cycle, especially if high inflation is anticipated for an extended period of time. The cost of that loan should decrease over time, giving the business a potential competitive advantage.

Diversify the supply

Having a diverse and flexible supply chain is always a good business practice. Relying on only one supplier can be problematic when prices rise or if a supplier has problems or delays. Delivery delays increased, creating shortages of critical components and skyrocketing prices. Supply chain diversification is the key to building a sustainable supply chain that is highly adaptable to major fluctuations in the world and regional economy, ensuring stable production activities, participating effectively in the global value chain. And when inflation occurs, businesses with many long-term relationships with suppliers will be easier to negotiate.

Limit just-in-time supply chain

While well-proven in times of stability, this supply chain strategy caused trouble for many manufacturing companies when their supply chains were disrupted in early 2020. Keeping inventories low “just enough” and only replenishing when necessary can cause problems when supply and demand begin to fluctuate under the impact of inflation. Having more stock than is theoretically necessary can help businesses prepare for increased demand and delays caused by supply issues. During times of rising inflation, it is beneficial for businesses to stock up early if they can afford to do so because the cost of that stock will continue to rise over time. This is similar to the thinking that drives consumers to stock up on certain key essentials when anticipating a prolonged period of inflation.

Reduce overall costs

Many businesses use periods of inflation as an opportunity to reevaluate all of their spendings. Enterprises must cut unnecessary investment costs and improve the efficiency of budget use. To implement this solution, businesses, especially state-owned enterprises, need to review investment items to ensure that the investment is not spread out, in accordance with their core competencies and advantages. its competition; promote private-public cooperation in investment to effectively control investment items, especially in the fields of infrastructure construction; strengthen debt recovery, reduce the amount of capital appropriated by customers; perform well financial management, attract and seek capital sources for production and business activities.

Enterprises focus on developing industrial and agricultural production, strengthening and strategically investing in science and technology, research and development, increasing value content, reducing the content of raw materials, and labor, increase the efficiency of using non-renewable input sources such as petrol, electricity, water...; enterprises need to actively research domestic and international markets to develop business strategies; actively exploit the market; improve risk control capacity...

Thorough solutions for saving in production and consumption such as saving electricity and energy, investing in low-energy consuming technologies, researching and using cheap alternative raw materials; accepting to reduce interest rates to stabilize prices, dragging selling prices lower than the rate of price increase...

For the field of real estate business: businesses review real estate investment items, avoid rampantly; coordinate with localities to speed up the site clearance progress; Limit intermediaries.

4.2.2. Government

Inflation or consumer price index is something that businesses have little to do with, because this is not under their control. In some cases, businesses have to sacrifice profits to keep prices stable. Therefore, it is important to control inflation and that depends a lot on the Government's policies, be it monetary policy, fiscal policy, or market regulation policies. transparent way.

Further, improve the enforcement efficiency of the government apparatus at all levels, strengthen market management, and control the observance of the State law on prices.

Ensuring the balance between supply and demand for goods, boosting exports, and reducing the trade deficit. It is necessary to reduce import tax rates on a number of items, stabilize exchange rates, reduce lending interest rates, prioritize capital creation for export activities, and prevent smuggling and trade fraud; have a national reserve strategy for a number of essential commodities, actively control epidemics in agriculture, support small and medium-sized enterprises in replacing energy-consuming technological equipment, etc.

Continue to have solutions to reduce costs for businesses, enhance access to support packages of the State; improve the efficiency of implementing policies to support recovery after the COVID-19 pandemic for businesses; It is necessary to have timely solutions to support a number of industries that are recovering strongly, such as tourism and services, which are currently facing difficulties in terms of human shortage.

5. CONCLUSION

Inflation is an economic phenomenon associated with the existence of market-based economies. Inflation has a profound impact on the operation of enterprises, especially can cause a decrease in business performance as well as an unnecessary increase in risks, creating a burden for many businesses. Listed steel companies are also not out of the above trend when most of the companies in the industry have had a decrease in revenue, profit, and profitability ratio as well as the potential risk of insolvency in recent years. threatening the existence and development of enterprises. That is the reason that requires enterprises to review their operations, understand their strengths and weaknesses, and take measures to improve their business performance to suit actual conditions. that businesses are facing.

The purpose of the study is to analyze the current situation of business performance under the impact of inflation, thereby offering solutions to improve the business results of listed steel enterprises in Vietnam. The study uses a combination of qualitative research methods such as interpretation, induction, analysis, synthesis, and comparison to reflect the current situation of business results of enterprises in the steel industry listed on the market. The quantitative analysis method by linear regression model in the article has clearly highlighted the factors affecting the business performance of listed steel companies. The research has deeply analyzed the business performance of listed steel companies in Vietnam in the period 2016 - 2021 and obtained some results as follows:

First, the study has systematized in detail the general theory of business performance of enterprises, about inflation, found out the state of affairs of recent business performance of enterprises from then go into research, objectively evaluate the effectiveness of that operation. The study has built a complete and comprehensive system of indicators for analyzing the business performance of enterprises.

Second, from the above findings, the article has presented some experiences in dealing with inflation in the US, Japan and China, thereby drawing lessons for Vietnam.

Third, the study has surveyed, analyzed financial statements and information related to 09 listed steel enterprises in Vietnam to show a complete picture of the business performance of these enterprises. Listed steel industry from 2016 to 2021. Analytical results have shown that the performance of listed steel companies in Vietnam still has many shortcomings, reflected in the main point: the degree of financial autonomy; unsustainable investment strategy; business performance decreased; profitability and solvency are still unstable; debt ratio is still increasing significantly over the years of analysis. The research has pointed out the factors that affect the performance of enterprises including inflation, debt coefficient, producer price index, etc. while factors can affect the bankruptcy risk of enterprises. financial leverage factor.

Fourth, on the basis of analyzing the business activities of enterprises, the study has proposed groups of solutions to improve the performance of enterprises in the steel industry, including Solutions for management and use of resources property; Capital mobilization solutions; Solutions for managing steel production and business costs...

Fifth, to come up with solutions that can be put into practice, the thesis has proposed many policy recommendations to the Government, ministries, departments, branches and management agencies to create favorable conditions for business activities. of enterprises. We can completely wait with the participation of the whole political system, the solutions mentioned in the thesis will have the conditions to apply and have practical results, contributing to improving the business performance of enterprises. listed steel industry in Vietnam.

With the research results achieved, the study has contributed more evidence, supplementing the research on the company's performance. The study will have practical significance for steel enterprises in being more fully aware of the business performance of enterprises, besides contributing to improving business performance and helping them to improve their business performance. Long-term, stable businesses. Although the picture of the listed steel industry has not really met the needs of investors, it still has not really dared to challenge inflation and other factors affecting the business performance of enterprises. Stemming from the actual situation, due to the small number of listed steel companies in Vietnam, due to limited information and data sources, this study only focuses on assessing the impact of inflation on the business performance of the whole steel industry listed on the market. The above limitations will be the basis of suggestions for future studies.

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JAPAN'S GREEN PUBLIC PROCUREMENT EXPERIENCE AND LESSONS FOR VIETNAM

Authors: Cu Hoang Lam Vu¹, Vu Anh Quan¹
Mentor: PhD. Nguyen Anh Quang¹

ABSTRACT: *This research concentrated on the experience of green public procurement activities in Japan and precious lessons that Vietnam could learn from. Technology and industrial advancement have greatly contributed to the economic growth of both countries. However, it also causes a lot of environmental issues and pollution. Japan has put a series of green-public-procurement measures so as to reduce detrimental environmental impacts and encourage sustainable development. The research finds out the policies, regulations and mechanisms that Japan had set up to promote green public procurement activities in public agencies and organizations. Besides, it also considers the specific steps that enterprises and individuals can take to participate in this model of green public procurement activities.*

Keywords: *experience, green public procurement activities, issues, measures*

1. INTRODUCTION

In this day and age, environmental pollution, climate change, resource depletion have become global challenges, thereby posing threats to the existence and development of mankind. Therefore, the governing bodies of different countries have been actively putting measures into practice with an aim of building a resilient, circular and environmentally-friendly economy. One of the most effective solutions is to promote green public procurement. Green public procurement is a process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a life-cycle basis while addressing equity principles for sustainable development, therefore benefiting societies and the environment across time and geographies. Having been aware of the positive values that green public procurement brought, Japan - a nation with limited resources and often influenced by climate change - has paid special attention and obtained numerous achievements in this field. For that reason, Japan is one of the most advanced countries in applying green public procurement, with a lot of experience that Vietnam can learn from.

2. LITERATURE REVIEW

2.1. Current situation and achievements of green public procurement activities in Japan

Currently, Japan is one of the most developed in green public procurement activities. According to the governmental report of Japan in 2020, the proportion of green technology products and services in public procurement activities of governmental units of Japan was 23,5%, increasing from 22,7% in 2019. Energy-saving products and services took the highest proportion of 14,6%, followed by products and services that reduce carbon emissions stood at 4,3%.

Governing bodies of Japan set a goal to increase the percentage of green technology products and services to 30% and 50% in 2030 and 2050 respectively. Besides, Japanese enterprises and organizations are actively participating in green public procurement with an aim to reduce negative effects on the environment and promote competitiveness between businesses.

Green technology products and services have been widely used in various fields in Japan, including the activities of local authorities, enterprises, organizations and families. Popular green technology products and services in Japan consist of energy-saving products and services; carbon-reduction products and

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services; products and services using renewable energy sources; products and services which reduce waste and smart city products and services. Green public procurement in Japan has created many environmental benefits, minimized expenses and provided new business chances for enterprises and organizations. The total value of green-public-procurement contracts of Japanese governmental entities in fiscal year 2019 was approximately 2,2 million dollars, which was 10% higher than the previous year. Green technology products and services are being widely used in construction projects in Japan, including office buildings, hotels, restaurants and other public buildings. Green technology products and services which are used in these buildings include energy-saving equipment, smart air-conditioning systems, energy-saving lighting systems and other devices. Enterprises in Japan are also actively participating in green public activities, with the goal of boosting the competitiveness between businesses and minimizing the impact on the environment. According to a report by the Japanese Ministry of Economy, Trade and Industry, over 60% of Japanese businesses carried out at least one green public procurement activity in 2018, and this proportion is expected to continue to rise in the future.

Apart from reducing the impact on the environment, green public procurement also helps businesses and organizations increase competitiveness and minimize costs. Green technology products and services usually have a high life expectancy, effects and lower price during operation, thereby reducing the costs for enterprises and promoting competitiveness in the market.

2.2 Several drawbacks still remain in Japan's green public procurement activities

Although green public procurement activities has numerous achievements, certain drawbacks and challenges still remain, including:

Firstly, High price: Although green technology products and services can help reduce costs during the operation process, their initial price is often high. Thus the cost rises when the governing bodies and businesses carry out green public procurement activities.

Secondly, The ability to make choices is limited: Due to the limited number of green technology products and services in the current market, especially products and services that meet the demand for strict requirements of environmental standards, local authorities and enterprises may find it hard to choose the suitable products and services

Third, Lack of homogeneity in standards: Environmental and social standards for green technology products and services are still not homogeneous globally, making it difficult for governmental units and businesses to determine appropriate standards of green public procurement activities.

Fourthly, Lack of government's motivation. Although Japanese governing bodies have launched many policies and regulations in order to support the green public procurement activities, there is still a lack of government's motivation to promote green public procurement activities to be conducted in a wider and more effective way.

Fifthly, Lack of awareness and knowledge: Many local authorities and enterprises still lack awareness and knowledge about green public procurement activities, so they cannot realize the advantages of this activity and lack of support in terms of information and training from governmental organizations and other support organizations.

Sixthly, difficulty in evaluating effectiveness: Although green technology products and services might bring numerous environmental and economic benefits, assessing the effectiveness of green public procurement activities is still a challenge, thus increasing the difficulty in making decisions on investment for these activities.

Seventhly, lack of relevant sides' participation: The implementation of green public procurement activities requires the involvement of relevant sides, including governing bodies, businesses, producers and consumers.. However, these relevant sides have not yet shown their active and efficient participation in the implementation of green public procurement activities

3. IMPLICATIONS

Japan's green public procurement activities is a typical example of how strict standards and regulations are applied to ensure that products and services are used in public activities that meet the criteria of environmental protection and minimize the impact on nature. Here are some lessons Vietnam can learn from the achievements and limitations of Japan's green public procurement activities:

Firstly, taking advantage of economic benefits to promote the advancement of green technology industries: The buying of green public products and services will fabricate demand for the supply and development of green technology industries, thereby helping strengthen the nation's competitiveness. Vietnam can also make use of its economic advantages and invest in green technology industries in order to flourish and reduce negative effects on the environment. This will help Vietnam save expenses and strengthen competitiveness in the international market.

Secondly, Boosting the management and surveillance system: The application of standards and regulations should be strictly conducted so as to ensure that products and services meet the environmental protection criteria and minimize the impact on nature. Vietnam ought to boost its management and surveillance system to ensure that the buying of green public products and services is fully and effectively carried out. This will make sure that products and services used in public activities meet the demand for environmental protection and reduce bad effects on nature.

Thirdly, Encourage education and raise awareness about the environment: It is extremely significant to raise awareness about the environment and the impact of production activities on nature. Vietnam needs to stimulate education and raise individuals' awareness about the environment, while promoting environmental education activities and developing training programs on green technology to fabricate awareness and motivation for people to participate in green public procurement activities.

Fourthly, the creation of policies and incentive mechanisms: The creation of policies and incentive mechanisms will help generate motivation for enterprises and organizations to participate in green public procurement activities. Vietnam also needs to build policies and incentive mechanisms for businesses and organizations in order to promote green public procurement activities, including tax policies and financial support.

Fifth, Seeking for international partners and cooperation: Looking for foreign partners and cooperation is extremely important to share experiences and learn from other countries about green public procurement activities. Vietnam may learn and apply experiences from developed nations like Japan in boosting green technology products and services, and simultaneously seek for international cooperation to encourage green public procurement activities and develop green technology products and services.

Conclusion: In general, selecting and drawing lessons from the success and limitations of green public procurement activities in Japan may help Vietnam develop green technology products and services, and simultaneously minimize the impact on the environment and the community. However, Vietnam ought to improve supervision and management of product quality, and at the same time seek for international cooperation and build policies and incentive mechanisms in order to promote green public procurement activities in our nation.

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HOW A COUNTRY LEVERAGING ITS SOFT POWER CAN REAP ECONOMIC BENEFITS: THE STUDY OF HALLYU-THE KOREAN WAVE, MUAYTHAI FESTIVAL AND THE CASE OF CHINA, AND WHAT VIET NAM CAN DO TO PROMOTE ITS SOFT POWER

Author: Nguyen Thi Thanh Hoai¹

ABSTRACT: As our world becomes increasingly interconnected and globalized, the importance of Soft Power in international affairs cannot be overstated. The use of Soft Power has become a critical component of foreign policy for nations around the world, as they seek to build positive relationships with other countries, promote their values and interests, and achieve their strategic objectives through non-coercive means. The overall objective of this study is to dig deeply into the essence of soft power, find out the economic motivations behind the soft power strategies of some typical nations in Asia, and, consequently, propose specific solutions which Viet Nam should implement to improve its soft power credentials, achieving economic goals.

Keywords: Soft Power, international relations

1. INTRODUCTION

When we look at nations around the world and their leadership through the lens of power, there are a variety of terms that can be applied to government policies and overall national influence: hard power, soft power, sticky power, old power, and new power. The concept of Soft Power was first introduced by Joseph Nye in 1990 who argued that there is an alternative method of foreign policy for states to win the support of others; rather than the traditional hard power method, which involves using military and economic means as the primary method of achieving its goals. Power is, not simply “the ability or right to control people or things”, but crucially it is also the possession of influence over others and the “ability to act or produce an effect”.

A country’s soft power comes primarily from three sources: its culture; its political values, such as democracy and human rights (when it upholds them); and its policies (when they are seen as legitimate because they are framed with an awareness of others’ interests). Actually, a government can influence others through the example of how it behaves at home (such as by protecting a free press and the right to protest), in international institutions (consulting others and fostering multilateralism), and through its foreign policy (such as by promoting development and human rights).

Soft power reflects a nation’s international impact through cultural, political, and ideological means. By leveraging its soft power, a nation can strengthen its foreign relations, enhance its international standing, and ultimately - reap economic benefits.

We are living in a world in which the definition of power is losing its emphasis on military force, and technology, education and economic growth are becoming more significant in international power. The strength of a nation in bringing others on-side can be said to rest broadly upon institutions, and rules of law. By proving the development of a nation’s domestic strength, a nation can further its influence and legitimize its role as an international player. Socializing accepted norms and values is also a large part of a nation’s effort to build its Soft Power reserve – a bank of influence created to affect the foreign policy of other nations. This is because nations, like humans, are more likely to trust those with whom they share familiar beliefs.

Apparently, soft power is not the only or even the most important source of power, because its effects tend to be slow and indirect. But to ignore or neglect it is a serious strategic and analytic mistake. *The Roman Empire’s power rested not only on its legions but also on the attraction of Roman culture and law.*

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Similarly, as a Norwegian analyst once described it, the American presence in Western Europe after World War II was “an empire by invitation.” No barrage of artillery brought down the Berlin Wall; it was removed by hammers and bulldozers wielded by people who had been touched by Western soft power. Therefore, studying soft power and drivers which enhance soft power will provide us with insights about how to utilize our advantages in terms of rich culture, traditions, tourist attractions, etc... to make a political and economic impact in the world.

2. THEORY

2.1: The origins and political progress of the concept of Soft Power and its driver factors.

To date, the concept of Soft Power has undergone a critical analysis by a wide range of academics, journalists, think tanks, politicians, diplomats, and consultancies. By virtue of that, there are differing definitions of Soft Power.

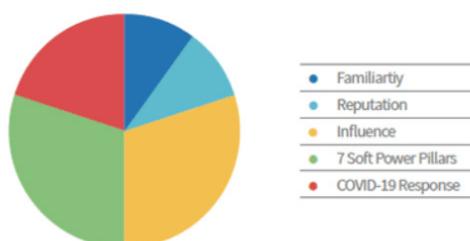
Soft power, first coined by Joseph Nye in the 1980s, is the ability to influence others through attraction rather than coercion or payment. In his 1990 book, *Bound to lead: the changing nature of American power*, Nye called soft power the co-optive power of the US. Culture and communications could direct the decisions and behaviour of others without the need for military force. Soft power means getting others to want what you want, using the intangible resources of culture, ideology, and institutional norms. Ideas and culture can set international standards in the same way that American software set standards for the world’s computers.

In the recent past, the concept of ‘soft power’ has faced criticism from a number of scholars and academicians. Niall Ferguson, in one of his critical examinations of the concept, said that soft power is too ‘soft’ to achieve national interests. Takeshi Matsuda, a professor at Stanford University, said that the use of soft power should be based on bilateral cultural exchange and not just on unilateral cultural imperialism. Janice Bially Mattern, in her article published in *Journal of International Studies*, suggested that the notion of power being ‘soft’ is delusional. She asserted the fact that any piece of art for cultural attractions, literature, films, music, and other forms of public and cultural diplomacy, has a ‘representational force’ behind it, which is responsible for the representation of the country. She has a realist perspective and has illustrated a number of other ideas where she questions the idea of soft power being really ‘soft’.

Today, soft power is being extensively used worldwide by a number of government administrations. Countries all around the world have been working on improving their soft power and outreach. Soft power today encompasses wider areas other than culture, political values, and foreign policy, like economic engagement,... investments in small and large-scale projects for infrastructure building, which can help create a positive view towards the nation that initiates these actions, hence, accumulating the intangible assets- soft power.

Soft Power is derived and exercised in a variety of ways. Normally, it is divided into 8 key pillars: Business & Trade, Governance, International Relations, Culture & Heritage, Media & Communication, Education & Science, People & Values, and Sustainable Future.

Global Soft Power Index Structure



2.2: Why soft power matters to a country

One of the key advantages of Soft Power is that it allows countries to achieve their goals through peaceful means. In contrast to hard power, which relies on military strength and coercion, Soft Power enables nations to win hearts and minds through dialogue, cultural exchange, and cooperation. This can be particularly effective in building relationships with countries that may be suspicious or hostile towards one's own nation. By demonstrating goodwill and promoting mutual interests, countries can build trust and create a more stable and peaceful international environment.

Another important aspect of Soft Power is its ability to foster economic development and prosperity. Nations can leverage Soft Power to attract foreign investment, enhance trade, promote tourism, and invite talent. All of those can help create jobs and boost economic growth in both partner countries. However, Soft Power is not without its challenges and limitations. It requires significant investments in education, culture, and diplomacy, and may not always yield immediate results.

In addition, Soft Power initiatives may be undermined by domestic policies or actions that are perceived as hypocritical or inconsistent with the values being promoted. Moreover, Soft Power may not be sufficient to address certain challenges, such as terrorism, which may require the use of hard power. Despite these challenges, the importance of Soft Power in international affairs cannot be ignored. In a world where power is increasingly defined by intangible factors such as reputation, influence, and values, Soft Power has become an essential tool for achieving strategic objectives and promoting international cooperation. It is up to policymakers, diplomats, and citizens alike to recognize the potential of Soft Power and to invest in the tools needed to wield it effectively. Only by embracing Soft Power can we build a more peaceful, prosperous, and just world for ourselves and future generations.

3. RESEARCH METHOD

The research methods include case studies and data analysis.

(1) Looking at typical soft power-boosting strategies successfully taken by Korea, Thailand, and China and the benefits of these strategies on economic growth

(2) Measuring particular factors that accelerate the process of bringing the soft power of a nation to the world.

4. RESULTS AND DISCUSSION

4.1. The Korean wave- Hallyu

K-pop is a global expression of soft power, fueled by the Hallyu, the "Korean wave," that has sought to expand its influence since the late 1990s. The success of K-pop is part of a Korean overhaul of the arts and entertainment sectors to explicitly project cultural power. In the same year that BTS reached the summit of the Billboard Hot 100, Bong Joon-ho's "Parasite" won the 2020 Oscar for best picture and K-pop girl groups Blackpink (reaching eighth) and Twice cracked the Billboard Global 100 for the first time.

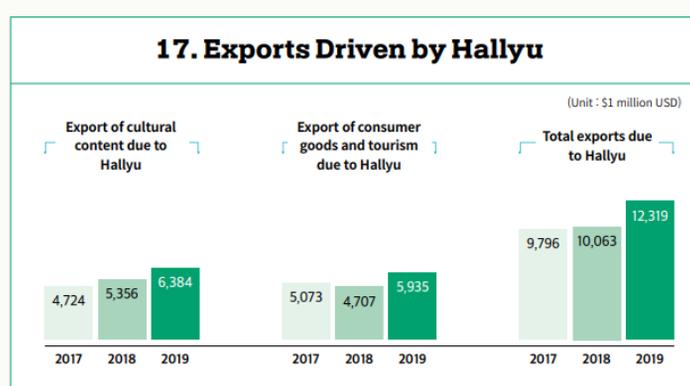
The Hallyu effect has been tremendous, contributing to 0.2% of Korea's GDP in 2004, amounting to approximately USD 1.87 billion. More recently in 2019, Hallyu had an estimated USD 12.3 billion boost on the Korean economy. Over the last two decades, South Korea has become very rich and very futuristic. In 1965, Korea's GDP per capita was less than that of Ghana. Today, South Korea is the world's 12th-largest economy.

Korea's exports of cultural contents doubled from \$5.1 billion in 2016 to \$10.3 billion in 2019. As these contents began to gain a wider following around the world in the late 1990s, a number of scholars and commentators simply dismissed this phenomenon as an unsustainable fad. However, its global popularity continues to grow, and its scope in terms of geographical coverage and genre has expanded further. There has also been a notable impact on other related sectors in Korea such as cosmetics, cuisine, and fashion that have gained international

attention on the back of Hallyu’s success. With such growing interest from around the world, the number of tourists and international students who visit Korea increased significantly prior to the COVID-19 pandemic. The worldwide emergence of Korean cultural contents coincided with Korea’s continued economic development. Given that Hallyu has been considered to have a domino effect upon related sectors, there have been endeavors to measure the impact on Korea’s economy. For example, the Korean Foundation for International Cultural Exchange (KOFICE) estimates that the export value helped by Hallyu reached \$6.4 billion in 2019 (see Table 1).¹ However, it is important to stress the fact that the largest share (73 percent) is from the game industry, which has grown despite a curfew (also known as the “Cinderella Law”) introduced in 2011 that prevented players under the age of 16 from playing online games between midnight and 6 a.m. (the curfew was lifted in August 2021). Furthermore, some argue that the exports of the game industry were led by large companies that were ineligible to receive government financial support.² Interestingly, a number of academic papers limit the impact of Hallyu to a few specific and relevant sectors instead of the entire economy.

	Industries	2016	2017	2018	2019	Growth rate (2019)
Export of cultural content	Broadcasting	411	362	400	426	6.6%
	Music	443	513	564	578	2.5%
	Film	44	41	42	64	54.3%
	Animation	136	145	173	179	3.6%
	Character	613	664	733	919	25.3%
	Game	3,277	5,923	6,392	7,860	23.0%
	Publishing	187	221	249	234	-6.2%
	Manhwa	32	35	40	46	13.9%
	Total	5,143	7,904	8,593	10,306	19.9%
Export value of cultural content helped by Hallyu	Broadcasting	366	323	345	368	6.6%
	Music	401	465	520	533	2.5%
	Film	31	29	30	46	54.3%
	Animation	59	63	86	89	3.6%
	Character	266	288	385	482	25.3%
	Game	1,917	3,465	3,835	4,716	23.0%
	Publishing	66	78	133	125	-6.2%
	Manhwa	11	12	22	25	13.9%
	Total	3,119	4,724	5,356	6,384	19.2%

Notes: 1. The data for 2019 is based on estimation; 2. The data for 2020 is not utilized as it is largely distorted by the COVID-19 pandemic.
Source: Jun and Kim, (2020): 45.



4.2. MuayThai Festival and Thailand Tourism

Tourism Authority of Thailand (TAT) has launched the “Amazing Muay Thai Travel Experience” campaign to promote the country’s tourism industry. The initiative aims to showcase the unique fighting techniques of four regions in Thailand associated with the ancient martial art of Muay Thai. The opening ceremony for the program was held at the TAT headquarters in Bangkok. Apichai Chatchalermkit, the TAT’s deputy governor for tourism products and business, explained that the authority is leveraging the art of fighting as a soft power asset to attract more tourists.

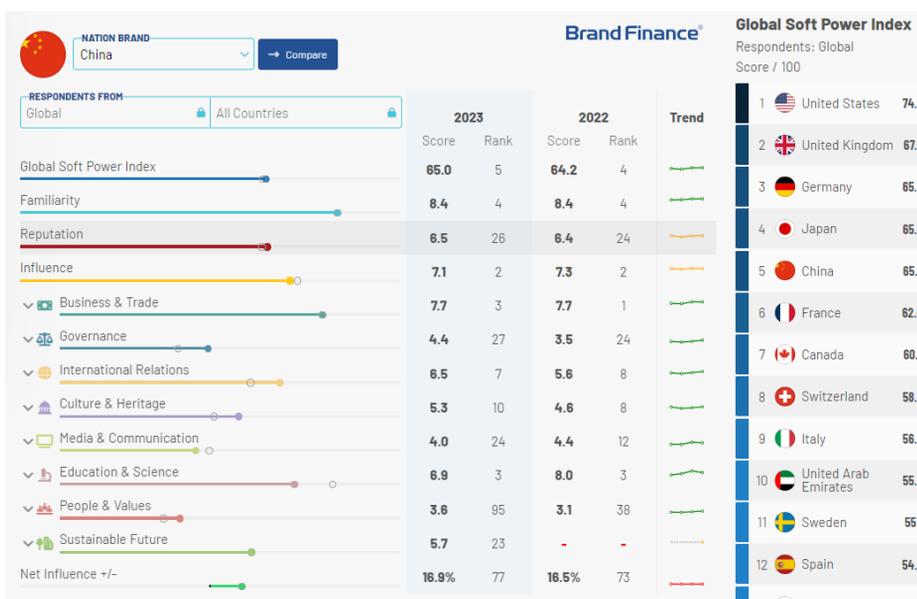
Last year, Thailand saw 11.8 million international tourist arrivals and 189 million domestic trips. In 2023, Thailand has its sights set for 2.38 trillion baht (US\$72 million) in overall tourism revenue – 80% of the revenue generated in 2019 – and looks to welcome 25 million international tourists and 250 million domestic trips.

According to the 2023 Global Soft Power Index, compiled by Brand Finance, Thailand ranks 41st out of 121 countries and third in ASEAN. The country possesses immense potential to capitalize on its rich cultural and creative assets, worth an estimated US\$42 billion, equal to 8.9% of Thailand’s GDP.

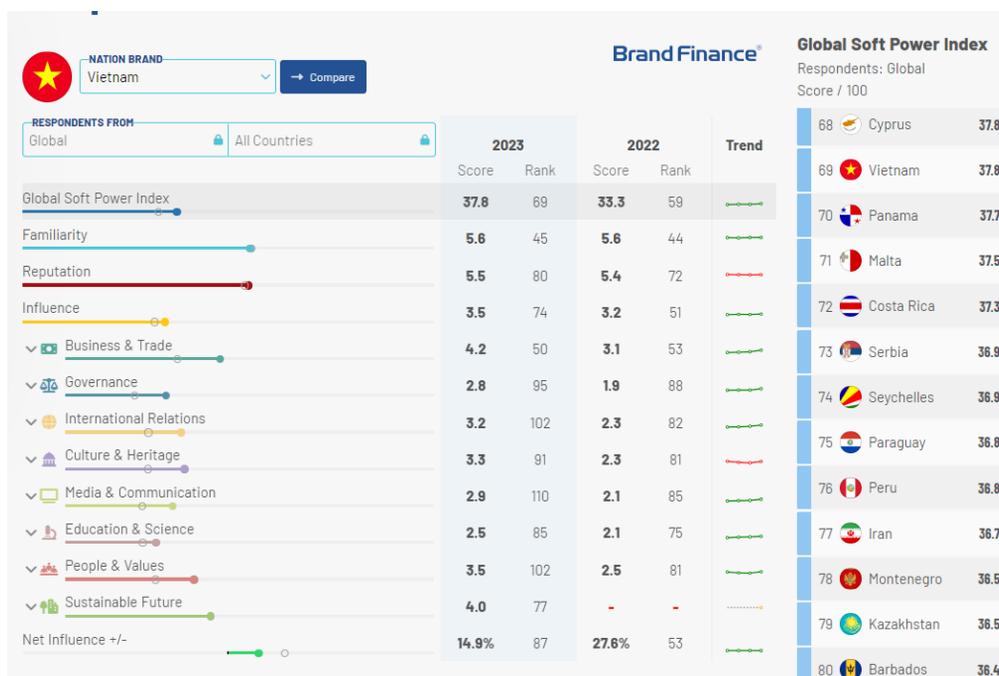
The Thai government has adopted a comprehensive approach to utilizing its soft power in attracting investment, tourism, and trade. Dubbed the “5Fs”, its soft power push encompasses “food, film, fashion, fighting, and festivals.”

4.3: The Case of China

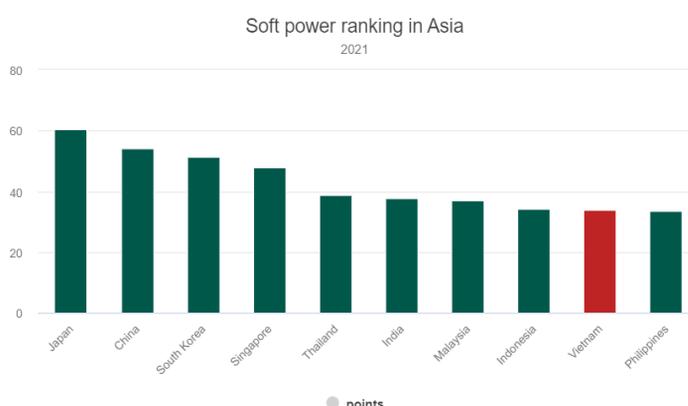
Although China has seen marginal growth of its Global Soft Power Index score (+0.8 to 65.0), it dropped in the ranking from 4th in 2022 to 5th in 2023, overtaken by Japan. While most nations accelerated their global engagement across trade, investment, tourism, and talent, China remained closed last year, maintaining a “zero COVID” policy. Reduced mental and physical availability of China’s nation brand among global audiences undermined its ability to improve perceptions at the same pace as competing economies, resulting in some relative declines, such as in the People & Value (down 57 to 95th) and Media & Communication (down 12 to 24th) pillars. Nevertheless, on many metrics. China has largely defended its position from last year and it remains 2nd in the world for Influence, behind only the US, and 3rd in the Education & Science pillar, with particularly strong performance across “leader in technology and innovation” (2nd), “leader in science” (3rd), and the new attribute: “invests in space exploration” (3rd). The nation also maintains its global #1 positions for “easy to do business in and with” and “future growth potential”, pointing to the resilience of its Business & Trade credentials, despite an overall rank drop for the pillar to 3rd. Revised economic growth forecasts by the International Monetary Fund confirm that China is back in business in 2023, predicting 5.2% GDP growth, above the level of previous expectations as private consumption rebounds following the country’s opening post-COVID at the end of 2022.



4.4: Where is VN in the world map of soft power and what can VN do to maximize benefits from enhancing its soft power?



In 2023, Viet Nam ranked 69th out of 100 worldwide and in Asia, Viet Nam was the 9th most influential country, according to Global Soft Power Index provided by Brand Finance, while this figure stood at 59th in 2022 and 47th in 2021.



The amazing leap in 2021 was thanks to a range of remarkable improvements in the national brand name and plenty of socio-economic achievements recorded over the past year. According to Brand Finance, Vietnam has made use of all aspects of soft power, especially the further integration of Vietnamese national brands and leading brands. Furthermore, the country’s national prestige over the past year has been enhanced due to the Government’s rapid response and policies, especially in terms of supporting businesses and promoting local brands both at home and abroad. Brand Finance, therefore, outlined that Vietnam represents a nation that objectively managed the impact of the novel coronavirus (COVID-19) extremely competently. It was spared a year full of lockdowns and overwhelmed hospitals, whilst recording one of the lowest COVID-19 infection and death rates in the world.

At the national level, Vietnam had established diplomatic relations with 187 out of 193 member states of the United Nations and completed the process of negotiating and signing new-generation FTAs -

including the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the EU-Vietnam Free Trade Agreement - making the country an important player in all regional and intra-regional economic links, which is a booster for Vietnam's imports and exports.

At the same time, the "Vietnam Value" program management agency, the Ministry of Industry and Trade of Vietnam (MoIT), has actively supported Vietnamese enterprises to improve their capacity through consulting business development, establishing information systems, and updating branding knowledge. All these initiatives and efforts have helped increase the awareness of the public, international consumers, and customers about the program and Vietnam Value products through various domestic and international media channels.

Meanwhile, the MoIT also focuses on building and promoting geographical indications and collective marks of Vietnam in foreign markets; supporting to improve the competitiveness of businesses based on quality reputation, environment-friendly production, and professionalism, thereby contributing to consolidating the position of Vietnamese brands in the world market.

Thanks to the efforts of the "Vietnam Value" program, Vietnam's processed food industry now contributes upwards of US\$17 billion of Vietnam's exports. The apparel industry makes up over US\$22 billion of Vietnam's exports. These economic contributions are absolutely crucial for Vietnam's overall growth, its reputation, and contribution to Vietnam's soft power.

In order to build up and promote its soft power, first of all, Vietnam needs to undertake a strategic orientation for systematic and long-term soft power promotion in the digital era. Secondly, it is necessary to improve growth quality and labor productivity, and to promote creative industries - thereby improving the competitiveness of the economy. Thirdly, to continue to preserve and promote the diversified and rich values of Vietnamese culture. Fourth, diplomacy should concentrate on enhancing capacity and asserting the role of "pivotal, leading and mediating" in the region and international affairs. Fifth, focused investment for science and technology development needs to be prioritized.

In addition to building and promoting soft power, Vietnam also needs to strengthen and accomplish its hard power to create a synergy – "smart power" -to demonstrate the nation's new geo-strategic and geo-economic position.

5. CONCLUSION

Indeed, the world has become and is continuing to evolve into a "softer world." World politics in the modern age has been undergoing changes that have elevated the importance of soft power relative to hard power. In this transformed international system, soft power will be a crucial element in enhancing influence over international relations because it has become more difficult to compel nations through the principal levers of hard power (i.e., threats and force). The Roman Empire's power rested not only on its legions but also on the attraction of Roman culture and law. Therefore, if a nation deliberately builds up its soft power, its position in the international arena will, certainly, climb up.

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THE DETRIMENT EFFECTS OF FOREIGN DIRECT INVESTMENT IN VIETNAM

Author: Dinh Nguyen Thanh Huyen, Truong Binh Ngoc

Mentor: Pham Thi Kim Len

ABSTRACT: *This paper aims to explore the negative impacts of Foreign Direct Investment (FDI) on the Vietnamese economy and society, with a focus on its environmental and social costs. Despite the advantages FDI brings such as job creation, technology transfer, and boosting the economy, there are also several negative effects. These include the repatriation of profits, unbalanced investment structure, outdated technology imports, environmental concerns, conflict of interest between investors and employees, transfer pricing, and negative social impact. To minimize these negative impacts, the Vietnamese government needs to strengthen FDI management, promote labor training, develop domestic enterprises, and strengthen international cooperation.*

Keywords: *Foreign Direct Investment, disadvantages, advantages, environmental costs, social costs, repatriation of profits, investment structure, technology transfer, environmental concerns, conflict of interest, transfer pricing, negative social impact*

1. INTRODUCTION

These days, there is a notable amount of literature discussing the impact of FDI on Vietnam's economy and society. However, it is worth noting that most of these papers focus on the benefits of FDI, with little attention given to any potential negative consequences. This paper aims to explore the negative impacts of FDI on the Vietnamese economy and society, focusing on its environmental and social costs. By shedding light on the hidden costs of FDI in Vietnam, we hope to contribute to a more informed debate on the country's economic development and its relationship with foreign investors.

2. RESEARCH METHOD

Comparison, review and summary the information from reliable sources related to foreign direct investment and its impact in Vietnam. These sources could include academic journals, books, and reports related to the topic of foreign direct investment and its impact in Vietnam.

3. RESEARCH SCOPE

The research scope of this study is focused on the negative impacts of FDI on Vietnam's economy and society, between 2017 and 2022.

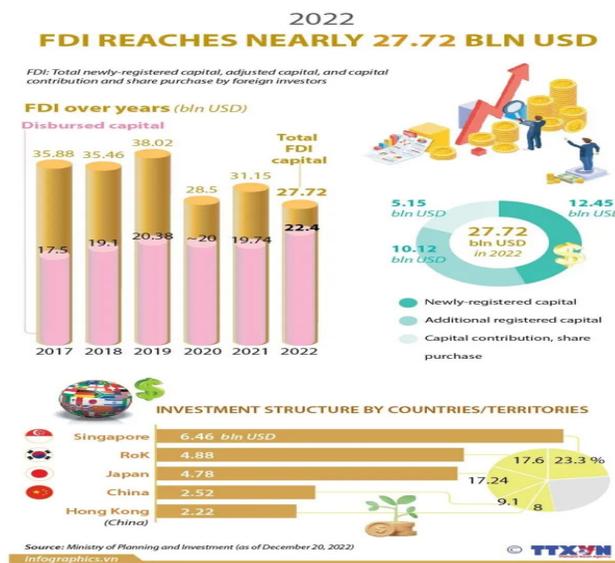
4. THEORETICAL FRAMEWORK

a. Definition of FDI

Foreign Direct Investment (FDI) is a category of cross-border investment in which an investor resident in one economy establishes a lasting interest in and a significant degree of influence over an enterprise resident in another economy.

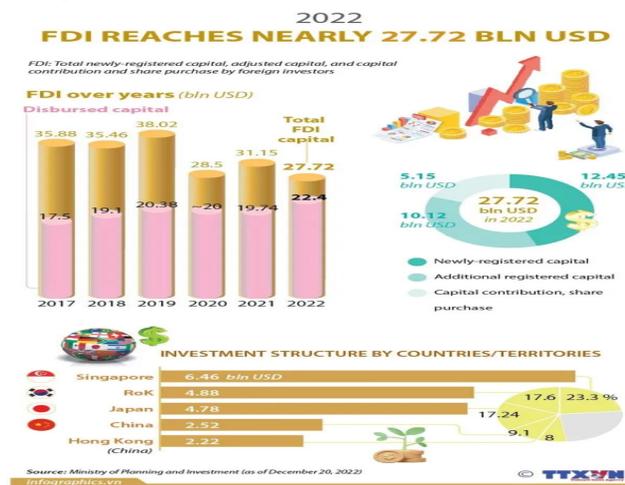
b. Summary of the foreign investment scenario in Vietnam

With a fresh open-door policy as well as attractive incentives and an investment environment, Vietnam has drawn a large amount of foreign direct investment (FDI) in recent years despite the effect of COVID-19 across the globe.



According to the paragraph, in the 2017 - 2019 period, the total registered FDI capital into Vietnam expanded from 35.88 billion USD in 2017 to 38.02 billion USD, while the number of disbursed capital also increased from 17.5 billion dollars in 2017 to 20.38 billion dollars in 2019. When COVID-19 hit Vietnam with full force in 2020, the total FDI capital dropped by about 9.52 billion USD from 38.02 billion dollars in 2019 to 28.5 billion USD in 2020. But then, the total FDI capital constantly recovered and reached 31.15 billion USD in 2021 and 27.72 billion USD in 2022.

Despite Covid 19 impacts, there was just only a slight drop in the amount of FDI disbursed in 2020 and 2021 at 19.98 billion USD and 19.74 billion USD. The disbursement rose 13.5% in 2022 to 22.4 billion USD, the highest level in five years since 2017.



Foreigners investors have poured money into 19/21 civil economic sectors, mostly in retail, wholesale, manufacturing-processing and science-technology. In 2022, 108 countries and territories invested in Vietnam, led by Singapore with nearly 6.46 billion USD, accounting for 23.3% of total FDI Vietnam lured in the year. The Republic of Korea came second with 4.88 billion USD, followed by Japan with 4.78 billion USD.

In conclusion, the figures showed that despite the adverse effect of the Covid-19 pandemic, foreign investors have maintained confidence in the economy and investment environment of Vietnam.

5. RESULTS

5.1. Foreign direct investment's disadvantages in Vietnam

Despite all the advantages Vietnam receive from FDI, there still have many negative impacts. Foreign Direct Investment can bring many advantages to Vietnam, such as flattering the economy, job creation and technology transfer. However, there are also some detriments associated with FDI, including:

1. Repatriation of Profits

Foreign companies operating in Vietnam may decide to send their profits back to their home country, which can result in the host country not fully benefiting from the profits generated by these companies. According to the analysis report of The Ministry of Finance, the number of foreign direct investment enterprises reporting losses in 2021 is 14.293 companies, accounting for 55% of the total number of FDI enterprises in the country.

2. The investment structure appears to be unbalanced

Since investors only invest in areas where they see the potential for growth and profitability, their ability to put capital into the areas we need is very low. As a result, FDI inflows have caused an imbalance to the economy. Industries with high added value and abundant human resources such as processing and manufacturing, real estate trading, production and distribution of electricity, gas, water, air conditioning, etc. have a large number of projects and FDI capital. Meanwhile, Vietnam's industries currently encouraging investment such as high-tech agriculture, medical equipment manufacturing, education, information and communication services, logistics... have not yet attracted FDI salaries. as expected.

3. "Obsolete" Technology Imports

Foreign investors contribute outdated technology and lack modern technology. Vietnam's imported machines are old and only suitable for simple tasks. Data from the Ministry of Science and Technology shows that only 5% of FDI transfers high technology, while 15% is outdated and the rest is medium technology. This means that the added value gained from technology transfer of FDI can only create about 20%. Domestic value remains modest at 10%.

4. Environmental concern

As a result of importing and transferring outdated technology, machinery, and equipment from abroad, coupled with environmental tax rates and fines that do not match the damage caused by enterprises, Vietnam has gradually become a country that "imports" pollution in the process of attracting FDI. Currently, a significant amount of FDI is being invested in industrial parks, industrial zones, and export processing zones. The risk of increasing environmental pollution is significant due to the inadequate and weak waste treatment status of industrial clusters. As much as 80% of industrial parks violate environmental regulations, while 70% of FDI enterprises discharge waste exceeding the standards, of which 23% discharge waste exceeding the allowed standards 5-12 times.

5. Conflict of interest between investors and employees

Foreign investors for the purpose of earning high profits have not properly and fully complied with the provisions of the labor law. These actions have caused negative reflection in public opinion, causing strikes and disrupting social order and safety.

In 2017, the whole country had 314 strikes and collective work stoppages in 36 provinces and cities, in which occurred mainly in FDI enterprises (accounting for 82.1%). Causes related to salary, income and salary adjustment.

6. Transfer pricing in FDI enterprises is quite common

The phenomenon of transfer pricing is shown through: declaring an increase in the value of contributed capital assets; buy raw materials and inputs at high prices; tax evasion or applying "subsidiary losses, parent

company profits” through raising input prices, lowering output prices to eat the difference right from the outside, trade fraud, tax evasion, taking advantage of monopoly to raise the price of products higher than the price of imported goods of the same type.

Transfer pricing activities not only cause capital of domestic partners to be annexed but also lead to loss of state budget revenue.

The most typical case is the case of Coca-Cola Vietnam being arrears and fines for more than 821 billion VND at the end of 2019. Since entering Vietnam from 1995 to now, Coca-Cola has reported losses for more than 20 consecutive years.

7. Foreign investors take advantage of Vietnam’s investment attraction policy

Some foreign investors take advantage of Vietnam’s investment attraction policy, carry out loan procedures, legalize contracts for the sale of equipment, machinery, and raw materials of poor quality or raise prices. value and then transfer the loan money out of the territory of Vietnam. Business owners fled back home, did not pay taxes to the state, leaving behind a block of bank debt and insurance debt of employees. For example, the factory producing the following products Steel of Metacor VN Co., Ltd. According to the financial report, in 2016 this enterprise lost 82 billion dong. Up to now, Metacor Company owes social insurance, personal income tax, bank debt and some Vietnamese enterprises with the amount of nearly 150 billion dong... In fact, the business owner has left Vietnam through the land border gate of Moc Bai, Tay Ninh at the beginning of June 2018. This is typical of FDI business owners leaving the country before the factory stops operating.

8. Negative social impact

The attraction of foreign direct investment (FDI) capital has more or less negative social impacts, such as affecting the cultural and social life of the investing countries, which is not consistent with the ethics and lifestyle of Vietnamese people. South and this is a deep-rooted cause leading to more and more social negatives.

5.2. Reasons

a. Objective reasons:

1. Incomplete infrastructure: Vietnam still has many difficulties in developing infrastructure, especially in the southern economic regions and the Central Highlands. This leads to FDI enterprises having to invest in infrastructure themselves, which is costly and reduces profits.

2. Small market and fierce competition: Vietnam is a country with a small area and population, along with strong competition among businesses in the same industry. This leads to FDI enterprises facing high competitive pressure and difficulties in finding product consumption markets.

3. Unclear legal regulations: Vietnam still has many difficulties in developing legal regulations on investment, business license and enterprise management. This leads to FDI enterprises facing legal risks and operating difficulties.

4. Rising labor costs: With the rapid growth of the economy, labor costs in Vietnam also increase. This leads to FDI enterprises facing pressure to increase production costs, reducing profits. Especially compared to other countries in the region, Vietnam occupies the 4th position with high labor costs after China, Brazil, and Russia, reducing FDI attraction.

5. Environmental pollution: With the attraction of many manufacturing enterprises to Vietnam, environmental pollution has become a serious problem. Exporting FDI - exporting capital means exporting waste. Many foreign businesses have been criticized for their negative impact on the Vietnamese environment, causing health problems for local people.

6. General economic situation: Economic downturn, financial crisis or competition with other investment markets reduce the attractiveness of an FDI investment market

7. Other negative effects: various tricks in the style of “peaceful evolution”: The attack of hostile forces to destroy the political stability of the host country always takes place under any circumstances. sophisticated and cunning form. The purpose of investors is to make a profit, so they only invest in the most profitable places, which will increase the imbalance between regions, between rural and urban areas. This imbalance can cause political instability, or FDI can also have negative social effects.

b. Subjective reasons:

1. Lack of strict state control: Some FDI enterprises in Vietnam have violated regulations on environmental protection, labor rights and land use. However, the Vietnamese state is not strict enough in controlling and handling these violations.

2. Lack of investment in research and development: Some FDI enterprises in Vietnam still focus on producing cheap goods and have not invested enough in research and development of new products. This leads to the fact that FDI enterprises cannot compete in the international market and may be pushed out of the market if they do not improve product quality.

3. Lack of linkages with local enterprises: The lack of linkages between FDI enterprises and local enterprises has reduced the operational efficiency of FDI enterprises. FDI enterprises cannot take advantage of human resources, material resources and markets of local enterprises.

4. Dependence on resources from abroad: Some FDI enterprises in Vietnam still depend too much on resources from abroad. This leads to instability in the business activities of FDI enterprises and reduces the independence of these enterprises.

5. Transfer pricing: Some foreign enterprises have used transfer pricing techniques to evade taxes in Vietnam. This is done by “subsidiary loss, parent company profit” through raising input prices, lowering output prices to eat the difference right from the outside, commercial fraud, tax evasion, taking advantage of monopoly to bring profits to customers. The price of the product is higher than the price of the same imported product.

6. Negative government attitude about foreign investment: Many governments do not support foreign investment and may see it as an interference in national sovereignty. Opposition, dissent or negativity about foreign investment can undermine the confidence of foreign investors.

6. SOLUTIONS

1. Strengthen FDI management: In recent years, Vietnam has taken significant steps to strengthen FDI management. These measures have been implemented to minimize the negative impacts of foreign investment. The Vietnamese government has introduced numerous policies and measures to ensure the rights of workers, protect the environment, promote technology transfer, and strengthen control over foreign investment flows. Additionally, it is necessary to restructure FDI capital in accordance with the country’s economic development requirements, as well as the development strategies and planning of important sectors and regions in Vietnam.

2. Promote labor training: To ensure that Vietnamese workers have the necessary skills to work in foreign companies, it is essential to promote labor training. This will help reduce dependence on imported labor and enhance the competitiveness of Vietnamese workers in the international labor market. To achieve this goal, several policies and solutions need to be implemented, including building a diversified education and training system, creating favorable conditions for universities and motivational training centers, developing appropriate training programs for fields that are in demand for labor, increasing investment in research and development to create advanced technologies, and strengthening research and development.

3. Promote the development of domestic enterprises: To reduce dependence on FDI, Vietnam needs to promote the development of domestic enterprises. This includes policy reform, business facilitation,

technology promotion, and management capacity building. This will help Vietnam create stronger companies and enhance its competitiveness in the international market. To achieve this goal, some solutions can be implemented, such as providing financial support, training and developing human resources, improving the business and investment environment, and improving the competitiveness of domestic enterprises.

4. Strengthen international cooperation: Strengthening international cooperation helps Vietnam take advantage of economic, technical, and investment cooperation opportunities from international partners. This can help strengthen competition and create more value-added products and services. Specifically, Vietnam can learn from other countries' experiences and grasp international trends and standards on FDI management, comply with international standards, find high-quality investors who are able to contribute to the sustainable development of Vietnam's economy, and seize new opportunities from FDI, especially in the high-tech sector.

7. CONCLUSION

In conclusion, foreign direct investment has both advantages and disadvantages for Vietnam. On the positive side, it can bring economic growth, job creation, and technology transfer. However, foreign investment can also lead to negative impacts such as environmental pollution, conflict of interest between investors and employees, transfer pricing, and negative social effects.

To minimize the negative effects of foreign investment, Vietnam needs to strengthen FDI management, promote labor training, promote the development of domestic enterprises, and strengthen international cooperation. The Vietnamese government has already introduced numerous policies and measures to ensure the rights of workers, protect the environment, promote technology transfer, and strengthen control over foreign investment flows. Additionally, it is necessary to restructure FDI capital in accordance with the country's economic development requirements, as well as the development strategies and planning of important sectors and regions in Vietnam.

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GREEN ECONOMIC DEVELOPMENT: EXPERIENCES OF OTHER COUNTRIES AND LESSONS FOR VIETNAM

**Author: Le Thi Minh Thu¹, Ha Thi Thao Van², Tran Thi Phuong Thao³,
Nguyen Khanh Ly⁴, Nguyen Thien Phuc Anh⁵
Mentor: PhD. Nguyen Hong Chinh⁶**

ABSTRACT: With the complicated developments of climate change and the risk of depletion of natural resources, most countries around the world consider green economic development is an indispensable step in their economic development strategy, including Vietnam. Green economy is an economy with a harmonious and close combination between green economic growth and sustainable development. This article focuses on systematizing international experience on green economic development in Japan, Korea and Singapore. Thereby, the authors give some lessons for the implementation of green economic development in Vietnam.

Keywords: Green economy, economic growth, green growth.

1. INTRODUCTION:

The United Nations (UNEP) defines a green economy as “one that delivers human welfare and social justice, while significantly reducing environmental risks and ecological degradation”. Accordingly, a green economy is simply an economy with low carbon emissions, efficient and economical use of natural resources, thereby ensuring social equity.

In the face of increasingly complicated developments and expected to increase rapidly in the future of climate change, along with severe destruction of natural resources, which has led to negative impacts on the environment and society, the integration of green growth goals into economic development is essential in every country. Green economy will be a new direction for the economy of the future, the United Nations Environment Program (UNEP) has stated that green economy creates jobs and enhances social equity, through which shows the positive impact of the green economy on the labor market.

In Vietnam, the issue of green growth and sustainable development has been particularly concerned by the Party and State in recent years. Thanks to the direction of the Party and the State along with the awareness of the social community about the importance of the green economy, so far, Vietnam’s economy has made great progress: Production and consumption behavior there are many significant changes and positive improvements; more and more practical actions contribute to the development of green economy. In addition, the process of implementing green economic development in Vietnam has always received a lot of attention and support from international organizations and communities around the world. Vietnam also attracts many foreign direct investment (FDI) sources into the green economy, especially green industry development, green energy, etc.

¹ Academy of Finance, CQ59/22.08 CLC.

² Academy of Finance, CQ59/06.08 CLC.

³ Academy of Finance, CQ59/22.04 CLC.

⁴ Academy of Finance, CQ59/06.07 CLC.

⁵ Academy of Finance, CQ 60/11.01 CLC.

⁶ Academy of Finance.

However, the process of developing and implementing the National Strategy on Green Economic Growth in Vietnam still faces many challenges and has some limitations: Capital sources, market instability, policies mechanism, high-quality human resources, etc. Therefore, this article aims to systematize the experience of developing a green economy in Japan, Korea and Singapore. Thereby, giving some lessons learned for the goal of green economic development in Vietnam.

2. BACKGROUND OF THE RESEARCH:

Currently, there have been many domestic and foreign researches and scientific articles with multi-dimensional perspectives providing information on green economic development trends in a number of countries, including Asia. Some typical projects and topics can be listed below:

(i) Domestic studies:

- The doctoral thesis “Green economic development of Korea and lessons for Vietnam” by Nguyen Thi Hoai Thu (2018) has pointed out the similarities and differences between Vietnam and Korea in green economic development, thereby, helping to better shape the nature of the green economy and the important transitions from a brown economy to a green economy.

- The topic “Green economic development: International experiences and lessons for Vietnam”, Banking Magazine of Doan Thi Cam Thu (2022) has systematized the experience of countries such as the US, Denmark, Korea, ... from which to draw lessons for the national strategy on green economic development in Vietnam.

(ii) Foreign studies:

- “The green economy transition: the challenges of technological change for sustainability” by Patrik Söderholm (2020) discussed a number of challenges encountered when pursuing sustainable technological change and indicated that beyond technological progress, economic and societal adjustment is necessary to achieve sustainability.

- “Green new deal policy of South Korea: Policy Innovation for a Sustainability Transition” by Lee Jae Hyup, Jisuk Woo (2020) gave an overview of the new green economic policy of Europe, the United States and analysis of Korea’s green new agreement along with specific projects to perform sustainable economic goals in the new era.

However, the above studies are mainly theoretical research and have not yet focused on the system of bright spots of countries in the world in developing a green economy. The author’s research paper will analyze and systemize the outstanding experiences of some Asian countries such as Japan, Korea and Singapore, from which to draw lessons for Vietnam. Therefore, this study does not duplicate previously published research results.

3. RESEARCH METHOD

The topic uses a combination of qualitative research methods such as case studies, methods of collecting, analyzing, comparing and synthesizing data... in order to give some lessons for the green economic development in Vietnam:

- *Case study method*: learning the experiences of typical countries in Asia on green economic development. Based on the obtained results, the authors choose to analyze the experience of 3 countries: Korea, Japan, and Singapore.

- *Data collection method*: collecting data and information from domestic and foreign studies on green economic development through articles, scientific research journals, thesis, etc.

- *Analytical method*: analyzing experiences from a multi-dimensional perspective based on outstanding achievements of countries: Japan – policy to encourage environmentally friendly products, policy on

carbon tax and transportation; Singapore – policy of cooperation, investment in science and technology for research and development on green economy towards a “low carbon” future; Korea - policies and laws on green economic development with many green spending stimulus programs.

- *Comparative method*: While analyzing experiences from different countries, compare these countries' situation with the development situation of Vietnam in order to choose the most appropriate lesson.

- *Synthetic method*: systematizing international experience on green economic development in some of the above countries, thereby giving some lessons for the implementation of green economic development in Vietnam.

4. RESULT: EXPERIENCES ON GREEN ECONOMIC DEVELOPMENT IN COUNTRIES

4.1. Japan

Until the late 1980s, the “Japanese economic miracle” was the result of a development model consisting mainly of industries, with heavy industry and chemicals predominating, and not a big contribution of service industries. This economic model, known as the brown economy, has worked well in the economic, political and social contexts inside and outside Japan for more than three decades after World War II.

However, since the late 1980s, the rapidly aging population, increasingly scarce and expensive fuels (especially oil and gas), and the pollution due to non-renewable fossil fuels and high greenhouse gas emissions, cause Japan to carried out a transformation of its economic model:

- Gradually shift from the economic structure of industry - service - agriculture, forestry and fishery to the economic structure of service - industry - agriculture, forestry and fishery;

- Using advanced machinery and equipment, advanced production processes and increasingly modern and highly efficient technology;

- The economic structure includes industries and technologies that use less labor, consume less fuel, limit emissions causing the greenhouse effect, and do not pollute the environment;

- Limit the use of solid, non-renewable fuels, but use more and more new and renewable fuels and energy.

With major geographical constraints, not rich in energy resources, Japan aims to be carbon neutral by 2050. Japan's strategies include:

- Strongly promote proactive initiatives of the business community;

- Mobilize policy resources towards a healthy cycle of the economy and the environment;

- Climate and energy policy, growth strategy is addressed in an integrated way as a national strategy and policy;

- Resources should be mobilized according to the green growth strategy;

- Promote initiatives in the industrial, transport and consumer sectors.

Thanks to the implementation and promulgation of drastic and correct policies and measures, Japan has become one of the leading and most successful countries in building a green economy.

About the policy of carbon tax and vehicle tax.

Entering the 21st century, Japan has promoted green growth by issuing and implementing a new growth strategy in December 2009 and revised in June 2010. One of the basic solutions to implement this program is that Japan has enacted and implemented new tax laws and reformed old tax laws towards greening. Japan collects a carbon tax on crude oil products and petrochemical products, coal and this rate increases gradually from the beginning of 2012 and the tax rate until 2022 is JPY 289/ton CO₂. The revenue from the carbon tax is used by Japan to invest in the development of low-carbon technology, improve energy efficiency and develop renewable energy.

Besides, Japan has started to apply a tax to stimulate consumption of eco-friendly vehicles at both national and local levels. In 2001, the automobile tax increased by 25-50% depending on fuel efficiency and emission level, for old cars this tax was added by 10%. Until 2009, the tax exemption and reduction policy was applied to value added tax and vehicle tonnage tax. New-generation vehicles, including hybrids, electric vehicles, clean diesel vehicles and natural gas vehicles, are exempt from tax. Technological improvements and tax incentives have facilitated the improvement of the energy efficiency of road vehicles, the development of smaller and more fuel-efficient vehicles.

Policy to encourage environmentally friendly products

Japan enacted the Green Public Procurement Promotion Law in 2011 to promote the procurement of environmentally friendly goods and services. All government agencies carry out the procurement of green goods, determine the annual target for the procurement of ecological products and report to the Ministry of the Environment. The policy to promote the procurement of environmentally friendly goods and services has provided a framework for green procurement at the national and government level that defines evaluation criteria for 246 categories of products and services, including materials and equipment used in public buildings.

Since the introduction of the green public procurement policy, the market share of environmentally friendly products widely used throughout the public administration has increased significantly. More than 90% of products and services procured by central agencies meet the required environmental standards. In order to manage the environmental product certification system, the Japan Environment Association (JEA) has assessed and issued an eco-label (EM) for products with a lower environmental impact than other similar products over their entire life cycle. As a result, the market share of EM-labeled products has now increased significantly and contributes to reducing CO₂ emissions, resource consumption and increasing the proportion of waste being treated.

4.2. Singapore

Singapore sets a goal by 2030 to become a green and beautiful city in nature.

In February 2021, the Singapore Green Plan 2030 launched a nationwide movement and promoted Singapore's national agenda for sustainable development in five pillars: Cities in nature; energy re-planning; sustainable living; green economy and self-resilient future.

Policy of cooperation in solutions to reduce greenhouse gas emissions

On June 10, 2021, Singapore and Australia signed a Green Economy Agreement (GEA) between the two countries, which aims to facilitate trade and investment in environmental goods and services, strengthen the governance of environmental management and contribute to building global capacity to tackle climate change, while supporting economic growth and job creation in green economic sectors. In the green economic development strategy, the two countries strengthen cooperation in solutions to reduce greenhouse gas emissions, make the transition to a green economy but still ensure to improve the quality of life for people and address the challenges of climate change.

Investment policy in science and technology for research and development of green economy towards a “low carbon” future

In the third quarter of 2021, the Singapore Government continues to invest in science and technology, focusing on research and development on green economy towards a “low carbon” future. Currently, Singapore emits 52.5 million tons of greenhouse gases per year, or about 0.1% of global emissions. It is expected that by 2030, emissions will peak at 65 million tons; and is projected to be halved by 2050 and go carbon-free by the end of the century.

Reducing carbon emissions for the civil service

Singapore is the first country in the world to set a target to reduce carbon emissions for the civil service. The civil service is assigned to take the lead in ensuring energy saving, reducing carbon emissions and using clean energy. The civil service aims to use 1.5 GWP by 2030, or about three-quarters of Singapore's total solar power, thanks to the development and installation of solar panels in offices, office. Official vehicles are also expected to be completely powered by clean energy by 2035. Reducing the use of cash transactions and switching to electronic forms of payment is also a method to help reduce carbon emissions. The Monetary Authority of Singapore is estimated to have generated more than 8,000 tonnes of greenhouse gases in 2020.

To reduce emissions, Singapore is prepared to "give up" its status as the world's oil and gas hub with a roadmap to cut output from its refineries. Singapore is making great efforts and has favorable conditions to rise to become the clean energy center of the region, becoming the Liquefied Natural Gas (LNG) supplier of Southeast Asia. Singapore has invested heavily in port infrastructure and storage of these zero-carbon fuels. The Monetary Authority of Singapore (MAS) has set up many programs to finance green economic projects and loans for sustainable development. In addition, MAS also established a management fund of USD\$2 billion to finance green finance activities outside of Singapore.

Becoming a clean energy center and providing financial solutions and green investments in Southeast Asia

One of the transformation orientations to exploit the high link in the "green economy" value chain is to make efforts to turn Singapore into a regional center for trading and exchanging carbon credits; providing green financial solutions and environmental service consulting, providing low-emission technology solutions, developing sustainable infrastructure (expertise in the engineering and management of hydrogen, LNG and other recycled energy...).

In order to become a center for providing green investment and financial solutions, Singapore established the Green Bond Program Office under the Ministry of Finance. The office is responsible for developing green bond programs and coordinating investment relations in the industry. Singapore's National Environment Agency is Singapore's first public agency to issue \$3 billion in green medium-term bonds to meet financial needs for infrastructure projects such as Tuas Nexus (Singapore's First Integrated Water and Solid Waste Treatment Facility). This project also allows the participation of private companies in green infrastructure projects. The office also has a capacity building function to assess risks and determine profit and loss for green projects.

Carbon-tax policy

Besides, Singapore is the first country in Asia to apply a carbon tax from the beginning of 2019. However, the carbon tax rate in Singapore is still quite low and is expected to be raised in the near future. The application of a carbon tax on the one hand reduces emissions, promotes the development of clean energy-using industries, and increases budget revenue for this country. Raising the carbon tax is expected to help businesses restructure their businesses soon, towards clean energy and thereby increase their competitiveness.

4.3. Korea:

Policies and laws on green economic development

Green economic development should be based on a legal basis. To achieve this, the government needs to set out principles, develop a legal framework and policies related to green economic development. At the same time, it must also bring benefits to the entire economy, respect the freedom and equality of all actors in the economy in order to balance the interests of the parties and keep the effectiveness of policies and laws. To do this, Korea has enacted policies and laws such as the Framework Act on Low Carbon, Green Growth (2010), the Greenhouse Gas Trading and Business Act (2012), Green Buildings Support Act (2013), Ordinance on the entry into force of the Greenhouse Gas Trading and Trading Act (2014), etc. This is the legal foundation to help Korea realize economic development green in a sustainable way.

Policy system on green growth, combining solving economic difficulties with many important stimulus programs for green spending

After the global financial crisis broke out, in order to cope with the impacts and overcome common difficulties, Korea has researched and implemented a policy system on green growth, combined with solving difficulties on economy with many important stimulus programs for green spending. Typically as:

- Choosing an industry structure based on the country's comparative advantages, to strongly develop labor-intensive light industries such as: textiles, fibers, footwear and tanning products.

- Select a model of industry restructuring towards industrialization and modernization, "shortening" the period of building an import-substituting industry structure, switching to an export-oriented industry structure. However, Korea's industrial restructuring took place in a shorter time, starting from an agricultural structure to an industrial one, from a capital-intensive heavy industry to a high-tech industry.

- Implement trade liberalization policy activities, loosen restrictions on the import of manufactured goods, carry out import liberalization; eliminate non-tariff barriers on a wide range of goods and services, including financial services; simplify import procedures, protect intellectual property rights, and strengthen and develop Korea's technology base.

- Restructuring of import and export in line with the process of restructuring economic sectors. Korea determines that exports create a continuous cycle with the process of import and investment (export - import - investment - export), play a key role in the process of industrialization and therefore apply many measures to promote these three activities.

- Choose a fairly flexible import-export market structure (niche market) in the direction of diversification to promote export activities. During the past three decades, Korea's main export markets have been the US, Japan and some OECD countries. When achieving a trade surplus with the US, Korea expanded to major markets for both physical goods and services to Japan, the EU, and Southeast Asia.

- Appreciate research and development (R&D) policy. The Korean government encourages private R&D activities, trying to grasp and quickly master technology to catch up with advanced countries; Encourage linkages between industries, universities and research institutions, and deploy high-tech science.

- Implement a flexible combination mechanism "hard government and soft market" in promoting structural transformation of the economic sector. Like Japan, the Korean government is closely linked with Chaebol conglomerates, encouraging and supporting Chaebol's development in all aspects.

- Promote the role of state-owned enterprises. Along with the private sector, especially Chaebol, large transnational companies, Korean state-owned enterprises also play a large role in promoting industrialization and economic restructuring.

The practical economic results obtained initially show that Korea's green growth policy is feasible, bringing a new growth engine to the country as well as international cooperation on green growth. With this green growth policy, Korea is expected to become one of the "seven green economic powers" by 2020 and one of the world's "five green economic powers" by 2050.

5. DISCUSSION: PROPOSING SOLUTIONS FOR VIETNAM

Green economy development is an important priority to build a sustainable future for Vietnam. Here are some solutions and experiences of other countries that Vietnam can refer to.

Firstly, policies to encourage and create conditions for green goods enterprises

- It is necessary to have specific and preferential policies to encourage businesses that are using outdated and environmentally unfriendly technologies to switch to advanced technology, contributing to improving production productivity, saving raw materials, meeting the standards of the green economy.

- Vietnam needs to quickly complete legal documents on green growth as well as green economy development, especially focusing on improving the effectiveness of the implementation of guidelines and policies on green economic development. At that point, the Government of Vietnam can refer to the Framework Law on Green Growth of the Korean Government. The promulgation and implementation of relevant legal documents is of great significance to the implementation of Vietnam's National Green Growth Strategy, ensuring that green economic development is always accompanied by a green environment and sustainable development.

Secondly, tax policies

- Tax policies need to be promulgated and enforced strictly and reasonably to limit the use and operation of high-emission vehicles and materials, and promote the use of eco-friendly products. Vietnam needs to accelerate the problem of carbon tax in the trend of green economic development. Because, Vietnam is the export market of most products and goods to developed countries. Therefore, when the US and European regions or other advanced countries have neutralized the carbon content that Vietnam has not yet done, it will be a minus point for Vietnam.

- In Vietnam, carbon tax is a relatively new term, it is an important tool of the circular economy. A carbon tax is an effective solution to reduce CO₂ emissions in each country. Along with that, the collection of a carbon tax contributes to an additional source of state budget revenue, the Government can use this revenue to re-invest in environmental protection and improvement, ensuring the target of green growth and low carbon.

Thirdly, investment on research and human training

- To develop a green economy, not only requires investment in machinery, equipment and green materials, but also requires the State to invest in scientific research and training human resources to operate the green economy effectively and economically.

- Scientific and technological research needs to simultaneously receive and transfer advanced technologies suitable to Vietnam's conditions.

- Promoting research to establish a theoretical, scientific and practical basis to build mechanisms, policies and management solutions to actively contribute to forecasting, prevention, treatment of environmental pollution, and restoration of biodiversity.

Fourth, raise awareness about environmental protection

- Awareness of environmental protection issues should be raised in society on the basis of innovative thinking, ways of doing, behavior, sense of responsibility towards nature and the environment.

- Environmental propaganda and education is an important job, from which to take practical actions in ecosystem restoration, biodiversity conservation, climate change prevention, etc. in each person, contributing to improving the effectiveness of strategies, programs and action plans set out by the Government towards a green economy, green and sustainable development.

- Ministries, sectors and localities should soon issue plans, programs, and perform according to their functions and tasks in order to have a basis for organizing and implementing green economic development and sustainable development in accordance with the guidelines and policies of the Party and State.

Fifth, multilateral cooperation

Based on the experience of countries that have achieved outstanding achievements in green growth and green economic development, it is necessary to exchange and cooperate with the international community. Through its relationship with the international community, Vietnam will have the opportunity to receive support not only on science and technology issues but also contribute to promoting the mobilization of investment capital towards green growth. (model of green industrial park and automation, development of transport infrastructure, green and clean energy, ...), solving the problem of climate change, constantly improve and ensure the quality of living environment for the citizen.

CONCLUSION

In summary, in the face of complicated developments of climate change and the risk of resource depletion, green economic development is an inevitable trend of most countries, including Vietnam. The article aims to analyze and systematize the outstanding experiences of countries such as Japan, Korea, and Singapore with a multi-dimensional perspective on policies to encourage consumption, on carbon tax and transport, on cooperation, investment in science and technology for research and development of green economy, etc. Thereby, the authors give some lessons for the implementation of green economic development in Vietnam.

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BENEFITS OF APPLYING CIRCULAR ECONOMY IN THE TEXTILE AND GARMENT INDUSTRY IN VIETNAM

Author: Le Thi Van Anh¹, Le Thi Ha Vy¹, Nguyen Ngoc Hoa²

Mentor: Nguyen Van Lich¹, Nguyen Minh Trang¹

ABSTRACT: The textile industry plays an important role in the growth of Vietnam's economy. However, this is also one of the industries that causes serious environmental pollution and waste of resources. These problems hinder the country's sustainable development goals. The transition to a Circular Economy is urgent in the context of dwindling resources and environmental degradation. In this view, we bring out the benefits of applying the Circular Economy and propose some solutions to promote the development of this economy in the textile industry in Vietnam.

Keywords: *textile industry; sustainable development; Circular Economy; dwindling resources; environmental degradation; Vietnam.*

1. INTRODUCTION

In Vietnam, the textile and garment industry is one of the industries that generate an important export turnover in the economic structure with 44 billion USD in 2022 (VTV, 2023). But this is also an industry that negatively affects the environment and financial resources. It is estimated that an average of 5.8 trillion liters of water and 391 billion kWh per year are used for fabric dyeing in the textile industry (Mai Van Huyen, 2019). Moreover, 17% - 20% of industrial water pollution also comes from textile dyeing and processing. Toxic chemicals used in the process of creating textile products such as explosion-proof agents, heavy metals, sodium sulfide, ammonia, formaldehyde... and waste in the production process have not been treated properly. The amount of chemicals that textile dyeing establishments emit is about 500-2000 kg/ton of products such as chemicals, acids, alkalis, solvents and other salts (Construction and environmental technology joint stock company Hop Nhat, 2020).

The current production, distribution and use of clothing in Vietnam operates in the old way, only concerned with resource exploitation, production, and consumption. It does not care about the impacts and consequences on their longevity to the environment. In Vietnam, many fibers extracted from non-renewable resources such as fossil fuels to produce clothing are used for a very short time, then dumped in landfills or incinerated. Along with that, the situation of environmental pollution in Vietnam continues to be complicated, the quality of the environment in many places has declined sharply, and it is no longer able to receive waste, especially in areas where many activities are concentrated in the industry; biodiversity and forest quality degrade to alarming levels, genetic resources are lost; drought and saltwater intrusion increase causing serious consequences, threatened ecological security. These problems hinder the country's sustainable development goals. Stemming from the actual situation of Vietnam and experiences from other countries around the world, the Circular Economy is an effective solution for sustainable socio-economic development of the country, in line with the conditions of natural resources. Resources are limited and are gradually being exhausted, the environment is being degraded.

¹ Diplomatic Academy of Vietnam

² Diplomatic Academy of Vietnam, ngochoa.sifedav@gmail.com>

2. THEORETICAL FRAMEWORK

2.1. General concepts

Linear economics is a way of economic development following a straight-line model, from resource extraction as input for production to distribution, consumption, and finally disposal. Promoting a linear economy is accelerating the process of exploiting resources and creating waste, which will inevitably lead to resource depletion, and environmental pollution (Hoang Nguyen Nam, et al., 2020).

The concept of Circular Economy was first mentioned in Pearce and Turner’s 1990 book “Environmental and Natural Resource Economics” (Environmental and Natural Resource Economics, 1990). Later, this concept was developed, and redefined from a lot of different aspects, organizations. For example, the European Union defines a “Circular Economy as an economy where the value of products, materials, and resources is maintained as long as possible and at the same time emissions are minimized”. A lot of concepts are put forward however, the Circular Economy essence is understood as a system, in which resources are reutilized or reused, and material flows are turned into inputs to continue production.

The Circular Economy is the connection between economic activities rationally and scientifically, in which each economic activity forms a premise for other economic activities and into an economic cycle. The Circular Economy should be understood not as a closed, rigid, and at the same time the Circular Economy has broad and narrow meanings: The broad meaning is within the whole country or a large area. With creativity, scientific calculation, and the special support of technological achievements, several large manufacturing industries are logically arranged as a cycle, supporting each other to develop and create new products quality products. In a narrow sense, it is a way of doing a Circular Economy, where one product is an input factor for the production of another product, including the reuse of wastes as raw materials for further production activities.

In the Circular Economy model, the design, production, consumption, and service activities aim to reduce the exploitation of raw materials and materials, prolong the product life cycle, limit waste generation, and minimize adverse impacts. to the environment. This is a sustainable development strategy being proposed to solve the pressing problems of environmental degradation and resource scarcity, in which resource inputs, waste, emissions, and energy are minimized. In the process of production and consumption from design, maintenance, repair, reuse, remanufacturing, refurbishment, and recycling based on economic dynamics, towards an economic model of no emissions.

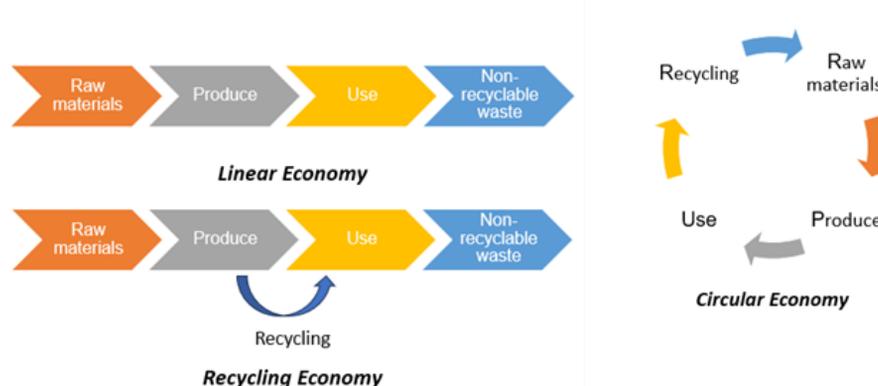


Figure 1.1.1. Working Diagram of Linear Economy and Circular Economy

2.2. Benefits of the Circular Economy

For the country, the development of the Circular Economy demonstrates the responsibility of the country in solving global challenges caused by environmental pollution and climate change, while improving

the capacity and competitiveness of the economy. The Circular Economy helps to take advantage of used materials instead of processing costs, minimize the exploitation of natural resources, make the most of the value of resources, minimize waste and emissions to the environment. For society the Circular Economy helps reduce social costs in management, environmental protection and response to climate change, creating new markets, new job opportunities, and improving people’s health. For businesses, the Circular Economy contributes to reducing the risk of overproduction and resource scarcity; creating motivation to invest, innovating technology, reducing production costs, and increasing supply chain.

3. RESEARCH METHOD

3.1. Qualitative research methods

The data are collected and analyzed using qualitative techniques, describing the properties and characteristics of the Circular Economy and the textile industry in Vietnam. The research uses document analysis method to analyze documents such as articles, policy documents, manuals, and scientific research documents, then discuss in groups to collect information and analyze different views and opinions. From there, synthesize and give results on the current situation, values and experiences of applying the Circular Economy in Vietnam’s textile and garment industry.

3.2. Quantitative research methods

Summarize the research results on environmental pollution in the textile and garment industry and the production situation in Vietnam drawn from the process of collecting information and data in the form of data. There by demonstrating the negative influence of the Linear Economy and benefits of the Circular Economy in the textile and garment industry in Vietnam.

3.3. Data collection methods

Searching and synthesizing information and data on the current state of environmental pollution in Vietnam, the benefits of applying the Circular Economy in the textile industry from sources such as the internet, and other scientific studies available. From there, build theories, prove and synthesize to form arguments.

4. RESULTS AND DISCUSSION

4.1. Limit environmental pollution

The textile industry is one of the industries causing serious environmental pollution. For the Linear Economy, in the production process, this industry can generate a large amount of emissions, wastewater and large solids, which seriously affect the quality of air, water and land. First of all, emissions in the textile and garment industry are generated by emission sources such as boilers, thermal oil furnaces; dust from scratching, shearing, brushing; chemical vapors from the fabric printing process and chemical vapors in the weighing and chemical mixing area. The air pollution factors in this industry include Ethylene oxide, Formaldehyde,...

ORDINAL NUMBER	SOURCE OF EMISSIONS	MAIN POLLUTANTS IN EXHAUST GASSES	MAXIMUM EXHAUST GAS FLOW (m ³ /h)
Source No. 01	Boiler exhaust 20 tons/hour	Flow, temperature, dust total, CO, SO ₂ , NO _x	60.000
Source No. 02	Exhaust gas from thermal oil furnace with a capacity of 7 million kcal/hour		35.000
Source No. 03	Factory dust	Total dust	20.000
Source No. 04	Chemical vapors from fabric printing	VOC, Ethylene oxide	2.000
Source No. 05	Chemical vapors in weighing and mixing areas	Phenol, Formaldehyde, VOC	2.000

Table 2.1.1. Summary of exhaust emissions of emission sources in All Seven Vietnam Textile and Dyeing Company in 2022

(Binh Phuoc gov, 2022)

Moreover, the textile industry is the 2nd largest source of water pollution in the world (Nguyen Hoang, 2018). Textile and dyeing factories always use a variety of chemicals such as acids, alkaline organic solvents,... Dyes in Vietnam discharge about 30-40 million m³ of wastewater into the environment (Vu Ngoc Tu, 2012), the amount of chemicals used in textile and dyeing enterprises is about 500-2,000 kg/ton of products (Hung Vo, 2019). In which, only about 10% of wastewater is treated before being discharged into the environment. In addition, a large proportion of water treatment facilities but the treatment system is not reasonable, so the quality of the output water does not meet the standards of BOD₅, COD, and color (Vu Ngoc Tu, 2012). Hazardous chemicals are toxins that kill aquatic organisms and directly affect human health. In addition, most enterprises in the textile and garment industry in our country are small and medium-sized, so they often only focus on producing and selling their products and react very passively to chemical management. Many businesses only pay attention to this work after an incident occurs or problems related to the use of chemicals in production at enterprises. Besides, solid waste generated during textile production also contributes to environmental pollution. The solid waste of the textile industry includes coal slag, scrap, rags, cotton dust, packaging and damaged dyes. It is estimated that each year the amount of solid waste is over 700,000 tons/year (QCVN environmental testing laboratories, 2021). These wastes often contain toxic chemicals and substances, which affect human health and the living environment. In particular, the level of pollution in concentrated industrial parks and clusters is huge. In Tham Luong industrial cluster, Ho Chi Minh City, water sources are contaminated by industrial wastewater with a total estimated wastewater of 500,000 m³/day from paper, washing, dyeing and textile factories. In Thai Nguyen City, industrial wastewater is discharged from yarn, paper, iron and steel smelting, non-ferrous metallurgy, and coal mining. In terms of the dry season, the total wastewater volume in Thai Nguyen city accounts for about 15% of the Cau River flow (Environmental and Society, 2020).

The Circular Economy is a green economy approach to ensure the sustainable development of the textile industry while minimizing the environmental's negative impact. Here, the input materials of the textile industry will mostly be natural fabrics such as cotton, wool, silk, bamboo... The process of growing these plants causes a lot of impacts on the environment nature. Instead, the Circular Economy model uses environmentally friendly fabrics. Manufacturers can use recycled or natural materials such as organic cotton, organic wool, bamboo,... to create environmentally friendly fabrics. They also use recycled materials such as recycled polyester with sustainable manufacturing processes such as saving water and energy, minimizing emissions and waste, and using environmentally safe chemicals. school and health. Moreover, the clean production process in the Circular Economy is also an effective factor in minimizing the textile industry's negative impacts on the environment. In the clean production process, enterprises must comply with environmental regulations and use clean production methods such as implementing wastewater treatment, exhaust gas filtration, and noise control. In addition, the Circular Economy also focuses on the collection and classification of products, treatment of discarded products after use and waste in order to recover resources and process them into recycled materials. These types of recycled materials will be further returned to the next production cycle at an appropriate rate to meet product quality requirements, or produce new products according to customer needs society.

In the world, many countries have successfully applied the Circular Economy in the textile industry. Germany is a country with a high rate of collection for reuse and recycling of textiles with 75% (M-Brain GmbH, 2021). In China, the implementation of Circular Economy in the textile industry can bring the total cost of access is 0.5 trillion yuan (80 billion USD) in 2030 and 1.2 trillion yuan (0.2 trillion USD) in 2040 when compared to the current development (Nguyen Quoc Dung, et al., 2020). In addition, an estimate from the 2021 Circular Gap Report claims that a Circular Economy could reduce global greenhouse gas emissions by 39% (Cassandra Julin, et al., 2022). Thus, the application of Circular Economy in textiles and garmefnts in Vietnam is an indispensable requirement to overcome the limitations of the traditional Linear

Economic model. With the goal of sustainable development being the general trend of the global textile and garment industry, now a number of Vietnamese textile and garment enterprises have approached the Circular Economy model. Among them is typical Green Yarn - Vietnam's first sustainable fabric brand specializing in researching, sourcing, and distributing environmentally friendly fabrics with the goal of reducing waste and limiting the biological footprint on the environment. Also pursuing the orientation of developing a sustainable economy, Faslink Fashion Connection Joint Stock Company is known as a pioneer enterprise that invests heavily in R&D and brings to the market a variety of green fabrics made from lotus, waste coffee, PET plastic bottles,... are environmentally friendly, minimizing environmental pollution, safe for users' health, easy to manipulate in apparel and can decompose over time. With the current potential and conditions of renewable resources, it can be affirmed that Vietnam has full potential for sustainable development in the textile industry based on the application of the Circular Economy in the market world.

4.2. Extend product life and safety for consumers' health

Wool textiles, cotton elastic fabrics, polyester fabrics, and nylon fabrics are common input materials used by businesses in the textile sector in the Linear Economy. Although these materials have varying textures, they all have the problem of shrinking or stretching after usage. If the product is exposed to sunlight or cleaned with hot water and strong detergents, it will fade fast and lose its unique beauty. After a while, these textiles will be ruffled, resulting in considerable deterioration in fabric quality. Furthermore, two forms of artificial fiber materials are polyester fabric and nylon fabric. The process of creating these two fabrics used a large amount of toxic chemicals, which affected consumers' health. In particular, polyester fabrics and nylon fabrics have poor sweat absorption, causing stress for users and facilitating the development of bacteria that adversely affect consumers' health.

In the Circular Economy, safe and sustainable fabrics such as pineapple fiber, bamboo fiber fabric, coffee fiber fabric, lotus fiber fabric,... are input materials in the textile production process. In Vietnam, some businesses have also researched and used safe and sustainable raw materials to produce good quality products with long service life in the textile and garment industry. Typically, Faslink Fashion Connect Joint Stock Company has successfully applied fabrics made from coffee fiber, lotus fiber, and oyster shells. In general, these fabrics are abrasion resistant, wrinkle resistant, and have good elasticity, making the product durable and consumers to operate comfortably while retaining their shape after many uses. In particular, coffee fabrics have three times the ability to control odors than normal fabrics, especially absorbing sweat and absorbing body odor extremely well. Coffee fiber fabric has a natural antibacterial ability, so it is possible to minimize the proliferation and growth of bacteria and odors in clothing to help protect consumers' health. The oyster shell fabric has better deodorizing and antibacterial ability than some other natural fibers because oyster shell powder contains biological calcium oxide, a substance that has anti-bacterial and deodorizing functions in fibers. This is the perfect choice for people with sensitive skin such as young children or people who work in bacteria-rich environments such as medical or environmental environments. Besides, lotus fiber fabric is the first plant-based AAA-containing fabric that is good for the skin and contains UPF 50 which is extremely resistant to UV rays. This fabric removes moisture quickly, keeps the skin always dry, deodorizes, and minimizes the production of bacteria, thereby preventing diseases and protecting human health.

4.3. Promoting the domestic manufacturing sector and economic development

According to experts' research, to make the same product value, Vietnamese enterprises must consume 1.5-1.7 times more energy than those of Thailand, China, and Malaysia. VECEA's survey in 2017 also showed that to produce 1 ton of textile products, Vietnam's textile and garment industry consumes about 200-300m³ of water, 2500-3500 kWh of electricity, and 12.5 tons of steam (Veecom, 2019). Meanwhile, the Circular Economy has been applied by many countries around the world and achieved remarkable effects. Not only did the Netherlands create more than 50,000 jobs, reduce waste by 10%, save 20% of the water

used in industry, and reduce imports of basic sources by 25%, but also generated 7 billion EUR for the economy. The textile recycling valley in northern France has aimed to recover 50% of waste fabrics and recycle 95% of them by 2019 (Financial Magazine, 2020). Thus, it can be seen that Vietnam’s textile and garment industry still has a lot of potential to reduce the consumption norm of raw materials and materials in wet processing of dyed textiles and if converted to value, it can save about 50-80 USD / 1 ton of products. A number of textile and garment enterprises in Vietnam have also successfully applied and proven the effectiveness of water-saving solutions in the production process.

Benefits	Water recovery and reuse solution group			
	Cooling water circulation dyeing machine	Cooling water recovery from feather burners, profiled stretchers, sanford machines, continuous washing machines	Condensate recovery	Reuse detergent end
Water savings	2-15%, equivalent to 57,800 m ³ of water / year	0.2-1%, equivalent to 3,120 m ³ of water / year	1.29%, equivalent to 7,634 m ³ /year	2.2%, equivalent to 17,639 m ³
The amount of steam saved	0.1-2%, equivalent to 878 tons/year		1.47%, equivalent to 695 tons of steam/year	
Savings	1.38 billion VND/year	62 million VND/year	223 million VND/year	234 million VND/year

Table 2.3.1. Benefits of water-saving solutions in the production process at enterprises in Vietnam’s textile and garment industry in 2022

(WWF-Viet Nam, 2022)

Therefore, instead of continuing to spend a lot of budget on fuel treatment costs, creating products derived from nature or reusing and recycling is a method to help recover resources to create circular output. Some enterprises in Vietnam have also been making significant progress in circular inputs of the textile and garment industry such as overcoming the use of very large amounts of electricity, in the period from 2017 to 2022, almost 100% of newly invested yarn factories and garment factories are equipped with rooftop solar power, with the garment factory is enough to use 100%, the yarn factory about 20% of the electricity needed for production. With new investment projects, renewable energy is already in the portfolio of the basic investment rate of a project. In the field of yarn, the proportion of factories spinning from fibers of recycled polyester fabrics, from natural cotton grown by organic methods, although not available in Vietnam before, by 2022, over 10% of yarn enterprises have the ability to supply stably and have long-term customers of these items. Although the proportion is small, the knitted fabric sector also has enterprises producing knitted fabric from recycled yarn of less than 5% of output (Vneconomy, 2022).

Thoroughly understanding the challenges and opportunities when innovating business activities to a circular model, a number of Vietnamese enterprises have successfully explored and applied this direction in the textile and garment industry. Typically, flame retardant fabrics are made of silica from rice husks of Vietnam Textile and Garment Group (Vinatex) and Kova Paint Group. Each year the world spends from 3.5-5 billion USD on fireproof fabrics, Vietnam alone spends about 120 million USD each year to import fire-retardant fabrics to sew domestic workwear. Domestically produced Vinatex - Kova fabric is expected to be about 14-15 USD/m², 15-20% cheaper than imported flame retardant fabric (Minh Tam, 2022). The water reuse factory project in Tam Thang textile dyeing industrial park, Quang Nam of (RTS) Renewable Technology Solutions Joint Stock Company has also made significant contributions to the supply, investment, and technology transfer of water treatment, wastewater, and reuse in industrial parks. Wastewater circulation helps reduce 80-97% of wastewater discharge, increase discharge quotas, and increase load capacity for the environment towards sustainable development in line with the world’s trend towards the Circular Economy (Vneconomy, 2022).

Therefore, instead of continuing to spend a lot of money to deal with the consequences of environmental pollution or having to import countless sources of raw materials from abroad, the implementation of the Circular Economy model will help textile and garment enterprises will have many benefits in improving the environment, saving, minimizing budgets and diversifying development opportunities in the domestic and international economy. Vietnam's textile and garment industry is facing many risks and challenges, but this is also an opportunity for the transformation to sustainable, circular models. This transformation needs close coordination between sectors and fields of agriculture, industry and trade, science, technology, innovation, entrepreneurship, and digital technology; coordination between the State, enterprises, science, and related parties. This is a long journey, with many challenges but an inevitable path to sustainable development for Vietnam's textile and garment industry.

4.4. Solution

4.1.1. For the state

Firstly, it is urgent to promote the dissemination and theoretical research and practice of Circular Economy development to equip full, comprehensive, and correct knowledge of this economic model in management agencies with businesses and people. At the same time, the Government needs to develop an appropriate management legal system in Circular Economy development, develop and develop a policy framework and management laws according to market needs, shift towards pollution prevention and efficient use of recyclable and construction materials, strictly apply standards for product quality management, quality of input materials. In particular, it is necessary to introduce policies and solutions to strictly control waste from the textile and garment industry through the early promulgation of standards, regulations, and guidelines related to the collection, transportation, and reuse of ash from coal-fired thermal power, strengthening extensive propaganda on the quality and efficiency of using non-baked building materials, developing the market for building materials from ash, slag ...

Secondly, the state should adopt policies to encourage textile and garment enterprises to use clean production process technologies, gradually implementing environmental management solutions. At the same time, it is necessary to create conditions for the formation of large industrial parks with centralized wastewater treatment, advanced technology, and green technology to attract investment in textile dyeing to solve bottlenecks in fabrics supplied for export garments and meet origin requirements for tax incentives.

Thirdly, the establishment and development of specialized research institutes with the task of training experts with extensive knowledge of the Circular Economy and more importantly, capable of imparting, spreading, and applying their knowledge into practice to lay the foundation for the Circular Economy in Vietnam. These institutes will be home to in-depth research on the entire closed loop of the Circular Economy from design to production, synthesis, reuse, recycling, and disposal.

Fourthly, the state needs to build an information database and apply modern information technology to promote the implementation of the Circular Economy model in the textile and garment industry. Building systems, information database centers, information cooperation on practice, and updating the Circular Economy model at textile and garment enterprises. Training high-quality human resources to ensure the requirements of building, sharing, and updating the database of market information in the textile and garment industry...

4.1.2. For businesses

Firstly, textile and garment enterprises need to improve production technology in a green, clean direction, minimizing energy use to match the global business environment. In particular, it is necessary to focus on the treatment of water pollution in production before being discharged into the environment. To treat wastewater sources of the textile and garment industry, enterprises and units need to deploy specific solutions such as building advanced wastewater treatment systems according to common standards, moving dyeing factories into textile and garment industrial parks with centralized wastewater treatment centers...

Secondly, enterprises need to optimize input material sources, control and management of input materials need to be considered and deployed throughout the entire system, including all processes and infrastructure closely related to human resources or production activities, as well as how to distribute the energy generated. At the same time, strengthen international cooperation, and promote the role of the non-state business community in piloting the implementation of the supposedly new model in Vietnam today.

Thirdly, to realize the Circular Economy, it is necessary to coordinate all stakeholders from government agencies, mineral and raw material extraction enterprises, processors, manufacturers, distributors, retailers, consumers, and garbage collectors... to be able to achieve success in the implementation process. Accordingly, it is necessary to raise the awareness of the whole society about the participation of the government, businesses, and other fields in the development of the Circular Economy.

Fourthly, instead of continuing to follow the path of the current production model, it will face risks in the future when the source of raw materials and fossil fuels is increasingly depleted, businesses must consider solving the problem for short-term benefits or accept going slower to accelerate in the future. The reason is that investment in new technologies will push up product costs, which may affect the consumption and competitiveness of products and services in the short term. Enterprises need to focus on prioritizing financial resources to transform production methods while developing the Circular Economy must be associated with scientific innovation and access to advanced technology. In the context that the Fourth Industrial Revolution is taking place strongly, affecting all areas of social life, the research to promote technological innovation, moving from the real world to the digital world will be a great opportunity to realize Circular Economy development, and bring higher growth efficiency. To develop a Circular Economy, it is necessary to build a team of good experts early, to solve problems well, from the beginning to the end of the whole process.

5. CONCLUSION

Despite its great contribution to Vietnam's economy, the textile and garment industry is an industry that has been and will lead to consequences of resource depletion, degradation and serious environmental pollution. In that context, choosing to shift from Linear Economy to Circular Economy is an inevitable trend in the world and Vietnam. Applying the Circular Economy to help the textile industry in Vietnam develop sustainably, solve the challenge between economic growth as well as protect the environment and natural resources. To realize this orientation, it requires the efforts of all sectors of society, especially, businesses are the central driving force, the State plays the role of creating, leading, and the community participates in the real world. to change both the perception and behavior of the whole society.

APPENDIX

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MACROECONOMIC SOLUTIONS TO STRENGTHEN THE FINANCIAL RESOURCES OF ENTERPRISES IN VIETNAM

Author: Dao Ngoc Uyen Trang¹, Mai Thi Le Thuy¹

Mentor: Msc. Luu Huyen Trang¹

ABSTRACT: Currently, the process of international integration of Vietnam is being actively implemented in the context of the world economy having many fluctuations. In particular, in order for Vietnamese businesses to move towards integration and globalization, more and more sustainable financial resources are required. However, the instability in the macroeconomic and the increasingly fierce competition among economic sectors have caused many difficulties and challenges to the financial resources of enterprises. To capture macro changes in the economy, this study uses VAR model to analyze macroeconomic variables and their effects on financial resources of enterprises. Thereby, the study proposes a number of macroeconomic solutions to increase financial resources for enterprises in Vietnam, contributing to creating favorable conditions for the growth and sustainable development of the country.

Keywords: Macroeconomic solutions; financial resources; enterprises; inflation; GDP growth rate.

1. INTRODUCTION

In the context of the current volatile macroeconomic, along with the innovation of the market economy and the increasingly fierce competition among economic sectors, it has caused difficulties and challenges to the businesses in Vietnam. The macroeconomic indicators are constantly changing in many different directions, namely the indicators of economic growth, inflation, exchange rate, etc., which have direct and indirect effects on financial resources of enterprises. According to the Vietnam Chamber of Commerce and Industry, nearly 10% of Vietnamese enterprises are in a state of shortage of financial resources, especially small, medium and micro enterprises. This affects the maintenance and expansion of production and business activities of enterprises.

To stabilize the economy, the Government has closely monitored macro indicators to ensure a large balance of the economy. Thanks to that, the family is gradually stabilizing, market sentiment and confidence are gradually being consolidated. Sources of capital mobilization such as stock and bond markets, although still facing difficulties, have shown more positive signs; the source of capital for the economy from banks is closely monitored; The State has also restructured the level of costs for borrowing activities so that businesses have more opportunities to access financial resources,...

Thus, to ensure financial resources for businesses, macro solutions play a very important role. The study on “*Macroeconomic solutions to strengthen financial resources of enterprises in Vietnam*” uses qualitative and quantitative research methods to examine the influence of the macroeconomic environment on the financial resources of enterprises, the results are the basis for making appropriate macroeconomic solutions in the coming time. The study selection period is from 2005 to 2022, and the proposed solutions apply to the period from 2023 onwards.

2. THE CURRENT SITUATION OF THE MACROECONOMIC ENVIRONMENT AND FINANCIAL RESOURCES OF ENTERPRISES IN VIETNAM

2.1. Situation of the macroeconomic environment

The macroeconomic environment is reflected through many different variables such as economic growth rate expressed through GDP growth rate, inflation rate, exchange rate... During the period from 2005 to 2022, macroeconomic indicators have many fluctuations, reflecting the macroeconomic situation in each period.

¹ Academy of Finance.

2.1.1. Economic growth rate

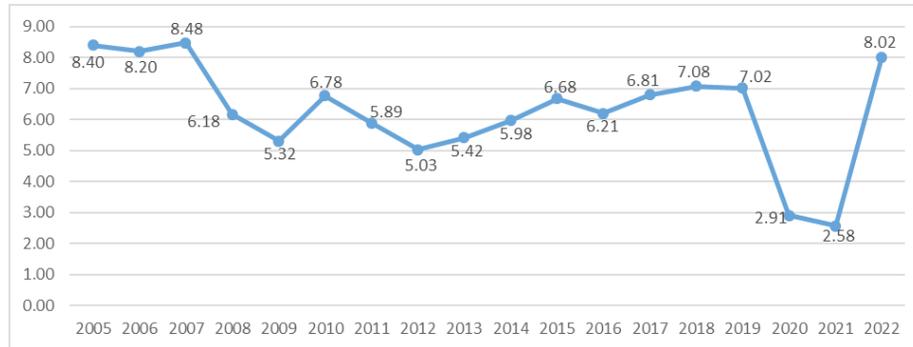


Figure 1: Economic growth rate of Vietnam in the period of 2005 – 2022

(Source: GSO)

The economic growth rate in the period 2005-2010 had strong fluctuations in the whole period. From 2005 to 2007, the level of economic growth remained quite high, above 8.2%. However, GDP growth dropped from 8.48% in 2007 to 6.18% in 2008 and over 5% in 2009 and the years from 2011 to 2014. The year 2015 marked a major turning point in the integration process. Vietnam's international economy after completing negotiations on a series of new-generation free trade agreements such as the ASEAN-China Free Trade Agreement (ACFTA), the Trans-Pacific Partnership (TPP) ,.... This is also the year that Vietnam's economy achieved an economic growth rate of 6.68%, the highest in the whole 2011-2015 period.

In the five-year period 2016 - 2020, the growth rate in the period 2016 - 2019 is quite high, averaging 6.78%/year. By 2020 and 2021, Vietnam is negatively affected by the Covid-19 epidemic, which began to spread from the end of 2019, leading to the economic growth of these two years reaching the lowest level in the whole period 2005 - 2022 with 2.91% in 2020 and 2.51% in 2021. According to the Socio-Economic Report in 2022, the economic growth of the whole year is estimated to increase by 8.02%, which is the highest increase in the period 2011 - 2022.

2.1.2. Inflation

In the period 2005 - 2015, Vietnam had performed well the task of controlling inflation thanks to the good coordination of flexible monetary policy and fiscal policy. During the whole period, basically, Vietnam's inflation rate was quite low and stable (below 10%). The financial crisis in 2008 had a negative effect on the world economy, including Vietnam, causing inflation rise, galloping at double digits of 19.9%. In 2010 - 2011, the implementation of economic recovery policies caused the inflation rate to increase to 11.75% and 18.13%, respectively.

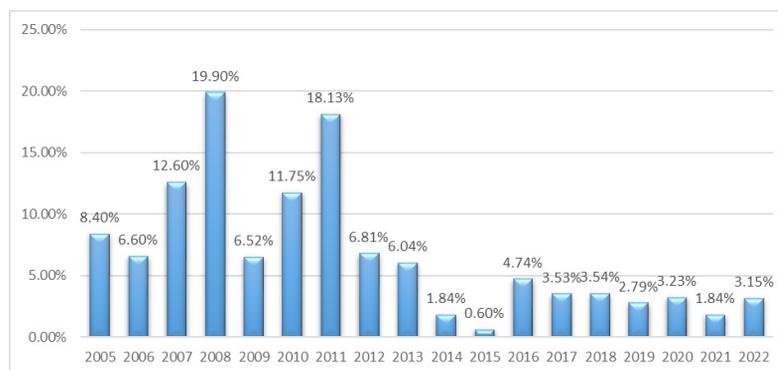


Figure 2: Inflation rate of Vietnam in the period 2005-2022

(Source: GSO)

Over the next years of the period, the inflation rate tended to decrease. Inflation in 2012 and 2013 was much lower than the threshold of less than 10% set by the Government. The inflation in 2015 was less than 1% - only 0.6%. In the 2016-2020 period, Vietnam’s macroeconomic remains firmly stable, inflation is controlled and always stays at around 4%, the average period of 2016-2020 is 1.64%, a sharp decrease compared to the previous period 2011 - 2015.

In the period 2017 to 2020, the inflation rate of Vietnam will basically remain at 2% to above 3% per year. In 2021, in the context of increasing global inflationary pressure, the inflation rate will only increase by 1.84% compared to 2020. Based on the forecast of the International Monetary Fund (IMF), inflation in Vietnam in 2022 increases by 3.9%. In general, Vietnam’s inflation rate has changed strongly over the years. Thanks to the Government’s close monitoring and statistics on the ratio, it is possible to promptly implement appropriate policies to ensure a stable macroeconomic.

2.1.3. Interest rate

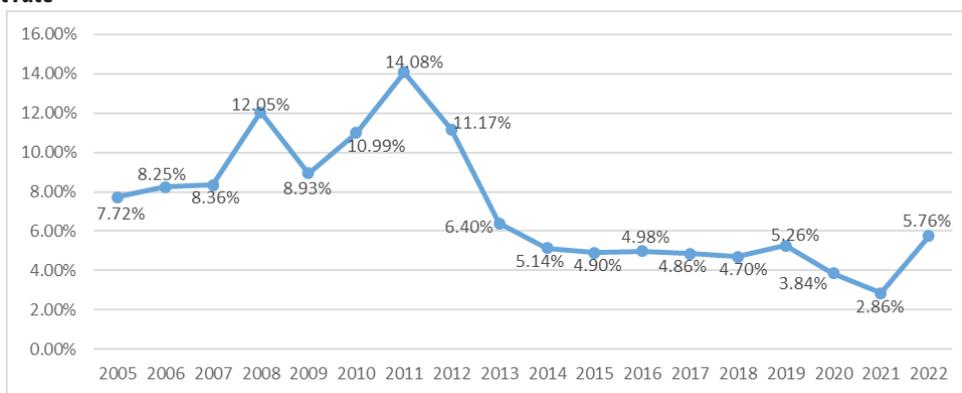


Figure 3: Average interbank interest rate of Vietnam in the period 2005 – 2022

(Source: Vietstock)

In the period 2005 - 2015, the average interbank offered rate for 6-month term in Vietnam has experienced many fluctuations and changes. Especially in 2008 (12.05%) and 2011 (14.08%), offered rate increased much more strongly than in previous years. Since 2013, the average interbank offered rate has decreased significantly, causing a positive impact on the economy, dropping deeply from 11.17% in 2012 to 6.4% in 2013, 5.14% in 2014 and 4.9% in 2015.

The year 2016 and 2017 basically did not change much, the average interbank offered rate by year with 6-month term in 2016 and 2017 was 4.98% and 4.86% respectively. In 2018, the interest rate continued to decrease to 4.7%. Since the beginning of 2019, a series of banks have adjusted interest rates and continuously increased sharply until the beginning of November 2019. From 2020, trade tensions between major countries negatively affected the global economic outlook, and under the impact of the Covid-19 pandemic, the State Bank had to proactively and promptly organize and manage operations reduced offered rates many times to support the economy’s recovery and bottomed out in 2021 with an average annual offered rate of 6 months of 2.86%. By the beginning of 2022, in the face of continuous interest rate increases by more than 90 central banks around the world, the State Bank of Vietnam also decided to increase the offered rate to 5.76% to control inflation and stabilize the macro economy. . Although in the period of 2016 - 2022, interbank offered rates have many fluctuations, but currently, offered rates are being managed and maintained quite stable, creating favorable conditions for businesses to access financial opportunities outside.

2.1.4. Exchange rate

Before 2011, the average exchange rate of VND/USD in Vietnam remained below 20,000 VND/USD. The highest exchange rate was in 2010 with 18,613 VND/USD.

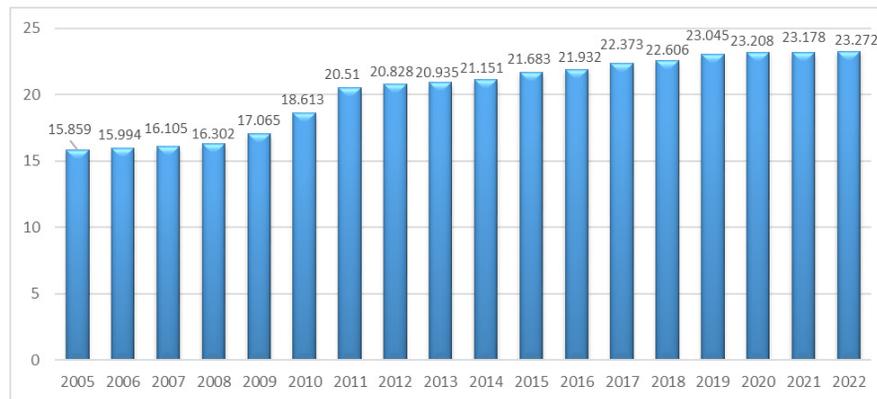


Figure 4: Average exchange rate of vietnam (2005 – 2022) (VND/USD)

(Nguồn: Vietstock)

Since 2011, the average exchange rate of Vietnam has continued to increase gradually over the years and are above 20,000 VND/USD. Specifically, the exchange rate in 2011 was 20,510 VND/USD and in 2012 was 20,828 VND/VND. In 2013, thanks to the policy of stabilizing the exchange rate and actively intervening in case of necessity, the foreign currency market in 2013 remained stable, the exchange rate fluctuated within the allowable range, there was no sudden change in demand. Foreign currency demand in the market is at 20,935 VND/USD. The year 2014 was the first exchange rate adjustment within a year, and the second time in nearly three years from 2011 to 2014. The decision to adjust the exchange rate has contributed to stabilizing the market and supporting exports in the last months of the year, thereby supporting economic growth. In 2015, the average exchange rate peaked during the period at 21,683 VND/USD.

The average exchange rate in 2016 was only 21,932 VND/USD, but by 2018 it had reached nearly 23,000 VND/USD, specifically 22,606 VND/USD – an exchange rate suitable for the macro economy at that time. In 2019, the VND/USD exchange rate fluctuated at 23,045 VND/USD. From 2020 to 2022, Vietnam's average exchange rate will always remain above 23,000 VND/USD. In general, in recent years of the period 2016 - 2022, Vietnam's exchange rate experienced many fluctuations and was strongly influenced by economic, political, epidemic factors... However, thanks to the intervention of the State, the exchange rate, although fluctuated strongly, was still under control

2.2. Financial resources of enterprises in Vietnam

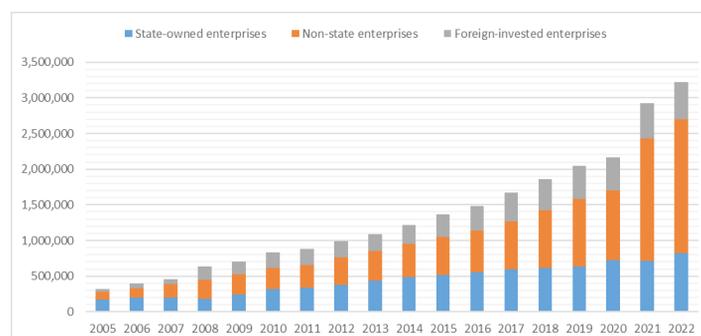


Figure 5: Financial resources of enterprises by ownership nature (2005 – 2022)

Source: GSO

State-owned enterprises are enterprises, units and organizations owned by the State. The value of financial resources of state-owned enterprises in 2005 was 172,000 billion VND and by 2021 is 713,577 billion VND, 4.1 times higher than in 2005.

Non-state enterprises including households, private enterprises... The value of financial resources of these enterprises in 2005 was 105,000 billion VND, in 2022 it is 1,873,200 billion VND, 17.84 times higher. compared with 2005.

The foreign-invested enterprise sector are investments made by foreign investors or joint ventures with domestic enterprises. The value of financial resources of this business sector in 2005 is 47,000 billion VND, in 2022 is 521,900 billion VND, 11.10 times higher than 2005. Besides, it can also be seen that, in 2022, the value of financial resources The main revenue of enterprises in all three regions increased, an increase of about 328,800 billion VND compared to the total in 2021, which proves that financial resources after the Covid-19 pandemic increased significantly.

3. THE INFLUENCE OF MACROECONOMIC VARIABLES ON ENTERPRISES' FINANCIAL RESOURCES THROUGH QUANTITATIVE MODELS

3.1. Methodology

The data included in the model are time series (in the period of 18 consecutive years from 2005 to 2022). The test results showed that the VAR model was selected for regression. Due to the limitation of data, the study selected factors to be included in the model, including the economic growth rate (GDP), inflation rate (I), the average interbank offered rate for 6-month term (IR), average exchange rate VND/USD (FX) and invested capital or financial resources (LIC). The financial resources of enterprises are divided into 3 separate areas: State Sector (LSIC); Non - State Sector (LNIC) and Foreign Invested Sector (LFIC). The research model and detailed variables are described as below:

$$LIC = f(GDP, I, IR, FX)$$

3.2. Research results and discussion

The research has done stationarity test, test for Optimal Lag Structure, Stability of the VAR Model and residual test. The results are detailed as in the Appendix.

3.2.1. Evaluating Granger Causality

Table 5: Synthetic of Granger causality relationship of variables to financial resources of three sectors

State Sector					
Dependent variable	D(LNSIC)	LNGDP	D(LNI)	D(LNIR)	D(LNFX)
D(LNSIC)		0.0974	0.6390	0.9174	0.5194
LNGDP	0.0378		0.1077	0.6020	0.9479
D(LNI)	0.1168	0.5463		0.5551	0.8003
D(LNIR)	0.7002	0.5375	0.5574		0.6622
D(LNFX)	0.0847	0.0350	0.8056	0.6575	
Non-state Sector					
Dependent variable	D(LNNIC)	LNGDP	D(LNI)	D(LNIR)	D(LNFX)
D(LNNIC)		0.0004	0.2864	0.1095	0.9966
LNGDP	0.0007		0.1024	0.2223	0.9674
D(LNI)	0.1607	0.6136		0.5138	0.8284
D(LNIR)	0.6773	0.3915	0.3075		0.8177
D(LNFX)	0.5134	0.0047	0.8406	0.6408	
Foreign-invested Sector					
Dependent variable	D(LNFIC)	LNGDP	D(LNI)	D(LNIR)	D(LNFX)
D(LNFIC)		0.6500	0.1827	0.4060	0.7570
LNGDP	0.1828		0.0762	0.5506	0.8986
D(LNI)	0.1559	0.5036		0.5297	0.8333
D(LNIR)	0.1550	0.8088	0.8493		0.9432
D(LNFX)	0.4748	0.0782	0.8306	0.6492	

Source: Results from Eviews 10

From the running results, it is shown that, at the 10% significance level, the test results show that Prob of all variables is less than 5%. Therefore, all the independent and dependent variables built in the model are interrelated and affect the financial resources of the enterprise. Specifically, this result shows that economic growth rate (GDP), interest rate (IR), inflation rate (I) and VND/USD exchange rate (FX) all have an impact on the financial resources of Vietnamese enterprises in different regions and vice versa.

3.2.2. Impulse response function (IRF)

From the graph in Appendix 5, it can be seen that the responses of financial resources in the sectors to changes from the economic growth rate, the inflation rate, the average interbank offered rate, the average exchange rate, and the average exchange rate are not the same. Overall, the push response results show:

For the State Sector: All indicators have strong fluctuations and in the last years, these indicators tend to decrease. The reason is that from the later period, GDP decreases while IR increases, causing the economy to grow slowly, thereby negatively affecting the financial resources of enterprises.

For the Non - State Sector: During the whole period, GDP, I and IR have a great impact on the financial resources of enterprises in the non-state sector, making financial resources in 10 years is always fluctuated. The reason for this is that the abnormal growth of the economy makes other macro factors affected, interest rates and inflation can be very high or very low. As a result, the ability of enterprises to mobilize financial resources is also affected and tends to fluctuate between years.

For the Foreign Invested Sector: GDP decreases in the first 4 years and the FX rate in the first and second years cause the decline of financial resources. The whole period after that, GDP increased but increased slightly and slightly decreased at the end of the period. With the proportional impact between GDP and the financial resources of enterprises, from the 5th year onwards, financial resources in the foreign-invested sector also keep a stable level. In addition, IR and I have a stronger fluctuation band, leading to unstable financial resources at this time, but at the end of the period, the response of the financial resources of enterprises in these two sectors is almost the same.

3.2.3. Variance Decomposition Test

The result of the analysis of variance shows that, during the 10-year period of the study, the financial resources of the state sector are greatly affected by the shock created by itself. Among the macro variables, GDP has the most explanatory role for the financial resources of the State sector and has a decreasing role (from 35.87% in the 2nd year to 32.58% in the 10th year) leading to financial resources decline.

The second influencing factor is inflation (I) with the explaining role increasing sharply. Along with that, the average FX rate also shows its influence on financial resources. The role of IR interest rates explains the increase and stabilization of about 0.3% of fluctuations in financial resources of the State sector. This result is completely reasonable because financial resources are proportional to GDP and inversely proportional to I, IR, FX.

The results of the analysis of variance show that, during the 10-year period of the study, financial resources in the non-state sector are mainly explained by itself and FX. On the other hand, the influential role of FX is completely opposite to financial resources in the non-State sector.

Next, GDP and IR tend to increase and remain more stable than other variables, but still explain only below 20%. The smallest explanatory role is the inflation rate, which remains below 5% and does not affect financial resources in the non-state sector much. LI explains at least the fluctuations of financial resources in the non-State sector, accounting for 0.5% to more than 2%.

The results of the analysis of variance show that, during the 10-year period of the study, the financial resources of the foreign-invested sector are mainly explained by itself. If its own explanation is the largest and decreases gradually (from 81.9% in the 2nd year to 72% in the 10th year), the independent variables I, IR, FX all tend to increase stably although not accounting for more than many roles affecting financial resources in this area.

Finally, GDP growth rate also has an effect on the financial resources of the foreign-invested sector. However, it accounts for only a small part and unstable over the years and always remains below 5.5%.

4. SOME MACROECONOMIC SOLUTIONS TO STRENGTHEN THE FINANCIAL RESOURCES OF ENTERPRISES IN VIETNAM

From the model results, it can be seen that the financial resources of enterprises in Vietnam are directly and indirectly affected by the economic growth rate (GDP), the average interbank offered rate (IR), inflation rate (I) and average exchange rate VND/USD (FX). In addition, all the above macroeconomic variables have positive and negative impacts on the growth of financial resources of enterprises in Vietnam. In which, the economic growth rate is the macroeconomic variable having the strongest influence.

From there, some macroeconomic solutions are proposed to strengthen the financial resources of enterprises in Vietnam:

Adapt to the international market

In order to stabilize the micro-economic variables affecting the financial resources of enterprises, the Government needs to monitor and promptly update developments in the world and in the country, analysis and forecast, and at the same time implementing flexible fiscal and monetary policies to both control inflation and promote the growth of financial resources of businesses.

Vietnam is a country with a developing economy and is in the process of international economic integration, so monitoring and updating the world situation, fiscal and monetary policies of other countries is very important large scale such as the US, China, Japan... will help Vietnam make smarter macroeconomic stability policy decisions in accessing corporate financial resources and ensure that those decisions will meet the requirements and changes of the international market. Moreover, this will help Vietnam seize new trade and investment opportunities from its important partners, which will help businesses increase investment cooperation, thereby, attracting more resources. finance and improve product quality for enterprises.

In addition, the Government also needs to closely monitor the developments of the labor market and employment to have a plan to promptly support businesses to overcome the labor shortage. On the other hand, it is necessary to focus on solutions to expand and diversify markets and export products; effectively exploit the signed Free Trade Agreements (FTAs). It is also necessary to make timely adjustments of policies to enhance the attraction of high-quality foreign direct investment.

Improve and strengthen measures to prevent risks from unfavorable electrical conditions

In the context of society when affected by unfavorable natural conditions, enterprises need to strengthen their readiness to deal with the impacts of these emergencies. Solutions include building a backup goods supply system, improving production capacity, and strengthening cooperation with other partners to solve difficult problems. In addition, enterprises are close to mobilizing other financial resources such as financial resources from international organizations, banks, and business partners to promptly deal with the difficult economic situation caused by the epidemic, natural disasters. To reduce the risk of unfavorable conditions, the Government and financial institutions need to increase support for enterprises including providing loans with low interest or interest free, tax support, cut the cost.

The strengthening of prevention of natural disasters and epidemics is a method of urgent need for Vietnam, especially local, which is easy to natural disasters such as floods, landslides, droughts and saltwater intrusion. Our country has also been strengthening activities to prevent, forecast, warn, prevent and respond to emergency situations in order to strengthen capacity for natural disaster prevention and disease prevention, such as:

- Building a system of warning and forecasting weather, natural disasters to minimize damage to people and financial resources of enterprises
- Strengthening disease control, vaccination against disease

- Promote coordination among agencies to proactively prevent natural disasters and epidemics

Strengthen the management of financial and monetary policy

Strengthening financial policy management is one of the important factors to ensure the stability of the economy. Strengthening financial policy management requires the Government to develop and implement policies and measures to ensure uniformity, efficiency and fairness in the management and allocation of financial resources of the country. The government has also introduced specific policies and measures to strictly manage budget expenditures, reduce waste and strengthen budget control. At the same time, develop the state budget revenue by increasing taxes and fees, tax reform and supervision over other revenues.

Strengthening financial policy management also includes strengthening supervision and control of financial activities of organizations and businesses, in order to prevent illegal financial activities, tax fraud, tax evasion, waste of budget, undermine transparency and honesty in financial management of the country. At the same time, it is necessary to strengthen training, improve capacity, skills and equip tools for relevant agencies, organizations and employees to ensure efficiency in financial management.

To do this, the Government can apply flexible fiscal policies, respond quickly and effectively to market changes, mitigate the impact of recession and strengthen economic growth.

Increase public investment: The government can increase public investment to stimulate economic growth. This can be done by increasing investment in economic sectors with high growth potential such as technology, energy and infrastructure.

Control inflation: The government needs to control inflation to keep economic growth healthy. Measures could include strengthening price controls, strengthening monetary reserve management, and promoting financial market stability.

These policies will help businesses increase productivity, reduce costs and increase their competitiveness, thereby helping to improve the financial resources of enterprises. The government also needs to create policies that encourage investment for new and potential businesses, especially in new fields and technological innovation. This will help our country's economic development and sustainable growth in the long term. In addition, the Government needs to strictly manage the exchange rate, minimize sudden fluctuations in the value of the currency, and strengthen inflation control.

Strengthen government regulation

The Government should create favorable conditions for domestic and foreign enterprises and investors to develop the financial resources of the most effective enterprises. That will contribute a significant part to GDP growth and increase state budget revenue. Moreover, the government can strengthen inflation control and financial management to ensure that financial resources are always at the best level for enterprises. From there, introduce policies to attract foreign investment in Vietnam to increase financial resources for businesses.

Government can also reduce interest rates to help reduce borrowing costs of businesses, while increasing the ability to reinvest and expand production activities business for enterprise. As a result, enterprises will maintain operations, economic growth and stabilize their financial resources. Moreover, the Government can provide directly financial resources to businesses when businesses are short of capital and are heavily affected by macro fluctuations, including funding and lending. This support helps businesses ensure enough capital for themselves so that they can promptly solve their business's financial problems and maintain operations, avoid bankruptcy risks, and help them have a can invest in business expansion. In addition, the Government can also provide other support to businesses to raise capital through funding and development assistance programmes.

Strengthen the internal capacity of the enterprise

To strengthen the internal capacity of the enterprises to adapt to macroeconomic variables requires a comprehensive and continuous approach to investing in improving human resources, management processes, technology and cooperation. Enterprises need to:

- First, investing in research and development (R&D) helps businesses capture and apply new and advanced technologies. Therefore, enterprises should facilitate and invest in research and development activities to improve products, production processes and technologies. This enhances business creativity and innovation, helps create new products and services, improves efficiency and strengthens competitiveness, and adapts to economic change.

- Second, invest in training and human development. Investment in training and human resource development is an important factor to improve the internal capacity of enterprises. By training and developing employees' skills, knowledge and leadership through training courses, expertise, seminars, ... to help businesses create a team of competent employees. high and fast adaptability. Besides, enterprises can build career development programs to encourage and create promotion opportunities for employees and help businesses quickly adapt to economic changes and seize new opportunities.

- Finally, Innovate and exploit digital technology. Using digital technology helps businesses enhance performance and business processes as well as improve production processes, data management, communication and interaction with customers. By using technologies such as artificial intelligence, big data, Internet of Things (IoT), and artificial intelligence businesses can optimize operations, increase productivity, and reduce costs, while helping businesses enhance the ability to adapt and seize opportunities in a rapidly changing business environment.

In conclusion, it is necessary to combine macroeconomic policies, including fiscal policy, monetary policy and other policies, to control macro indicators. In this way, the financial resources of enterprises for their operation and development are ensured.

APPENDIX

Appendix 1: Result of stationarity test

Variable	ADF	P-value	Stop chain	Result	Critical value (t-statistic)		
					1%	5%	10%
Ln(SIC)	-3.925275	0.0115 (**)	Dln(SIC)	Stop	-4.004425	-3.098896	-2.690439
Ln(NIC)	-8.519854	0.0000 (**)	Dln(NIC,2)	Stop	-3.959148	-3.081002	-2.681330
Ln(FIC)	-5.083147	0.0011 (**)	Dln(FIC)	Stop	-3.920350	-3.065585	-2.673459
Ln(GDP)	-3.889516	0.0106 (**)	Ln(GDP)	Stop	-3.920350	-3.065585	-2.673459
Ln(I)	-5.182122	0.0011 (**)	Dln(I)	Stop	-3.959148	-3.081002	-2.681330
Ln(IR)	-3.673192	0.0161 (**)	Dln(IR)	Stop	-3.920350	-3.065585	-2.673459
Ln(FX)	-3.286406	0.0377 (**)	Dln(FX)	Stop	-4.057910	-3.119910	-2.701103

Source: Synthesized results from Eviews 10 software

Appendix 2: Results of Optimal Lag Structure testing of 3 areas

○ State sector

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-231.3160	NA*	4643246.	29.53949	29.7809*	29.55186
1	-202.4541	36.07736	3469979.*	29.05676*	30.50536	29.1309*

○ Non-State sector

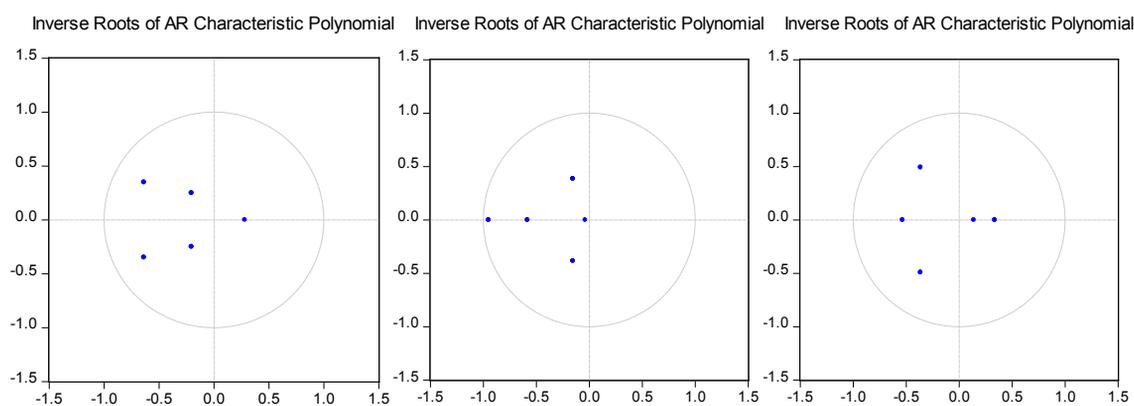
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-241.9240	NA	1.37e+08	32.92320	33.15922	32.92069
1	-201.4415	48.5789*	2198724*	30.8588*	32.27497*	30.84378*

○ **Foreign-invested sector**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-224.8561	NA*	2070807*	28.73202*	28.97345*	28.74438*
1	-205.6303	24.03226	5161274.	29.45379	30.90240	29.52797

Source: Results from Eviews 10

Appendix 3: Stability of the model



Source: Results from Eviews 10

Appendix 4: Results of residual test of 3 areas

○ **State sector**

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	38.75098	25	0.0390	1.910643	(25, 5.2)	0.2369

○ **Non-State sector**

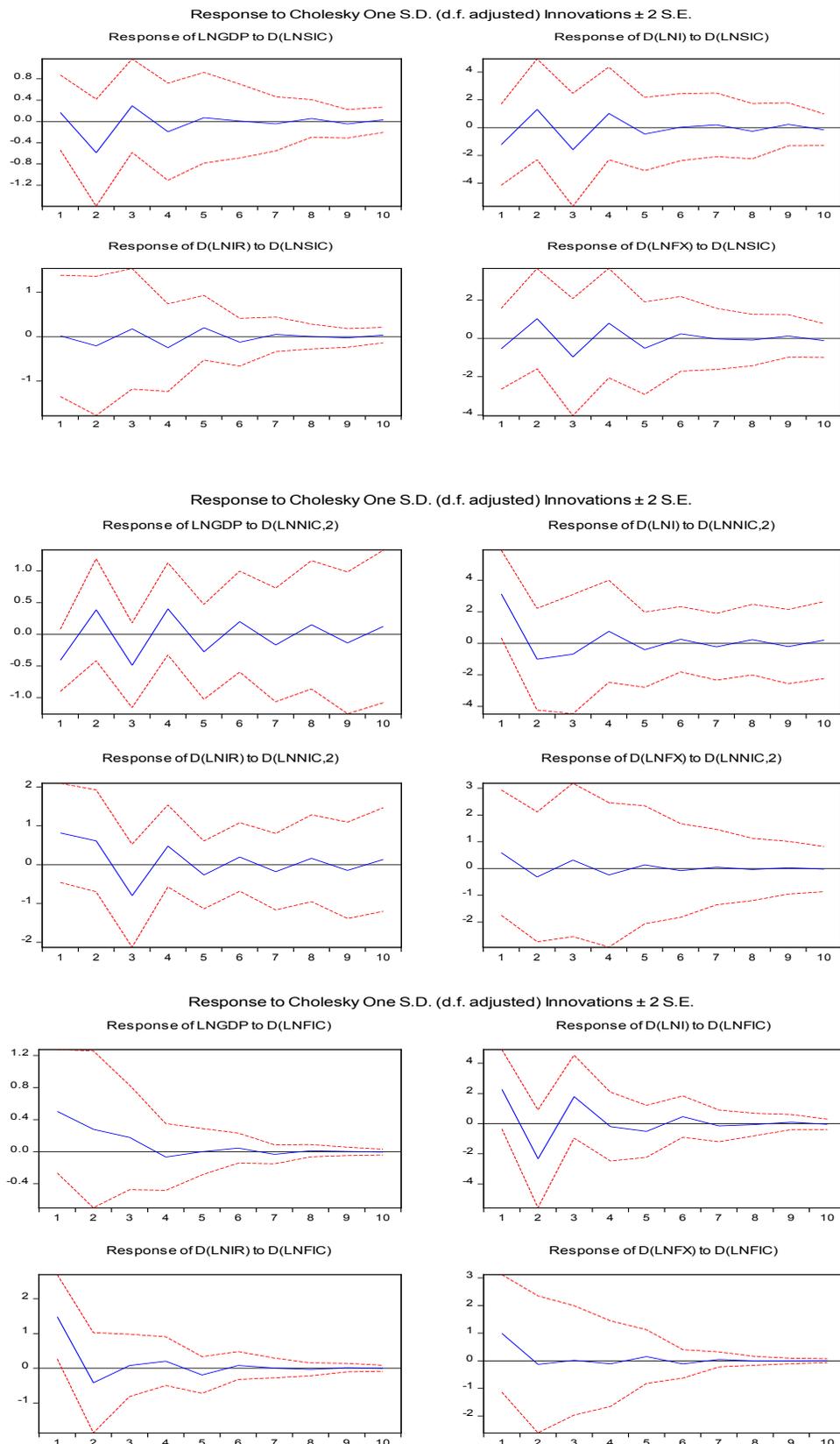
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	151.1759	25	0.0000	6734.916	(25, 1.5)	0.0012

○ **Foreign-invested sector**

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	32.04044	25	0.1568	1.209924	(25, 5.2)	0.4531

Source: Results from Eviews 10

Appendix 5: Results of impulse response function



Source: Results from Eviews 10

Appendix 6: Variance decomposition results

Period	S.E.	Variance Decomposition of D(LNSIC):				
		D(LNSIC)	LNGDP	D(LNI)	D(LNIR)	D(LNFX)
1	26.21126	100.0000	0.000000	0.000000	0.000000	0.000000
2	39.57710	54.16817	35.86618	3.479257	0.081441	6.404952
3	45.21433	43.51687	33.92071	15.71623	0.166248	6.679943
4	47.98644	38.65816	34.08081	17.85994	0.332206	9.068887
5	48.85029	38.01591	33.48607	17.61054	0.376814	10.51066
6	49.28067	38.37378	32.90432	17.39978	0.372120	10.95000
7	49.62639	38.52522	32.61667	17.61320	0.372161	10.87275
8	49.88506	38.39923	32.55359	17.90260	0.380528	10.76406
9	50.03061	38.22877	32.56763	18.06452	0.388543	10.75054
10	50.09139	38.13638	32.57688	18.10817	0.392532	10.78605

Period	S.E.	Variance Decomposition of D(LNNIC,2):				
		D(LNNIC,2)	LNGDP	D(LNI)	D(LNIR)	D(LNFX)
1	128.3677	100.0000	0.000000	0.000000	0.000000	0.000000
2	180.6522	81.79595	12.57223	4.108232	0.750096	0.773485
3	219.9760	68.28964	8.536706	4.040723	4.378176	14.75475
4	267.7432	51.18029	8.482818	3.611459	7.344740	29.38070
5	317.3410	38.60677	10.22702	3.307083	8.815158	39.04397
6	364.1840	30.44830	12.08836	3.062924	9.482947	44.91747
7	406.3386	25.15740	13.61544	2.861938	9.813997	48.55123
8	443.3863	21.60662	14.78226	2.707020	9.998639	50.90546
9	475.6405	19.12476	15.66297	2.591628	10.11049	52.51016
10	503.6694	17.32371	16.33370	2.505205	10.18243	53.65495

Period	S.E.	Variance Decomposition of D(LNFIC):				
		D(LNFIC)	LNGDP	D(LNI)	D(LNIR)	D(LNFX)
1	28.51348	100.0000	0.000000	0.000000	0.000000	0.000000
2	33.00979	81.94212	5.447036	0.005880	10.07048	2.534483
3	34.57424	74.82744	5.095852	7.386654	9.897933	2.792119
4	35.48177	72.98010	5.088207	7.772615	9.606629	4.552452
5	35.94388	72.40242	4.986601	7.593561	9.415144	5.602272
6	36.06677	72.08461	4.970412	7.660343	9.386320	5.898313
7	36.08922	72.00370	5.000177	7.705708	9.379630	5.910782
8	36.09950	72.00272	5.008574	7.703993	9.376038	5.908672
9	36.10294	71.99924	5.007853	7.706139	9.377548	5.909221
10	36.10394	71.99530	5.008125	7.709707	9.377954	5.908916

Source: Results from Eviews 10

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THE STATUS OF VIETNAM'S EXPORT OF GOODS TO EUROPE AFTER VIETNAM- EU TRADE AGREEMENT

PhD. Tran Phuong Anh¹, Doan Thi Nhi¹

Abstract: The article aims to clarify the results achieved after more than 2 years of the Vietnam - EU Free Trade Agreement (EVFTA) taking effect. This is one of the important agreements, which can open a new trade corridor for Vietnamese businesses in development. The article uses statistical, analytical, and comparative methods to clarify the successes and development potentials that Vietnamese businesses have been approaching since the EVFTA took effect.

Keywords: Vietnam – EU Free Trade Agreement, EVFTA, trade, export

1. INTRODUCTION

In the process of developing a market economy in Vietnam, international economic integration, free trade exchanges between Vietnam and the world is an extremely important and meaningful step. An open economy, with reduced barriers to the movement of goods and services domestically and internationally, towards free international trade is necessary for building and perfecting an economy in the world. Therefore, Vietnam has taken advantage of the success in international trade negotiations to increase exports.

The EU is one of the largest markets in the world, which helps Vietnamese exporters reach out. The EU-Vietnam Free Trade Agreement is one of the important agreements, highly appreciated by researchers for its benefits for both sides. The commitments of the Agreement will certainly create many changes in the trade relations between Vietnam and the EU.

2. THEORETICAL FRAMEWORK

The EU-Vietnam Free Trade Agreement (EVFTA) officially took effect on August 1, 2020, marking an important milestone in the 30-year journey of cooperation and development between Vietnam and the European Union. As the first Free Trade Agreement (FTA) between Vietnam and the European Union (EU), the EU-Vietnam Free Trade Agreement (EVFTA) is the bridge connecting the Vietnamese economy directly with 27 EU economies. This is also a new generation of FTA, the second highest standard that Vietnam has signed, with commitments covering many fields, a strong degree of liberalization, and a higher level of commitment than most of the existing FTAs of Vietnam. Therefore, the EVFTA is assessed to bring significant and positive economic and political impacts to Vietnam.

In the EVFTA agreement, the EU has committed to open the market for several key export products of Vietnam, including seafood, textiles, footwear, rice, and vegetables. As follows:

- For seafood products: The tax rate for Vietnam's seafood exports to the EU was 10.8% (higher than the weighted average tax rate of 3.8%) but the EU will eliminate import tax on seafood products of Vietnam (except canned tuna and fish balls) within 7 years from the date when the Agreement took effect. For canned tuna, the EU agreed to give Vietnam an adequate amount of tariff quota. But to enjoy this preferential tariff, Vietnam's seafood products must ensure quality and strict food safety from the EU.

- For textile products: currently, the average tax rate for textiles and garments from Vietnam to the EU is 9.6%. According to the commitment in the EVFTA, the EU will eliminate taxes within 7 years. That

¹ Academy of Finance.

is, the EU will eliminate taxes for this group of goods, not immediately but within seven years after the agreement comes into force. In addition, according to the memorandum of understanding between the two sides, the EU will eliminate taxes for this item, but will also take measures to ensure the origin of textiles. These EU regulations aim to ensure that Chinese goods do not take advantage of the agreement to flood the EU market. Accordingly, the EU sets out quite strict rules of origin for garments that must be sewn from fabric made in Vietnam and fabric made in Korea - another FTA partner of the EU.

- For footwear products: Currently, the tax rate of this item to the EU ranges from 3% to 17%. And according to the EU's commitment to the EVFTA to Vietnam, the tax rate of this item to the EU will be 0% after 7 years from the effective date of the EVFTA. Concerning the EVFTA, the EU's GSP preferences for Vietnam will not be abolished until they enjoy the preferential rates under the new Agreement (According to Mr. Jean-Jacques Boufflet - Head of Trade and Economic Department, EU Delegation). In other words, Vietnamese footwear will benefit the most. However, footwear also has to face regulations of origin of raw materials such as textiles if it wants to enjoy these incentives.

- For wood products: Vietnam's wooden furniture exported to the EU is currently enjoying GSP tax with the main tax rate of 0% (some product codes are subject to 2.1%). The EU commits to be completely tax-exempt for this item in the EVFTA Agreement. Wood products and products from pine wood will enjoy GSP incentives even after the EVFTA comes into effect

Besides, Vietnam commits to eliminate most of the export tax after a certain procedure; only reserving export tax for some important products, including crude oil and coal. This means that Vietnam's key products exported to the EU will not be subject to additional tariff costs, increasing the competitiveness of Vietnamese goods in the EU market.

The EU's commitment to Vietnam in trade in services and investment is higher than in the WTO and equivalent to the highest level in recent EU FTAs. And the EU will protect 39 geographical indications of Vietnam. This has great significance for creating brands for Vietnam's key export products to the EU when collective brands are being focused on and promoted.

3. RESEARCH METHOD

The trade situation of the European Union (EU) is facing many challenges and fluctuations. Some of the key issues include Economic downturn: The EU has faced an economic downturn due to the Covid-19 pandemic, which has had a major impact on business and exports. Competition with other trading partners: The EU is competing with other trading partners such as the US and China in important markets. Difficulty in reaching a trade agreement: The EU has had difficulty reaching a trade agreement with major partners such as the US, Canada, and Mercosur. Brexit Impact: The UK's departure from the EU has created many negative impacts on EU business and trade. However, the EU remains one of the regions with the largest economies in the world, with a large consumer market size and strong research and development investment. The EU is also making efforts to improve its competitiveness and diversify export markets, and at the same time accelerate the signing of new trade agreements with different partners.

After 2 years of the COVID-19 outbreak, both Vietnam and the EU are adapting better and better to the pandemic, speeding up the vaccination process and booster shots. In particular, the Vietnam - EU economy and trade with a solid foundation from the EVFTA will face many promising opportunities after the pandemic, bringing practical benefits to the business communities of both sides. The EVFTA plays the role of not only a lever to promote two-way trade but also a preeminent advantage for the business communities of both sides in the context of the global economy and trade being seriously affected by the COVID-19 pandemic.

Statistics from the General Department of Customs show that two-way trade exchange between Vietnam and the EU after one year of EVFTA implementation reached 54.87 billion USD, increased by

12.1% over the same period; in which export turnover reached 38.48 billion USD, increased by 11.3% and import turnover reached 16.39 billion USD, increased by 14.04%.

Although Vietnam was severely affected by the 4th outbreak of the epidemic in the southern key export region, in the first 11 months of 2021, two-way trade between Vietnam and the EU still recorded positive growth, including compared to the pre-pandemic period.

Specifically, the import-export turnover between Vietnam and the EU reached 51.3 billion USD, increased by 13.8% over the same period in 2020; in which exports reached 35.96 billion USD, up 12.6% and imports reached 15.34 billion USD, up 16.6% over the same period in 2020. In particular, Vietnam had a trade surplus with the EU of 20.6 billion USD, increased by 9.8% compared to the same period last year.

Group of textiles

The EU is the second largest textile import market after the US.

Exports to the EU market accounted for 11.08% of total garment exports, with an annual growth rate of 7-10%. Among the members of the EU, four major markets, namely Germany, the Netherlands, France, Spain, and Belgium, account for nearly 70% of Vietnam's textile and garment exports to the EU. 10 items have the largest export turnovers, including jackets, pants, t-shirts, underwear, shirts, children's clothing, shorts, workwear, skirts, and swimwear, accounting for 88.42% of total garment exports from Vietnam to the EU.

In 2020, Vietnam's textile and garment exports to the EU decreased, mainly due to a sharp decrease in exports to Germany, the Netherlands, Spain, Italy, Sweden, and Denmark. Vietnam's textile and garment exports to the EU decreased by \$450.7 million compared to 2019, mainly due to the decrease in exports of many types of products such as jackets, pants, shirts, underwear... Notably, exports of jackets, underwear, pants, and shirts decreased sharply, greatly affecting the speed of Vietnam's textile and garment exports to the EU market. In which, Vietnam's Jacket export turnover to the EU reached 841 million USD, down to 152.5 million USD compared to 2019, equaling 33.84% of the decrease in export turnover to this market. Similarly, underwear and pants are also equal to 18.31% and 18.41% of the decrease in export turnover to the EU market.

In particular, while Vietnam's exports of most types of ordinary textiles and garments to the EU market decreased, the export of workwear (including medical protective equipment) increased sharply in the year. 2020. In 2020, Vietnam's export of this item to the EU will reach 227.9 million USD, an increase of 72.49 million USD compared to 2019, equaling 21.2% of the decrease in export turnover, contributing to slow down the decline in textile and garment exports to the EU market.

In 2021, despite the difficult situation of the Covid-19 pandemic in the EU, Vietnam's textile and garment market share in the EU in 2020 still improved compared to 2019, and the EVFTA Agreement was applied more broadly and deeply. A recent report by the European - American Market Department (Ministry of Industry and Trade) in collaboration with the Center for Trade and Industry Information published, citing preliminary statistics of the General Department of Customs, said that in January In December 2020, Vietnam's textile and garment export turnover to the EU market was estimated at 270 million USD, up 3.05% compared to November 2020 and down 11.48% compared to December 2019. In general, in 2020, Vietnam's textile and garment exports to this market reached 3.08 billion USD, down 12.77% compared to 2019.

Footwear group

As the number one key export product of Vietnam to the EU market, the import tax rate for shoes, suitcases, and bags entering the EU market is relatively high, ranging from 2 to 17%. When the EVFTA comes into effect, leather, and footwear are considered one of the major beneficiaries of the agreement when the EU commits to eliminating 100% tariffs on Vietnamese footwear products, with the longest duration being 7 years.

According to statistics from the General Department of Customs, after the EVFTA officially took effect, Vietnam's footwear exports to the EU market gradually recovered, especially in the first quarter of

2021. From August 2020 to March 2021, there have been 6 months that Vietnam’s footwear exports to the EU increased (except in February 2021, exports to the EU decreased due to the Lunar New Year holiday).

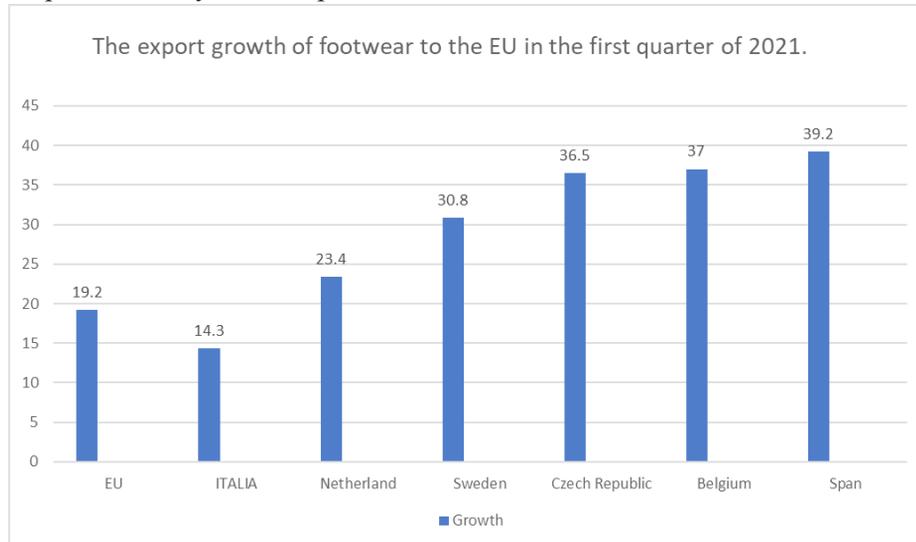


Chart: Export growth of footwear to the EU in the first quarter of 2021 (Data obtained from the General Department of Customs) (Unit: % compared to the same period).

It can be seen that in the first quarter of 2021, the footwear industry has many good signs compared to the same period in 2020. Specifically, footwear exports to the EU increased by 19.2% over the same period in 2020. Meanwhile, at the same in the first quarter of 2020, it only increased by 0.1%, and in the first quarter of 2019, it increased by 11.9%. In particular, exports to many markets increased sharply at double digits: Belgium increased by 37.0%, the Netherlands increased by 23.4%; Italy went up by 14.3%, Spain went up by 39.2%, Czech Republic up by 36.5%, Sweden up by 30.8%...

In terms of product structure, Vietnam’s sports shoes have made good use of this incentive, when export turnover to the EU has increased sharply and is the most exported category to this market. According to statistics, the export of sports shoes: tennis shoes, basketball shoes, gym shoes, and uppers made of textile materials... to the EU in the first quarter of 2021 reached 370.48 million USD (accounting for 34.1 % of total footwear exports to the EU), an increase of 31.2% over the same period in 2020.

The above positive result is thanks to the fact that domestic footwear manufacturing enterprises have well met the rules of origin and are entitled to tariff incentives from the EVFTA. According to statistics of the Import-Export Department (Ministry of Industry and Trade) from August 1, 2020, to December 31, 2020, Vietnam’s footwear export turnover to the EU is granted C/O from EUR.1 is 1.37 billion USD. This number increased rapidly in the first quarter of 2021 with 1.17 billion USD, reaching 98.98% of export turnover.

The EU’s tariff reduction roadmap for Vietnamese footwear is quite fast and deep. 100% of footwear lines are reduced to 0% with a maximum of 7 years. In which, some basic items are reduced to 0% as soon as the agreement comes into effect, and some other items have a longer reduction schedule but only 3-7 years. This has helped many Vietnamese footwear manufacturers enjoy 0% tax (more favorable than GSP) as soon as the EVFTA comes into effect.

Therefore, footwear is always a commodity with a high export turnover of C/O level and a high rate of preferential C/O usage when exporting to the EU market. In addition, Vietnam’s footwear industry also has an advantage when most of the countries exporting footwear to the EU currently do not have an FTA with the EU.

In particular, when compared to textiles and garments, which are also one of Vietnam’s key export products in the EU market, the criteria of origin for leather and footwear products in the EVFTA are relatively flexible.

Seafood group

Seafood exports to the EU in 2020 decreased by 26% compared to 2019, reaching about \$ 960 million, the main reason is due to Brexit, the UK leaving the market. The UK is a large import market of this block with seafood import turnover from Vietnam from 280 to 340 million USD/year. Therefore, if only EU27 is counted (except for the UK), exports to this bloc in 2020 did not decrease. In the context of Covid-19 and the IUU yellow card, stable exports to the EU show the clear impact of the EVFTA that has boosted exports to this market.

In the first 9 months of 2020, seafood to the EU increased by nearly 4% to reach USD 744 million, in the context of Covid-19 strongly affecting trade logistics, especially the supply chain in the third quarter, also showing a positive trend, maybe due in part to a boost from preferential tariffs under the EVFTA.

In the first 7 months of 2021, shrimp and seafood exports to the EU increased sharply thanks to higher demand after better control of Covid-19, maintaining a stable source of raw materials for export production, and applying preferential taxes for products with domestic raw materials.

Shrimp exports to the EU in the first 7 months of the year increased by 26%. Total seafood products exported to the EU increased by 23%, only decreased in some species imported for processing and export such as cod, and pollock... due to the impact of logistics issues on the import of raw materials for processing and exporting. Pangasius exports to the EU decreased by 13% due to high input costs (especially logistics, containers, and sea) while export prices did not increase.

In 2021, Vietnam's seafood exports were worth 8.9 billion USD (increased by 5.8% over the same period in 2020). In which, Vietnam's seafood export turnover to the EU market was about \$1.077 billion, up 12.3% compared to 2020, making the EU the third largest market after the US and Japan. It can be said that this is a positive result in the first year that Vietnam implements the EVFTA, businesses have made good use of the preferential conditions brought by this Agreement. This figure could have been even higher if the third quarter of Vietnam's seafood production had not been interrupted by the COVID-19 pandemic.

In the last 3 consecutive years, shrimp has always been the leading product in the structure of seafood exports to the EU market. In 2021, shrimp exports reached 613,136 million USD, an increase of 18.6% compared to 2020 (517,108 million USD). In which, exports to the Netherlands increased by 10%, to Germany by 25%, and to Belgium by 19%.

The second in seafood exports is tuna, with a proportion of 13.4%, increased by 6.4% compared to 2020. Processed tuna products increased sharply, while fresh tuna showed signs of a decrease of 18%. This gradually proves the value of seafood export products in Vietnam.

Pangasius still holds the position as one of the main products exported to the EU (accounting for nearly 10% of the proportion). However, in the past 3 years, this proportion has continuously decreased. In 2020, pangasius exports reached 127,778 million USD; however, by the end of 2021 this figure only reached 106.190 million USD, decreased by nearly 17% growth rate. One of the reasons for the decrease in pangasius export turnover in the EU market is that the competitiveness of this item is relatively large, and the consumption volume in many markets has not increased, in addition, logistics costs, and transportation costs... increased significantly.

Wood products group

According to Eurostat, EU wood furniture imports in 2019 reached 21 billion USD, increased by 6.4% compared to 2018. Statistics from the General Department of Customs, Vietnam's exports of wood and wood products to the market EU in July 2021 reached 44.5 million USD, increased by 22.1% compared to July 2020. Generally, in the first 7 months of 2021, the export of wood and wood products to the EU market reached 396.9 million USD, up 34.1% over the same period in 2020.

According to calculations from statistics of the General Department of Customs, Vietnam's exports of wood and wood products to the EU market in May 2021 reached 47.39 million USD, up 70% compared to

May 2020. Generally, in the first 5 months of 2021, the export of wood and wood products to the EU market reached US\$294.23 million, up 37% over the same period in 2020.

Wooden furniture is the main export item to the EU market in the first 5 months of 2021. The export turnover of this item reached US\$246.07 million, accounting for 84% of the total export turnover of wood and wood products to the EU market.

Most of the items in the structure of export wooden furniture have an increase in turnover in the first 5 months of 2021. In which, office furniture is the item with a very high growth rate, reaching \$ 7,5 million, an increase of 94% over the same period in 2020. Next is the furniture set with \$16.39 million, up 93% over the same period.

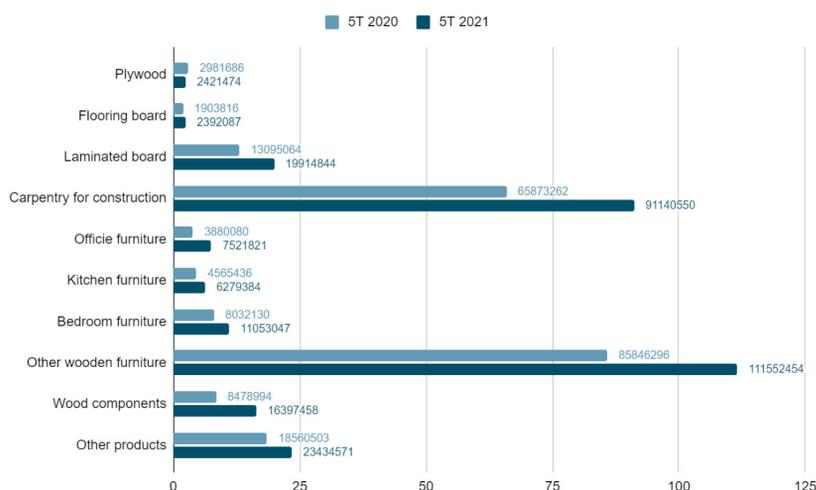


Chart: The main export commodities to the EU in the first month of May 2021 (Customs Statistics, Unit: milion USD)

Other wooden furniture products accounted for the highest proportion, 40% of the total export value to the EU in the first five months of 2021, reaching 111.55 million USD, up 30% over the same period in 2020. Next are other items such as seats, bedroom furniture, and kitchen furniture.

In the structure of wood products and wood products exported to the EU market in the first 7 months of 2021, wooden furniture is an item with a high proportion of exports, the export turnover of wooden furniture to the EU market is quite high. EU market reached 331.7 million USD, an increase of 36.3% over the same period in 2020. In which, export turnover of living room and dining room furniture, wooden frame chairs are the two items that account for the highest proportion of wooden furniture item structures. The strongest growth rate is office furniture and kitchen furniture.

In the first 7 months of 2021, the export turnover of wood and wood products to EU markets has grown quite well. Leading in terms of export turnover is the German market with USD 80.3 million, increased by 16.7% over the same period in 2020, accounting for 20.2% of the total export turnover of wood and wood products to the EU. Following is the French market with 78.4 million USD, up 29.5%; Netherlands reached 63.4 million USD, up 50%; Belgium reached 40.5 million USD, up 55.7%...

4. RESULTS AND DISCUSSION

4.1. Results

In the textile and garment group, with a fast and strong growth rate (increased by 16.8% over the previous year) is an admirable growth rate for the second largest export value item in the country. The textile and garment industry not only plays an important role in the goal of recovering economic growth but also ensures the balance of trade in Vietnam when it faces by the “new generation” FTAs. Typically, after the financial crisis, the growth rate of textile and garment exports has always increased steadily and strongly.

Currently, Vietnam is the second largest footwear exporter in the world, and the second largest market of the EU, after China, which has experience and prestige and is a good choice for footwear importer. The growth rate of export turnover of the footwear industry has been continuously stable over the past 5 years, despite periods of global economic downturn. Moreover, Vietnam's footwear products have been officially removed from the mature list and continue to enjoy preferential tax rates in the EU's universal preferential tariff program (GSP) with a tax rate of 0% for non-sensitive NS (non - sensitive NS) and a reduction of 3.5% on the ad valorem rate of the standard import tax in the EU General Tariff Schedule for the sensitive commodity (S - sensitive), so the export turnover of this item to the EU market is more prosperous. The group of seafood products is a familiar export group for Vietnam, becoming one of the key commodities exported to the EU market. In recent years, the seafood industry with its advantages has made significant strides to boost exports to European countries.

4.2. Discussion

Currently, EU investment is mainly focused on high-tech industries, however, there is a tendency to develop more in service industries such as post and telecommunications, finance, offices for lease, and sales. retail, clean energy, supporting industries, food processing, high-tech agriculture, pharmaceuticals...

European investors with technological advantages will actively contribute to the creation of several new industries and new products with high-technology content. In particular, the investment flow from the EU into Vietnam in the medium and long term will increase significantly with many high-quality projects of high value, while promoting technology transfer support.

According to a report by Standard Chartered Bank titled "The Future of Trade 2030: Trends and Markets to Watch Out for", total global exports will nearly double from \$17.4 trillion to \$29.7 trillion in the next decade. The report also outlines 13 markets that will make a major contribution to this growth, key trade corridors, and five trends shaping the future of global trade. Vietnam is an important market contributing to the growth of global trade. Vietnam's total export turnover is expected to record an average growth of more than 7% per year and reach more than 535 billion USD by 2030.

Also according to this report, 41% of global enterprises surveyed currently have manufacturing operations in Vietnam or plan to manufacture in Vietnam in the next 5 to 10 years. This shows that Vietnam will be one of the important drivers of global trade growth in the next 10 years.

With international trade on the rise, Vietnam is emerging as an important manufacturing base. The following sectors will contribute greatly to exports by 2030:

Sector	The export proportion by 2030	Compound annual growth rate 2020-2030
Machinery and electrical appliances	40%	6.4%
Textile	21%	6.4%
Agriculture	15%	8.1%

Table: Forecast of sectors contributing to exports in 2030

(Source: Vietnam Standard Bank forecast)

Market	Export turnover by 2030 (USD)	Average annual growth
Viet Nam	535 Billion	7%
China	5022 Billion	7.1%
India	563 Billion	7.6%
Korea	971 Billion	7.1%
HongKong	939 Billion	5.7%

Table: Forecasted Import Growth of the EU from Selected Markets

(Source: Forecast by Standard Vietnam Bank)

With the advantage of an abundant labor force, a geographical location close to major global supply chains, and an open policy to foreign direct investment, Vietnam is emerging as a manufacturing center of the world, attracting foreign enterprises to invest. Increased integration into the world economy through free trade agreements such as Vietnam - EU, Vietnam - UK, CPTPP, and RECP is bringing Vietnam many advantages, helping to promote exports, strengthen the value chain in the fields as well as create jobs requiring high skills. We are optimistic about Vietnam's future trade growth prospects and always strive to take advantage of our international network and deep understanding of the domestic market to support this process.

According to the Project on promoting the export of agricultural, forestry, and fishery products to the EU market until 2030 presented by the Department of International Cooperation (MARD), the goal of the project in 2025 is the export value of agricultural, forestry, and fishery products to the EU market from 5 to 5.5 billion USD; The proportion of exports of processed agricultural, forestry, and fishery products to the EU reaches about 30%, and agricultural, forestry, and fishery products directly approach the final customer channel in the EU reaches 20%.

According to the Ministry of Agriculture and Rural Development, Vietnam belongs to the top 10% of developing countries in terms of the proportion of agricultural, forestry, and fishery products exported to the EU market with certificates or recognition of achieving international standards on the environment and society.

The goal is that by 2030, the export value of agricultural, forestry, and fishery products to the EU market will reach from 7.5 to 8 billion USD, the proportion of exports of processed agro-forestry-fishery products to the EU will reach about 50% and continue to grow, direct access to the final customer channel in the EU will reach 30%. At the same time, Vietnam is among the top 5% of developing countries in terms of the proportion of agricultural, forestry, and fishery products exported to the EU with certificates or recognition of achieving international environmental and social standards, the Department of International Cooperation (MARD) informed.

The first point of view is that it is necessary to effectively exploit opportunities and advantages from the EVFTA Agreement to increase the quality, content, and creativity in agricultural, forestry, and fishery exports, increase added value, and develop ecological and sustainable agriculture. The Ministry of Agriculture and Rural Development considers the EU to be the first and most important test to build the brand name of Vietnamese agricultural products and improve its global reputation in line with the orientation and agricultural strategy that has been set out as being transparent, responsible, and sustainable.

Up to now, the EU market is one of the four major export markets for Vietnam's agricultural, forestry, and fishery products; The EU is also one of the three largest markets for agricultural, forestry, and fishery products in the world. Vietnam is also one of four Asian countries that have signed a Free Trade Agreement with the EU. Therefore, the opportunity to exploit the EU market is huge, contributing to increasing added value and export turnover, building a brand for agricultural products in the direction of responsibility, transparency, and sustainability, and helping to transform the country's economy from "agricultural production to an agricultural economy.

5. CONCLUSION

Vietnam is trying to go deeper into international agreements and organizations, trying to flatten all barriers, boldly with a large, challenging, and potential playing field. The capture of market opening opportunities is now open to businesses. Especially with big markets like the EU. With the long-established relationship, along with the EU - Vietnam Free Trade Agreement (EVFTA) completing the negotiation and signing procedures, now bringing Vietnam's key export products to the EU market as being opened with many great opportunities. That affirms that the EVFTA Agreement is an important turning point, a great success on the negotiating table of experts, and a new door to be opened wider in the cooperation relationship between the EU and Vietnam.

But besides those “golden” opportunities, there are still difficulties and challenges when Vietnamese exporters have to comply with strict rules and regulations from the EU. Therefore, to seize the opportunities for exporting key commodity groups, Vietnam needs to make efforts to build and develop supporting industries; associating and cooperate with foreign enterprises to create a supply of input materials; constantly trying to understand the market, full of effective research, exploitation, and marketing activities.

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STARTUP ECOSYSTEM IN VIETNAM - LESSONS FROM SINGAPORE

Author: Dao Thanh Hang¹

Mentor: Nguyen Thi Quynh Nhu¹

ABSTRACT: According to the survey results conducted by Amway Corporation in collaboration with Technische Universitat Munchen and market research company Gesellschaft fuer Konsumfors, Vietnam ranks first in the world in terms of entrepreneurial spirit and second in positive attitudes towards entrepreneurship. However, according to the evaluation scale by Startup Genome on a four-stage ecosystem, Vietnam's ecosystem is still at a very early stage compared to the world. Additionally, the success rate of startup businesses is still very low (less than 10%). According to the research by Nguyen and Dao, the reasons for the low success rate of startup businesses include limited capital and related fundraising policies, weak customer acquisition by businesses, and the lack of practicality in the products created. Furthermore, the institutional framework for innovation and entrepreneurship still lacks appropriate legal frameworks for these new business models. To accelerate Vietnam's pace, it is necessary to enhance learning and international cooperation. According to a recent World Bank business report, Singapore is the leading country in terms of friendliness towards startup businesses and business operations. In the human capital index, Singapore ranks as the best country in the world for human resource development. Along with strong financial support from the government, the country continues to enhance the agility and flexibility of its workforce through initiatives like Skillfuture. Therefore, Singapore has emerged as a startup hub in recent years and is an ideal destination for Vietnam to seek improvements in its entrepreneurship support system.

Keywords: entrepreneurship, ecosystem, startup ecosystem

1. INTRODUCTION

In the study, the author used references to various documents and data sources both domestically and internationally to obtain a comprehensive and multidimensional overview of the startup ecosystem.

• Research Overview

According to Viettonkin, the article “Start-up ecosystem in Vietnam” (2019) introduced the current status of Vietnam’s startup system and evaluated the position of Vietnam’s startup ecosystem compared to the global market based on various rankings. The report successfully highlighted the traps that Vietnamese startups encounter when entering the real market, and provided detailed solutions for the startup community to escape those market traps and expand their projects. However, the article’s perspective is still incomplete and lacks comprehensiveness, failing to delve into the underlying causes, resulting in the proposed solutions being superficial and lacking depth.

The study “Entrepreneurship and Innovation in Vietnam in the context of the Fourth Industrial Revolution” by author Bui Nhat Quang argues that the Fourth Industrial Revolution is starting to impact various sectors of the economy, society, and politics in Vietnam at different levels. The author successfully highlighted the current policies and orientations of the state and the realities of entrepreneurship and innovation in Vietnam. Based on that, the author proposed solutions to promote entrepreneurial activities, such as the importance of classifying startup businesses among newly established enterprises, establishing proper directions for startups, enhancing the level of scientific and technological application in businesses, and the need for more relaxed policies. However, the proposed solutions are not yet practical and difficult to implement in the current state of Vietnam’s startup ecosystem.

In addition, there are many other studies on entrepreneurship and startup ecosystems. All of these studies mainly focus on theoretical aspects of entrepreneurship and the theoretical foundation of

¹ Academy of Finance

entrepreneurship. However, there is no comprehensive study on “The Startup Ecosystem of Singapore and Lessons for Vietnam” available yet.

- **Urgency**

In the context of increasing international labor competition due to strong international integration, entrepreneurship is playing an increasingly important role in sustainable development in many countries. Numerous studies have shown the contribution of startup businesses to national economic development, particularly through job creation and increasing economic diversity. Therefore, promoting entrepreneurship has become a crucial objective in the economic development strategies of many countries.

- **Research Objectives and Questions**

Research objective:

To systematize the theoretical foundation of entrepreneurship and ecosystems in general, based on theory to analyze the current state of the startup ecosystem and the experiences in building and developing the startup ecosystem in Singapore, thereby deriving some lessons for building the startup ecosystem in Vietnam.

Research questions:

What has Singapore done to become such a highly attractive and tightly-knit startup hub in the world?

What is the current state of the startup ecosystem in Vietnam?

From an overview of Singapore’s startup ecosystem, what lessons can be drawn for Vietnam?

- **Research Subject and Scope**

Research subject: The startup ecosystem of Singapore

Research scope: From 2014 to 2022

- **Research Methodology**

Appropriate research methodology: Theoretical research method; analysis and synthesis method.
Theoretical framework về khởi nghiệp và hệ sinh thái khởi nghiệp

1.1. Theory of Entrepreneurship

1.1.1. Concept of Entrepreneurship

There are various definitions of entrepreneurship. According to Wikipedia, a startup is “a term commonly used to describe companies in the early stages of business (Start-up company), often specifically referring to technology companies in the startup phase. A startup is an organization designed to deliver products and services under conditions of extreme uncertainty.” Some common dictionaries in the US and UK define a startup as a newly established company, but they do not specify the age, leading to misunderstandings that startups exist only for 1-2 years. However, time is not the standard measure to determine whether a company is a startup or not. According to the CEO of Warby Parker, a startup is an organization designed to deliver products and services under conditions of extreme uncertainty, where risk does not necessarily have to be high but is not yet calculated.

Investopedia (2022) defines a startup as a company in its early stages of operation that offers innovative products in the market. Companies in this stage are often funded by the founders themselves to develop products and services they believe have a market demand. Due to limited revenue and high costs, most small-scale startups are not stable in the long term without support from investment funds. In this research, the author uses the definition provided by Investopedia (2022).

1.1.2. Features of Entrepreneurship

Every startup project has two common characteristics:

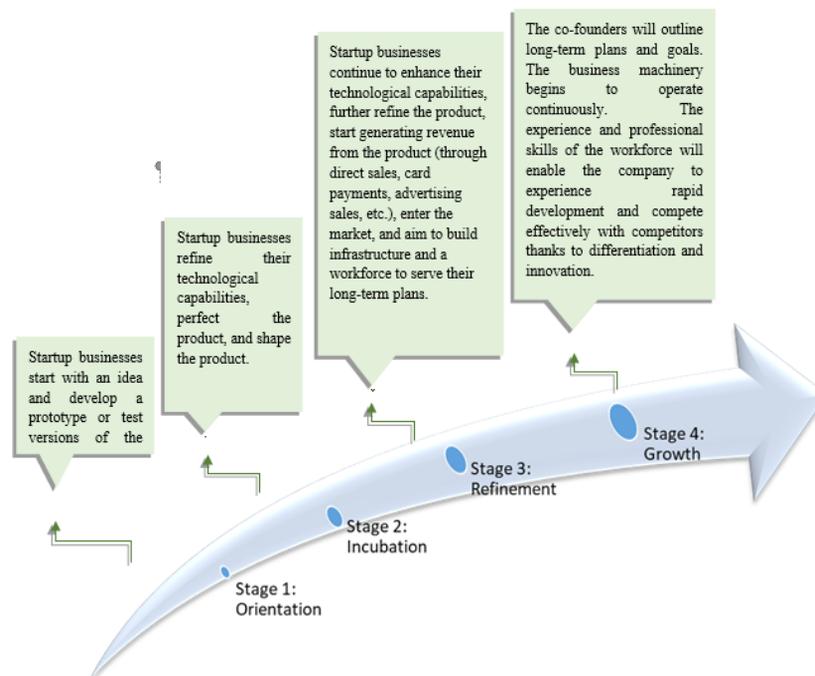
Innovation: The innovation of a startup is reflected in the products/services that entrepreneurs bring to their customers. Startups often create something that has never been seen on the market or improve upon

existing offerings, even surpassing them, demanding high competitiveness. This could be a new business model, a new product or service, a new market segment, or a technology never before seen in the world.

Growth: Growth is the ability to scale and develop the business, the capacity to handle a larger workload without compromising capacity or revenue. Startups do not set goals or limit their growth. They typically operate with a desire to achieve the best possible development.

1.1.3. The stages of entrepreneurship.

Startups typically go through the following stages:



1.2. Concept of the startup ecosystem

1.2.1. Theory of the startup ecosystem

According to Wikipedia, “an entrepreneurial ecosystem is the way a country or a city establishes to promote local entrepreneurial activities. Meanwhile, the OECD defines an entrepreneurial ecosystem as ‘the combination of formal and informal linkages among entrepreneurial actors, entrepreneurial organizations, and related institutions and entrepreneurial processes that directly impact the local entrepreneurial environment’.”

The National Agency for Science and Technology Information states that “an entrepreneurial ecosystem is a collection of interconnected business agents (both potential and existing), business organizations (such as companies, venture capitalists, angel investors, banks), institutions (universities, government agencies, financial entities), business processes, continuous serial entrepreneurs, sellout mentality within companies, and business ambition level, all formally and informally combined to connect, arrange, and govern activities within the local business environment.”

The definition provided by the National Agency for Science and Technology Information aligns closely with the mentioned viewpoints. In this research, the author adopts this definition.

The primary members of the entrepreneurial ecosystem are clearly startup businesses. Other members are considered part of the ecosystem, including funds and investors, incubators, startup accelerator programs, and other service providers (both public and private), as well as processes, events, and other entities (such as networking meetings, competitions).

According to researchers, the development of the entrepreneurial ecosystem can be observed through the following stages: (i) Nascent ecosystem, (ii) Foundational ecosystem, (iii) Developing ecosystem, (iv) Basic mature ecosystem, (v) High-performance ecosystem, (vi) Rapidly developing ecosystem, and (vii) Frontier ecosystem.

1.2.2. Characteristics of the startup ecosystem



Local Orientation

Entrepreneurial ecosystems often have a local character. Taking Singapore as an example, its entrepreneurial ecosystem is characterized by a vibrant economy, a good education system, a business-friendly environment with open policies, and features that create opportunities for business activities. Therefore, this ecosystem tends to attract talent from various fields, including a significant number of foreign professionals.

Abundance of Information

Working within an entrepreneurial ecosystem provides startup entrepreneurs with many opportunities for communication, mutual support, and information sharing. They have exposure to numerous partners and experienced entrepreneurs within the startup community, individuals with expertise, knowledge, and the ability to connect people with resources to support young businesses. In addition to sharing professional experience, information, and resources, entrepreneurs also provide each other with relationships with suitable individuals and organizations (such as customers, service providers, and talented individuals) that can help actualize their dreams.

Cultural Aspects

Cultural aspects are also important characteristics of entrepreneurial ecosystems. The “give-and-take” culture has become an essential trait in the startup community, where members widely share experiences, knowledge, and expertise, as well as opportunities for development. The attitude of startups toward failure is crucial: entrepreneurs are not afraid and never feel ashamed of failure. Some companies may temporarily suspend operations, but they can quickly rise again and seek angel investors.

Startups often participate in outsourcing projects and are welcomed as consultants for other companies or advisors/managers for business promotion organizations. This is accompanied by a philosophy of embracing novelty, where startups can have new ideas today and immediately test experimental projects. In dynamic startup communities, many people are experimenting with new ideas and willingly fail quickly to find suitable and potentially successful ideas.

Availability of Financial Resources

The availability of financial resources is another important characteristic of an entrepreneurial ecosystem. Notably, the necessary number of angel investors, current entrepreneurs, and high-level managers are always ready to provide financial support and other assistance. However, the decisive factor for investors lies in the potential of the product as well as the founders’ ability to attract funding. Local investors must have connections with national and international venture capital funds to increase investment capital and continue investing in subsequent stages, providing essential value-added support for business development.

Startup Regeneration Process Drives Growth

The startup regeneration process is understood as follows: entrepreneurs who have previously built successful companies and then sold them often leave the company immediately after the sale or may still work for a short period to have the opportunity to learn management experiences in a higher-level developed company.

However, the important point is that they still participate in the cluster/ecosystem, reinvest their wealth and experience to generate additional innovative entrepreneurial activities. Some become entrepreneurial founders, starting with new ventures. Others may become angel investors, providing startup funding and contributing their expertise through a position on the board of directors. Some become consultants and advisors, board members, and engage in business education as pracademics (experienced experts).

Some entrepreneurs invest their own money to establish and support activities that improve the innovative entrepreneurial environment, such as advocating for the government and establishing organizations that support entrepreneurial activities. The participation of experienced entrepreneurs is the main factor contributing to the success of an entrepreneurial ecosystem.

1.2.3. The role of the startup ecosystem

The startup ecosystem plays a role in providing new opportunities for individuals and organizations within the system. It not only helps diversify job opportunities but also promotes the formation of new industries and stimulates society's innovative and creative thinking.

The more the startup ecosystem supports innovation in new industries, the more it drives production, enhances quality, increases income for local residents, and creates significant opportunities for the export market.

A highly supportive startup ecosystem will experience faster development and ensure that the local area possessing that startup ecosystem can progressively grow its economy and foster a spirit of innovation and diversity across various industries.

The startup ecosystem helps modernize traditional education and ensures that future generations are educated about emerging industries, new technologies, and grasp the entrepreneurial spirit of the times.

1.2.4. Factors in the startup ecosystem

Based on the definitions above, it is easy to see that the startup ecosystem will include various elements depending on the economic, political, and educational conditions of each locality. Isenberg (2014) also asserted that it would be a mistake to create a replica of the "Silicon Valley" due to the fundamental differences between the United States and other countries. However, in general, we can summarize the components of a startup ecosystem according to Isenberg (2010) and the World Economic Forum (WEF) as follows:

A startup ecosystem comprises nine components: (i) Government policies; (ii) Legal framework and infrastructure; (iii) Capital and finance sources; (iv) Culture; (v) Consultants, advisors, support systems; (vi) Universities playing a catalytic role; (vii) Education and training; (viii) Human resources; (ix) Domestic and international markets.

1.2.5. Tools to support the startup ecosystem

There are many tools, or more accurately, programs and organizations that support startup businesses. Although the programs may differ in purpose and implementation, they are all designed to help increase the value of startups at various stages. These include: (1) Incubator programs; (2) Accelerator programs; (3) Co-working spaces; (4) Startup competitions, programs, and events.

2. RESEARCH METHOD

2.1. Theoretical Research

Theoretical Research is a research method primarily conducted through books, documents, theories, and ideas.

2.2. Analysis - synthesis method

The main method is the analysis-synthesis method, which involves analyzing the collected information to draw conclusions for the research. Research techniques used include: utilizing existing sources of

information and data inherited from previous studies, reports, or searching for new and updated sources of information.

2.3. Other methods

Other methods are employed to support the research, such as analysis-synthesis method, statistical analysis, interpretive analysis, comparing information, utilizing data collected through the internet, articles, and research papers.

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. Results of the research on the success of the start-up ecosystem in Singapore.

Singapore's startup ecosystem is a tightly-knit and successful system. There are several factors contributing to the remarkable development of entrepreneurship in this Lion City, with the most notable being the government's business-friendly policies and investment sources providing millions of dollars in capital to expand and support startup enterprises.

The government has implemented various support programs for entrepreneurship and innovative initiatives within Singapore's startup ecosystem.

Agency	Year	Program Name	Related Parties/ Target	Program Type	Level of Support
SPRING	2000	SPRING (SEEDS) - Entrepreneurship Development Program	Equity Investment	Investors	Up to 2 million SGD per project (1-to-1 matching)
	2005	BAS - Business Angel Scheme	Equity Investment	Angel investors	Up to 2 million SGD per project (1-to-1 matching)
	2015	SSA - Industry-Specific Accelerator Center	Equity Investment	Acceleration centers	70 million SGD for the entire program
	2008	TECS - Technology Commercialization Program	Funding	Investor/enterprise projects	Up to 250,000 SGD for each proof-of-concept project / 500,000 SGD for each feasibility proof project
	2008	YES! - Young Entrepreneurs Scheme for Schools	Funding	Schools	Up to 10,000 SGD per school (total fund of 4.5 million SGD)
	2009	IDP - Incubator Development Program	Funding	Incubators or business acceleration centers	30 million SGD for the entire program in 2009
	2012	ACE - Action Community for Entrepreneurship	Funding	Startups	50,000 SGD per startup (7 SGD for every 3 SGD matching)
Quỹ nghiên cứu quốc gia (NRF)	2008	ESVF - Early-Stage Venture Fund	Equity Investment	Venture capital firms	140 million SGD for the entire program
	2008	TIS - Technology Incubation Scheme	Equity Investment	Technology incubators	Up to 500,000 SGD per startup (85% investment capital)
	2008	POC - Proof-of-Concept Program	Funding	Research institutes/ universities	Up to 250,000 SGD per proof-of-concept project
Cơ quan phát triển Infocomm (IDA)	2010	iSTART: ACE Program (Acceleration and Catalysation of Entrepreneurship)	Funding	Technology startups	Up to 250,000 SGD (50% salary for 5 technical staff)

Therefore, non-governmental organizations and investment funds also have many opportunities to play their roles in the startup ecos11. iSTART: ACE Program (Acceleration and Catalysation of Entrepreneurship) 11. iSTART: ACE Program (Acceleration and Catalysation of Entrepreneurship)

system. However, in terms of infrastructure, a significant obstacle for Singapore as an option is the higher cost compared to other markets.

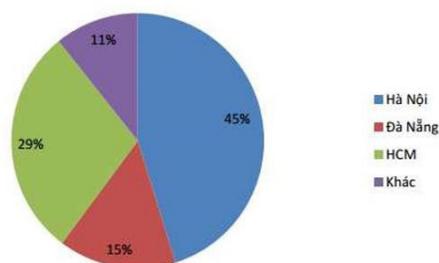
Additionally, the university factor has also demonstrated its capabilities by implementing entrepreneurship training programs in schools since 2000 to nurture business mindset, with strong support from the government and the community. However, university graduates here do not feel attracted to the entrepreneurial spirit or working in startup projects.

Despite being dubbed one of the four Asian Tigers, Singapore also faces difficulties in expanding beyond its market size, from accessing distribution channels to resource acquisition issues. Furthermore, this market encounters challenges in recruiting employees, labor costs, increasing competition, uncertain global economic environment, and high rental costs.

3.1.2. Results of the research on the start-up ecosystem in Vietnam

The results show that the startup wave in Vietnam is no longer concentrated only in major cities like Hanoi, Ho Chi Minh City, and Da Nang but has expanded to provinces and cities across the country on a considerable scale. However, the number of these entities in Vietnam is still considered relatively modest.

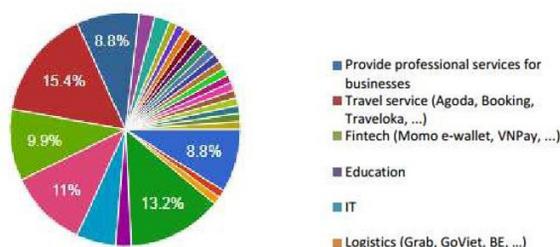
Chart of the number of start-up businesses in Vietnam by region



(Source: "Start-up Market Research Report," Viettonkin Consulting, 2019.)

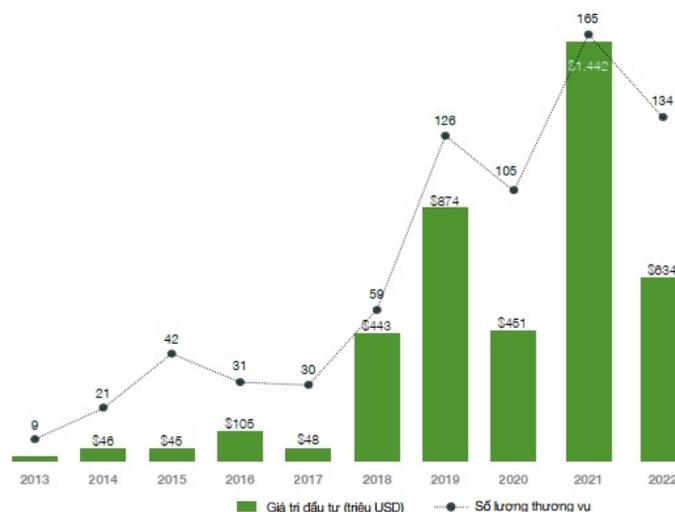
Based on a survey by Viettonkin Consulting, there are various sectors that startups choose to venture into. In the tourism service sector, 15.4% of startup owners have chosen this industry. Information technology ranks second among popular startup sectors. Food and beverage account for 11% of startup businesses. E-commerce, professional services, hardware, and software are also popular areas for startups, accounting for nearly 10%, 8.8%, and 8.8% respectively.

Chart of startup sectors in businesses



(Source: "Start-up Market Research Report," Viettonkin Consulting, 2019.)

The startup market in Vietnam has formed later compared to other countries around the world. However, the number of investment deals for Vietnamese startups is astonishing during the period from 2013 to 2022.

The number of investment deals for Vietnamese start-ups during the period 2013-2022.

(Source: Research by Do Ventures, NIC, and Cento Ventures)

According to the 2023 Vietnam Innovation and Technology Investment Report by NIC and DO Venture, the total investment deals in Vietnam in 2022 decreased by 19% compared to 2021 but still remained 28% higher than the figures in 2020. Although the average value per deal decreased, the number of deals increased towards the end of the year. Vietnam still holds the third position in terms of the number of deals but dropped to fourth place in terms of total investment value. In Southeast Asia, Indonesia and Singapore continue to lead in both the total number of deals and investment value.

Vinnie Lauria, the Managing Partner of Golden Gate Ventures, said, “Vietnam will shine amidst the global economic challenges and will continue to rise within the Vietnam-Singapore-Indonesia startup triangle. With global tech conglomerates heavily investing in technology manufacturing in Vietnam, the domestic market is expanding rapidly with an expected GDP growth rate of 6.2% (the highest globally), making Vietnam a magnet for tech talent.”

However, the majority of schools still follow a traditional teaching model and consider “classroom learning” as the core model, with little supplementation from other activities, thus not providing opportunities for students to actively engage in entrepreneurship activities.

Furthermore, the small and fragmented nature of startups and their limited quantity, coupled with the prevalence of incomplete information systems, also acts as a bottleneck hindering the development of the entire startup ecosystem.

3.1.3. Based on Singapore’s experience, what does Vietnam need to do to enhance the promotion of its startup ecosystem? Focus on building and enhancing the startup ecosystem

Vietnam needs to focus on building a startup ecosystem with the support of the government and a closely-knit network to develop the startup ecosystem, including new science and technology startups, successful science and technology companies, angel investors, research institutes, universities, investment funds, incubation centers, and other entrepreneurship support organizations. The government will play a role in connecting and coordinating these entities, regularly supporting them within this network to ensure the sustainable operation and development of the startup ecosystem.

- *Harness the positive role of the private economic sector*

Experience from Singapore has shown that the private sector operates efficiently and has the ability to help the government address various social issues and create employment opportunities for the economy.

Startups themselves also require specialized support, expertise, and resources to conduct effective business operations. Therefore, close coordination between the government and the private sector through investment cooperation is necessary to share responsibilities and leverage the advantages and capabilities of each party to establish and develop startup companies.

- *Develop startup support programs and incubators*

Vietnam also needs to develop startup support programs and research and collaboration centers to promote research activities in universities, research institutes, and provide practical work experience for graduating students. Enhancing partnerships with domestic and international universities for learning, professional exchange, and inviting entrepreneurship experts to share startup experiences is important.

- *Implement supportive policies on legal frameworks, administrative procedures, and taxation for entrepreneurship-related activities*

Drawing from the experiences of Singapore, Vietnam's conditions and policies need to be reformed towards reducing barriers in capital, shortening the time required to establish companies, simplifying administrative procedures, and creating a flexible investment mechanism and policy framework. Applying tax incentives for research and development activities to encourage innovation within companies is essential. The Vietnamese government needs to formulate policies to reduce capital barriers, establish mechanisms to attract foreign investment, and attract investment funds to support startup projects, providing favorable conditions for startups to access investment capital.

- *Leverage unique advantages*

Another lesson is the importance of specialization and connecting the ecosystem with other global centers (such as collaboration between local startups and multinational corporations). This is even more crucial for Vietnam as it does not have the advantage of being a "first-mover" and needs to find its own "unique advantage" to compete with other ecosystems.

3.2. Discussion

1. Conclusion

With deepening integration, Vietnam has been receiving attention and investment from businesses worldwide. Consequently, the startup ecosystem has gradually been forming, aiming towards the goal of a national entrepreneurial ecosystem with innovation at its core. Alongside this, Singapore is renowned as one of the best startup hubs globally, surpassing the technological haven of Silicon Valley and maintaining its position as a leader in entrepreneurial talent due to favorable government policies, initiatives, and an attractive investment environment.

Singapore and Vietnam are two countries with many similarities in terms of culture and socioeconomic conditions, both ranking among the top attractive and rapidly developing startup ecosystems. Therefore, it is necessary to study and apply the experiences of Singapore's startup ecosystem in Vietnam at this time to objectively and accurately assess the contributions of startups and provide directions and solutions to support these businesses.

The research has synthesized the successes and limitations of Singapore's startup system. The overall picture of Singapore's ecosystem demonstrates the close integration of its various components. Additionally, the robust development of the country's startup ecosystem is attributed to the government's prominent role through a series of strategic policy choices made by policy planners at the national level. These choices include three strategies: accelerating innovation, developing business activities, and shaping the ecosystem. The research also highlights the drawbacks of having a small domestic market within the ecosystem.

The analysis and evaluation in the study partly reflect the current implementation of startup support policies in Vietnam. Specifically, it identifies the main obstacles faced by Vietnamese startups, such as unclear and incomplete legal corridors, the ability to attract funding, and the startup support ecosystem. The

study also addresses, analyzes, and evaluates the implementation of startup support policies in Singapore's entrepreneurial ecosystem to draw lessons and experiences for the future implementation of startup support policies in Vietnam. Through the analysis, it is evident that the state's policy objectives primarily focus on financial support, training and human resource development, technological innovation support, assisting businesses in attracting and accessing capital from domestic and international venture capital funds.

APPENDIX

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Note: Requirements on submission papers: from 5.000 to 7.000 words including references and appendix presented on A4 paper, Times New Roman font, font size 11, 2cm margins.

IMPACTS OF EVFTA ON THE EXPORTATION OF VIETNAMESE AGRICULTURAL PRODUCTS TO THE EU MARKET

Author: Phan Thi Thanh Thuy¹, Nguyen Ha Phuong¹, Dao Xuan Hung¹

Mentor: Ph.D. Doan Thi Hai Yen¹

ABSTRACT: The European Union – Vietnam Free Trade Agreement (EVFTA) was started and negotiated in the context of bilateral relations between Vietnam and the European Union (EU), especially in the field of economy and trade. Although the EVFTA Agreement officially has come into effect in 2 years since 01/8/2020, it has been having a significant impact on economic development in Viet Nam. The Implementation of an agreement makes a strong push not only for the export market but also the agricultural exports market. The article focuses on analyzing agricultural export performance – one of the products having competitive edges in Vietnam so far and proposing a system of solutions to take advantage of opportunities and respond to difficulties and challenges in order to further promote our country's agricultural exports to the European Union market.

Keywords: Free Trade Agreement, agricultural export, opportunities. EU.

INTRODUCTION

The European Union (EU) with 27 member countries has a total population of about 516 million people is a prosperous economic area, GDP accounts for about 23% of the world's nominal GDP, per capita income is up to 32,900 USD/person/year. With a large market size and capacity, the EU has become an area with great demand for importing goods from all over the world, in which agricultural products have great potential for consumption in this region. Since the normalization of diplomatic relations between Vietnam and the European Union in October 1990, trade relations between the two have continuously grown, particularly in recent years. According to Maliszewska and her partners (2019), the EVFTA Agreement is expected to have a profound impact on Vietnam, potentially even surpassing the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). This agreement presents a significant opportunity for Vietnam to accelerate economic growth, increase export turnover, reduce poverty, and improve living standards of its people. In recent times, the EU has emerged as Vietnam's third-largest trading partner, and it stands as the second-largest export market, accounting for 18% of the country's exports. The primary exports to the EU are mainly agricultural, forestry, and fishery products. Undoubtedly, the EU stands out as one of the largest export markets for Vietnam's agricultural products.

The export turnover of agricultural products to the European Union (EU) market in 2018 was estimated at 40 billion USD, a record of Vietnam's agricultural industry, making Vietnam ranked 15th in the world, although in the context of the world market in 2018 there were many fluctuations, typically the US-China trade war; increasing protection through standards of quality management and food safety and hygiene of major agricultural market countries of Vietnam including the US, EU, China, Japan and Korea... for imported agricultural products.

However, Vietnam also encounters numerous challenges related to its agricultural product exports, including pricing and demand issues. Particularly, the country faces strict standards imposed on imported agricultural products, notably from the US market. These challenges include maintaining and increasing protectionist measures such as imposing anti-dumping taxes on Vietnamese seafood products, conducting ongoing inspection programs for catfish in accordance with the Law on Agriculture (Farm Bill), and implementing the Lacey Act Law rigorously concerning wood and wood products, among others. The EU

¹ Academy of Finance.

still keeps the yellow card warning for imported fishery products from Vietnam, and drafts new regulations on substances used on plant seed products,.. In addition to high requirements on goods quality, the EU also applies many regulations on the import of goods, while Vietnam's agricultural exports have no added value, still fragile in production, and the ability to meet the standards is low for the import market. Therefore, to boost the exportation of agricultural Vietnamese products to the EU market while in the context that the Vietnam - European Union Free Trade Agreement has been effective for nearly 3 years, the first and necessary thing to do is carefully study the EVFTA Agreement, commitments to agricultural products, policies for agricultural production and encourage agricultural exports,.. Next, it is essential to analyze and evaluate the current situation of Vietnam's exports to the world and EU market in general, assess the success and drawbacks of Vietnam's agriculture, and on that basis, propose highly effective and feasible solutions.

FREE TRADE AGREEMENT BETWEEN VIETNAM AND THE EUROPEAN UNION AND ITS IMPACTS ON VIETNAM'S AGRICULTURAL EXPORTS

Free Trade Agreement between Vietnam and the European Union

General information:

EVFTA is a comprehensive, high-quality agreement that balances benefits for both Vietnam and the EU, and is in line with the regulations of the World Trade Organization (WTO). EVFTA is one of Vietnam's FTAs with the best utilization rate, not only a leverage to promote two-way trade but also a preeminent advantage for the business community, especially in the difficult economic context due to the impact of COVID-19, we can take advantage of the incentives from EVFTA through the use of certificates of origin (C/O). Besides, the wave of investment from Europe into Vietnam is also growing stronger. Vietnam has attracted high-quality investments and successfully assimilated advanced science and technology from the EU. This has led to the creation of significant value and benefits for businesses and investors on both sides.

The Agreement consists of 17 Chapters, 2 Protocols and a number of Memorandums of Understanding with the following main contents: Trade in goods (including general provisions and commitments to open markets); Trade defense; Customs and trade facilitation; Technical barriers to trade (TBT); Food safety measures (SPS); Non-tariff barriers to trade and investment in renewable energy production; Investment liberalization, trade in services and e-commerce; Public procurement; Competition policy; State enterprises; Intellectual Property; Trade and Sustainable Development; Minh Bach Hoa; Dispute resolution; Cooperation and capacity building; Legal-institutional issues.

Specific sectors:

- **Commodity trading**

For Vietnam's exports, as soon as the Agreement comes into effect, the EU will eliminate import taxes on about 85.6% of tariff lines, equivalent to 70.3% of Vietnam's export turnover to the EU. After 07 years from the date of entry into force of the Agreement, the EU will eliminate import tax on 99.2% of tariff lines, equivalent to 99.7% of Vietnam's export turnover. For the remaining 0.3% of export turnover, the EU committed to give Vietnam a tariff quota with an import tax within the quota of 0%. So far, this is the highest level of commitment that a partner has for us, in addition, this benefit is especially meaningful when the EU is continuously one of our two largest export markets today.

For important commodity groups, the EU's commitments are as follows:

- Textiles, footwear and seafood (except canned tuna and fish balls): The EU will completely eliminate import duties for Vietnamese products within 7 years from the date of entry into force of the Agreement. For canned tuna, the EU agreed to give Vietnam an adequate amount of tariff quota.
- Rice: The EU grants Vietnam a substantial quota for milled, unmilled and fragrant rice. Rice imported under this quota is completely tax-free. Particularly for broken rice, import tax will be eliminated according to the roadmap. For rice products, the EU will bring import tax to 0% within 7 years.

- Honey: The EU will eliminate taxes as soon as the Agreement comes into force and will not apply tariff quotas.

For EU exports, Vietnam commits to eliminate tariffs as soon as the Agreement comes into effect with 48.5% of tariff lines. Then, after 7 years, 91.8% of tariff lines, equivalent to 97.1% of export turnover from the EU, were eliminated by Vietnam. After 10 years, the level of tariff elimination is about 98.3% of tariff lines (accounting for 99.8% of import turnover). For about 1.7% of the remaining tax lines of the EU, we apply a roadmap to eliminate import taxes longer than 10 years or apply tariff quotas according to WTO commitments. Including wine, spirits, beer, pork and chicken, Vietnam agreed to eliminate import taxes for a maximum period of 10 years.

Other contents related to trade in goods: Vietnam and the EU also agreed on the contents related to customs procedures, SPS, TBT, trade remedies, etc., creating a legal framework for the two sides to cooperate, facilitating the export and import of businesses.

- **Trade in services and investment**

The commitment made by Vietnam and the EU regarding trade in investment services is geared towards establishing an open and advantageous investment environment for businesses on both sides. Notably, Vietnam's commitments surpass those made in the WTO, indicating the country's willingness to go the extra mile. On the other hand, the EU's commitments exceed those in the WTO and are in line with the EU's most substantial commitments found in recent EU FTAs.

Vietnam has pledged to create a favorable environment for EU investors in various sectors, including professional services, financial services, telecommunications services, transportation services, and distribution services. Additionally, both parties have made commitments on the principle of national treatment concerning investment. The two sides have also discussed the content of dispute settlement mechanisms between investors and the state, demonstrating their dedication to addressing potential disputes in the investment arena.

- **Government procurement**

Vietnam and the EU agreed on contents equivalent to the Government Procurement Agreement (GPA) of the WTO. With some obligations such as bidding online, setting up an electronic portal to publish bidding information, etc., Vietnam has a roadmap for implementation. The EU is also committed to providing technical assistance to Vietnam to fulfill these obligations. Vietnam reserves for a definite period the right to reserve a certain percentage of the value of the bidding packages for domestic contractors, goods, services and labor.

- **State owned enterprises**

Regulations on State-owned enterprises in the EVFTA Agreement aim to create an equal competitive environment among economic sectors. The commitment also takes into account the important role of SOEs in realizing public policy goals, stabilizing the macro-economy and ensuring security and defense.

The main obligations of the State Enterprise Chapter are: (i) operating under the market mechanism, which means that enterprises have the right to make their own decisions in business activities and without the administrative intervention of the State, except in the case of implementing public policy objectives; (ii) there is no discrimination in the purchase and sale of goods and services for industries and fields that have been opened; (iii) transparency of basic information of enterprises in accordance with the provisions of law on enterprises.

- **Intellectual Property**

Commitments on intellectual property include commitments on copyrights, inventions, patents, commitments related to pharmaceuticals and geographical indications, etc. Basically, Vietnam's commitments to intellectual property are in line with current laws. Some key features of intellectual property commitments are as follows:

Regarding geographical indications: When the Agreement comes into effect, Vietnam will protect over 160 geographical indications of the EU (including 28 members) and the EU will protect 39 geographical indications of Vietnam. The geographical indications of Vietnam are related to agricultural products and

foodstuffs, creating favorable conditions for some types of Vietnamese agricultural products to build and assert their brands in the EU market.

Regarding trademarks: The two sides commit to applying a convenient and transparent registration procedure, including having an electronic database of published trademark applications and registered trademarks for public access, and at the same time allowing invalidation of registered trademarks but not actually used within 5 years.

On enforcement: The Agreement contains provisions on border control measures for exports suspected of infringing intellectual property rights.

Commitment to most favored nation treatment (MFN)

- **Transparency**

Stemming from the fact that the domestic regulatory environment has a great influence on trade, the EVFTA Agreement dedicates a separate chapter on transparency with the most general requirements to ensure an effective and predictable regulatory environment for economic actors, especially small and medium enterprises.

- **Other contents**

The EVFTA also includes Chapters related to competition, state-owned enterprises, sustainable development, cooperation and capacity building, and legal-institution. These contents are consistent with Vietnam's legal system, creating a legal framework for the two sides to strengthen cooperation and promote the development of trade and investment between the two sides.

Commitment to trade in agricultural products within the framework of EVFTA.

Trade policies affect the EU agricultural product market

- **Government policy and agricultural production**

The EU's Common Agricultural Policy (CAP) was adopted in 1962 with the goal of increasing agricultural productivity in order to stabilize food sources and help EU farmers secure their livelihoods. Since the establishment of the WTO, this policy has had important changes to implement the commitments under the Agreement on Agriculture in the WTO and its Accession Protocol, such as the use of diminishing export subsidies or market subsidies being replaced by green subsidies permitted by the WTO Agreement. The CAP consists of three main pillars: Market support, income support and rural development. Direct payments in the CAP are intended to provide a safety net for farmers in the form of income support, stabilizing farmers' incomes when market prices fluctuate.

- **Export promotion policies (EPPs)**

Under the common agricultural policy, the EU sets minimum prices for certain agricultural commodities to encourage farmers to continue producing food. In some cases, these minimum prices are higher than the world prices for the same product. When farmed products are exported outside the EU, this refund allows to close the price gap between EU prices and world market prices and to support high input prices within the EU. Tax refund rates vary, depending on time, industry and specific products.

- **Import control policy**

Tariff policy:

The EU's tariff network includes preferential trade mechanisms, which, together with the EU's unilateral preference system, is adding to the complexity of the EU tariff regime. The level of priority given by the EU varies depending on whether a developing country is eligible only under the Generalized System of Preferences (GSP), under which all developing countries are eligible, or under other autonomous trading regimes.

There are essentially three preferential trade regimes for entering the EU market for agricultural goods originating from developing countries: the Generalized Preferential Tariff Scheme (GSP), which applies to all developing countries, a valid list of which includes (1) the "everything but arms" (EBA) initiative which

provides support to all least developed countries; (2) Autonomous preferential regimes under the Cotonou Agreement for ACP countries

Tariff escalation: The European market seems to be quite open to developing countries thanks to the many preferential agreements that the EU has signed with its partners (GSP, EPA with ACP countries, FTA with non-ACP,...).

Non-tariff barriers:

The import ban and import supervision, among other things, are maintained on the basis of security, technology, sanitary, epidemiological, environmental and according to international agreements and conventions. Exporters must obtain import permits for international treaties and conventions. Exporters must obtain import permits for products subject to restrictions in quantity, in terms of tariff quotas and protection measures or for monitoring and supervision of imports.

Current situation of Vietnam’s agricultural exports to the EU market

From 1/8/2020 until now, agricultural products exported to the EU have shown remarkable movement, with some items experiencing substantial growth. Notably, pepper stands out as a strong performer, with its export value increasing by 78.64% in 2021 compared to 2020, and then experiencing a slight decrease of 2% in 2022. Additionally, various other commodities have also witnessed significant growth compared to the period before the agreement came into force.

Table 1. The value and output of agricultural products exported to the EU from 2019 to 2022

Items	2019		2020		2021		2022	
	Output (Ton)	Value (1.000\$)	Output (Ton)	Value (1.000\$)	Output (Ton)	Value (1.000\$)	Output (Ton)	Value (1.000\$)
Pepper	34.122	102.601,08	30.020	84.019,86	35.342	150.096,69	29.615	17.048,89
Cashew	104.818	762.511,54	106.797	673.757,99	120.148	694.917,42	101.308	589.869,22
Vegetables and fruits	-	148.187,94	-	146.419,77	-	150.733,48	-	186.289,65
Rice	19.845	10.682,37	23.724	12.868,95	29.872	19.548,31	31.167	20.541,41
Tea	771	1.654,86	474	1.227,84	592	1.695,74	387	1.114,84
Rubber	85.609	113.767,43	66.291	92.563,74	96.383	168.868,28	69.907	112.17,30
Coffee	725.704	1.164.243,10	604.126	982.705,56	547.748	1.025.456,13	689.049	1.491.452,10
Total	970.869	2.303.648,32	831.432	1.993.563,71	830.085	2.211.134,05	921.433	2.548.483,41

Source: Central Statistical Office

Nevertheless, it can be seen that the export of agricultural products to the EU market is still not commensurate with the potential. The biggest difficulty that Vietnam faces in exporting is that the conditions and standards of the EU market are quite high and strict. In addition to the standards of quality, traceability and food safety, agricultural products are also pressured by the requirements of green growth indicators from the EU. That is one of the great challenges that have a strong impact on export sales and the strategy of developing green agricultural products, and building Vietnam’s rules of origin to meet this difficult market.

Rice

Vietnam holds a prominent position as one of the major exporters of agricultural products in both the region and the world. Among these exports, rice stands out as one of the main agricultural products, showcasing robust growth in export turnover over recent years. The volume of rice exported to the EU in 2021 reached nearly 30 tons with a value of 19.5 million USD, the average export price is 526 USD/ton. Vietnam’s rice exports account for about 12.5% of the world’s rice export market share, behind India and Thailand. Vietnam’s rice products have been exported to 28 markets (in 2021). In recent years, the scale and turnover of rice exports tend to increase. Vietnam’s rice export volume increased from 19.8 thousand tons in 2019 to 29.8 thousand tons in 2021, accounting for an average of more than 12% of the world’s total rice export volume. Rice export turnover rocketed sharply from 12.8 thousand USD in 2020 to 19.5 trillion USD in 2021. Rice export turnover growth in 2021 increased by 1.52% compared to 2020.

Currently, export prices tend to increase, in 2021 the average export price is 526 USD/ton, although still affected by the Covid-19 epidemic, Vietnam's rice exports still achieve positive results. Incentives from the Agreement have been effective in the last 2 years. In 2021, rice exports to the EU will reach nearly 30,000 tons, equivalent to USD 19.5 million, up 26% in volume but up to nearly 52% in value over the same period in 2020. This shows that enterprises have recovered significantly after the pandemic and are catching up with the trend of producing high-quality varieties towards the high-end market. By 2022, the market has stabilized with an average growth of about 5% in both volume and value. Although Vietnam's rice exports to the EU tend to increase, the proportion accounts for only 1% of the total export turnover of agricultural products to this market (Table 1).

In recent years, Vietnam's rice exports have become more and more diversified with major export rice products such as fragrant rice of all kinds, premium rice, glutinous rice, japonica rice,...

Coffee

Over the years, although the world economy has had many difficult times leading to a decrease in purchasing power, Vietnam's coffee exports have maintained a very impressive growth rate. Coffee exports in 2019 reached 725 thousand tons with a value of 1.164 billion USD. Compared to the following years, the quantity tends to decrease from 604 thousand tons in 2020 to 547 thousand tons in 2021, but export turnover increases, specifically, to 1,491 million USD in 2022. In 2022, Vietnam's coffee export price in 2022 recorded the highest level in many years with an average of 2,282 USD/ton, up 16% compared to 2021.

Additionally, the EU market holds a significant position as the traditional and largest market for Vietnamese coffee, accounting for nearly 40% of the market share and valued at approximately 800,000 USD per year. The primary imports from Vietnam to the EU consist of green coffee. Germany, Italy, Spain, Belgium and the UK are countries in the EU that import a myriad of Vietnamese coffee with a market share of 11.77%, respectively; 5.83%; 5.79%; 3.63%; 2.25%. Currently, Vietnam has 20 coffee trading enterprises in the true sense of the word and 8 roasters making up 80% of Vietnam's exports.

Tea

Vietnam is the 7th largest tea producer and 5th largest tea exporter globally, with 130,000 hectares of tea plantation area and more than 500 production and processing facilities, with a capacity of over 500,000 tons of dry tea per year. Vietnam has a large production scale, with favorable agricultural climatic conditions for the expansion of tea cultivation area to increase production and area. Presently, tea is grown in 34 provinces and cities nationwide, the average yield reaches 9 tons of fresh buds per hectare, attracting about 3 million workers to participate. Tea varieties in Vietnam are diverse and abundant, so they can provide a full range of green tea, black tea and speciality tea for export to meet the rich consumer demand around the world. Over the years, many localities have focused on developing many high-yielding tea varieties that have been put into mass cultivation. The transition from seed tea cultivation to branch tea cultivation, the introduction of many foreign tea varieties into cultivation and the application of scientific and technical advances in tea intensification on a large area, the yield and quality of fresh bud tea have constantly increased. However, the tea industry in Vietnam still faces an inherent weakness – it is fragmented and comprises small tea plantations, averaging only about 0.2 hectares per household. This fragmentation makes it challenging for tea farmers to access new technological advancements and obtain certifications for producing safe tea. Consequently, Vietnamese tea encounters difficulties in competing with teas from other countries in the global market.

Pepper

Vietnamese pepper is present in 100 countries and territories around the world, accounting for up to 55-60% of the global supply. On the European market, Vietnam and Indonesia are the two largest pepper sources. EU pepper import turnover from Vietnam is about 40 thousand tons per year, accounting for 23% of total pepper export volume of Vietnam and meeting 53% of the EU's pepper demand. The largest market today is Germany with the import turnover of pepper from Vietnam up to 65.9 million USD in 2016.

However, recently, the EU has warned that the residue of plant protection drugs in Vietnam's black pepper exceeds the safe level, and many Vietnamese consignments have been returned. Some EU countries are gradually turning to import pepper from India and Brazil.

Cashew

Although it is the world's first exporter, the added value of the cashew industry is not yet high. Vietnam's cashew industry needs to move to the 2nd period, focusing on doubling the production, processing and export value of the industry, contributing to the country's socio-economic development. With the EU market, this is one of the third largest cashew kernel import markets from Vietnam with a market share of about 27%. In particular, the Netherlands is the largest importer of cashew nuts with about 22-25 thousand tons per year. Next is the UK with about 5.3-7 thousand tons per year and Germany with 2-5 thousand tons per year. However, it is essential to highlight that the proportion of deeply processed, high value-added products from Vietnam, such as salted roasted cashew kernels, seasoned cashews, honey-infused cashews, cashew sandwiches, and more, play a pivotal role in capturing the attention of consumers in these markets. to the EU is quite modest. From 2019 to 2021, cashew nut exports increased. In 2019, cashew nut export volume reached approximately 86 thousand tons, the export value reached 762 million USD. In 2021, export volume reached nearly 121 thousand tons, the export value reached about 694 million USD. Vietnam mainly exports raw, there are not many products with high added value.

Vegetables and fruits

Due to climatic conditions, the EU imports a lot of tropical fruits such as bananas, oranges, mandarins, mangoes, and pineapples. The top EU importers are Germany, the UK, France and the Netherlands accounting for more than 70% of the EU fruit and vegetable import turnover. Regarding the export situation of Vietnamese fruits and vegetables to the EU, Vietnamese vegetables and fruits only account for a very small share (about 1%) of the EU's fruit and vegetable imports. Among EU countries, Vietnam's main fruit and vegetable export markets are the Netherlands (5%), the UK (0.9%), France (1.9%), Germany (2%) and Italy (1.1%). The import of fruits and vegetables into the EU is mainly through the Netherlands, which is considered the gateway to the EU market. In the group of fresh fruits and vegetables exported to the EU, fruits always reach the highest turnover with key products including pineapple, dragon fruit, coconut muscle, rambutan and mango. Vietnamese vegetables and fruits are mainly exported to the EU in fresh and semi-processed forms, due to poor post-harvest technology, technology not being transferred to farmers, harvesting and preservation are still done manually. Export turnover in 2019 reached an export value of about 148 million USD. By 2022 with an export value of up to 186 million USD (up 12.5% compared to 2019).

General assessment of the impact of Vietnam's agricultural exports

These achievements

The export of Vietnamese agricultural products to the EU in recent years has been continuously expanded and achieved remarkable achievements. Although subject to import tax, agricultural products have penetrated very strongly into the EU. Therefore, when the EVFTA comes into effect, with the immediate removal of 85.6% of tariff lines (for goods in general imported from Vietnam), the opportunity to boost agricultural exports to the EU will be even greater. With the available advantages in terms of natural conditions such as geographical location, topography, climate ..., production and business capacity, Vietnam's agricultural industry can take advantage of many opportunities from the EVFTA Agreement, creating an important foundation for Vietnamese agricultural products to open the door to the world and sustainably develop the country in the process of deeper international integration.

Opening up many new opportunities and export markets: New-generation FTAs open up new opportunities, putting Vietnam in front of a new playing field with strategic changes to improve economic cooperation and removing previous tariff barriers that hindered trade between countries. New generation

FTAs will help Vietnam enjoy more preferential treatment on tariffs and non-tariffs, and at the same time have conditions to restructure the import-export market towards a more balanced direction, avoiding excessive dependence on certain markets. Specifically, with the CPTPP, a series of agricultural exports from member countries, including Vietnam, will be taxed, such as: in the Canadian market, Vietnam has reached an agreement that 100% of wood export turnover will be eliminated from tariffs; to get rid of tariffs of 78% of agricultural export turnover, 91% of seafood export turnover and 97% of wood export turnover in the Japanese market; Chile will eliminate taxes on most agricultural and aquatic products with export strengths of Vietnam.

Opportunities to improve competitiveness for agricultural products: The signing and implementation of the EVFTA Agreement have driven the restructuring of Vietnam's agricultural sector, with a primary emphasis on enhancing competitiveness through improvements in product quality, traceability, packaging, and more. These efforts have played a crucial role in integrating Vietnam's agricultural products further into global supply chains. The agreement has also facilitated cost reduction and increased production productivity, thanks to the tariff incentives offered. As a result, key industries in Vietnam, including rice, coffee, honey, and fruit, have benefited from preferential tariffs right from the initial years of the agreement. The EU is committed to opening up very strongly for Vietnamese vegetables and fruits by immediately eliminating 94% of the total 547 tax lines on vegetables and fruit and vegetable products when the Agreement comes into effect. Most of the tax lines the EU has committed to eliminate immediately have an average tax rate of 10%, especially some fruit and vegetable products that are subject to a 20% tax rate. Price competition in the agricultural industry today is very large. Thus, with this commitment of the EU, creating a price advantage for Vietnamese vegetables and fruits.

Helps to diversify the market, avoiding too much dependence on one market. Creating opportunities for Vietnamese agricultural products to reduce dependence on the Chinese and Southeast Asian markets, promoting the creation of new relationships and establishing new networks, participating in regional and global supply chains, especially opportunities for capital cooperation, transfer of agricultural product processing technology and more modern and effective management methods, etc. Besides, it can be seen that, in addition to the advantages of tariffs, the comprehensive agricultural agreement and rules of origin, the agreement and the EVFTA are more comprehensively leveraged. , especially the enhancement of added value of agricultural products, associated with the "green and clean" factor, ensuring the value of labor, accompanied by certificates of exploitation and farming in accordance with geographical indications. At the same time, the Agreement will promote production linkages between farmers, fishermen, cooperatives and businesses in a value chain, associated with the "real signal" of the EU market in particular as well as developed markets in general, contributing to raising the image of Vietnamese agricultural products.

Accelerating the application of technology, meeting the standards of Vietnamese agricultural product exporters. The EVFTA has contributed to raising the awareness of farmers as well as production/processing businesses and exporters, if they want to access the EU market, they need to conduct methodical production, establish a specialized material growing area, and meet international standards. Previously, Vietnam's agricultural product industry focused on developing the supply of raw materials and unprocessed products, leading to low export value. Many factories are equipped with modern machinery and equipment and all have been certified for quality management standards (ISO 9001 and HACCAP). The management of these plants is well maintained through the quality standards set by the importing countries especially for products contaminated with chemicals exceeding the allowable residues (MRL's) and good agricultural practices (GAP).

Putting pressure on export enterprises to restructure their export activities. The EVFTA helps export businesses to restructure their operations by researching, learning, and setting up the process of bringing Vietnamese agricultural products to the EU market through supermarkets, and bringing sample products to reach consumers. Furthermore, it is essential for businesses to take proactive measures in preparing their capacities and securing a stable source of goods. Improving competitiveness should be achieved through the development of a long-term and methodical plan while strictly adhering to regulations on traceability.

Simultaneously, businesses should focus on building and safeguarding their brands, as this will play a crucial role in promoting sustainable exports to the EU market. By adopting these strategies, businesses can strengthen their position in the EU market and ensure long-term success in their export endeavors.

Transparency of procedures and technical barriers for export agricultural products: The implementation of commitments in the EVFTA Agreement involves addressing institutional, policy, and legal issues beyond the border and improving the overall business environment in Vietnam. As a result, this will drive changes in Vietnamese laws to become more transparent and aligned with international practices. The aim is to create a conducive and attractive environment for both domestic and foreign businesses, fostering growth, and encouraging foreign investment in Vietnam. These changes will contribute to enhancing the country's economic integration and competitiveness in the global market. Commitments to fair, equal treatment, safe and full protection for each other's investments and investors in the IPA agreement will also contribute to transparency in procedures and technical barriers that Vietnamese agricultural products must overcome. Thereby, Vietnamese enterprises have the opportunity to participate in the regional supply chain, thanks to the investment shift of multinational corporations, ensuring a stable business environment and institutional policies.

Besides opportunities to expand export markets, Vietnam's agricultural products still face many difficulties and challenges when the EVFTA comes into effect, specifically as follows:

Production is still backward: Science and Technology has always been considered as a key solution to create breakthroughs in productivity and quality of agricultural products and productivity and labor efficiency in agriculture. Good application of science and technology will contribute to the growth of the agricultural sector from 30 to 40%. However, the transfer and application of science and technology to agriculture is still lacking in synchronization from design, construction, labor training to operation and management of the system, which has not met the requirements or even promoted its effectiveness. In addition, investing in the application of science and technology in production requires a very large and prolonged initial investment while the climate, weather and land conditions are not really favorable, which leads to the fear of risk-averse investment. On the other hand, the high investment cost for production leads to high product prices, making it difficult to compete in the market.

The EU's mandatory requirements for quality, food hygiene and safety are very strict and not easy to meet. In Vietnam, farming methods and production practices are still not suitable to meet strict quarantine measures. In order to meet standards and comply with international standard processes, enterprises have to adjust their production activities or production methods, apply advanced technology, etc., leading to increased compliance costs, creating financial pressure on Vietnamese enterprises. In addition, many agricultural product exporters are facing a lack of timely information, as a result, the time they have to respond to requirements for sanitary and phytosanitary measures has been significantly reduced, leading to increased costs or possibly limiting their ability to export.

Some of the EU's intellectual property requirements are higher than those of the World Trade Organization. Meanwhile, in Vietnam, the phenomenon of infringement of intellectual property rights is increasing. One of the reasons why intellectual property infringement cases still happen frequently is that businesses have not paid attention to intellectual property issues and protect their brands. Vietnamese agricultural enterprises only focus on export volume, not really paying attention to branding. 90% of Vietnam's agricultural products are only exported in raw form, although large output and high quality are exported, the economic benefits are low. In addition, expensive protection costs are also an issue affecting the decision to register for protection of enterprises. Therefore, the interest in building and developing the brand has been an urgent issue for the agricultural products of our country.

EVFTA rules of origin. EVFTA commits to eliminate import tax up to 99.2% of tariff lines for Vietnamese goods entering the EU. However, to enjoy this preferential level, goods exported to the EU must have materials that must meet a certain percentage of internal content (materials originating in the EU and/or Vietnam).

This can be a big challenge for Vietnamese businesses, because most of Vietnam's production materials are imported from abroad. If the rules of origin cannot be guaranteed, Vietnam's exports to the EU will only enjoy the MFN tax rate, not the 0% tax rate as committed in the EVFTA. The regulations on traceability of the importing countries are getting stricter and stricter, the risk of Vietnamese goods being "borrowed" to export to the EU has also been warned by economic experts. This causes many consequences that cause Vietnamese goods exported to the EU to be subject to high anti-dumping duties. In addition, the EU requires agricultural products to have Global Gap certification (Global Good Agricultural Practices Standard), in addition, the preliminary and processing stages must also be certified HACCP (food safety management system based on the analysis of hazards and critical control points). These are all of the highest standards in the world.

The level of science and technology is still not high. The industrial revolution 4.0 has been affecting many manufacturing and export industries, including the agricultural sector, if we do not meet this development, it will lead to "lagging" in technology and processing techniques for agricultural products, leading to a loss of competition compared to other competitors, especially in markets with "high requirements" like the EU.

Some solutions for Vietnam to effectively implement the Vietnam-EU Trade Agreement (EVFTA) to export agricultural products.

Completing and renovating trade mechanisms and policies: In order to take advantage of opportunities and overcome challenges brought by the EVFTA, Vietnam's state management agencies, policy makers, consultants and legislators need to soon improve institutions and laws to ensure legal compatibility, especially Vietnam's dispute settlement and protectionist mechanisms with European and international laws. The functional agencies must quickly review, adjust, supplement and develop new standards on quality, technique, requirements on labeling, product packaging, food hygiene and safety, animal and plant quarantine measures in accordance with the requirements of the WTO, EU and international practices, and at the same time strengthen the ability to negotiate and negotiate with export markets to have appropriate technical standards. The State needs to identify key agricultural products for export and plan the development of the agricultural sector. It is necessary to focus on developing tropical agricultural products, seafood and agricultural products that have room and high export value such as oilseeds and fruits, cereals, cocoa, and vegetable oils. The State has a policy to support agricultural enterprises exporting agricultural products to the EU market, it is necessary to continue to form a concentrated production area large enough to provide a stable supply for businesses, as well as to have an investment insurance policy in agriculture, insurance for long-term consumption contracts, especially for export crops, which have a relatively stable consumption market. At the same time, the Government helps to form the value chain, creating a brand of high-quality Vietnamese goods with clear standards of origin to meet the needs of the countries of the European Union.

Propaganda and dissemination of the EVFTA Agreement: Organizing introductory seminars and in-depth training courses on the EVFTA Agreement to different beneficiaries, especially the business community in different clusters of provinces and cities across the country; Organize business seminars/forums in the EU to introduce and disseminate the Agreement and market access opportunities, as well as connect trade promotion and investment attraction of EU enterprises to Vietnam, especially in the field of agricultural product processing to create a source of quality goods for export back to the EU as well as to other markets; Building an FTA portal including the EVFTA and CPTPP so that businesses can easily and quickly look up the commitments of FTA partners to open the market for Vietnamese goods and services; Innovating methods of communication and training on the Agreement through designing and organizing online training programs for businesses; Develop and maintain an in-depth TV/radio program about the EVFTA Agreement for the business community and the people; Providing information on the trade promotion portal, and on the website of Vietnamese food and agricultural product brands (including English and Vietnamese content) to promote exports to EU partner countries.

Enterprises should pay attention to meeting the regulations on rules of origin according to each mechanism. Actively prepare capacity and product resources, improve competitiveness through building long-term and methodical plans, improve production and business capacity through the application of science and technology to increase the value of agricultural products, study and apply existing successful models to have the best preparation when facing competitive pressure in the “home field”. Actively cooperate and link to enhance strength, create a supply chain through promoting production linkages between businesses, cooperatives and farmers and production households, thereby completing the “value chain” from production, cultivation, processing and distribution to consumers to ensure product quality, meet the strict requirements of the Agreement and the EU’s high standards for agricultural products. Besides, it is necessary to improve the competitiveness of products through quality and price, and at the same time build and protect the brand name to promote sustainable export and maintain and diversify the market. Enhancing corporate social responsibility, paying attention to the sustainable development of the Agreement, in particular, it is necessary to pay attention to the principles and standards of labor (for example, regulations on ending forced labor, not using child labor, not discriminating in employment and occupation in the workplace, etc.), and regulations and principles on climate protection and environmental protection, protection of forest products, protection of forest products, and protection of forest products, for example. marine and aquatic resources) because these are issues that the EU is particularly interested in.

Financial support, credit for businesses. Capital plays a very important role in every business. However, at present, many Vietnamese enterprises are facing difficulties in capital. In a survey, there are 561,064 Vietnamese enterprises operating, in which, small and medium enterprises (SMEs) account for about 97%, contribute 45% of GDP, 31% of total budget revenue and attract more than 5 million employees. However, only less than 36% of these SMEs have access to bank capital. In fact, most agricultural enterprises in Vietnam are SMEs.

CONCLUSION

The EU is a market with great potential and growth potential for Vietnamese agricultural products. When the EVFTA comes into effect, it will be a big boost for Vietnam’s agricultural exports to a market of more than 500 million people with a tax rate of 0% applied to a quota of 80,000 tons. Besides the open opportunities, the challenges posed are not small. Among them are the challenges of the production process, product quality and labeling standards, we need to identify the psychology that the trade barriers applied by the EU will shift from tariff measures to non-tariff measures, which are much more sophisticated and effective. Therefore, we need to actively invest, transform production methods, and improve product quality to meet the high requirements of our partners. Joining the EVFTA is both a challenge and an opportunity for us to transform strongly towards a more modern direction, improving labor quality and efficiency.

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Part 4

Accounting - Auditing

IMPACT OF SUPERVISORY BOARD CHARACTERISTICS AND INDEPENDENT AUDIT ON FINANCIAL REPORTING QUALITY: EVIDENCE FROM VIETNAM

**Author: Thi Hoang Anh¹, Nguyen Thanh Dat², Tran Quynh Anh²,
Nguyen Vo Quynh Nhu², Nguyen Thi My An²
Mentor: Nguyen Thi Mai Anh³**

ABSTRACT: In the developed market economy, the quality of financial statements is one of the issues of concern to improve investment efficiency and support States in the financial managerial function in listed enterprises in Vietnam. Independent Audit and Supervisory Board are considered the highest risk defense lines in the governance mechanism, in order to limit earnings management. Based on an empirical study of 603 non-financial enterprises listed on Hanoi Stock Exchange (HNX) and Ho Chi Minh Stock Exchange (HOSE) in the period of 2010-2021, the study has shown the association of independent audit, supervisory board and financial reporting quality. Specifically, supervisory board' characteristics including size, gender and tenure of the supervisors are positively correlated to financial reporting quality. In addition, the selection of an independent audit, i.e. Big 4, also helps improve the quality of financial statements. The results suggest the coordination of internal and external control in monitoring the corporate financial accounting process

Keywords: corporate governance, independent audit, supervisory board, financial reporting quality, Vietnam

1. INTRODUCTION

The quality of financial statements has received more public attention after a series of financial scandals at the beginning of the 21st century from leading companies in the world declaring bankruptcy after the manager's profit manipulation was exposed such as Enron, Worldcom, etc. In Vietnam market, along with the development of investment activities, the number of businesses undergoing a decrease in profit continues to account for an overwhelming proportion (about 60%) (State Securities Commission of Vietnam, 2023). An unstable business situation is a risk for corporate managers to take actions to adjust financial statements to achieve economic goals, improve the value of the company, and attract market investment.

In the context of globalization, improving the quality of financial statements is extremely necessary because it is a useful source of information to evaluate the actual financial performance of enterprises. The improvement of the quality of financial reporting information aims to improve investment efficiency for individual and institutional investors and is the basis for the State and related parties to perform the financial supervision function to ensure the economic interests of management entities. In addition, the improved quality of financial statements contributes to creating a healthy business environment in which the interests of stakeholders are also strengthened. The raising concern of improving financial quality calls for the effectiveness of coordination between independent audit and supervisory boards in ensuring the truthfulness of financial reports.

Although there have been many researches in the world, i.e. Piot et al. (2007), Rainsbury et al. (2009), Abbott et al. (2016), have conducted analysis on the results of the combination of internal and external resources in the improvement of financial statements; however, not many research articles in Vietnam market have thoroughly explored this topic compared to the number that has been published abroad. Firstly, our

¹ Foreign Trade University - Ho Chi Minh City Campus; Email: fwhoanganhthi@gmail.com

² Foreign Trade University - Ho Chi Minh City Campus.

³ Foreign Trade University - Ho Chi Minh City Campus; Email: nguyenthimaianh.cs2@ftu.edu.vn

study evaluates alternative accrual-based models for estimating financial reporting quality including Jones model, adjusted Jones model, and performance-matching model. Secondly, previous research papers have mostly focused on analyzing the impact of the executive apparatus of enterprises, i.e. Board of Directors, General Directors on the quality of financial statements, our study selects a focused study on the effective corporate governance model, specifically the coordination of Independent Audit and Supervisory Board is the subject to pay attention to, to analyze the impact on the efficiency of financial statements

2. THEORETICAL FRAMEWORK

2.1. The role of supervisory board and independent audit in the corporate governance mechanism

Corporate governance is also an issue of interest in studies on improving the quality of financial reporting during financial crises (Erkens et al., 2012). Based on the agency theory, in joint-stock companies, a conflict of interest exists between executives and corporate shareholders' interests. Accordingly, managers will seek to optimize their personal interests or adjust the information in the financial statements to achieve the targets set by the business. In addition, the problem of asymmetric information also causes difficulties in business management. Managers are expected to have more useful information because they are directly involved in the process of running the business and deliberately do not disclose information that will be detrimental to them. Therefore, listed firms are subject to extremely strict management from State agencies. Specifically, the way and efficiency of enterprises operate must comply with strict legal regulations, especially in the aspect of transparent disclosure of financial statements. Therefore, in order to monitor the day-to-day business activities of the executives, specifically for the board of directors and the board of directors, the Vietnam Enterprise Law 2020 has required the establishment of a supervisory board and related provisions to supervise managers' activities through internal audit resources.

On the one hand, in terms of Supervisory Board, Law on Enterprise 2022 stipulates the supervision function of (i) the current status of business activities and financial status of the company; (ii) The level of compliance with internal audit regulations, risk prevention, and management regulations, reporting regulations, and other internal governance regulations of the company; (iii) legality, systematic and truthfulness in accounting, bookkeeping, contents of financial statements, appendices, and related documents; [...]. In the model "4 Lines of Enterprise Risk Defense" (IIA, 2013; BIS, 2015), Supervisory Board is the subject of the "third line of defense"; which, according to the International Accreditation Forum (IAF), the "third line of defense" will provide assurance about the effectiveness of the controls applied when operating a business. (BIS, 2015), Supervisory Board is the subject of the "third line of defense"; which, according to the International Accreditation Forum (IAF), the "third line of defense" will provide assurance about the effectiveness of the controls applied when operating a business.

On the other hand, an Independent Audit helps minimize conflicts of interest between managers and owners (Jensen and Meckling, 1976; Xiao et al., 2004). Researchers have published the following conclusions about large-scale auditing firms: (i) Perform audits more effectively because they have a better reputation (DeAngelo, 1981). Large audit firms often carry more reputations than small ones, so reputation costs for small firms are significantly lower than for large audit firms (Hogan, 2003). 1997). Based on the capital theory, because there is greater credibility for larger auditing firms, audit firms with great reputations are often considered as having higher credibility and financial reports are more precise (Teoh and Wong, 1993; Lennox, 1999). (ii) Audit quality is reflected in the quantity and level of implementation of audit procedures by auditors and audit firms with many resources - this means that audit quality belongs to the large-scale auditing firms (Dopuch and Simunic, 1982); (iii) There is a higher compliance and quality of disclosed information in large-scale non-Big 5 auditing firms when compared to large-scale non-Big 5 audit firms. smaller (Krishnan and Schauer, 2000).

In general, the coordination of the supervisory board and independent audit is considered as the last 2 lines of defense in the “4 Lines of Enterprise Risk Defense” fully complemented by the Bank for International Settlements (BIS) and the Institute of Internal Auditors (IIA), which help improve internal and external control to ensure the quality of financial statements of enterprise

2.2. Hypotheses Development

Independent Audit and Financial Reporting Quality

According to DeAngelo (1981), reputable audit firms, such as the Big 4, perform better audits because they need to maintain their good reputation by issuing accurate financial reports. Additionally, large audit firms like the Big 4 have more resources and personnel to conduct thorough audit procedures (Dopuch and Simunic, 1982).

H1: Companies audited by the Big 4 have a positive association with financial reporting quality.

Supervisory Board Size and Financial Reporting Quality

Xie et al. (2003) and Peasnell et al. (2001) noted that larger supervisory boards can minimize earnings management and improve financial reporting quality. Research has shown that a large supervisory board with diverse expertise, fields, and work experiences can provide multidimensional perspectives, comprehensively solve conflicts, and limit cases of individual manipulation or imposition of opinions on the board.

H2: The size of the supervisory board is positively associated with financial reporting quality.

Proportion of Female Members and Financial Reporting Quality

Women on supervisory boards with responsibilities for management and supervision to better regulate earnings management practices in enterprises, ensuring and enhancing the accuracy of financial reporting (Faccio et al., 2016). Sabatier (2015) noted that women tend to pay more attention to business and financial aspects, thereby creating a more multi-dimensional and careful consideration in the process of monitoring the quality of financial reporting.

H3: The proportion of female members on the supervisory board is positively associated with financial reporting quality.

Average Tenure of Supervisory Board Members and Financial Reporting Quality

Members with longer average seniority have higher independence and better efficiency in their work, helping to accumulate more experience in curbing fraudulent behavior in financial reporting, which negatively affects profit management behavior (Beasley, 1996).

H4: Supervisory boards with higher average tenure are positively associated with financial reporting quality.

Audit and Accounting Expertise and Financial Reporting Quality

DeZoort and Salterio (2001) have shown that supervisory board members specializing in finance and accounting help to focus on the structure and quality of financial reports while also resolving conflicts between business management and independent auditing. They also have an advantage in understanding audit processes and focusing on the quality of the content of financial reports rather than just the form.

H5: The supervisory board members' audit and accounting expertise is positively associated with financial reporting quality.

Supervisory Board Members' Independence and Financial Reporting Quality

Companies engaging in financial statement fraud had fewer independent members than industry benchmarks (Beasley et al., 1996). Zain et al. (2006) found that supervisory boards made up only of independent (or outside) directors will be more productive and are likely to request a wider range of internal audit procedures and activities, which will strengthen internal controls and increase the efficiency of the internal audit function.

H6: Supervisory board members' independence is positively associated with financial reporting quality.

3. RESEARCH METHOD

3.1. Sample data

Our research data contains non-financial companies listed on Hanoi Stock Exchange (HNX) and Ho Chi Minh Stock Exchange (HOSE) in the stable period from 2010 to 2021. Data about the selection of independent audit, characteristics of the supervisory board, and ownership structure is hand-collected from annual report on Vietstock; data about the financial position of business is retrieved from Finnpro. In terms of data processing, we exclude inappropriate observations including: (1) financial institutions such as banks, and insurance companies,... as the records of financial reporting are complicated, (2) abnormal outliers whose values range less than 1% or greater than 99%; (3) observations do not have complete data. Our final data includes 3,630 observations of 630 firms in 11 years (between 2010 and 2021).

3.2. Regression model

3.2.1. Measure of financial reporting quality

Given that accounting earnings are the most widely used measures of financial reporting quality, a vast body of research on empirical financial accounting has focused on factors that affect earnings management (Becker et al., 1998; Francis et al., 2004). The incentives of earnings management decrease the quality of financial reporting. In terms of earnings management, accruals earnings management can have a negative impact than real earnings management because the management of accrued profits can be more easily adjusted and receive less attention from stakeholders than cash flow, therefore, businesses can take advantage of accrual management to manipulate financial statements (Choi and Pae, 2011).

Our paper evaluates alternative accrual-based models for detecting earnings management Abnormal accruals are measured based on prominent models including the Jones Model (Jones, 1991), the adjusted Jones Model (Dechow et al., 1995), and the Performance-matching model (Kothari et al., 2005). Financial reporting quality are calculated by estimating the negative sign of absolute fitted value ($-|\varepsilon_{ij,t}|$) of 3 following models:

$$\frac{TA_{ij,t}}{Asset_{ij,t-1}} = \beta_0 + \alpha_1 \frac{1}{Asset_{ij,t-1}} + \alpha_2 \frac{\Delta Rev_{ij,t}}{Asset_{ij,t-1}} + \alpha_3 \frac{PPE_{ij,t}}{Asset_{ij,t-1}} + \varepsilon_{ij,t} \quad (1)$$

$$\frac{TA_{ij,t}}{Asset_{ij,t-1}} = \beta_0 + \alpha_1 \frac{1}{Asset_{ij,t-1}} + \alpha_2 \frac{\Delta Rev_{ij,t} - \Delta Rec_{ij,t}}{Asset_{ij,t-1}} + \alpha_3 \frac{PPE_{ij,t}}{Asset_{ij,t-1}} + \varepsilon_{ij,t} \quad (2)$$

$$\frac{TA_{ij,t}}{Asset_{ij,t-1}} = \beta_0 + \alpha_1 \frac{1}{Asset_{ij,t-1}} + \alpha_2 \frac{\Delta Rev_{ij,t} - \Delta Rec_{ij,t}}{Asset_{ij,t-1}} + \alpha_3 \frac{PPE_{ij,t}}{Asset_{ij,t-1}} + \alpha_4 ROA_{ij,t} + \varepsilon_{ij,t} \quad (3)$$

where *FRQ*: financial reporting quality; *TA*: total accruals (measured by change in net operating profit and cash operating expenses); *ij,t*: company *i* in *j* industry; *t,t-1*: fiscal year *t* and *t-1*; *Asset*: total firm' assets; ΔRev : difference in net sales in year *t* and net sales in year *t-1*; ΔRec : difference in receivables in year *t* from receivables in year *t-1*; *PPE*: gross cost of fixed assets; *ROA*: return by lagged total assets

3.2.2. Corporate governance: independent audit and supervisory board

We examine the association between FRQ and external auditors by using the dummy variable AUBIG4, which is defined as 1 if enterprises are audited by Big4, and 0 otherwise. Moreover, consistent with prior research, the authors have reviewed and selected the most characteristic features of the supervisory board and referred to the features prescribed by law in the Law on Enterprises 2020 including: SBSIZE is the size of the supervisory board, measured by the total members in supervisory board; SBGEN is the proportion of

females in SB, SBTEN is the average seniority of the supervisory board, measured by logarithm of average tenure of members in SB; SBEXP is the proportion of SB members with finance and accounting expertise; SBIDP is the independence of SB members, defined as 1 if the proportion of outside supervisors is greater than 51%, and 0 otherwise

33.2.3. Control variables

Previous study indicates that firm characteristics are useful predictors for earnings management. We control the financial characteristics of businesses: CFOA is the cash flows from operating activities deflated by average total assets; LNSIZE is the natural logarithm of total firm’s assets; ROA is the rate of return on lagged total assets; LEV is financial leverage, measured by total debts by total assets; GROWTH is sales growth, measured by the change in sales revenue between year t and t-1 divided by total sales revenue in year t. Moreover, we expect an association between the ownership structure of firms and financial reporting quality. Specifically, the higher the ownership ratio of the Board of Directors (OWN_MNG) and state ownership (OWN_STA), means that the quality of financial statements is improved in a positive way as the interests between managers and owners are expectedly minimized (Jensen and Meckling, 1976). Given that earnings management differs over time and across industries, we also control the year and industry effects with dummy variables.

$$FRQ_{ij,t} = \beta_0 + \beta_1 AUBIG4_{ij,t} + \beta_2 SBSIZE_{ij,t} + \beta_3 SBTEN_{ij,t} + \beta_4 SBGEN_{ij,t} + \beta_5 SBEXP_{ij,t} + \beta_6 SBIDP_{ij,t} + \beta_7 CONTROL_{ij,t} + \varepsilon_{ij,t}$$

Table 1. Sources and description of study variables

Variables	Description	Expected sign	Research source
Dependent variables			
FRQ1	Negative sign of abnormal accruals calculated based on Jones model		Jones (1991)
FRQ2	Negative sign of abnormal accruals calculated based on adjusted Jones model		Dechow et al. (1995)
FRQ3	Negative sign of abnormal accruals calculated based on performance-matching model	+	Kothari et al. (2005)
Independent variables			
AUBIG4	The selection of independent audit (indicator variable coded 1 if the auditor is a Big 5 audit firm, and 0 otherwise)	+	Francis et al. (1999); Gallery et al. (2008), Komal et al. (2021)
SBSIZE	The size of supervisory board (measured by total number of supervisors)	+	Abbott et al. (2004); Lin and Hwang (2010); Diem et al. (2021)
SBTEN	The seniority of supervisory board (measured by logarithm of average tenure of supervisors)	+	Chtourou et al. (2001), Yang and Krishman (2005), Xiong (2016)
SBGEN	The proportion of females in supervisory board (measured by the percentage of female supervisors)	+	Gul et al. (2009); Gavius et al. (2012); Jizi and Nehme (2017)
SBIDP	The independence of supervisory board (indicator variable coded 1 if the percentage of outside supervisors is greater than 51%, and 0 otherwise)	+	Beasley (1996); Klein (2002); Lin and Hwang (2010)
SBEXP	The expertise of supervisory board (the proportion of supervisors with finance and accounting expertise)	+	Dahya et al. (1996); Agrawal and Chadha (2015)
Control variables			

Variables	Description	Expected sign	Research source
CFOA	Cash flows from operating activities deflated by average total assets	+/-	Dechow et al. (1995), Chen et al. (2007), Cho and Chung (2022)
LNSIZE	Natural logarithm of total firm's assets	+	Mardessi and Fourati (2020), Chen et al. (2007), Watts and Zimmerman (1986)
ROA	Return on lagged total assets	+	Chen et al. (2007), Cho and Chung (2022)
LEV	Financial leverage (measured by total debts by total assets)	+/-	Chen (2007), Tan (2009), Li et al. (2021)
GROWTH	Sales growth (measured by the change in sales revenue between year t and t-1 divided by total sales revenue in year t)	-	Yang (2005), Kusumaningtyas (2019)
OWN_STA	The proportion of State's ownership (measured by the total shares hold by States by the total holding shares)	+	Alves (2012), Kazemian and Sanusi (2015)
OWN_MNG	The proportion of Board of Directors's ownership (measured by the total shares hold by Board of Directors by the total holding shares)	+	Alves (2012), Kazemian và Sanusi (2015)

Source: Synthesized by the author (2023)

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Descriptive statistics

Table 2 – Descriptive statistics of dependent variables

Variable	Obs	Mean	Std.Dev	Min	Max
FRQ1	3.630	-0,086	0,073	-0,649	0
FRQ2	3.630	-0,087	0,075	-0,647	0
FRQ3	3.630	-0,087	0,075	-0,642	0

Source: The authors (2023)

Statistics describing the dependent variables of the three models are shown in detail through table 4.1. In particular, FRQ1, FRQ2 and FRQ3 are dependent variables representing the opposite levels of profit management through abnormal accruals. In general, the minimum and the maximum value of these variables are approximately equal. This shows consistency in terms of results in all three ways of determining variable value depending on measuring the quality of financial report quality through limiting profit management behavior. The data showed that there was no huge difference between the mean in these variables, with FRQ1 recording the highest mean value of -0.086 and FRQ2, FRQ3 recording a lower mean value of -0.087. Comparing with other research results in the world, such as Feng Chen and Ole-Kristian Hope (2011) recorded values from -0.1 to -0.047, we find that the financial report quality of Vietnam is much lower than the general level of emerging markets in the world.

Table 3 – Descriptive statistics of independent and control variables

Variable	Obs	Mean	Std.Dev.	Min	Max
AUBIG4	3.630	0,208	0,406	0	1
SBSIZE	3.630	3,003	0,321	3	5
SBTEN	3.630	7,060	4,3378	0	38
SBGEN	3.630	0,463	0,317	0	1

SBEXP	3.630	0,271	0,310	0	1
SBIDP	3.630	0,166	0,372	0	1
ROA	3.630	0,164	0,153	0	0,734
CFOA	3.630	0,055	0,131	-0,688	0,704
LEV	3.630	0,090	0,128	0	0,787
GROWTH	3.630	0,167	1,211	-0,953	48,802
LNSIZE	3.630	27,154	1,332	23,708	31,264
OWN_MNG	3.630	0,0634	0,112	0	0,854
OWN_STA	3.630	0,167	0,238	0	0,830

Source: The authors (2023)

4.1.2. Model testing

To test whether the model exists multicollinearity, the study calculated the Variance Inflation Factor (VIF). The results obtained show that in model testing with dependent variables FRQ1, FRQ2, FRQ3, the average VIF coefficients have a value of 1.16 and no outlier data value exceeds 2 (Appendix 1). This is consistent with the Gujarati (2011) study, where the VIF coefficient of variables in the model should have values less than 2. We conclude that multicollinearity does not occur in the three choice models. Breusch–Pagan–Godfrey test is then conducted to check the existence of heteroskedasticity (Appendix 2). All three tests show that Prob > chi2 = 0.000 is less than 5% significance level, therefore, the model is affected by heteroskedasticity. The results of Wooldridge test showed that the Prob > F values of the three models are less than 5% significance level, so the model also occurs autocorrelation (Appendix 3). The correlation matrix is shown in the Appendix 4.

The tests conducted showed that the model had two defects: heteroskedasticity and autocorrelation. To overcome the two phenomena simultaneously, the Feasible Generalized Least Square (FGLS) estimation method is selected. FGLS estimation should be chosen to deal with heteroskedasticity or autocorrelation in a model using tabular data (Wooldridge, 2002).

4.1.3. Regression results

The tests conducted showed that the model had two defects: heteroskedasticity and autocorrelation. To overcome the two phenomena simultaneously, the Feasible Generalized Least Square (FGLS) estimation method is selected (Wooldridge, 2002). Our research used the Feasible Generalized Least Square (FGLS) estimation method to estimate the regression model and analyze the results (Table 4).

Table 4 - Regression results using the Feasible Generalized Least Square (FGLS) estimation method

Variable name	(1) FRQ1	(2) FRQ2	(3) FRQ3
AUBIG4	0,00629* (0,00336)	0,00632* (0,00344)	0,00687** (0,00346)
SBSIZE	0,00738** (0,00375)	0,00662* (0,00384)	0,00668* (0,00386)
SBTEN	0,00499** (0,00247)	0,00390 (0,00253)	0,00485* (0,00254)
SBGEN	0,00734* (0,00389)	0,00822** (0,00398)	0,0100** (0,00400)
SBEXP	-0,00159 (0,00423)	-0,00178 (0,00433)	-0,000115 (0,00435)

SBIDP	0,00130 (0,00335)	0,000726 (0,00343)	-0,00145 (0,00345)
ROA	0,00505 (0,00902)	-0,00870 (0,00924)	-0,00709 (0,00928)
CFOA	0,0311*** (0,00988)	0,0354*** (0,0101)	0,0409*** (0,0102)
LNSIZE	0,00278** (0,00121)	0,00286** (0,00124)	0,00288** (0,00125)
LEV	0,00768 (0,0110)	0,00355 (0,0112)	0,00440 (0,0113)
GROWTH	-0,00102 (0,000992)	-0,00169* (0,00102)	-0,00215** (0,00102)
OWN_MNG	0,0280** (0,0118)	0,0287** (0,0120)	0,0237* (0,0121)
OWN_STA	0,0160*** (0,00562)	0,0154*** (0,00576)	0,0130** (0,00579)
Constant	-0,222*** (0,0342)	-0,221*** (0,0350)	-0,225*** (0,0352)
Observations	3.630	3.630	3.630
Fixed year	Yes	Yes	Yes
Fixed industry	Yes	Yes	Yes

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: The authors (2023)

Results of regression of independent variables

The results of the research on the impact of independent audits on the financial reporting quality show that the selection of the Big 4 independent auditor (AUBIG4) has a positive impact on the financial reporting quality across all three models measuring the financial reporting quality and is significant at the level of 5% and 10%. As independent audit firms, Big 4 independent auditors need to ensure their reputation by being honest in audit activities which can enhance the transparency, honesty and quality of the financial reporting quality (Arioglu, 2019; Francis and Wang, 2008). This result is similar to Becker et al. (1998), Cho and Chung (2022)

For the research results on the characteristics of the supervisory board to the financial reporting quality, table 4.5 shows that among the 5 independent variables included in the model of the characteristics of the supervisory board, there are 3 statistically significant variables: the size of the supervisory board (SBSIZE), The percentage of female members in the supervisory board (SBGEN), the average tenure of supervisory board members (SBTEN).

The regression results show the positive relationship between the number of members in the supervisory board and the financial reporting quality in all three models according to 3 measures. The SBSIZE variable was statistically significant at 5% in model (1) and significant at 10% for two models (2) and (3). The result shows that the larger the size of the supervisory board can enhance the financial reporting quality. In Vietnamese enterprises, the supervisory board is considered an effective monitoring mechanism for managers to minimize fraudulent acts in financial reports because the supervisory board plays the highest

role in the “Four lines of risk defense “ proposed by IIA (2013), at the same time, the supervisory board must comply with the supervisory functions in the Law on Enterprise 2020.

The percentage of female members on the supervisory board (SBGEN) was statistically significant at 10% for model (1) and significant at 5% for two models (2) and (3). The regression coefficient in all three models show a positive sign indicating the presence of female controllers in the supervisory board to improve the quality of financial report. This result further supports theories about the role of females in corporate management systems as women tend to be more cautious in overseeing financial reports and more neutral than men in making ethical decisions in their behavior, thereby improving the supervision activities of female controllers and the financial reporting quality. The synergistic impact of the proportion of female members on the supervisory board on the financial reporting quality shown by the study is similar to Halpern (2000), Gul et al. (2007), Li et al. (2021).

The average tenure of members of the supervisory board (SBTEN) positively affects the financial reporting quality with a significance level of 5% for the model (1) and significance at 10% for the model (3). This shows that the more experience working as a controller, the more it will mitigate the earnings management, or in other words, increase the financial reporting quality. The tenure of controllers contributes to improving their specific knowledge of their work, equipping them with the ability to solve complex procedures of stakeholders, thereby improving the quality of information on financial report of enterprises. The results coincide with Kosnik (1990), Yang and Krishnan (2005). As can be seen, the longer a member of the supervisory board has been active as a controller of the company activities, the more they will have an understanding of the company’s activities and therefore have a basis to protect the interests of shareholders and improve the performance of the company better thanks to their supervision (Kosnik, 1990; Hermalin and Weisbach, 1991). However, the above arguments differ from the model results (2) measured by Dechow et al. (1995) because the results show that there is insufficient evidence to conclude that the tenure of the supervisory board has a positive impact on the financial reporting quality.

In addition, the study also examined the influence of the percentage of members of the supervisory board with accounting and financial expertise (SBEXP) and the percentage of independent supervisory board members (SBIDP) on the financial reporting quality. However, the research have not found a significant relationship to conclude the influence of these two independent variables on the transparency of financial report in all three measures FRQ1, FRQ2, FRQ3. This means that the H5 and H6 hypotheses are not accepted. Empirical results cannot prove that members of the supervisory board with expertise in finance and accounting will reduce the financial reporting quality. This coincides with empirical results from research by Carcello et al. (2008), Sun et al. (2011), Sun et al. (2014). The reason for this difference is that the disclosure of the background of accounting and financial expertise of controllers in Vietnam is voluntary and there is no specific declaration standard on qualification and certificate requirements. Therefore, the authors’ use of the results collected in the listed financial report is also affected. The research also found no empirical evidence demonstrating a mutually beneficial relationship between the independence of the supervisory board and the financial reporting quality. This result is consistent with Kusnadi et al. (2016).

Results of regression of control variables

The control variables the authors put into the regression model are divided into two groups (1) The group of control variables about the financial position of the enterprise includes: profitability (ROA), enterprise size (LNSIZE), cash flow from operating activities (CFOA), financial leverage (LEV) and sales revenue growth rate (GROWTH); (2) The group of control variables on ownership of enterprises includes: State ownership (OWN_STA) and ownership of the board of directors (OWN_MNG). Of the 7 control variables in these 2 groups, 5 were statistically significant, specifically:

For the control variable group of the financial position of the enterprise, the enterprise size variable

(LNSIZE) is positive and significant at 5% in all 3 models corresponding to 3 financial reporting quality measures. The attention of the market will be on large-scale companies, so to increase transparency in financial reporting, large companies tend to properly declare actual profits in financial report and managers also tend to minimize fraudulent behavior through their financial report. The results coincide with studies by Mardessi and Fourati (2020), Chen et al. (2007), Watts and Zimmerman (1986). The cash flow from operating activities (CFOA) is positive, significant at 1% in all 3 models. This means that the greater the ability to generate money from the internal operations of the business, the less the managers of that company have to adjust the information in the financial report, because they have met the needs of debt repayment, dividends to shareholders or increased investment. The results prove that the larger the cash flow from business activities, the quality of financial report will also improve. This coincides with studies by Dechow et al. (1995), Chen et al. (2007), Lobo and Zhou (2006), Cho and Chung (2022). The GROWTH variable shows the inverse relationship between the growth rate of sales revenue and the financial reporting quality in models (2) and (3), when revenue grows, the financial reporting quality decreases. This can be explained that when revenue increases, it means increased costs and customer receivables, if not good management easily leads to bad debt, resulting in reduced profits. The change in working capital is also a risk for managers to manipulate profits in case of bad governance, thereby reducing the financial reporting quality.

The impact of corporate ownership on financial reporting quality is reflected in two control variables OWN_STA and OWN_MNG. Both state ownership (OWN_STA) and board ownership (OWN_MNG) variables have a positive impact on the financial reporting quality across all three measurement models. The OWN_MNG variable is significant at 5% for models (1) and (2) and significant at 10% for models (3). This shows that the higher the ownership ratio of the board of directors, the better the financial reporting quality because at this time the ownership and management functions mentioned in the “Agency theory” almost coincide (Kazemian and Sanusi, 2015). State ownership (OWN_STA) has a significant impact on the financial reporting quality through positive regression coefficients and statistical significance levels of 1% and 5%. Enterprises with high state ownership often tend to report more transparently in financial reports because the state often wants to strictly control financial report.

4.2. Discussion

One of the main concerns and desires of investors is to get accurate information about financial information in the market, especially through the preparation of financial reports. Regarding the preparation of financial reports, accounting practices in general and the desire of investors are that “financial reports must be reliable”. This facilitates stakeholders in making decisions about the allocation of resources to the business (Dáhtbayaz et al., 2018). The fundamental theories have also shown the great impact of the financial reporting quality on the business results of enterprises, so enterprises need to prepare many policies to improve the financial reporting quality to promptly address and eliminate opportunities and motivations leading to the act of misreporting information in the financial reports of managers. Businesses often have many fraudulent ways in financial reports to hide the eyes of shareholders such as raising virtual capital and issuing “junk” stocks and bonds,... This comes from the separation of management and ownership. The supervisory board is elected by the General Meeting of Shareholders for the purpose of supervising the Board of Directors, Director or General Director in the management and administration of the company, appraising the completeness, legality and truthfulness of business situation statements, financial reports. Therefore, the supervisory board represents the remote observation and control of shareholders, helping to ensure and maximize shareholder benefits in the enterprise. The Board of Shareholders needs to consider the characteristics of the supervisory board (including size of supervisory board, gender and seniority of supervisors) to make a decision on the appropriate supervisory board structure. In addition to focusing on internal audit resources through the supervisory board supervision activities, enterprises need to focus on the independent audit aspect in the effective management

model so that they can promptly detect and control, minimize arising risks, avoid dishonest or erroneous financial information and reporting. Enterprises should choose reputable and quality independent units to ensure that information on financial reports is audited transparently and clearly, serving the interests of stakeholders. Big 4 companies including E&Y, Deloitte, KPMG and PwC are considered to have higher reliability, even bringing intangible benefits to businesses because the common view of financial report users is that reports issued by member firms of large foreign auditing firms are of higher quality. However, the proportion of companies listed on the stock market choosing Big 4 as the EIA is still low, because in Vietnam, there exist mainly small and medium enterprises, so they are quite concerned about audit costs. Enterprises need to have a long-term orientation in choosing EIA because in the long term, investors often appreciate and place more trust in businesses that have been audited by the Big 4 for a long time.

The results of the study have shown the impact of independent audits and supervisory board characteristics on the financial reporting quality, however, due to some limitations on many aspects of information published in the market, the process of collecting and processing data has been somewhat difficult. More specifically, the dataset used in the study paper is secondary data, which the authors collected from annual reports of listed companies from 2010 to 2021. Thus, the authenticity of the data is only relative. In addition, because each enterprise has its own information collection standards for reports, leading to inconsistency in the collected data samples, reducing the number of samples for analysis of the research topic.

In addition, the research paper lacks comprehensiveness on the impact of the supervisory board and independent audit of all enterprises on the Vietnamese stock market because the analysis data sample is only collected from companies listed on two stock exchanges, HOSE and HNX.

In addition, the characteristics of the supervisory board studied in the article are generally not enough to fully and practically generalize the impact of the supervisory board on the financial reporting quality in listed enterprises of Vietnam. Specifically, in terms of the professional aspect of the supervisory board, most of the data samples collected only stop at degrees with the field of economics in general, not classified by majors in finance, accounting and auditing. This made it difficult for the authors to determine the qualifications of each supervisory board member, leading to a decrease in the reliability of the scale of measurement of professional variables of the research topic.

5. CONCLUSION

By quantitative method, OLS regression based on the Feasible Generalized Least Squares (FGLS) method, the results of the study show that factors related to external auditors and Supervisory Board characteristics have certain impacts on the quality of financial report of enterprises. However, an enterprise cannot always satisfy all the best conditions for improving the quality of financial report at the request of investors and shareholders, so enterprises should have appropriate policies on the structure of financial statements and the selection of an independent audit unit to ensure the quality of financial statements information in stakeholder eyes.

Enterprises should focus on retaining controllers with seniority, experience, compliance with the provisions of the Law on Enterprise and pay attention to the aspect of social responsibility in the process of operation. In addition, the Government and authorities also need to complete and make amendments in the laws to encourage the presence of female controllers in the Supervisory Board, as well as take measures to deter enterprises that do not have an appropriate Supervisory Board structure as prescribed by law when there are not enough members in the Supervisory Board.

Besides, to adapt with the trend of global integration and quickly access to the international market, in the coming time, companies and enterprises listed on the Vietnam stock exchange should also consider using and referring to the development orientations of large corporations to apply to their companies to complete the apparatus, respond to governance standards and international practices.

6. APPENDIX**APPENDIX 1: VARIANCE INFLATION FACTOR (VIF) TEST**

Variables	VIF
AUBIG4	1,27
SBSIZE	1,02
SBTEN	1,02
SBEXP	1,06
SBGEN	1,04
SBIDP	1,06
CFOA	1,12
ROA	1,21
LNSIZE	1,59
LEV	1,32
GROWTH	1,01
OWN_STA	1,15
OWN_MNG	1,14

Source: The authors (2023)

Appendix 2: Breusch–Pagan–Godfrey Test

	FRQ1	FRQ2	FRQ3
Chi2(1) = 259,85	259,85	309,71	296,86
Prob > chi2	0,000	0,000	0,000

Source: The authors (2023)

APPENDIX 3: WOOLDRIDGE TEST

	FRQ1	FRQ2	FRQ3
Prob > F	0,0000	0,0000	0,0001

Source: The authors (2023)

APPENDIX 4: CORRELATION MATRIX

	FRQ1	FRQ2	FRQ3	AUBIG4	SBSIZE	SBTEN	SBGEN	SBEXP	SBIDP	ROA	CFOA	LNSIZE	LEV	GROWTH	OWN_MNG	OWN_STA
FRQ1	1															
FRQ2	0,946***	1														
FRQ3	0,915***	0,965***	1													
AUBIG4	0,043*	0,041*	0,047**	1												
SBSIZE	0,051**	0,048**	0,047**	0,065***	1											
SBTEN	0,079***	0,072***	0,073***	-0,057***	0,009	1										
SBGEN	0,019	0,023	0,031	-0,076***	-0,034*	-0,060***	1									
SBEXP	-0,0005	-0,005	0,005	0,104***	-0,013	-0,062***	0,134***	1								
SBIDP	0,001	0,009	0,003	0,050**	0,029	-0,028	0,069***	0,078***	1							
ROA	-0,005	-0,033*	-0,032	-0,004	-0,047**	-0,014	-0,063***	-0,011	-0,104***	1						
CFOA	0,083***	0,094***	0,1***	0,039*	0,069***	0,072***	-0,006	0,021	0,054**	-0,285***	1					
LNSIZE	0,034*	0,029	0,033*	0,385***	0,024	-0,077***	-0,002	0,152***	0,156***	0,143***	-0,06***	1				
LEV	0,025	0,024	0,024	-0,003	0,026	-0,015	-0,017	-0,012	0,077***	-0,131***	0,02	0,386***	1			

	FRQ1	FRQ2	FRQ3	AUBIG4	SBSIZE	SBTEN	SBGEN	SBEXP	SBIDP	ROA	CFOA	LNSIZE	LEV	GROWTH	OWN_ MNG	OWN_ STA
GROWTH	-0,034*	-0,043**	-0,05**	-0,008	-0,008	-0,010	0,006	-0,008	0,012	-0,037*	-0,052**	0,03	-0,005	1		
OWN_MNG	0,009	0,006	0,001	-0,121***	-0,034*	0,041*	0,003	-0,024	-0,106***	0,171***	-0,088***	-0,037*	-0,070***	0,014	1	
OWN_STA	0,068***	0,066***	0,059***	-0,040*	0,086***	0,066***	-0,045**	-0,073***	0,002	-0,06***	0,134***	-0,023	0,164***	-0,048**	-0,265***	1

Source: The authors (2023)

Note: **FRQ1** is the absolute value of the abnormal accruals of the Jones model (Jones, 1991) multiplied by -1; **FRQ2** is the absolute value of the abnormal accruals of the adjusted Jones model (Dechow et al., 1995) multiplied by -1; **FRQ3** is the absolute value of the abnormal accruals of the performance-matching model (Kothari et al., 2005) multiplied by -1; **AUBIG4** is the selection of independent audit (indicator variable coded 1 if the auditor is a Big 5 audit firm, and 0 otherwise); **SBSIZE** is the size of supervisory board (measured by total number of supervisors); **SBTEN** is the seniority of supervisory board (measured by logarithm of average tenure of supervisors); **SBGEN** is the proportion of females in supervisory board (measured by the percentage of female supervisors); **SBEXP** is the expertise of supervisory board (measured by the proportion of supervisors with finance and accounting expertise); **SBIDP** is the independence of supervisory board (indicator variable coded 1 if the percentage of outside supervisors is greater than 51%, and 0 otherwise); **CFOA** is cash flows from operating activities deflated by average total assets; **LNSIZE** is natural logarithm of total firm's assets; **ROA** is return on lagged total assets; **LEV** is financial leverage (measured by total debts by total assets); **GROWTH** is sales growth (measured by the change in sales revenue between year t and t-1 divided by total sales revenue in year t); **OWN_STA** is the proportion of State's ownership (measured by the total shares hold by States by the total holding shares); **OWN_MNG** is the proportion of Board of Directors's ownership (measured by the total shares hold by Board of Directors by the total holding shares)

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THE INFLUENCE OF EMOTIONAL INTELLIGENCE AND OTHER PERSONAL CHARACTERISTICS ON THE PROFESSIONAL ETHICS OF ACCOUNTANTS IN VIET NAM

**Author: Nguyen My Duyen¹, Nguyen Chau Anh¹, Ta Thi Thu Ha¹,
Pham Thi Khanh Linh¹, Nguyen Hai Ly¹
Mentor: Le Thi Thu Ha¹,**

ABSTRACT: *Professional ethics is one of the issues that deserves attention today, especially for accountants. To understand and strengthen the ethical compliance of accountants, we need to identify the factors that affect the ethical behavior of accountants. In this study, we examine the influence of emotional intelligence and personal characteristics on the ethical judgment and ethical self-intention of accountants in Vietnamese enterprises. The results show that emotional intelligence and gender have a significant influence on the professional ethics of accountants. Specifically, accountants with higher emotional intelligence are less likely to act unethically. Regarding gender, female accountants tend to accept unethical behavior more than male accountants. Based on the obtained results, our team has come up with a number of solutions to help improve the professional ethics of accountants in the business.*

Keywords: Vietnamese accountants, professional ethics, ethical judgments, ethical self-intention, emotional intelligence, age, gender, years of experience.

1. INTRODUCTION

Behaviors and personal qualities are important factors that determine the consciousness and attitude at work of each person in general and accountants in particular. It is known that accounting is a system of recording and measuring business activities, in order to give readers results and understanding of the transactions that have occurred in the business process of an organization. Therefore, compliance with professional ethics is one of the most important requirements for accountants, a factor to ensure the truthfulness of accounting information.

To understand and strengthen the ethical compliance of accountants, we need to identify the factors that affect the ethical behavior of accountants. One of the factors that are believed to affect the behavior of individuals and are receiving recent attention is emotional intelligence. By controlling and perceiving the emotions and actions of oneself and those around, each individual will have the ability to grasp psychology and come up with an appropriate response to each situation. So, how do accountants' emotional intelligence and personal characteristics affect accountants' ethical judgments and behavior?

Although there have been a number of studies on professional ethics in Vietnam, these studies are limited to some specific aspects. For example, Nguyen et al. (2021) refer to the impact of different cultural environments on the ethical behavior of accountants, or the study of Le et al. (2022) assess the impact of ethical standards and corporate ethical values on the ethical judgment of auditors in Vietnam. Thus, these studies tend to focus on the impact of environmental factors on professional ethics. To the best of our knowledge, there is currently no research on the influence of emotional intelligence on the intended behavior of accountants in Vietnam.

Among the personal characteristics of a person, emotional intelligence is a factor that can influence human behavior, help people to perfect their personality, manage emotions and behavior, and avoid negative influences in society. Therefore, the study of the influence of Emotional intelligence as well as

¹ Banking Academy.

other individual factors will help managers to better understand the factors affecting the ethical behavior of individuals, thereby providing solutions and methods to improve the ethics of accountants in Vietnam. Therefore, our team conduct this study on the impact of *Emotional intelligence* and personal characteristics on the ethical behavior of Vietnamese accountants to clarify the impact of these factors, namely: *Emotional intelligence* and personal characteristics to the professional ethics of accountants, thereby proposing measures to decrease the unethical actions of accountants in Vietnamese enterprises.

Our research consists of 5 parts: part 1 is the introduction, part 2 presents the theories and hypothesis development, part 3 presents research methods, part 4 is research results and discussion and finally part 5 concludes the research.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Definition of professional ethics of accountants

Professional ethics are standards and ethical rules set forth with the aim of leading and controlling the actions of each individual in a certain profession, not only ensuring practitioners can complete their work with good quality and efficiency, in accordance with the provisions of the law, but also building the trust of society in the services provided. Along with the development of society, each job will have its own rules and ethical standards issued by the government and other relevant professional bodies, to minimize unethical behavior in the professions. In short, professional ethics are standards that are established to reduce unethical behavior, which are strongly supported by the community.

Accounting is a job that requires a high level of accuracy and care, so it is extremely important to set up principles and ethical standards in this profession. Those are the standards that accountants must apply and follow to make appropriate behavior and judgments in all job situations.

2.2. Theories on the development of ethical behavior

In order to clarify the formation and development of personal ethical behavior, some researchers have developed theoretical bases for the development of ethical behaviors based on the development stages of perception and decision-making in relation to ethical issues.

a) The stages of moral development by Lawrence Kohlberg (1969)

Lawrence Kohlberg's Stages of Moral Development is a comprehensive theory of moral development based on the doctrine of moral judgment for children by Jean Piaget (1932) and developed by Lawrence Kohlberg in 1958. Kohlberg's theoretical framework consists of six stages divided into three general levels of moral development. These levels include the followings: ***Level 1: Pre-conventional ethics***. At this level, morality is controlled from the outside. This view holds that ethical behavior is the behavior that a person can achieve or that makes the individual happy. ***Level 2: Conventional ethics***. At this level, the emphasis on ethics shifted from personal interests to the benefits of relationships with people in the society. The individual tries to follow the rules set by others as parents, peers, and the government. And they control their approval or maintain social order. ***Level 3: Post-conventional ethics***. In this level, the individual must focus on abstract principles and values that apply to all in some possible situations in society. Understanding and gathering knowledge about ethical behaviors will help people improve ethical behavior over time. And this will depend on the development and self-improvement of each individual.

b) Rest's Action Model (1986)

Ethical actions are not the result of a single decision-making process; but rather a combination of individual perceptions and psychology. Rest's four-step model provides the foundation for ethical reasoning and includes the following steps: 1) defining dilemmas; 2) applying moral judgment; 3) defining the expected behavior; and 4) performing ethical actions.

This model shows that defining behavior and making action decisions is not easy for each person because many barriers with external influences can make an individual oscillate. For example, individuals may receive instructions from their superiors, or the interests of individuals may be affected by performing an ethical act.

2.3. Factors affecting the professional ethics of accountants

Researchers have identified several factors that influence the professional ethics of accountants.

a) Emotional Intelligence

The theory of emotional intelligence (EI) was formulated in 1920 by E.L. Thorndike, who used the term “social intelligence” when talking about emotional intelligence. Later, the concept was made famous by Mayer et al. (1990), who coined the term emotional intelligence, and Goleman (1995), who published a book on the term. Emotional intelligence is the ability to monitor the emotions of yourself and those around you, discern the difference between them, and use the information to control an individual’s thoughts and actions (Mayer et al. 1990, p. 189). It is an individual’s unique factor in managing the emotions of himself and others, thereby forming and directing the thoughts and actions necessary to respond to pressures and needs from others in society (Van Rooy and Viswesvaran 2004; Mesmer-Magnus et al. 2008). Mesmer Magnus et al. (2008, 2010) and Angelidis and Ibrahim (2011) have found that people with emotional intelligence who are good at explaining the morality of others’ actions are more likely to behave more ethically and less likely to engage in unethical activity than those with lower scores. Specifically, research has shown that employees with high emotional intelligence perform better at work, are more satisfied with their work context, less likely to experience burnout, more likely to better adapt to changing working conditions, more engaging a diverse workforce, and better team members. Based on the results of the conducted studies, we propose the first hypothesis as follows:

H1: Emotional intelligence has an impact on the professional ethics of accountants.

b) Gender

Gender is one of the factors identified as a personal factor related to ethical decisions and has been tested extensively in empirical studies on different aspects of the ethical decision-making process (Roxas & Stoneback, 2004). However, studies showing the influence of this factor on ethical decision-making have mixed results. O’Fallon and Butterfield (2005) show that female accountants behave more ethically than male accountants in certain situations. These findings are consistent with an earlier review conducted by Ford and Richardson (1994). Smith and Oakley (1997) found that women exhibit stronger moral attitudes than men in dilemmas involving personal and social relationships. Lopez et al. (2005) show that men are often more tolerant than women in unethical situations. Research by Emerson et al. (2007) confirms that men are more likely to accept immoral behaviors than women. Based on the results of the conducted studies, we propose the second hypothesis as follows:

H2: Gender has an impact on the professional ethics of accountants.

c) Age

Research by Hunt and Vitell in 1986 or Kohlberg in 1969 have shown that the ethical decision-making process of accountants can be affected by age. According to Kohlberg (1969), older accountants often decide by following principles. However, the evidence carried out by experimental studies has shown mixed results. Loe et al. (2000) found that surveyed accountants made more ethical decisions than younger people. Research by Conroy (2010) with accountants in the US has similar results with a rate of 16 out of 30 situations. Thus, the influence of *Age* on ethical behavior needs to be further studied because of differences in research results in scientific works on the relationship between the two factors. Based on the results of the conducted studies, we propose the third hypothesis as follows:

H3: Age has an impact on the professional ethics of accountants.

d) Years of experience

The experimental research results have also determined a positive correlation between professional ethics and years of experience. For example, research by Harris (1990) shows that individuals who have been with the company for ten years or more are less likely to accept non-cheating and deceptive practices than those with less experience. Shapiro, Koh, and Killough (2003) found a positive correlation between expected ethical action and skill in their study of 82 practitioners in the eastern United States. Hay Conroy et al. (2010) show that there is a difference when comparing less experienced and more experienced members in dealing with unethical actions when surveying 195 accountants. Thereby, we can see that the studies of the correlation between the number of years of work and professional ethics have different results and have not found specific conclusions. Based on the results of the conducted studies, we propose the second hypothesis as follows:

H4: Years of experience has an impact on the professional ethics of accountants.

3. RESEARCH METHODS

3.1. Research sample

To collect data, we design a survey using Google form to send to the accountants working at companies and organizations in Vietnam from February 2023 to March 2023. We obtain the list of accounting undergraduates and postgraduates from universities in Hanoi. We sent 300 survey forms to the respondents and received 150 responses. Information about the personal characteristics of the respondents are provided in Table 1.

Table 1. Descriptive statistics of the respondents

	Frequency	Percentage(%)
Age		
21 - 30	90	60
31 - 40	47	31.3
Over 40	13	8.7
Gender		
Male	57	38
Female	93	62
Work position		
Accountant	82	54.7
General Accountant	26	17.3
Chief Accountant	42	28.0
Years of experience		
1 – 5 years	72	48
6 – 10 years	59	39.3
Over 10 years	19	12.7

The questionnaire consists of three parts. Section 1 contains personal details about the survey participants. Section 2 includes questions related to Emotional Intelligence. Section 3 presents several ethical dilemmas and asks respondents to indicate their views based on a scale of the extent to which each situation relates to each accountant's behavior.

3.2. Measurement of the variables

3.2.1. Emotional Intelligence

We use the emotional intelligence scale developed by Law and Friends (2004). Accountants were required to indicate their level of agreement with each item on a scale of 1 - Strongly disagree to 7 - Strongly agree. Answers low on the Likert scale show low emotional intelligence, while high answers indicate high emotional intelligence of survey participants. We calculate the average score of 16 questions to measure the *Emotional intelligence* of each survey subject. Detail information about the survey questionnaire is in Appendix

3.2.2. Gender

Many previous studies have shown that *Gender* has a significant influence on the ethical behavior of accountants. As usual, gender is divided into Male and Female, Male gets the value 0 and Female with the value 1.

3.2.3. Age

Hunt, Vitell (1986), and Kohlberg (1969) said that *Age* is one of the factors affecting the professional judgment of accountants. In this study, we divide the age group into three groups:

Group 1 includes accountants aged from 21 to 30 years old

Group 2 includes accountants from 31 to 40 years old

Finally, group 3 includes accountants over 40 years old

3.2.4. Years of experience

Many experimental studies have also yielded mixed results. Therefore, to better understand the influence of years of experience on the professional ethics of each accountant, through research and data collection, our team divides working experience into 3 data fields as follows:

Group 1: From 1 to 5 years

Group 2: From 6 to 10 years

Group 3: Over ten years

3.2.5. The level of professional ethics of individuals

Since observing ethical behavior in practice is nearly impossible, vignettes have been widely used in previous research on ethics to construct measures of moral attitude and behavior (Buchan 2005). To assess the moral level of survey participants, we use five ethical dilemmas, taken from Lan Anh Nguyen et al. (2021), in which a fictitious accountant assumes to make a decision regarding professional ethics in the course of work. After each scenario, we asked respondents to comment on the hypothetical accountant's behavior and to indicate whether they would act like that accountant. The two questions are similar in each vignette: Please indicate 1. The level of ethics of the accountant in the above vignette; 2. The probability that I will do the same. These two questions help collect information about ethical judgment and self intention, corresponding to the second and third steps in Rest's (1986) model of moral action. The specific vignettes are shown in the survey questionnaire in Appendix 1.

The five situations are based on five ethical principles according to the Code of ethics for professional accountants issued by the Ministry of Finance in 2015. In each vignette, the accountant's actions are complying with the code of ethics. Therefore, respondents who give a low score on the Likert scale are considered as having high morality. If the response is low, this indicates that the survey respondent made an appropriate ethical judgment and intended action. Conversely, if the response is high, this represents that the survey respondent made inappropriate moral judgments and expected actions. To measure the ethical judgment and self-intention of survey respondents, we calculate the average score of responses for five scenarios for each survey subject.

3.3. Data analysis

We use Pearson correlation to test the relationship between variables, then uses multiple regression models to measure the influence of independent variables on the dependent variable in the following two equations:

$$\text{Ethical Judgment} = \beta_1 \text{Emotional Intelligence} + \beta_2 \text{Gender} + \beta_3 \text{Age} + \beta_4 \text{Years of Experience} \quad (1)$$

$$\text{Ethical Self-intention} = \beta_1 \text{Emotional Intelligence} + \beta_2 \text{Gender} + \beta_3 \text{Age} + \beta_4 \text{Years of Experience} \quad (2)$$

Ethical Judgment and *Ethical Self-intention* are two dependent variables measuring the level of

professional ethics, measured by the average score of each respondent with the accountant's actions on a scale from 1 to 5 in five specific ethical situations.

Emotional intelligence is based on the emotional intelligence scale developed by Law et al. (2004), calculated as the average of survey respondents' responses to 16 questions.

Age, *Gender*, and *Years of experience* are among the factors related to the individual characteristics of each accountant. As noted above, *Gender* is 0 for men and 1 for women. Like the *Age* variable, the *Years of experience* divides into three groups.

4. RESULT AND DISCUSSIONS

4.1. Descriptive statistics

Table 2 presents the survey results related to *Emotional intelligence*. Table 2 shows that the answers have pretty high scores, with an average score of 5.41 to 5.73, proving that the accountants understand and capture their emotions.

Table 2. Result of respondents of Emotional Intelligence

	Min	Max	Mean	SD
Cronbach's Alpha: 0.970				
State 1	1	7	5.63	1.442
State 2	2	7	5.67	1.673
State 3	2	7	5.52	1.661
State 4	2	7	5.63	1.591
State 5	2	7	5.41	1.719
State 6	1	7	5.53	1.795
State 7	1	7	5.53	1.861
State 8	1	7	5.41	1.654
State 9	2	7	5.73	1.499
State 10	1	7	5.50	1.419
State 11	2	7	5.46	1.861
State 12	2	7	5.81	1.254
State 13	2	7	5.62	1.351
State 14	1	7	5.58	1.655
State 15	2	7	5.49	1.527
State 16	1	7	5.45	1.578

Table 3 shows the results of the accountants' responses to the situations. The situations presented are ethical dilemmas for accountants. All the actions of the accountant represent inappropriate behavior, so a lower score is expected. The actual scores range from 1.67 to 3.20, indicating a general disagreement with the unethical actions of the fictitious accountant. Scenario 4 has the lowest average score, implying that leaking confidential information is considered the most unethical behavior for respondents. While integrity, objectivity, professional competence and professional behavior of accountants are considered less significant issues.

Table 3. Result of respondents of ethical vignette

	Min	Max	Mean	SD
Cronbach's Alpha: 0.756				
Vignette 1				
Ethical judgment	1	5	1.76	1.103
Self-intention	1	5	3.20	1.433
Vignette 2				
Ethical judgment	1	5	1.91	1.244

Self-intention	1	5	3.10	1.427
Vignette 3				
Ethical judgment	1	5	1.81	1.139
Self-intention	1	5	3.05	1.268
Vignette 4				
Ethical judgment	1	5	1.67	1.108
Self-intention	1	5	3.19	1.508
Vignette 5				
Ethical judgment	1	5	1.93	1.205
Self-intention	1	5	3.14	1.259

The results in Table 3 show that for each situation, the average score of the first question (the accountant’s moral judgment) is lower than the average score of the second question (likelihood that the accountant would do the same thing), showing that although the accountants disagree with the behavior of the hypothetical accountant, the respondents are still likely to perform the inappropriate actions similar to the hypothetical accountant. This is because when deciding to take action, accountants must consider many different factors such as relationships within the organization, pressure from superiors, or their interests. Thus, even though they know actions are unethical, an accountant can still take that action if it is in their interest or to please a manager.

To check the reliability of the scale, we use Cronbach’s Alpha and Explanatory Factor Analysis (EFA). The results show that:

Regarding the emotional intelligence scale: Corrected Item-Total Correlation is higher than 0.03, Cronbach’s Alpha is more than 0.6, the KMO test is higher than 0.5. The Bartlett test is less than 0.05, and through the matrix component of *Emotional intelligence* proves that the 16-variable scale is reliable and represents the same independent variable.

Similar to *Emotional Intelligence*, the scale of professional ethics also gives the positive result when the correlation coefficient of the sum of the scales is also greater than 0.5, the KMO coefficient is also greater than 0.5, Bartlett’s test is less than 0.05, and through the component matrix of two variables *Ethical judgment* and *Ethical Self- intention*, that the 5-variable scale is reliable and represents the same independent variable. The Cronbach’s Alpha and EFA results are reported in Appendix 2.

4.3. Correlation Among Variables

Pearson’s correlation analysis was used to evaluate the linear relationship between the dependent and the independent variables.

Table 4. Correlation matrix among variables.

	Emotional intelligence	Gender	Age	Years of experience	Ethical judgment	Self -intention
Emotional intelligence	1	-0.326**	-0.033	0.047	-0.348**	-0.170
Gender		1	-0.259**	-0.280**	0.129	0.249**
Age			1	0.691**	-0.058	0.077
Years of experience				1	-0.154	-0.007
Ethical judgment					1	-0.149
Self-intention						1

Pearson’s correlation shows that Emotional Intelligence and Years of Experience are negatively correlated with Ethical Judgment and Ethical Self - intention. Meanwhile, Gender has a positive relationship at 5% significance level with Self-intention and Ethical Judgment of each accountant. Age is negatively correlated with the Ethical Judgment variable, while there is a positive correlation with the Self-intention variable.

4.4. Regression Results

To investigate the impact of *Emotional Intelligence* and other personal characteristics such as *Age*, *Gender*, and *Years of Experience* on the professional ethics of accountants, we use a multivariable regression model. Multivariate regression was used to investigate the effects of independent variables on the mean scores of two dependent variables collected from five ethical situations since the outcome variable in this case can be considered as a continuous variable.

Table 5. Regression Results of model (1)

Variables	Standardized Coefficients	t	Sig	Tolerance	VIF
Emotional Intelligence	-0.142	-1.650	0.101	0.877	1.140
Gender	0.051	0.572	0.568	0.810	1.235
Age	0.081	0.713	0.477	0.509	1.963
Years of experience	-0.188	-1.668	0.097	0.510	1.959
R ²	0.055				
Adjust for R ²	0.029				
Durbin-Watson	1.684				
F	2.117				
Sig	P value = 0.082				
N	150				

Table 5 presents the regression results of the regression model (1) in which the dependent variable is *Ethical judgment*. It can be seen that, in this model, there is no relationship between the factors to the Ethical Judgment of the accountants because the p-values are all greater than 0.05. Therefore, the above factors are not statistically significant to Ethical Judgment.

Table 6 presents the regression results where the dependent variable is *Ethical Self-intention*. Through the regression results, it can be seen that the F-statistic is statistically significant at the 5% level, which means that the model fits the data, the VIF coefficients (variance inflation coefficient) are all less than 2, so the model does not have multicollinearity.

Table 6. Regression Results of model (2)

Variables	Standardized Coefficients	t	Sig	Tolerance	VIF
Emotional Intelligence	-0.282	-3.458	0.001	0.877	1.140
Gender	0.183	2.135	0.033	0.810	1.235
Age	0.145	1.354	0.178	0.509	1.963
Years of experience	-0.043	-0.404	0.687	0.510	1.959
R ²	0.155				
Adjust for R ²	0.132				
Durbin-Watson	1.234				
F	6.656				
Sig	p-value = 0.000				
N	150				

In Table 6, the Durbin-Watson is 1.234 means there is no autocorrelation in the sample. To test the heteroskedasticity issue of model 2, we use the Spearman rank correlation between the independent and dependent variables. This test finds out the relationship between the independent variables with the absolute value of the normalized residuals in a model and must satisfy the condition that the sig value between the variables must be greater than 0.05. Then, we can confirm that the linear regression model has constant error variance. We compare the independent variables with the normalized residuals of the numerical regression model (2). The result shows that the value of the sig of each independent variable is higher than 0.05, so we can see that the regression model (2) has a constant variance. The results of the test are reported in Appendix 3.

The results in Table 6 show that *Emotional Intelligence* has a negative regression coefficient at a 1% significance level, which means that accountants with higher emotional intelligence are less likely to act unethically. This result is in line with expectations. This result is also consistent with the previous findings of Mesmer-Magnus et al. (2008, 2010), Deshpande and Joseph (2009), Angelidis and Ibrahim (2011), and the study also has similar results to Suhaiza Ismail's (2015) research shows that *Emotional intelligence* is positively related to the ethical action of auditors, that is, individuals with higher emotional intelligence have better ethical judgments. From the previous evidence, we know that good emotional intelligence management is a vital ability that accountants should have.

Contrary to *Emotional Intelligence*, *Gender* is positively related to the professional ethics of accountants, which means that female accountants tend to accept unethical behavior more than male accountants, so this goes against expectations. This result is in contrast to some previous studies such as Smith and Oakley (1997) found that women exhibit stronger moral attitudes than men in dilemmas involving personal and social relationships. Research by Lopez et al. (2005) shows that men are generally more tolerant than women in unethical situations in four out of five ethical vignettes presented. However, the results of this study are consistent with some other studies showing that women are not necessarily more ethical than men. For example, Sikula and Costang (1994) use Rokeach's (1973) values survey to conclude that women are no more ethical than men. Arthur Dobrin (2014) points out that women would act unethically when they could justify themselves as to why breaking law or rule is justifiable and for acceptable reasons. Research by Atari et al. (2020) has shown that, when talking about Western cultures, men are more likely to focus on family values; thus, when moral judgments are related to the above issues, it is possible that men will be more conscious in identifying ethical actions.

However, for *Age* and *Years of Experience*, all have negative coefficients but do not reach the usual significance level. Therefore, there is no significant correlation between *Age* and *Years of experience* in the professional ethics of accountants in Vietnam.

5. CONCLUSION

Through research, we can see, *Emotional intelligence* is a factor that affects the expected action of each accountant. That shows that managing their own emotions well will help accountants determine what is ethical behavior and what is contrary to professional ethics. For the Gender variable, the results show that male accountants are less likely to act unethically than female accountants. This result is in contrast to some previous studies. However, the results of this study are consistent with some other studies showing that women are not necessarily more ethical than men, for example, Sikula and Cotang (1994), Dobrin(2014).

From the results of the study, we can see that understanding and managing emotions well will help accountants make rational and appropriate decisions with professional ethics. Therefore, the ability to manage personal emotions is the factor that managers need to consider when recruiting and training employees. Businesses can open training courses on emotion management for accountants and add questions related to personal emotional management in the recruitment process to select appropriate candidates. They have the right skills to manage personal emotions and are more likely to respect the code of ethics when working at the company.

This study analyzes the relationship between personal factors and the professional ethics of Vietnamese accountants. The study has some limitations. First, the study only looks at the impact of some demographic factors on the professional ethics of accountants; therefore, in the future, research can consider other factors such as national culture, corporate culture, etc. Second, the present study only targets a group of accountants in Vietnam. Therefore, future research may aim to expand the scope of the survey respondents to include internal auditors, state auditors, and so on. to gain more comprehensive insights on the factors affecting professional ethics of accountants in general.

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ASSESSMENT OF FACTORS AFFECTING CHOICE OF INTERNATIONAL PROFESSIONAL CERTIFICATE IN THE FIELDS OF ACCOUNTING - AUDITING OF STUDENTS BANKING ACADEMY

Author: Ngo Thi Thu Trang¹, Pham Hong Yen

Mentor: Tran Thi Ngoc Tu

ABSTRACT: International professional certificates are understood as documents issued by associations and organizations. The international profession is granted to qualified subjects. Possessing international professional certificates will obviously have great benefits for practitioners both in terms of economy and job opportunities, in addition to factors such as technical skills, professional skills, qualifications, etc. The general objective of this study is to study the factors affecting the choice of studying international professional certificates in the field of Accounting and Auditing, not only of Banking Academy students but also of students who have been, are currently, or will pursue this career path in the future. Studies prove that there are a number of factors affecting students' choice of study, of which the factor "Characteristics of individual learners" has the strongest impact on student's decisions. Since then, a number of implications and policies have been recommended for the Banking Academy and Educational Institutions in Hanoi to improve the quality of Vietnam's human resources by attracting students choose to study international certificates for students majoring in accounting or auditing in the near future.

Keywords: international professional certificate, accounting, auditing, students, assessment of factors

1. INTRODUCTION

The International Professional Certificate represents the certification of a reputable professional association, recognized by a national professional body. It affirms learners' professional knowledge and skills in a certain field and at a certain level. Possessing an international professional certificate will bring great benefits to practitioners in terms of economy and job opportunities, as well as professional skills and qualifications.

Several prestigious specialized certificates in the field of Accounting - Auditing:

- The Association of Chartered Certified Accountants (ACCA)
- The Institute of Chartered Accountants (ICAEW)
- Certified Public Accountant (CPA)
- Chartered Institute of Management Accountants (CIMA)
- Certified Management Accountant (CMA)

The qualities and learning process of each international professional degree in the field of accounting and auditing will vary, but all offer the holder a number of advantages, including:

First of all, certification assists students in expanding their employment options. Today, earning these certifications demonstrates to employers that students have received training in line with the International Accounting Standards framework, which is highly valued as it guarantees knowledge and experience in the accounting and auditing sector. Of course, the contribution one makes to the organization will outweigh the income and advantages that come with it.

In the second place, a global career can be accessed with an international professional diploma, which is a "powerful passport". Students who possess these certificates will be regarded favourably by

¹ Banking Academy.

both domestic and foreign companies as candidates who are well-versed in corporate accounting laws, standards, and international accounting rules. As a result, it will have widespread employer trust and present numerous employment opportunities around the globe.

Furthermore, professional recognition on a global scale offers tremendous networking potential.

In order to exchange ideas, pick up new skills, and take advantage of job opportunities, holders of these credentials can interact with numerous foreign specialists or members of other international professional groups in the same sector.

2. LITERATURE REVIEW

From a very early age, researchers have studied the factors affecting students' choice to study an international professional certificate in the field of accounting and auditing in the period of international integration. There have been many studies in the world about studying for international vocational certificates, such as:

KhaledAbed Hutaibat (2011) published a study titled "*Factors Affecting the Participation of University Students in Studying International Professional Certificates in Jordan*". Research shows that higher education should be responsible for contributing to society a perfect workforce by encouraging students to participate in vocational certification to improve knowledge and opportunities for themselves. In which job opportunities and income are the two most important factors affecting students' study participation. Solikhah (2014) has shown that attitudes towards professional accounting certification, objective subjects, and controlling behaviors affect intention to own that practicing certificate; this result is consistent with theory's intended behavior. In addition, the research results of Aziz, Ibrahim, Sidik, and Tajuddin (2017) indicate that career sustainability, financial support, and people's determination have a positive impact on the intention to achieve a practicing certificate.

In addition, some authors believe that the factors affecting students' decisions are salary, cost, personal factors, promotion opportunities, and career development. Arleta Szadziewska and Jaroslaw Kujawski (2015), with the study "*Factors affecting students' knowledge of the brand of professional accounting and auditing organizations*" at the University of Gdansk, Poland, have clearly identified the factors. this and state the influence of each factor. And Coe (2016) shows that the factors that positively affect the intention to take the practice certification exam include factors related to the exam, support, and professional factors.

In Vietnam, domestic studies related to factors affecting the choice of international professional certificates are quite limited. In 2017, Nguyen Thi Bich Van and colleagues published research "*Những nhân tố ảnh hưởng đến việc lựa chọn học ngành kế toán ở Việt Nam*". They have identified and measured the factors affecting students' choice to study accounting through four groups of factors, which are: university characteristics, learner characteristics, career prospects, professional, and social. Tran Thi Nhung (2020), with the theme "*Nghiên cứu đề xuất các yếu tố ảnh hưởng đến lựa chọn chuyên ngành kế toán của sinh viên - Nghiên cứu cụ thể tại trường Đại học Kinh tế và Quản trị kinh doanh*". Research results show that there are four factors affecting the decision to choose accounting as a major for new students, including the quality of the accounting major at the school, your own abilities and passions, counseling and orientation, and career opportunities.

After reviewing the research in the world and in the country, the authors found that there are very few research topics on the factors affecting the choice of studying for an international professional certificate, especially for the industry. Accounting and Auditing: no research on this topic has been done within the Banking Academy. This study examines in general and determines the factors affecting students' choices to study international professional certificates in the fields of accounting and auditing. It will assist administrators, policymakers, and educators in promoting students' intentions to achieve professional certification in the future.

3. METHODOLOGY

3.1. Research Methods

Data Collection Method: The study was carried out through data collection by direct survey questionnaires and online questionnaires with Likert scale questions (with 5 points and increasing agreement level gradually from 1 to 5). We used conditional sampling to survey the subjects who were students of the Banking Academy. The main research method was the quantitative research method. We carried out quantitative research by collecting data from survey questionnaires and processing it with SPSS software to analyze data by the following techniques: descriptive analysis, Cronbach's Alpha test, EFA exploratory analysis, and multiple regression analysis.

3.2. Research hypothesis

3.2.1. Hypotheses about individual characteristics of learners

Individual characteristics of learners are an important basis in determining careers and future directions (Worthington & Higgs, 2003; Nguyen Phuong Toan, 2011,...). Personal characteristics of learners include a number of factors such as gender, cognitive ability, financial ability, personality, capacity, interests, forte, and even the learners' expectations about the industry... Michael Borchert (2002) stated that, of the three main groups of factors affecting career choice (environment, opportunities, and personal characteristics), the group of individual characteristics has an important influence on the student's career choice. Therefore, when making a decision about choosing a major or career for the future, personal characteristics are an important factor.

3.2.2. Theory of Family, Relatives and Friends

Family is also one of the factors affecting the decision of students to study international professional certificates, as each student is still studying and depends on their family both financially and spiritually. Therefore, every important decision, especially related to career development, is consulted with the family for reference and to receive their support and consent. Myburgh (2005) conducted research on factors that affect freshmen's choice to become an accountant at the University of Pretoria, and found that, in addition to aptitude, the advice and guidance of parents had a great influence on student's decisions. Tan and Laswad (2006) also showed that the advice of family members and relatives affects student's intentions to choose the accounting profession. Furthermore, Hossler and Gallagher (1987) confirmed that parents, family, and friends have a strong influence on students' decisions.

3.2.3. Theory about the School

Bromley H. Kniveton (2004) studied the motivations for Loughborough University students to make their career choices, concluding that "schools and families can both provide direct or indirect information and guidance that influence the career choice of young people". In 2017, Tran Van Quy and Cao Hao Thi assessed the impact of five factors affecting high school students' decisions to choose a university, including the characteristics of the university; the better the university's characteristics, the better the student's decision to choose it. Nguyen Minh Ha et al. (2011) showed, based on survey data of 1,894 full-time first-year students at the Open University of Ho Chi Minh City, that there are seven factors affecting students' choice of university. According to the research results, teaching quality is a factor of concern for both teachers and learners, with learners particularly interested in an active learning environment that creates conditions for them to explore, learn, and research on their own.

3.2.4. Theory of the Benefits of International Certifications

Based on the actual context, many bachelors cannot find jobs when they graduate, the authors find that possessing professional certificates and international skills is a new direction that will open up career opportunities in Vietnam and worldwide for students. Therefore, more and more students aim to achieve

international professional and skill certificates. In addition to supplementing the necessary skills and knowledge, these courses also provide a prestigious certificate issued by prestigious universities or organizations, which is a solid basis for affirming learners' competence with recruiters. This is like a passport to help learners take the first steps on the career path, and is a standard to measure the knowledge, capacity, enthusiasm, and other qualities of learners in each specific field of Accounting or Audit. This is also convincing evidence to employers about the potential value of candidates participating in the certification process.

3.2.5. Hypothesis on Brand and Reputation of Certifications

According to Kotler and Keller (2006), "brand is extremely important because it represents the responsibility of the manufacturer to the consumer". Therefore, when deciding which certificate to choose, of students the consider the brand and reputation certificate itself or the organization or professional association that issues will university it.

Joseph Kee Ming Sia (2010) developed the model of David W. Chapman (1981) and Nurlida (2009), which has proven that the university's reputation, facilities and financial support have a strong impact on students' decision to choose a university. The author also explains that information satisfaction also affects students' decision to choose a school. Currently, there are about 6-7 international professional certificates in the field of Accounting-Auditing for students to choose to study. While these certifications have similarities, they still have their own characteristics and benefits. Therefore, students need to go through the brand and reputation of certificates to determine possible job positions, professional qualifications,... etc. after owning that certificate, or possibly a legal relationship between the organization or association that issues the certification and employers.

3.2.6. Hypothesis about the characteristics of the Vietnamese accounting system

In the context of international economic integration, free trade, and increasingly fierce competition, it is imperative that financial information conform to international standards. According to Irina-Donia Pascan/Procedia Economics and Finance 32 (2015), "Accounting standards, legal and political systems, and financial reporting preferences all affect the quality of accounting". At the same time, Vietnam Accounting Standards (VAS) have been developed and completed in accordance with International Accounting Standards (IAS) to suit the characteristics of the economy as well as the situation of Vietnamese enterprises in the country. integration trend. However, practise shows that there is still a large gap between VAS and IAS/IFRS (International Financial Reporting Standards) today, which significantly affects the integration process of Vietnamese accounting. Therefore, this is also a factor affecting the choice of international professional certificates, including factors such as the ability to change and apply the international standard system in the future. International standards bring many new approaches, Opportunities to work abroad, multinational companies approaching the international standard system,...

3.3. Research models

To identify, measure, and evaluate the influence of six groups of factors obtained from exploratory factor analysis (EFA). The author conducts an analysis of a multivariable linear regression model using SPSS 25 software with six independent variables. We have a research model:

* **Equation form:**

$$LC = \beta_0 + \beta_1 * CN + \beta_2 * GD + \beta_3 * NT + \beta_4 * LI + \beta_5 * TH + \beta_6 * DD + \varepsilon$$

* **Chart form**



Source: Author's analysis, 2022

Hypothesis H1 (H1): Characteristics of individual learners have a positive influence on the choice of international professional certificates of Accounting - Auditing students at Banking Academy.

Hypothesis H2 (H2): Family, relatives and friends have a positive influence on the choice of international professional certificates of Accounting - Auditing students at Banking Academy.

Hypothesis H3 (H3): Schools have a positive influence on the choice of international professional certificates of Accounting - Auditing students of Banking Academy.

Hypothesis H4 (H4): The benefits of international certificates positively affect the choice of international professional certificates of Accounting - Auditing students at Banking Academy.

Hypothesis H5 (H5): Brand and reputation have a positive influence on the choice of international professional certificates of Accounting - Auditing students of Banking Academy.

Hypothesis H6 (H6): The characteristics of the Vietnamese accounting system have a positive influence on the choice of international professional certificates of Accounting - Auditing students at Banking Academy.

4. RESULTS AND DISCUSSION

4.1. The results of testing the reliability of the variables

The results of Cronbach's Alpha analysis of the components of the scale of the observed variables presented.

Table 1. Cronbach's Alpha coefficient test results

Observed variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
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Characteristics of individual learners (CN)				
Cronbach's Alpha = 0.876				
N of Items = 6				
CN1	17.28	15.269	0.711	0.850
CN2	17.25	15.386	0.634	0.863
CN3	17.20	14.929	0.698	0.852
CN4	17.26	14.691	0.694	0.853
CN5	17.31	14.681	0.709	0.850
CN6	17.32	16.445	0.648	0.861
Characteristics of family, relatives and friends (GD)				
Cronbach's Alpha = 0.902				
N of Items = 9				
GD1	25.21	38.015	0.686	0.890
GD2	25.25	37.183	0.727	0.887
GD3	25.20	38.391	0.686	0.890
GD4	25.42	37.153	0.759	0.884
GD5	25.41	37.777	0.758	0.885
GD6	25.47	37.623	0.728	0.887
GD7	25.45	37.003	0.729	0.886
GD8	25.45	36.988	0.761	0.884
GD9	25.08	44.476	0.206	0.921
Characteristics of school (NT)				
Cronbach's Alpha = 0.813				
N of Items = 7				
NT1	20.05	14.456	0.653	0.769
NT2	20.20	14.054	0.703	0.760
NT3	20.19	14.611	0.656	0.769
NT4	19.98	16.875	0.489	0.800
NT5	20.17	14.478	0.629	0.774
NT6	20.12	13.910	0.664	0.766
NT7	19.99	18.317	0.116	0.858
Benefits of international certificates (LI)				
Cronbach's Alpha = 0.770				
N of Items = 4				
LI1	10.25	5.193	0.585	0.707
LI2	10.31	5.017	0.598	0.700
LI3	10.30	5.512	0.501	0.750
LI4	10.18	5.104	0.599	0.699
The Brand and Reputation Factor of the certificates (TH)				
Cronbach's Alpha = 0.769				
N of Items = 4				
TH1	10.24	4.368	0.657	0.667
TH2	10.24	4.529	0.587	0.705
TH3	10.25	4.758	0.530	0.735
TH4	10.22	4.748	0.511	0.745

Characteristics of the Vietnamese accounting system (DD)				
Cronbach's Alpha = 0.790				
N of Items = 4				
DD1	10.17	4.802	0.579	0.747
DD2	10.16	4.705	0.609	0.732
DD3	10.20	4.616	0.612	0.731
DD4	10.22	4.817	0.592	0.741
Choosing to study an international certificate of students				
Cronbach's Alpha = 0.855				
N of Items = 6				
LC1	17.44	8.962	0.695	0.821
LC2	17.41	9.633	0.613	0.837
LC3	17.32	9.624	0.565	0.845
LC4	17.41	8.965	0.659	0.828
LC5	17.46	8.835	0.728	0.815
LC6	17.41	9.576	0.597	0.839

Source: Author's analysis, 2022

The results of the Cronbach's Alpha coefficient test show that all the independent and dependent variables in the research model: "Characteristics of individual learners", "Characteristics of family, relatives and friends", "Characteristics of school", "Benefits of international certificates", "The Brand and Reputation Factor of the certificates" and "Characteristics of the Vietnamese accounting system" all have Cronbach's Alpha range from 0.769 to 0.902. At the same time, most of the observed variables have a total correlation coefficient greater than 0.3. All these indexes are larger than the minimum to ensure the reliability and discriminability of the factors, so they are included in the analysis in the next steps.

Particularly, observed variable GD9 has a total variance of $0.206 < 0.3$ and Cronbach's Alpha coefficient if Item Deleted = $0.921 >$ Cronbach's Alpha coefficient and observed variable NT7 have a total variance of $0.116 < 0.3$ and a coefficient of Cronbach's Alpha if Item Deleted = $0.858 >$ Cronbach's Alpha coefficient of the population, so these two observed variables are not reliable enough and will be excluded from the scale.

4.2. Exploratory analysis of factors

After analyzing EFA exploratory factors second times, it still appears that the observed variables upload in both factors and do not guarantee the difference in load factor from 0.3 are: CN6 and NT4 the author advances Eliminate the above 2 variables and perform the third exploratory factor analysis

Table 2. Summarize the results of EFA factor analysis for independent variables

Rotated Component Matrix ^a						
	Component					
	1	2	3	4	5	6
GD5	0.776					
GD8	0.771					
GD6	0.767					
GD4	0.766					
GD7	0.765					
GD2	0.717					
GD3	0.701					
GD1	0.688					
CN1		0.763				
CN2		0.758				

CN4		0.722				
CN3		0.713				
CN5		0.712				
NT5			0.774			
NT2			0.764			
NT1			0.717			
NT6			0.712			
NT3			0.658			
DD4				0.749		
DD2				0.745		
DD3				0.745		
DD1				0.732		
TH3					0.771	
TH1					0.765	
TH2					0.683	
TH4					0.655	
LI4						0.709
LI3						0.705
LI1						0.684
LI2						0.655

Source: Author's analysis, 2022

So, after analyzing EFA exploratory factors, the author eliminated two observed variables (**Table 2**) and obtained those variables: CN1, CN2, CN3, CN4, CN5, GD1, GD2, GD3, GD4, GD5, GD6, GD7, GD8, NT1, NT2, NT3, NT5, NT6, DD1, DD2, DD3, DD4, TH1, TH2, TH3, TH4, LI1, LI2, LI3, LI4.

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.922
Bartlett's Test of Sphericity	Approx. Chi-Square	4134.073
	df	496
	Sig.	0.000

Source: Author's analysis, 2022

With an Eigenvalue coefficient of 1.221, the analysis results show six factors. All variables have Factor Loading factor greater than 0.5, so these variables are statistically significant. The total variance extracted is 63.729% > 50%, this proves that six factors are extracted succinctly, explaining the 63.729% variation of observed variables.

Table 4. EFA factor analysis results for dependent variable

	Component
	1
LC5	0.831
LC1	0.804
LC4	0.778
LC2	0.733
LC6	0.725
LC3	0.694
Hệ số Eigenvalues	3.488
Progressive Extract Variance %	58.130
KMO	0.846
Sig Bartlett's Test	0.000

Source: Author's analysis, 2022

Table 4 shows that, for the dependent variable, the results of factor analysis for six observed variables have converged on one factor, with the test coefficient KMO = 0.846, Sig. = 0.000, extracted variance = 58.130%, showing the possibility of convergence and a good representation of the observed variables in the scale.

4.3. Regression analysis and testing of research hypotheses

The regulatory response results show that the model's fit with the research data with the adjusted R2 data is 0.675, which shows that the independent variables have leaked 67.5% of the change in the dependent variable, the remaining 32.5% is due to variables outside the model and random error. Durbin – Watson coefficient = 1.926, in the range from 1.5 to 2.5, so there are no most equivalent relational series. (Table 5).

Table 5. Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.826 ^a	0.683	0.675	0.34210	1.926

Source: Author's analysis, 2022

Next, the authors conducts a regression analysis. Regression analysis will determine the degree of impact of the independent variables on the dependent variable.

The results of the regression analysis on the selection of international professional certificates in the field of Accounting - Auditing of Banking Academy students are shown in Table 6.

Table 6. Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.365	0.144		2.541	0.012		
	NT	0.138	0.036	0.178	3.864	0.000	0.613	1.631
	CN	0.237	0.034	0.320	6.979	0.000	0.622	1.607
	GD	0.087	0.035	0.121	2.514	0.013	0.560	1.785
	DD	0.219	0.036	0.256	6.165	0.000	0.755	1.324
	TH	0.099	0.037	0.114	2.668	0.008	0.720	1.388
	LI	0.142	0.038	0.173	3.779	0.000	0.620	1.612

Source: Author's analysis, 2022

The results of regression analysis (Table 6) show that all 06 factors have the same effect on LC. Specifically, two factors, individual characteristics of learners and characteristics of the accounting system in Vietnam, have the strongest impact on LC with standardized Beta coefficients of 0.320 and 0.256. Thus, hypotheses H1, H2, H3, H4, H5 and H6 are all accepted at the 5% significance level. At the same time, all 06 independent variables in the proposed research model have an impact on LC. This means that the hypotheses H1, H2, H3, H4, are accepted and all have significance Sig < 0.05. The variance magnification factor VIF < 2, so it can be concluded that there is no multicollinearity line between these three factors.

The linear regression equation showing the factors affecting the choice of studying an international professional certificate in the field of Accounting - Auditing for Banking Academy students is built as follows:

$$LC = 0.32*CN + 0.121*GD + 0.178*NT + 0.173*LI + 0.114*TH + 0.256*DD$$

Based on the magnitude of the normalized regression coefficient Beta, the order of impact level from the strongest to the weakest of the independent variables to the dependent variable LC is as follows: CN: 0.32; (2) GD: 0.121; (3) NT: 0.178; (4) LI: 0.173; (5) TH: 0.114; (6) DD: 0.256. In there:

LC: Choosing to study an international certificate of students

CN: Characteristics of individual learners

GD: Characteristics of family, relatives and friends

NT: Characteristics of school

LI: Benefits of international certificates

TH: The Brand and Reputation Factor of the certificates

DD: Characteristics of the Vietnamese accounting system

5. CONCLUSIONS

According to research findings, there are six categories of factors that influence students at the Banking Academy's decision to pursue international professional certificates in the fields of accounting and auditing. These categories are: individual learners; families, friends, and acquaintances; schools; the influence of Vietnamese accounting system characteristics; advantages of pursuing international certifications; and brands and reputations of international certifications. The individual qualities of the learners had the most influence on the students' decisions, with all six of these variables being positively correlated to the student's choice of major.

Recommendations are drawn from the research results

Improve the quality of the school's training

One of the six factors affecting students' choice decisions is the characteristics of the school, with the quality of the teaching staff having a direct effect. Therefore, the university should improve pedagogical skills and professionalism, and promote the training and fostering of lecturers by encouraging and supporting them to pursue ACCA, ICAEW certifications, etc. Teachers should also spend appropriate time guiding students to self-study methods in a scientific way, such as how to read and understand documents, how to detect the nature of problems, and apply them to practice.

In addition, the university needs to design training programs close to actual needs, strengthen relationships with corporations and companies, and create conditions for students to participate in real-life experiences, attend seminars with experts in the field of accounting and auditing. This will help students have the motivation to study, practice skills, and participate in learning more international certificates early, to prepare the best luggage in today's competitive job market.

Improve advertising to spread the image and reputation of international certificates to students of the Banking Academy.

Currently, when there are too many international certificates for Accounting-Auditing students, the choice has made learners feel confused about which certificate is right for them. Therefore, in order it is necessary to provide some communication to help certificates, learners access and understand more about the methods, such as using the Academy's website and fanpage, to convey all the information about the certificates to students, including information about the certificate issuer after completing the course, the content to learn, the practical applicability, the level of remuneration when going to work, pictures demonstrating specific examples for students to have a better insight into studying for international certificates, and promoting the image and reputation of certificates on electronic newspapers. Additionally, building a specialized media team will help attract the attention of students and organize competitions and seminars on international certificates.

Apply international certifications in business:

The employment of a team of professional accounting and auditing employees who can be applied in practice to meet the needs of international integration is required to ensure high-quality human resources. It plays a significant role for all university students, not just those attending the Accounting and Auditing Faculty of the Banking Academy. Therefore, in order to attract and hire workers with strong professional credentials, businesses must set restrictions on their human recruitment policies. Businesses also need to exert significant influence over the competition by demanding that high-level personnel hold international qualifications and offering competitive pay when they do.

Career planning:

Career planning is the best method that allows each student to realize the most optimal path to achieving their career goals. For students majoring in Accounting - Auditing, in the context of a highly competitive labor market, along with opportunities and challenges when Vietnam opens for integration, it is very important to orient and plan for oneself.

Limitations and future research directions

Although this research topic contributes from both theoretical and practical perspectives, the study still has some limitations that need to be improved in the future.

Firstly, due to the limitations of information, space, and time, the study only conducted a survey for regular university students of the Accounting - Auditing faculty who are being trained at the Banking Academy. Therefore, this can be a new research direction in the future with the survey subjects being students and alumni of all training systems (formal, college, and joint).

Secondly, the research model is built focusing on six groups of factors with a total of thirty-four observed variables. However, there may be other groups of additional factors influencing students' choice to study international professional certificates that have not been identified in the study. As a result, the continuation of empirical research is a necessary activity to identify and test other factors that may affect the student's choice of majors.

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APPLYING ARTIFICIAL INTELLIGENCE IN THE FIELD OF ACCOUNTING AND AUDITING: OPPORTUNITIES AND CHALLENGES

Author: Lê Thị Linh Chi¹, Lê Thảo Vi¹, Nguyễn Thu Thủy¹

Mentor: Le Thi Yen Oanh²

ABSTRACT: Artificial intelligence is no longer the robots and computers of science fiction from Hollywood movies. The ideas of developing machines that can “learn” are centuries old. The capacities of the computers and software of today create and exhibit intelligence, but also bring with it concerns along with much promise. With the explosion of technology, artificial intelligence has significant effect on all sort of industries, and the accounting and auditing is no exception. There are many different opinions about the impact of artificial intelligence on the accounting and auditing. Some people think that it is an opportunity to improve the quality of accounting information while others believe that is threat to accountants and auditors. The article discusses the impact of artificial intelligence on the accounting.

Keywords: Artificial Intelligence (AI), accounting, auditing, impact.

1. INTRODUCTION

The use of AI in accounting and auditing is becoming increasingly popular across the world. Currently, Vietnam is determined to focus on developing AI technology in general and in the field of accounting and auditing in particular. Vietnam has determined that this will be an effective factor for those working in the field of accounting and auditing, but the application of AI in Vietnam is still difficult such as costs, worries about AI will replace humans, the level of accounting has not been improved to be able to apply AI effectively.

Artificial intelligence has given great advantages to help accountants and auditors improve productivity and efficiency at work; automation of artificial intelligence to detect fraud increases transparency and efficiency in accounting; help businesses reduce costs. But there are also challenges in applying intelligence to accounting: a shortage of high-quality financial and accounting personnel; the mismatch between the old rut and corporate culture with digital innovation; poor quality information technology infrastructure, low security...

2. THEORY OF FRAME WORK

2.1. AI technology in accounting and auditing

The history of AI applications in the field of accounting can be traced back to the 1980s. An extensive study has been conducted by academics and practitioners on the application of AI in auditing, taxation, financial accounting, management accounting and personal financial planning. The development and use of expert systems (ES) in the field of accounting is probably the most studied area. A number of ES's have been used in accounting firms such as: ADAPT (Gillett, 1933), Delloitte Touches' Audit Planning Advisor, Price Waterhouse's Pllanet, Arthur Andersen's WinProcess and KPMG's Krisk (Brown, 1991; Bell et al., 2002, Zhao et al., 2004). Most of these systems assess risk (Zhao et al., 2004).

In 1995, Arthur Andersen claimed to have developed a system to help assess litigation risks associated with audit clients (Berton, 1995) and the results showed that it was not beneficial. In contrast,

¹ Academy of Finance, CQ59/21.01CLC

² Academy of Finance.

AI is more successfully applied primarily to structured jobs, programmed work, and repetitive work in which incorporating human expertise is not too difficult. For example, extensive studies of ES for jobs in accounting. Audits from the mid-1980s (Abdolmohammadi 1987: Gal and Steimbart, 1987: Hansen and Messier, 1987: Brown and Murphy, 1990: Dena et al., 1991: Brown and Coakley, 2000).

2.2. The roles of artificial intelligence applied in accounting and auditing

For accountants and auditors: artificial intelligence can receive and process simple and low-level transactions in accounting, which helps to reduce the accountant's workload. save time, money and increase efficiency for the accounting apparatus. In addition, AI technology will improve the accuracy of data entry and reduce the risk of liability for accountants.

The use of artificial intelligence is also driving the growth of innovation in the audit industry. AI helps detect fraudulent transactions early, suspect anomalies or errors, thereby recognizing and dealing with them before problems can occur. With audits, digitalization in the advanced audit process security level. Using digital trackers, auditors can track each file that is accessed. Instead of searching all the paper documents, digital files can easily be audited. As a result, the digitization process in the audit provides improved audit accuracy.

3. RESEARCH METHOD

3.1. Current application of artificial intelligence in accounting and auditing

3.1.1. The application of artificial intelligence in accounting and auditing around the world

AI has been applied in many fields, including accounting, by countries such as the US, China, Germany, Japan, Brazil, India, and Nigeria. Countries with integrated global economies, lower technological levels, or underdeveloped digital infrastructure have also participated in AI application activities.

As for trends and information in AI in auditing, innovation is happening fastest at the Big4 audit firms: Deloitte, EY, PwC, and KPMG. Therefore, the AI technologies introduced by Big4 are particular and applicable: Deloitte partnered with Kira Systems in March 2016 to bring innovation and machine learning to the workplace. Deloitte created Argus, a perception app designed specifically for audit purposes, which uses advanced machine learning techniques and natural language processing to automatically identify and extract important accounting information from any electronic document. PwC won both the International Accounting Bulletin's Auditing Innovation Awards in 2017 and 2019. PwC's GL.ai technology can replicate the auditor's thinking and decisions and examine all transactions, users, amounts, and accounts to detect unusual transactions on the ledger. KPMG partnered with Microsoft, delivering integrated innovation to their customers. KPMG also mentioned Digital Solution Hub, based on Microsoft Azure cloud services, connecting it with artificial intelligence tools.

AI enables broader analysis and trend identification, allowing accountants and auditors to have more input into what creates future value for the company. Expertise is still needed for manual accounting and auditing work.

3.1.2. The application of artificial intelligence in accounting and auditing in Vietnam

Accounting work started with excel until recently; the accounting industry witnessed an innovation revolution when a lot of specialized accounting software was born, and all recording and calculation activities became faster and more accurate than ever.

The survey results on a sample of 300 businesses doing business in Vietnam by the team of experts from Duy Tan University show that today only some businesses use Excel software to set up accounting documents and create financial statements, and only a small number of small businesses (8.3%) still use Excel as the primary way to set up report templates for data storage.

Excel still plays a leading role in data tracking and report extraction, but it relies on accounting software when exporting financial statements.

Almost all businesses use accounting software (99%) in the survey sample to serve data processing and reporting and set up financial statements through accounting software for data analysis and business plan implementation.

Some accounting software of Amis, electronic invoice service of Reinvoice, accounting software for small and medium-sized businesses of Misa have attracted a lot of attention from business managers. Recently, VACOM Accounting Software Technology Joint Stock Company in Ho Chi Minh City. Ho Chi Minh City has also introduced instant authentication invoices (E-invoice) and used and achieved certain results such as making, sending and multiplying invoices quickly with high accuracy, streamlining work process.

3.2. Opportunities and challenges in applying artificial intelligence in accounting and auditing.

3.2.1. Opportunities

Firstly, artificial intelligence can help accountants and auditors improve their productivity and efficiency at work.

One of the core tasks of traditional accounting is manual data entry, a time-consuming and error-prone task. This problem can be completely solved when applying artificial intelligence. Artificial intelligence technology can complete repetitive tasks, and access and handle simple and low-level transactions in accounting such as transaction classification, account reconciliation, and entry. and match data from receipts and invoices, compare costs with norms, track price changes from suppliers... Accountants, auditors, and financial professionals can spend time using their expertise to take on a more proactive, strategic role in the business when manual data entry tasks are performed by artificial intelligence technology. The finance and accounting departments will have more time to analyze financial data or make proactive recommendations related to business profitability.

It can be seen that, with only very little human supervision, artificial intelligence can complete the basic tasks of accounting and auditing with greater efficiency and accuracy. Thus, for accountants, artificial intelligence can be considered a special colleague in the working process.

Second, the automation of the process by artificial intelligence helps to detect fraud and increase transparency and efficiency in accounting and auditing work.

Currently, in the field of Auditing, countless potential fraud risks cause serious consequences for businesses. Such as risks related to internal control. After the Covid-19 pandemic took place, many businesses still maintained the form of remote work. This can lead to risks associated with the transition of financial reporting processes from direct to indirect, and the potential for a breakdown in internal control. If in the past, the auditor could rely on the effectiveness of internal controls, when these controls are shut down during a pandemic, such an approach is no longer viable. In addition, after the pandemic, many businesses are still severely affected economically, so employees may be pressured to make fraudulent entries to maintain the company's existence.

To adapt to the new form of corporate governance as well as significantly repel forms of fraud in the audit, the application of artificial intelligence is extremely necessary. There are a few applications such as MindBridge.ai, this is an application developed by an AI company specializing in financial data analysis and auditing. Mindbridge.ai helps manage business operations and control risk more effectively by aggregating the big picture of financial data and leveraging AI for financial analysis, automated risk assessment, and financial assessment.

Third, artificial intelligence helps businesses cut operating costs.

Artificial intelligence along with the cloud system can calculate and analyze large volumes of data in a short time, thereby helping businesses cut costs. Because artificial intelligence provides the chief accountant with a detailed analysis report of the expense items incurred at the enterprise, assessing the ratio of revenue

costs, helping to understand which costs are not reasonable that offering a cost-saving plan, cutting unnecessary costs to help optimize profits. In addition, increasing the productivity of the accounting department will help businesses save on human and other costs. In addition, process automation using artificial intelligence also helps increase transparency and efficiency, so businesses can cut costs. Estimates show that implementing artificial intelligence in the accounting department can reduce costs for businesses by 80%.

It can be seen that this technology brings many benefits when it saves time, reduces costs, increases productivity, and provides accurate results for businesses. With such strengths, artificial intelligence has provided accountants and auditors with large volumes of data, high reliability, and shortened reporting time while still ensuring accuracy and high efficiency. This has the indirect result of encouraging business growth.

Fourth, artificial intelligence makes data collection, calculation, and reporting simpler and faster for businesses.

With access to accurate financial data in real-time, a business can react quickly to any unexpected fluctuations, from its sales negotiations, hiring decisions, business plans, and so on. expansion, supplier partnerships, or infrastructure investment strategies. Traditionally, we can see that the financial statements can only be delivered a few weeks after the end of the accounting period because the accountant still takes a lot of time to enter the data. Check the bank's subsidiary books, and prepare accounting records. The use of artificial intelligence greatly reduces the time it takes for accountants to perform month-end operations, thus allowing them to complete and submit monthly financial statements in a timely manner. Currently, artificial intelligence technology has been able to help accountants synthesize information and produce reports automatically while detecting book errors and giving warnings. Besides, with a cloud-based accounting and auditing system, business leaders can access the system and get report data about their business at any time. Other studies also show that artificial intelligence helps to limit, and eliminate confusion and minimize accounting errors. In short, instead of at the end of the month, at the end of the quarter, and the end of the year, businesses can make financial statements to grasp the situation and make adjustments, now with the support of artificial intelligence technology. created, every problem is controlled by the business, and decisions and solutions are made faster with a more accurate database.

3.2.2. Challenges

First, the shortage of high-quality accounting and finance personnel.

Human resources in the accounting and auditing industry in Vietnam are not only lacking in quantity but also low quality. Statistics from the Vietnam Association of Certified Public Accountants show that up to two-thirds of accounting and auditing graduates have not met the needs of employers in many aspects.

Not to mention the many changes in accounting and auditing activities in the 4.0 era, but most of the personnel in this industry still have limited information technology knowledge and skills. In Vietnam, accounting and auditing work is currently mainly done on records and papers. Meanwhile, the industrial revolution 4.0 transforms all that data into electronic information, which is both diverse and elusive. Therefore, if accountants and auditors are not tech-savvy, they will face many difficulties in performing professional tasks. In addition, the soft skills or foreign language ability of personnel in financial management, accounting, and auditing are also considered to be limited compared to other professions.

Second, the mismatch between old-fashioned thinking and corporate culture with digital innovation.

The reality shows that the directors of enterprises - especially state-owned enterprises, are operating business activities mainly with experience, with old knowledge, or with unsystematic accumulated knowledge, not updated continuously. This is the cause of the old way of thinking, not grasping the trend of the times, so management decisions are often inadequate, slow compared to the market's urges, and thus missed business opportunities. These entrepreneurs also do not grasp the knowledge of digital transformation, so it is difficult

to apply artificial intelligence to the field of accounting. Traditional thinking strategies are no longer suitable for accounting and auditing firms. Leaders of accounting and auditing businesses need to change their thinking to have an effective digital operation strategy, create initial experiences and integrate those experiences into the strategic business development process. On the other hand, culture is a big contributor to the success of digital transformation. A new culture in the organization must be established, ensuring that employees believe in the potential of digital transformation and agree to change toward the common purpose of the business.

Third, the information technology infrastructure is of poor quality and low security.

For the accounting and auditing industry, before the transformation of technology, the work of accountants and auditors in Vietnam was associated with records and papers and faced many difficulties in terms of convenience as well as information security. But in today's digital era, the introduction of technologies in the industrial revolution 4.0 has completely changed the current accounting method and process: all data is digitized into information. electronic information, blockchain technology becomes a giant "ledger". Therefore, in the long run, if accountants and auditors are not knowledgeable about technology, it will be difficult to perform the work. The actual survey shows that the knowledge, understanding, and application level of information technology of Vietnamese accountants and auditors are still limited and uneven. Training has only stopped at the transmission of background knowledge, not in-depth, multidisciplinary, especially for knowledge with specific technology, security, and artificial intelligence...

Fourth, the cost of development investment, technology improvement, and training of accounting and auditing staff

In Vietnam, the number of small and medium-sized enterprises accounts for more than 90%, and capital investment to upgrade technology and train accounting staff is a matter to consider. Investment in technological equipment will bring high efficiency, but investment costs are a matter of concern for the whole industry when the scale is not large. In addition to investing in the development of technological equipment, the training of accounting staff can quickly access new technology, master technology, and turn technology into an effective tool for customers. Accounting and business activities cannot be done in a day or two. Although Vietnam's accounting human resources are ready for integration, the quantity and quality are still not enough to meet international requirements. This fact shows that Vietnam is not only small in number but also weak in expertise. The accounting training meeting international quality standards, capable of meeting working standards in the current competitive environment is still a matter of concern.

4. SUGGESTIONS FOR BETTER APPLICATION OF ARTIFICIAL INTELLIGENCE IN ACCOUNTING AND AUDITING

Firstly, on the part of accountants and auditors, it is necessary to change awareness and accept change to adapt to new technology. Changing perceptions about the impact of digital technology in general and the 4.0 industrial revolution in particular on accounting and auditing activities. The process of digitizing the accounting and auditing fields in Vietnam is an inevitable trend because economic activities are increasingly diversified and abundant. The important thing is that the advances from the industrial revolution 4.0 will become the driving force to help individuals, businesses, and organizations operating in the domestic accounting field develop, grasp, and change timely to adapt to new technology, and improve labor productivity and work quality. In the near future, technology will not completely replace humans, so the role of accountants and auditors needs to be raised to the level of checking, controlling, analyzing data, and managing operations. However, in the future, there will be a lot of machine work that will replace humans, and data processing speed is done faster with larger volumes. Therefore, the role of accountants in the entire process of collecting, processing, and providing accounting information has also changed. Accountants need to grasp the problems that occur to go ahead, take the lead, and avoid being left behind.

In addition, the accounting and auditing departments must constantly improve their professional qualifications to keep up with the trend. With the emergence of new business models associated with technology,

regulatory agencies will also issue many regulations to regulate. Therefore, accountants and auditors must update their knowledge and improve their qualifications to be able to develop high-quality human resources, catch up with the general trend and effectively serve their work at the enterprise in particular. In particular, this also helps create a competitive position for accountants and avoids the risk of being fired.

Secondly, the management department needs to continue to be more aware of the impact and benefits of technology on the accounting field as well as have an appropriate approach to this trend. According to experts, for the development of the accounting field in the digital economy era, accountants still play a key role because current machines cannot make professional judgments. However, it is necessary to have full awareness and take proactive measures for the accounting and auditing system to operate effectively, to converge and harmonize among countries, to take advantage of the benefits, and to limit the negative impacts from industrial revolution 4.0. The management agency also needs to coordinate with professional associations to promote more propaganda activities so that stakeholders can grasp it more easily. Along with that, it is extremely important to develop a strategy for the development of the accounting and auditing field in both the short and long term. In particular, the strategy should be based on the current status of accounting and auditing and the problems posed by digital technology. Focusing on development to ensure the accounting and auditing industry operates synchronously, operates effectively, and with quality, in line with the market mechanism, and adapts to the scientific and technical advances of the digital technology revolution.

Third, in the immediate future, businesses need to build a large database to meet increasingly large transaction data; apply artificial intelligence technology to analyze and process data, and ensure security, safety, and security. To meet this requirement, enterprises need to regularly update data, store data, including financial and non-financial data; integrate accounting software with the management system in the general information technology system; Accounting software development. Besides, regulations that are binding, restricting the digital transformation process need to be considered for adjustment or removal. Enterprises should devote certain financial resources to accounting and auditing work in general and the application of digital technology achievements in particular in production and business activities. However, the transition to a new software system, and applying high technology, cannot happen overnight, but it takes time.

In particular, businesses need to focus on information safety and security associated with network security against the threat of cybercriminals. The risk of theft of accounting and audit information is very present in the network environment. This is a big risk that accountants and auditors need to be aware of and prepare for possible problems when applying new technologies, especially artificial intelligence. Therefore, businesses need to focus on building a network security system and ensuring high confidentiality of accounting and audit data.

Fourth, training institutions need to continue to innovate programs, teaching content, and teaching methods to update and keep up with technological changes. It is necessary to change the view of training in the direction of starting from what we have, but having to come from the requirements of reality, providing high-quality human resources for society. Focus on building accounting and auditing training programs in line with world development trends. Training institutions should review their training programs in accounting and auditing in line with the training programs of professional associations to aim at mutual recognition between professional training institutions and professional associations' qualifications.

Moreover, it is extremely necessary to establish relationships between training institutions and domestic and foreign enterprises and organizations. In the explosive era of industrial revolution 4.0, establishing relationships with enterprises is increasingly expanding not only with domestic units but also abroad, because it helps training activities and research is linked to solving practical problems, and meeting the requirements of businesses. Training units need to organize practical programs to help students have early access to accounting practice at enterprises; organize seminars, and share experiences between lecturers

and experts in accounting practice at many enterprises, especially those operating in the field of accounting and auditing. These activities aim to train accounting human resources with full professional capacity and necessary skills to increase job adaptability and successful start-up opportunities.

5. CONCLUSION

Artificial Intelligence is critical to the future of the accounting and auditing professions. AI is a vital tool that will provide these professionals with the needed tools to increase the efficiency and effectiveness of their occupations. The repetitive tasks of bookkeeping or process-driven assignments are more likely to be replaced with an automated technology than the higher value specialties that involve professional judgment. As AI is impacting and will have more impact on the role of accountants, accounting educators need to change their mindset and develop the necessary skills and competencies related to smart technologies, business enhancement applications. Accountancy curricula should be considered and prepared for graduates for successful careers. So many believe that The younger generation of accountants and auditors need to understand and be prepared to work alongside artificial intelligence.

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FACTORS AFFECTING THE APPLICATION OF INTERNATIONAL FINANCIAL STANDARDS IFRS IN VIETNAM IN DIGITAL TRANSFORMATION

Author: Nguyen Duc Tien¹, Thai Thi Huyen Trang¹, Vu Van Anh¹

ABSTRACT: *The study identifies and measures the influence of factors affecting the application of IFRS in Vietnam. Using a combination of qualitative and quantitative research methods, in order to improve the quality of the work. With data collected on 160 survey samples including accountants - auditors and experts, the author chooses to use SPSS 22 software to perform regression. The results obtained are 08 factors affecting the application of IFRS in Vietnam with different levels of impact described in the regression equation. From there, analyze the causes and propose some solutions to promote the application of IFRS in Vietnam in the context of digital transformation.*

Keywords: *Financial report, IFRS, accounting, audit, digital transformation.*

1. INTRODUCTION

IFRS (International Financial Reporting Standards) is known as the International Financial Reporting Standards including accounting standards issued by the International Accounting Standards Board (IASB).

IASB was established in 2001, with headquarters in London, England. The function of the IASB is to develop and issue International Financial Reporting Standards (IFRS), to submit drafts and to adopt recommendations made by the Financial Reporting Standards Committee. Before 2001, the IASB was also known as the International Accounting Standards Committee (IASC). The standard prepared by IASC is called IAS International Accounting Standards). After a period of use, the above standards were renamed International Financial Reporting Standards (IFRS). The purpose of these standards is to both ensure the accuracy of accounting and ensure transparency in the financial statements.

The application of IFRS in Vietnam is a long and new process, leading to many disadvantages for audit reports, low reliability and not really trust among information users. However, this cannot be delayed because this is an urgent goal in the context of deeper international economic integration, especially in the era of digital transformation. So, what factors will influence that process? Studying the factors affecting the decision to apply IFRS in Vietnam is urgent for the current period, contributing more research value. With the desire to meet the above requirements, the authors selected the topic “Factors affecting the application of international financial reporting standards IFRS in Vietnam in the context of digital transformation” for the study. The research results are expected to have theoretical and practical significance in order to quickly find solutions to improve and promote the application of IFRS in Vietnam

2. THEORETICAL FRAMEWORK.

2.1.1 . Factors affecting the application of IFRS in Vietnam in the context of digital transformation.

2.1.1.1. Macrofactor group.

The group of macro factors includes the following 07 factors: cultural factors (**VH**), economic growth factors (**economic growth**), capital market factors (**TTV**), education level factors (**TDHV**), factors of international economic integration (**HNKT**), legal system factors (**HTPL**), political factors (**CT**).

The factors have many close relationships with each other, but the degree of influence on the application of IFRS in Vietnam is different. In Vietnam, there has long been a risk-avoidance mentality and uncertainty,

1 Academy of Finance, CQ58/22.07.

so countries that tend to be cautious, certain, and legally controlled like ours will be less likely to accept the immediate application of the standard. international standards on accounting that will follow the roadmap. In addition, according to Enthoven (1965) said: A developed economy requires effective accounting tools to create confidence for transactions as well as efficient use of capital.

Economic growth is a necessary condition for economic development while stimulating economic growth helps create impetus for countries to apply IFRS. Vietnam is a developing country, moving from a centrally planned economy to a socialist-oriented market economy, so the application of appropriate standards to attract foreign investment capital is very reasonable because the financial statements prepared according to IFRS will be a common standard reporting system, applied and accepted in the world, helping to save the cost of accessing capital, the information will be disclosed to the public. Investors in one country are relevant and meaningful to investors in other countries, which is favorable for international capitalization, businesses will increasingly attract foreign investors to our country.

2.1.1. Microfactor group.

The scope of the micro-study is gathered with 10 factors: factor of listing in foreign markets (NYNN), factor of leverage (DB), factor of firm size (QMDN), factor of profitability Profitability factor (KNSL), audit quality factor (QUALITY), factor of accounting human resource qualification (TDKT), factor of connection between accounting and tax (SKN), factor of foreign capital borrowing (VVNN), investment factor of foreign investors (DTNC) and factor of foreign participation in the Board of Directors (TGNNN).

Several studies by authors such as: Iatridis (2010), Kim et al, (2011) have found a significant impact between IFRS compliance and profitability; Al-Htaybat (2018) showed that there is a relationship between the qualifications of accountants and the application of IFRS in enterprises; Bananuka et al (2019) applied new institutional theory to examine the influence of audit quality and some other factors in Ugandan, the results indicated that audit quality is also an influential factor. affect the application of IFRS; The studies of Ploybut (2012), Eierle and Haller (2009), Otchere and Agbeibor (2012) all have the common conclusion that it is easier and faster for enterprises to borrow money when preparing and presenting financial statements according to IFRS , ...etc. For our country, since the renovation of the economic management mechanism in the direction of a market economy, the tax policy and the accounting system of Vietnam have undergone many changes in the direction of being more and more consistent with the economic system. new management and integration with economies in the region and the world.

Through a preliminary summary of two groups of micro-factors and macro-factors, it is found that the factors are interrelated and closely related to the accounting-audit industry. However, in terms of the influence of factors on the application of IFRS in Vietnam in the context of digital transformation, the level of factors is different.

2.2. The applicability of IFRS and factors affecting its application in the context of digital transformation in Vietnam.

2.2.1. The applicability of IFRS in the context of digital transformation in Vietnam.

The digital transformation of the accounting industry is the application of technology to accounting activities, which can be understood as a digital transformation that affects the methods, functions and processes of accounting activities in enterprises, helping employees accountants take place faster and more efficiently. Accordingly, the Ministry of Finance has issued regulations that require businesses to apply for e-invoices, except for some special cases that are regulated as of July 1, 2022. Digital technology has impacted most accounting processes, methods and functions, such as accounting-auditing software, electronic sales software, electronic office software, etc... These are all aimed at conformity with IFRS international standards and this is also the future trend of the accounting-audit profession.

On March 16, 2020, the Minister of Finance issued Decision No. 345/QD-BTC approving the “project to apply financial reporting standards in Vietnam”. In this project, the roadmap to apply IFRS in our country is divided into three phases by the Ministry of Finance:

Preparation period (2020 - 2021). The Ministry of Finance prepares necessary conditions such as: Publication of the Vietnamese translation of IFRS; developing and promulgating documents guiding the application of IFRS; Develop relevant financial mechanisms; Human resource training, deployment processes for businesses.

Phase 1, voluntary application (2022 - 2025). For the consolidated financial statements, the following enterprises with voluntary needs and resources are selected by the Ministry of Finance: The parent company of a large-scale state economic group with sponsored loans by international financial institutions; Listed company; Large-scale public companies are unlisted parent companies; Other parent companies have the need and resources to voluntarily adopt IFRS. For separate financial statements, enterprises with 100% foreign direct investment capital with needs and sufficient resources are voluntarily selected by the Ministry of Finance.

Phase 2, mandatory application (after 2025). The Ministry of Finance shall base itself on the needs and readiness of enterprises and the actual situation to stipulate a specific time for the compulsory application of IFRS for each specific object.

2.2.2. Advantages and disadvantages of the process of digital transformation in the field of accounting - auditing.

In the context of globalization today, IFRS is becoming more and more popular, in Vietnam has also initially launched its own roadmap to apply IFRS. The application of IFRS will open development opportunities for the country, but it will also bring certain challenges for accounting - auditing in particular and the development of enterprises in general.

2.2.2.1. Advantages.

Firstly, by shortening the gap between accounting and the world, IFRS creates consistency in the preparation and presentation of financial statements, shortens the difference in accounting standards, and helps improve accountability by reducing information gaps between inside and outside the company.

Secondly, by helping businesses increase profits and attract investment, when Vietnam applies IFRS, it will help partners and investors, especially foreign investors.

Thirdly, in developing career opportunities in accounting, the global accounting language IFRS is a bridge to help Vietnamese accountants find a common voice with international accountants, this is an opportunity for human resources to serve them. Vietnam's accounting service industry develops its profession.

2.2.2.2. Disadvantage.

Firstly, because of the system problems caused by the law, the accounting system focuses on promulgating specific regimes and there is no consistency in legal documents that affect the financial work of enterprises such as: tax policy, financial reporting standards and financial mechanisms.

Secondly, the capital market and financial market in Vietnam mainly operate within the country, not having much connection with the capital markets of the region or the world. due to the small scale, small products and substandard quality.

Thirdly, human resources, most of the management team in Vietnam are trained and grown up in a centralized and subsidized bureaucratic economy, so they are more or less affected by the stereotyped culture, heavy on administration and care. Serious risk aversion and an unwillingness to disclose financial status or intentionally conceal weaknesses will be barriers to the IFRS approach.

Fourth, information technology system, in order to apply IFRS, enterprises need to have a strong enough information technology system to support the collection, processing and presentation of financial information, but not enterprises. Every country has the ability, qualifications and human resources to implement such synchronously, especially our country which has developed economy with a system of many small, medium and micro enterprises. like nowadays.

3. RESEARCH METHODS.

3.1. Hypothesis building.

Based on the research framework built by the author in combination with previous studies, the author believes that there are two major groups of factors affecting the application of IFRS in Vietnam in the context of transition. current number. The macro factor includes 07 small factor variables and the micro factor includes 10 small factor variables.

As elaborated, mentioned and briefly analyzed in the theoretical part, each macro and micro factor hypothesized by the authors will have different levels of influence in the process of making IFRS far-reaching and comprehensive. within the country of Vietnam.

3.2. Research process.

In order for the research paper to be in-depth and reliable through theoretical analysis and also to publish regression data, the research team carried out the research process of the study using 02 methods: Process Qualitative Research and Quantitative Research Process.

Qualitative research process : The author builds a survey sample for the purpose of collecting sample data and interviewing experts about their opinions and re-evaluating the value of small variables in two macro- and micro-factors. micro-relevance and up-to-date. By exchanging and introducing concepts and institutions so that experts have a common view, the survey's assessment is the most objective and accurate.

Quantitative research process : Survey data is synthesized through two direct forms and Google forms, then classified and sorted into Excel software for data entry and analysis through the SPSS 22 tool. Author Analyze the collected data in 4 steps:

Step 1: Descriptive statistics of survey data – Indicate the number of levels of assessment from experts on a scale from 1 to 5 on the influence of variables on the application of IFRS in Vietnam. Declare the mean of each variable, the highest and the lowest evaluated.

Step 2: Use Cronbach's alpha reliability coefficient to evaluate the reliability of the scale - the rating reflects the level of close correlation between the observed variables. In order to consider the scale to be evaluated well for reliability, it is necessary to satisfy both conditions: (1) Cronbach's alpha coefficient is greater than 0.6 and (2) Corrected Item - Total Correlation is greater than 0.3.

Step 3: Use the Pearson correlation analysis method - Use two indexes: the Sig value of the correlation relationship and the correlation R value. The Sig value of the correlation relationship is less than 0.05 with 95% confidence, which means that the pair of variables considered has a linear relationship with each other and vice versa. The correlation R value ranges from -1 to 1, the closer to 1, the stronger the linear correlation, the closer the correlation R value goes to 0, the weaker the linear correlation.

Step 4: Conduct multivariable regression analysis - a regression that considers the linear relationship, modeling the straight-line relationship between the independent variable and the dependent variable by a linear regression model.

4. RESULTS AND DISCUSSION.

4.1. Qualitative research results.

The author conducted interviews to collect the opinions of 06 experts on macro and micro factors affecting the application of IFRS in Vietnam. Interviews were conducted according to the following procedure:

First: The author presents 07 macrofactors and 10 microfactors that affect the application of IFRS in terms of concept and background theory. The author asks questions in the form of "Agree" or "Disagree" for experts to express their views on the factors. The results show that experts completely agree (100%) that 07 macro factors and 10 micro factors all have different levels of influence on the application of IFRS.

Second: The author interviews with open-ended questions to allow the expert to add factors from their

point of view to the research. The expert results add research factors affecting the application of international accounting standards for a relatively low percentage of experts, less than 20% (ratio of 16.67%). After discussing the possibility that data collection in quantitative research is not feasible, it was decided not to include additional factors from experts in the official survey.

As a result of qualitative research, the author recovered 07 macro factors and 10 micro factors which were agreed upon by 100% of experts to build a formal survey to actually do quantitative research.

4.2. Quantitative research results.

The author collects data in two ways, directly and indirectly. The results obtained 24 direct survey votes and the author team actively sent votes through Google Forms, stopping at 136 votes to ensure a total of 160 votes.

Step 1: Descriptive Statistics

Meaning of each mean value on the distance scale (1-5):

Distance value

$$= (\text{Maximum} - \text{Minimum}) / n$$

$$= (5 - 1) / 5 = 0.8$$

Mean value – Meaning of the scale

1.00 – 1.80 : Very unimportant

1.81 – 2.60 : Unimportant

2.61 – 3.40 : Average

3.41 – 4.20 : Important

4.21 – 5.00 : Very important

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std . Deviation
VH	160	1	5	2.72	1.203
TTKT	160	1	5	3.79	,772
TTV	160	1	5	3.36	,894
TDHV	160	1	5	4.07	,942
HNKT	160	1	5	4.00	,984
HTPL	160	1	5	3.29	1,085
CT	160	1	5	2.49	1,234
NYNN	160	1	5	3.45	1,191
DB	160	1	5	2.67	1,321
QMDN	160	1	5	3.02	,897
KNSL	160	1	5	2.77	1,188
CLKT	160	1	5	3.74	,820
TDKT	160	1	5	4.06	1,056
SKN	160	1	5	3.50	,978
VVNN	160	1	5	3.37	,866
DTNC	160	1	5	3.55	,944
TGNNN	160	1	5	2.66	1.138
APDUNG	160	2	5	3.05	,742

Thus, through the descriptive statistics, it partly reflects the opinion of the survey subjects who are accounting and auditing experts on the factors that are predicted to affect the application of IFRS in Vietnam. Male.

Step 2: Analyze Cronbach’s Alpha coefficient

The author conducts an analysis of Cronbach’s Alpha coefficient for each macro and micro scale obtained:

Reliability Statistics	
Cronbach’s Alpha	N of Items
,792	7

The macro scale includes 7 independent observed variables, the Cronbach’s Alpha coefficient of the population reaches 0.792, satisfying the condition greater than 0.6 and is evaluated that the scale used is good. Reflect the stronger the correlation between each independent variable and the rest, and the better the independent variable. Thus, the set of macroscale scales fulfills condition (1).

Considering condition (2): Corrected Item – Total Correlation greater than 0.3 satisfy all observed variables with the smallest coefficient achieved at 0.425. Therefore condition (2) is satisfied.

Condition (2) considers Corrected Item – Total Correlation of all observed variables is greater than 0.3 except the variable **TGNNN** ($0.282 < 0.3$). To ensure that the scale meets standards and reliability, the research team decided to remove the observed variable **TGNNN** from the research model and bring the Cronbach’s Alpha coefficient to 0.848.

In conclusion, analyzing Cronbach’s Alpha coefficient in the scope of macro and micro studies and evaluating the reliability of the scale for variables, the author removed only the variable measuring the amount of **TGNNN**. The The rest of the scales ensure the reliability to test the research hypothesis.

Step 3: Pearson correlation analysis

To come to the choice of accepting or rejecting the hypothesis that the variables are related, it is necessary to use the **Sig index** (p - value). A pair of variables are correlated with each other when **Sig value** < 0.05 and no correlation when **Sig value** > 0.05 .

Reliability Statistics	
Cronbach’s Alpha	N of Items
,838	ten

Sig values < 0.05 , the correlation coefficient **R** (Pearson Correlation) ranges from -1 to 1, then the pair of variables are correlated. The correlation coefficient **R** is closer to the two ends -1 and 1, which represents the network correlation relationship, the closer to 0, the weaker the correlation.

Performing pearson correlation analysis in the macroenvironment gave the following results: The factor **CT** has a correlation coefficient of **R** -0.008, which explains the negative impact on the dependent variable, the **Sig value** of $0.842 > 0.05$ shows that **CT** variable is not statistically significant. The hypothesis that political factors affect the application of IFRS in Vietnam is rejected. The variables **TTV** , **TDHV** and **HNKT** have a relatively high correlation coefficient **R** , the largest is **0.675** and the smallest is **0.552**. The statistical significance of these factors for the dependent variable has a relatively strong correlation.

Pearson correlation for micro-factors: The factors of **self- efficacy** , **QMDN** and **NYNN** have **Sig** values from high to low of 0.493, 0.208 and 0.184 all > 0.05 , not satisfying the condition. Therefore, the above variables are excluded because there is no impact on the application of IFRS in Vietnam. **TDKT** with the largest correlation coefficient **R** reached 0.611. Besides, the factors **SKN** , **DTNC** and **QUALITY** have relatively high correlation coefficients of 0.551, 0.548 and 0.449, respectively, all having a **Sig** value of 0.000 which also has an impact on the dependent variable **APDUNG** .

After performing the Pearson correlation analysis on the research scope including macro and micro, the factors **CT** , **NYNN** , **QMDN** , and **KNSL** were removed .

Step 4: Multivariate regression analysis

Model Summary b		
R	R Square	Adjusted R Square
,856 a	,733	,725
ANOVA ah		
Sig.		
<0.001 b		

The results of multivariate regression, the Adjusted R Square result of $0.725 > 0.5$ reflects the regression model as well. Thus, 72.5% of the variation of the application of IFRS in Vietnam can be explained by the linear relationship of the independent variables. The fit of the model is relatively good.

Sig value of the model reaches the threshold $<.001$, satisfying the condition <0.05 , so the model exists. Conclusion the model is suitable.

Coefficients ^a			
Model	B	Sig.	VIF
(Constant)	4,018	<,001	
VH	-,098	,134	1,112
TTKT	,246	,001	1,797
TTV	,336	,000	1,932
TDHV	,461	,000	1,394
HNKT	,098	,277	1,782
HTPL	,140	,010	1,589
DB	,036	,330	1,408
CLKT	,280	,000	1.695
TDKT	,312	,000	1.868
SKN	,053	,581	1.166
VVNNN	,102	,012	1.893
DTNC	,218	,006	1,914

According to the variance exaggeration factor (VIF) of the regression results, all 10 VIF values of the model are less than 10, explaining that the model used does not have multicollinearity. Independent variables **SKN**, **DB**, **HNKT** and **VH** with large **Sig** indexes of 0.581, 0.330, 0.277, 0.134 > 0.05 do not satisfy the condition. Therefore, removing 04 variables from the model has no impact on the application of IFRS in Vietnam according to the statistics of the sample data.

We get the results of the regression equation of the corresponding model as follows:

$$\text{APDUNG} = 4.018 + 0.246 \cdot \text{TTKT} + 0.336 \cdot \text{TTV} + 0.461 \cdot \text{TDHV} + 0.140 \cdot \text{HTPL} + 280 \cdot \text{CLKT} + 0.312 \cdot \text{TDKT} + 0.102 \cdot \text{VVNN} + 0.218 \cdot \text{DTNC}$$

4.3. DISCUSSION

The results showed that a number of factors were assessed as having no impact on the application of IFRS in Vietnam according to the sample data. There are many reasons why the linear relationship between these independent variables and the dependent variable is not really clear. Global integration promotes assimilation, creating a great driving force for the economy, so cultural and political factors have not been clearly recognized. World economic integration is only considered a great influence on the decision to apply IFRS to developed countries because there are already favorable foundations and conditions. No Vietnamese enterprises have been listed on foreign stock markets yet, so it is not possible to evaluate the positive

effects of foreign listings by applying international standards. The number of foreigners participating in management under the leadership of Vietnamese enterprises is not large, so the impact of this factor has not been recorded. In fact, in Vietnam, large-scale enterprises are usually corporations, joint stock enterprises converted from state-owned or state-owned enterprises participating in capital contribution, so the factor of enterprise size has not yet reflected the level of impact of the process of applying IFRS in Vietnam.

Thus, the research work has completed all the objectives set when conducting the implementation: Successfully building an empirical research model on the factors affecting the application of IFRS in Vietnam on a large scale tissue and micro. Giving results of the group of macro factors: economic growth, capital market, education level and legal system; Micro factors: audit quality, accounting qualifications, foreign loans and investment by foreign investors. Each factor has a different level of impact, but the level of prediction of the overall fit of the model is relatively high (72.5%), so the study achieves the set goal.

4.4. Proposals and recommendations to promote the application of IFRS in Vietnam.

4.4.1. Recommendations for the group of macro factors affecting IFRS in Vietnam.

The state needs to develop a clear set of strategies with the goal of growing Vietnam's market economy. Specifically: The State and relevant agencies need to accelerate the completion of the legal system and economic environment, creating a synchronous and transparent legal corridor, in line with the requirements of international standards. economic. The State Securities Commission and relevant agencies will implement a roadmap for a period of 5 years, towards building a green capital market.

Focusing on the strategy of developing and training young human resources with professional qualifications through coordination with the Ministry of Education and Training to build a team of skilled accountants and auditors in the direction of integration. Coordinate with universities, professional organizations, training and support organizations to regularly update and disseminate new regulations and terms in the spirit of revision.

Empower professional associations in the translation and drafting of international standards. promote cooperation with university training institutions to improve accounting majors from next generation of students (Academy of Finance, Foreign Trade, National Economics University, Banking University, ...), extensive cooperation with international professional organizations (CPA, ACCA, ICAEW, reputable international enterprises).

4.4.2. Recommendations for the group of micro-factors affecting IFRS in Vietnam.

Improve the professional quality of auditors generally operating outside of Big4 and other auditing firms to ensure the auditor's opinion when performing an audit. Reviewing and checking the qualifications of not only state accountants but also enterprises, they need to take the initiative in training and improving the qualifications of the accounting staff at their affiliated units.

Promote the strategic process of economic restructuring for state-owned enterprises, accept strategic investors to participate in the management of large enterprises in order to promote integration and the listing of capital on the international market. Business leaders need to raise awareness of the importance and benefits of IFRS. State-owned enterprises should focus on the process of equitization and listing on the stock market and the formation of capital markets and capital mobilization channels.

The above has some implications as well as suggestions and recommendations for directions to promote the application of international accounting standards in Vietnam. Achieving positive results requires constant efforts and coordination between macro and micro factors in a timely and reasonable manner.

5. CONCLUSION

Currently, in the context of global economic integration, it is a good time to support Vietnamese businesses to challenge and affirm the 4.0 industrial revolution. In order for the process of applying IFRS

in our country to be conducted smoothly and effectively, it is necessary to have smooth and synchronous coordination between the State and relevant agencies in the process of training, updating and learning. practice and apply it in practice. The above is a summary of the research work conducted jointly by the three authors with the goal of contributing to the process of promoting the application of the international accounting standard system (IAS/IFRS) in Vietnam. The research work cannot avoid errors, in the spirit of learning, the authors are happy to receive comments from readers in order to draw on their experience and add to the following research. We sincerely thank the readers for their interest in this study.

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THE SOLUTION TO COMPLETE THE RECORDING AND PRESENTATION OF ACCOUNTING ESTIMATES ON THE FINANCIAL STATEMENTS OF VIETNAMESE ENTERPRISES

Author: Nguyen Ngoc Anh¹, Nguyen Dieu Anh²
|Mentor: Dr. Ly Lan Yen³

ABSTRACT: The estimate is an approximate evaluation, the fact that the term estimate is increasingly common in situations when we can not decide ourselves with certainty. Estimate used by a variety of both theoretical and practical areas, and in our case we are dealing with accounting estimates. Since they are estimated, there cannot be an exact standard for the value of these items, and it highly depends on the subjective judgment of the estimator. Therefore, businesses can use accounting estimates as a powerful tool to manipulate profits, which is in line with the financial policy of the business in each period and helps to make the financial information of the business look better, attracting more investment capital, and benefiting the business.

By qualitative research method based on the results of interviews, surveys for enterprises in Hanoi, the study has reflected the current situation of accounting estimates, thereby drawing comments and assessing the advantages, limitations in the recognition and presentation of accounting estimates in the financial statements. Therefore, propose some solutions to improve the accounting of provisions and contingent liabilities.

Keywords: *accounting estimates, Financial Statements, presenting information*

1. INTRODUCTION

Along with the development of science and technology and international economic integration, Vietnamese enterprises in general and the accounting field in particular are facing many development opportunities but also encountering numerous risks and challenges from micro and macro factors. In particular, Financial Statements are one of the most important information channels to help accountants provide necessary information about the financial and business situation of enterprises to internal and external information users. In the process of preparing Financial Statements, businesses often have to use a lot of accounting estimates. The value of these estimates often directly affects the profit level of the business in the period.

It can be said that the estimate is the opposite of “precise determination”. So, regardless of the method, the reason or the process of estimating is used, the estimated fundamental principle is the same: the location of the estimates closer to the actual level of knowledge required parameters at a given time so that the margin of error is minimal.

Using accounting estimates is an essential part of preparing Financial Statements in most enterprises. However, there are views that the value of estimated items depends heavily on the subjective judgment of the accountant and there is no standard to evaluate the reasonableness, which will reduce the reliability of financial information. Accountants may try to conceal important information if that information has an adverse impact on the interests of the enterprises. Accounting estimates are still widely used in businesses because of their significant benefits, including:

Firstly, using accounting estimates helps Financial Statements to better meet their role in providing financial information, thereby helping enterprises express their true value in the most accurate way. Businesses can use accounting estimates to reduce or increase their benefits, which helps users of financial information evaluate businesses at the most reasonable value.

¹ Academy of Finance, _CQ58/21.06_Email: nna26032002@gmail.com,

² Academy of Finance, CQ58/21.02.

³ Academy of Finance.

Secondly, although accounting estimates are based on subjective professional judgments and contain risks, it is not feasible to completely eliminate accounting estimates, resulting in low economic efficiency.

Thirdly, using accounting estimates to ensure the conservatism principle. However, when implementing the conservatism principle to make accounting estimates, enterprises must pay attention to make provisions, but they are not allowed to make excessively.

Allowing businesses to use subjective judgments in preparing Financial Statements is not a perfect solution for businesses to use for the purpose of improving the quality of financial information, but it is indispensable in preparing Financial Statements. If accounting estimates are not presented in financial statements, it could have significant implications for information users, such as investors, lenders, regulators, and other stakeholders. Some effects can be mentioned as:

Lack of transparency: Accounting estimates provide a level of transparency into a company's financials. Without these estimates, financial statements could be opaque, making it difficult for users to evaluate the company's financial performance and make informed decisions.

Inaccuracy: Accounting estimates are often necessary to account for uncertainties, such as the useful life of assets or the likelihood of bad debts. If these estimates are not presented, financial statements may not accurately reflect the company's financial condition, which could lead to inaccurate assessments of the company's value and risk.

Limited comparability: Accounting estimates are used to standardize financial statements across companies and industries. Without them, financial statements may lack the comparability necessary to benchmark a company's financial performance against its peers. This could make difficulties for investors to evaluate a company's performance relative to its competitors.

Increased risk: Accounting estimates are used to manage risk, such as estimating the value of inventory and determining provisions for potential losses. If those are not presented, users may not have a clear understanding of the risks related to the company's operations, which could lead to higher investment risk.

Overall, the absence of accounting estimates in financial statements could significantly impact information users, potentially leading to a lack of transparency, inaccuracies, limited comparability, and increased investment risk.

In the context of evaluation by evaluation by estimate, we often meet in the specialized literature definitions such as:

Accounting Estimate is a technique to measure those items in accounting that have no accurate quantification and are therefore estimated based on judgment and knowledge derived from experience.

“Provision is a liability of uncertain timing or amount.” (IAS 37, p5)

“Contingent liability is:

(a) a possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity; or

(b) a present obligation that arises from past events but is not recognised.” (IAS 37, p5)

“Contingent asset is a possible asset that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity.” (IAS 37, p6)

“Onerous contract is a contract in which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it.” (IAS 37, p6)

2. ACCOUNTING ESTIMATES

2.1. Legal documents on accounting estimates in Vietnam

The Ministry of Finance has issued a relatively complete system of Vietnamese Accounting Standards (VAS) with 26 accounting standards accompanied along with a lot of information guiding the implementation.

Vietnamese Accounting Standard No. 18 (VAS 18) provides readers with the most comprehensive view of provisions and potential debts. After many amendments and supplements, in 2019, the Ministry of Finance issued Circular 48/2019/TT-BTC “Guidelines for making and handling of provisions for devaluation of stocks, loss of investment, provisions for bad receivable debts, and warranties for products, goods, services, and construction projects at enterprises.” In addition, the Ministry also issued Circular 200/2014/TT-BTC guiding how to apply the Accounting Regime for enterprises and Circular 133/2016/TT-BTC for small and medium-sized enterprises, which have facilitated enterprises to understand and apply easily, and made it easier for people to compare information with other companies in the same industry. The completion of the legal framework on accounting has contributed to improving the economic management capacity of enterprises in terms of accounting estimates and has had significant results. Besides accounting standards, circulars, and accounting regimes, Vietnam also has regulations in the unified accounting system. This is a unique point of Vietnam, and guidelines on provisions in the unified accounting system will make it easier to apply in practice and uniformize accounting in enterprises. However, the application of the legal documents on accounting in economic management in general still has many shortcomings and has not received much attention.

2.2. Content of International Accounting Standards on accounting estimates

According to the International Accounting Standard 37 (IAS 37), accounting estimates consist of three types: provisions, contingent liabilities and contingent assets.

Provisions include: provision for loss of assets (Provisions for decline in value of investments in securities, Provisions for decline in the value of other investments, provision for bad receivable debts, provision for devaluation of stocks), and provision for payables (Provision for warranty for products, goods and construction works, provision for enterprise restructuring, provision for other payables). Provisions are recognized in the balance sheet at the end of the accounting period when the enterprise reviews, revaluations and makes provisions if the enterprise can make a reliable estimate of the provision.

A contingent liability is lower than a provision for payables. Contingent liabilities and contingent assets both occurred unexpectedly and their exact economic value cannot be determined. Therefore, contingent liabilities and contingent assets are not recognized in the balance sheet. However, if these amounts meet certain conditions and may affect the financial position of the enterprise, they may be noted in the Notes to the Financial Statements.

In addition, there are many cases that may need accounting estimates such as: depreciation of fixed assets, prepaid expenses, value of work in progress, revenue recognized in advance, revenue from construction contracts in progress, accrual expenses, etc.

3. RESEARCH METHOD

To achieve research objectives, the study used research methods such as:

3.1. Methods of document collection:

- Secondary data collection: Secondary data in the document topic is collected through the internet; collected from the databases of the Library of the Academy of Finance, the information pages of the State agencies, etc., including national and international articles, research papers,...; reports of state agencies such as the General Statistics Office; ... to serve as a basis for presentation in the research. In order to have a basis for practical analysis, the topic uses secondary information from the financial statements of a number of enterprises in Hanoi, etc. The information quoted from the study is noted clearly and listed in the bibliography. Methods of analyzing and synthesizing theories and documents.

- Analysis of document sources: From the source of documents (journals, scientific reports, scientific works, archives of mass information, theses, etc.), the author conducts analysis of different sources documents and select high-quality scientific sources to build a theoretical foundation for the topic of the document.

- Content analysis: based on the detailed outlines that have been built, the author conducts research on specific contents and selects appropriate research methods. This method helps the author to select and filter the necessary arguments to build a theoretical foundation.

3.2. Method of survey and statistics:

The study was conducted with the aim of identifying the limitations and confusions when applying accounting estimates in Vietnamese enterprises. Based on survey data collected through Google Form from accountants and chief accountants of businesses in Hanoi. The study sent a sample of 150 questionnaires to the accounting department staff of 150 businesses in Hanoi and received 108 responses on Google Form (72% confirmed). In order to secure information for businesses participating in the survey at the request of businesses, the topic did not list the names of enterprises participating in the survey. In addition, author synthesized and analyzed collected data to display the results in table and graphs. This method helps the author to understand and evaluate the actual situation of applying accounting standards in accounting estimates in Vietnamese enterprises.

4. RESULTS AND DISCUSSION TO COME UP WITH SOLUTIONS

4.1. Results and discussion

4.1.1. Survey results on the recognition and presentation of accounting estimates in financial statements in enterprises in Vietnam

The current accounting system in Vietnam is gradually meeting the demands of integration and still fitting the specific characteristics of our economy, politics, and domestic economic situation. In recent years, based on the foundation of International Accounting Standards, Vietnam has achieved certain successes. after much research, amendments and supplements, the Ministry of Finance has established a system of accounts and principles of provisioning that are suitable for the current economic situation in Vietnam. The accounting regime for provisions is built on selective application of international accounting standards, providing favorable conditions for Vietnamese accountants to integrate with international accounting and meeting the requirements of the state in the current period. The current accounting system for provisions has clear provisions on: time of making provisions, the method for determining the value of provisions, and the method of accounting for provisions for each separate provision. The introduction of clear regulations as above has partly helped businesses to apply the nature of the provisions and have financial resources to compensate for the occurrence of risks; on the other hand, to avoid the situation that businesses take advantage of making too large provisions to falsely reduce taxes paid to the state.

According to the author surveyed at 108 enterprises in all fields in Hanoi, only 73/108 respondents knew about Vietnam's accounting standards VAS 17 (corresponding to 67.7%), the remaining 35 votes (32.4%) have not learned about this Standard. Basically, businesses in Vietnam do a pretty good job of recording accounting estimates. More than half of the surveyed enterprises have made provisioning and contingent liabilities. Most enterprises consider and fully record the contents of provisions, especially those that are typical and actually arise at the enterprise such as provision for bad debts, provision for product warranty. Enterprises that have made provision are recorded on the basis of the legal framework and presented in the accounting books and financial statements in accordance with current regulations and initially shown in the Notes to the financial statements.

From the survey results obtained, we can see that the situation of recognizing provisions, potential debts, and potential assets in corresponding businesses in different fields of operation is different. The difference is mainly due to the specific characteristics of assets, capital sources, production processes, and business operations of each field. In addition, there are differences in accounting estimate recognition for businesses with different capital scales. Specifically, for large-scale businesses, regardless of their industry, the proportion of companies that set up provisions and recognize potential debts and potential assets is

mostly higher than that of medium and small-scale businesses. As large businesses often have a significant impact on the economic and financial situation of society, applying accounting standards will be more specific, accurate, and comprehensive.

According to the survey results of 108 businesses, the level of implementation of provisions based on a 5-point scale, with level 1 being businesses that do not set up provisions for potential debts and liabilities, and level 5 being businesses that regularly and fully set up provisions for potential debts and liabilities, had an average of 2.75/5. Among them, level 1 (businesses that do not set up provisions for potential debts and liabilities) had the highest number of selected options with 30 votes, accounting for 27.8%, and level 5 (businesses that regularly and fully set up provisions for potential debts and liabilities) had the fewest votes with only 12, accounting for 11.1%. Among them, small and medium-sized businesses often answered that their level of implementation of provisions for potential debts and liabilities ranged from 1 to 3, while larger businesses usually set up provisions at a level ranging from 3 to 5.

There are many factors that affect the application of the international accounting standard IAS 37 on provisions, contingent liabilities and contingent assets in enterprises, such as the level of expertise of accounting staff, the level of expertise of the chief accountant, and the encouragement and support from leadership. To prepare for changes in accounting policies, it is essential that the accounting team be well-trained, understand and effectively implement new regulations, and have good technology applications.

In the survey of 108 enterprises in Hanoi, it was found that 71.3% of accounting staff had a university degree or higher, 20.4% had a college degree or higher, and 8.3% had a vocational school degree or higher. As for the level of the chief accountant, the survey found that 60.2% of chief accountants had a university degree and 39.8% had a postgraduate degree or higher. Therefore, the implementation of accounting standards is somewhat facilitated. Additionally, the support from leadership also has a significant impact on the application of accounting standards for provisions and contingent liabilities in enterprises. According to the survey, 61.1% of leaders support and encourage the provision of provisions, while the remaining 38.9% do not support it.

4.1.2. Limitations of recognizing and presenting accounting estimates in the financial statements of enterprises in Vietnam

However, alongside the achievements, Vietnamese businesses still face many difficulties, as reflected in the following points:

i) Limitations in legal regulations on estimates accounting

Currently, the accounting regulations on provisions and contingent liabilities in Vietnam are still heavily influenced by the financial mechanisms and tax policies of the state according to mandatory regulations. This makes the recognized provisions may not fully reflect the actual loss, so businesses do not recognize the correct value of provisions. A part of the issued guidelines are too detailed, so they are unreasonable and not suitable for the business. For some provisions, the regulations are still unclear and incomplete, such as:

Regarding the provision for liabilities: This is a fairly complex provision due to many different types and methods of setting up each type. However, in VAS 18, there is a reference to the provision for high-risk contracts and corporate restructuring, but in guidelines through many amendments and supplements such as Circular 13/2006, Circular 228/2009, Circular 48/2019, there are only guidelines for making provisions for product warranty and construction works without guidances on the method of making provisions for high-risk contracts and corporate restructuring. The lack of comprehensive and detailed guidelines on provisions will cause many difficulties for businesses to apply in practice.

Provisions for bad receivable debts, and warranties for products, goods, services, and construction project have a fixed ratio, make it difficult for businesses to rely on the actual situation of the economy in each period to make provisions, so the provision made by businesses may not accurately reflect the current financial situation of the business.

In addition, the lack of consistency between the Accounting Law and the Tax Law, in particular, calculated expenses in the accounting law is different from calculated expenses in the Corporate Income Tax Law, which makes businesses tend to prioritize form over substance, doing accounting according to the Tax Law's regulations to simplify procedures and work.

ii) Limitations on accounting estimates in Vietnamese enterprises.

Vietnam Accounting Standards No. 18 (VAS 18) was issued in 2005, but in practice, it is still relatively new and not widely adopted by enterprises. As a result, it is difficult for enterprises to realize the benefits and role of strictly implementing VAS 18 when identifying, recording, and presenting provisions and contingent liabilities. Only a small number of enterprises clearly understand and strictly implement regulations on provisions and contingent liabilities when preparing financial statements. Besides, many businesses do not pay attention or misunderstand the nature of accounting estimates, resulting in making inadequate or not making provisions. This directly affects the information presented in financial statements, making it difficult for information users to collect information and make decisions.

There are still some limitations in the application of VAS 18 when identifying, recording, and presenting accounting estimates on financial statements in Vietnamese enterprises:

Firstly, most medium and small-sized enterprises do not understand the importance and misunderstand the nature of provisions, resulting in not making provisions or making incomplete provisions. These enterprises view provisions as an unnecessary expense or an insignificant expenditure. However, in reality, provisions are necessary expenses to protect the assets of the enterprise and reduce risks.

Secondly, most enterprises, including large ones, can not clearly explain the basis for making provisions, the subject and the corresponding amount when presenting information on the Notes to the financial statements. The Notes to financial statements of Vietnamese enterprises are often prepared according to a certain template issued by the Ministry of Finance, so enterprises often do not reflect the true nature of the financial situation as well as specific explanations of issues that are not yet clear on the balance sheet, income statement, and cash flow statement but simply present figures.

Thirdly, most enterprises make provisions for product warranties, goods, services, construction, and provisions for bad receivable debts mechanically based on the prescribed rate, rather than based on the future value of the liabilities or other factors or conditions. Therefore, the value of the provision may not accurately reflect the financial situation of the enterprise.

Fourthly, some enterprises do not make provision for devaluation of stocks or do not present information transparently on the financial statements. Many businesses keep inventory for several years in stock but do not make provisions for devaluation. For example, some specific products such as medicinal products of the medical industry or dairy products and ready-to-eat foods of the consumer goods industry, etc, although the market value of products which are close to the expiration date is still high, when they are almost out of date, it is difficult for enterprises to sell those products to the market. Therefore, enterprises are forced to make provisions. When such products expire and must be destroyed, enterprises will convert that provision into expenses incurred in the period.

Fifth, when presenting information about the provision for bad receivable debts in the financial statements, enterprises usually do not present the fluctuations of receivable debts in the fiscal year, but only the beginning and the end numbers of the year. This makes it difficult for information users to know how debts increase or decrease, old debts still receivable and new receivables arising during the year.

4.1.3. Reasons for limitations of recognizing and presenting accounting estimates in the financial statements of enterprises in Vietnam

Limitations in applying VAS 18 and IAS 37 in recording, and presenting accounting estimates in financial statements arise from several reasons.

Firstly, in terms of legal regulations: The current accounting standards for provisions are still generalizable, with new and abstract terminology, causing difficulties and limitations for accountants. Moreover, the issued legal documents have not really closely followed the actual operating of Vietnamese enterprises, in the condition that most of which are small and medium-sized enterprises with very different characteristics from large enterprises. On the other hand, the difference between tax bases according to the Corporate Income Tax Law and the Accounting Law tends to lead accountants not to focus on the nature of the transaction and follow the tax law to reduce workload and occupational risks.

Secondly, in terms of inspection and supervision: Current accounting legal document system in Vietnam does not have any mandatory regulations requiring enterprises to strictly implement accounting estimates for provisions and contingent liabilities. All documents only provide guidelines and encourage enterprises to apply regulations to ensure more accurate accounting information, but there are no documents that regulate penalties if the enterprise does not comply with the regulations. The inspection and supervision of the State's provisions and contingent liabilities have not been given sufficient attention to timely adjust arising issues to ensure more accurate accounting information on the financial statements. Therefore, many enterprises often overlook or allocate provisions insufficiently.

Thirdly, in terms of accountants: Their capacity of the accounting staff in many places is still weak, and they do not understand regulations related to provisions and contingent liabilities. They do not understand the nature and method of making provisions, leading to a lack of knowledge of how to apply the provisions or applying machinery, affecting the information on financial statements. Furthermore, services supporting accounting estimates such as financial consulting and asset valuation are not widely applied in practice. On the other hand, the awareness of the management department in the enterprise is still limited, and they do not understand the importance of making provisions and contingent liabilities, so its required for accountants to present accounting estimates on financial statements are not high.

Fourth, in terms of the actual situation at the enterprise: Each enterprise operating in different fields with different sizes has different business characteristics, so the application of common accounting policies for all businesses is impossible. In fact, provisions at each enterprise have their own characteristics and methods of calculation, but the majority of enterprises have not developed a separate policy system on regulating each provision at the enterprise.

Fifth, the subjective purpose of businesses: The purpose is to adjust the information on the financial statements to be more beautiful and to avoid losses. Especially for joint stock companies, the prestige and trust of shareholders play a very important role in attracting investment capital. Therefore, the financial statements of the enterprise need to show the good business situation of the enterprise. From there, it helps businesses affirm their position and easily attract investment capital from shareholders.

4.2. Solutions to improve the identification, recognition and presentation of accounting estimates on financial statements in Vietnam.

Starting from the limitations that businesses encounter in identifying, recording, and presenting accounting estimates on financial statements, the author proposes some solutions to improve the process as follows:

4.2.1. For businesses

Businesses are responsible for directly applying and implementing accounting for provisions and contingent liabilities. To improve the identification, recognition, and presentation of provisions on financial statements, businesses need to:

- Organize accounting work in accordance with specific conditions in the business as prescribed by the Accounting Law.
- Have professional accountants with qualifications commensurate with their responsibilities. Create favorable conditions for accounting staff to have the opportunity to learn, improve professional qualifications by regularly organizing training sessions to enhance the skills of accounting staff.

- Improve awareness of the relationship between accounting standards, accounting regimes, financial policies, and tax policies, thereby proactively selecting methods to determine provisions and contingent liabilities suitable for the characteristics and actual conditions of each business, with the most important of which is to raise awareness of business managements.

- Flexibly apply accounting standards and regimes in accordance with the actual conditions of the business to ensure reliable estimates of provisions and contingent liabilities, and improve the efficiency of the business's accounting.

- For some specific industries, businesses need to flexibly apply legal regulations of each industry, presenting the characteristics of their industry products on the Notes to the Financial Statements, such as making provisions for devaluation of stocks for expired medicinal products of the medical industry.

- It is necessary to have a risk identification department in various fields such as financial risks, technical risks, etc. After identifying all the risks, effective risk management measures must be taken.

- Create conditions for equipment and infrastructure to help accountants improve their ability to receive, process, control, and provide information.

- Construct the accounting model suitable to the characteristics and management requirements of their businesses.

4.2.2. For the State

i) The Ministry of Finance

- The Ministry of Finance needs to continue developing the accounting system, and regulations related to accounting in general, and accounting for provisions and contingent liabilities in particular. Also, the ministry needs to review the relevant legal documents to ensure consistency among these documents, especially circulars guiding accounting standards and regimes. The Ministry of Finance also needs to supplement the missing contents, amend the contents that are not suitable with reality on the basis of reference to international experience, especially countries which have many similar economic developments with Vietnam.

- For circulars, it is necessary to provide specific regulations to avoid the situation of providing general regulations, which are difficult for businesses to apply.

- Research and issue new accounting standards to improve the legal framework for accounting in Vietnam, such as accounting standards for financial instruments, fair value standards, etc.

- Continue to specify the regulations of accounting standards, specifically instructing methods for determining accounting estimates to serve the accounting of provisions and contingent liabilities.

ii) Tax authorities:

- It is necessary to enhance the accounting skills of tax officials, avoid the situation where tax officials do not thoroughly study the guidance in accounting standards, and do not update the latest regulations and rules on accounting, leading to inconsistency between businesses and tax authorities.

iii) Accounting and Auditing Professional Association:

This is a professional organization with an important role in auditing, control, training and improving the quality of accountants, providing accounting services, etc. Therefore, the state needs to have specific policies to develop the Accounting and Auditing Professional Association. For the Accounting and Auditing Professional Association, there should be measures to develop the profession such as:

- Encouraging and motivating accountants at enterprises to participate in the Vietnam Association of Accountants.

- Creating conditions for accountants to join in the association's activities.

- Regularly providing guidance and inspecting enterprises in implementing current accounting regimes.

- Advising the Ministry of Finance in drafting accounting standards as well as guidance circulars.
- Cooperating with the tax authorities to regularly provide training courses on specialized professional skills for tax officials and chief accountants of domestic enterprises.

5. CONCLUSION

Vietnam's economy is in the process of transformation and integration with the regional and world economy, bringing development opportunities for all industries and businesses, but also bringing challenges and risks that force the economy to grow. Businesses must adapt to survive. In production and business activities, there are always potential risks and risks, so businesses need to pay attention to setting up provisions.

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RESEARCH ON THE PROCESS OF RISK ASSESSMENT IN AUDIT OF FINANCIAL STATEMENTS IMPLEMENTED BY EXTERNAL AUDIT FIRM

**Author: Nguyen Thuy Thanh¹, Le Quynh Anh², Nghiem Thi Van Anh², Do Thi Thuy Van²
Mentor: Ph. D Dang Thi Huong³**

ABSTRACT: *During the audit process, auditing risk assessment is an extremely important step, helping audit firm develop plans and implement audit in a reasonable and effective manner. The authors conducted a survey from the auditors of 30 external auditing companies about the risk assessment process through three stages of the audit of financial statements. The research results show that in practice, the problem of research still has numerous inherent disadvantages, inadequate issues for external auditors and external audit companies in Vietnam in general. The study also presented several specific and detailed solutions, recommendations to contribute and complete the issues that still have inadequacies under the group's general reviews and discussions on the research.*

Keyword: *risk assessment process, audit of financial statement, external audit*

1. INTRODUCTION

The process of formation and development of auditing activities has become an indispensable requirement for economic activities. The economy is more and more growing, the more diverse and more complex economic transactions, the possibility of information on the financial statements can also be less reliable, easily leading to serious consequences for users to use information in making economic decisions. Therefore, the financial statements audit, which is performed by external audit, is considered as a measure to ensure the transparency and fairness of the market economy, especially the countries have economy which are in transformation process as Vietnam. The auditors come from the identification and assessment of the risks of the companies to formulate the audit plan and select audit procedures to implement the audit appropriately and effectively. Therefore, in the audit, in order to contribute to giving an opinion at reasonable level for the reliability of the financial statements and achieving the effectiveness of the audit, auditors and auditing companies have continuously enhance, improve the necessary skills for audit risk assessment process. Currently, risk-based audit approach is popularly applied and prescribed in international and Vietnamese reporting standards. However although the process of the financial statements risk assessment in Vietnam has progressed and has many similarities with the international risk assessment process, it has not yet been completed and exists a number of limitations, because this is a challenging work and requires the high level of auditor's judgement.

The objective of the study is to make contribution to completing the audit risk assessment process in the audit of financial statements through the interview, collecting surveys from the auditors of external audit firm in Vietnam, based on the basic theoretical system of the risk assessment research process. Since then, analyzing and assessing the situation of research and proposing several solutions to complete the risk assessment process in the audit of the financial statements performed by external audit of Vietnam in accordance with the current economic context based on the current economic context based on the basis of reality has shown.

¹ Academy of Finance - CQ58/22.01CL - nguyenthuythanh2002@gmail.com.

² Academy of Finance- CQ58/22.01CL

³ Academy of Finance.

2. THEORETICAL FRAMEWORK.

According to VSA 315, identifying and assessing risks has material misstatement through knowledge of the audited companies and environment of business of them, the goal of the auditors and audit firm is to identify and evaluate risks which have material misstatement due to fraud or errors at the level of financial statements and the level of assertions, through knowledge of the unit audited and the environment of the unit, including internal control, thereby providing the basis for the design and implementation of handling measures to risks with material misstatements that have been evaluated.

Audit risk is a function of financial statement risk (the risk that the financial statements are materially misstated), and detection risk (the risk that the auditor will not detect such misstatements). Audit risk is the risk of that auditor giving inappropriate audit opinions when the financial statements still contain material misstatements. Audit risk includes risks of material misstatement (including potential risks, control risks) and detection risks.

Inherent risks: According to VSA 200: “Inherent risks are the ability of assertion of a group of transactions, account balance or disclosure information that can contain material misstatements, before considering any relevant control”. Thus, auditors do not create or control potential risks, auditors can rely on a lot of different sources of information such as the financial statements of the previous years, or the audit results in previous years, ... The level assessment of inherent risk will depend on the judgment of the auditor about the influence of the factors that make up the inherent risk.

Control risk: According to VSA 200: “It is a risk of material misstatement, when considering individual or aggregated, for the assertion of a group of transactions, account balance or disclosure information that the internal control of the audited companies can not prevent or detect and repair promptly”. This is a type of risk related to the weakness of the internal control system of companies, which is estimated by the auditors to the higher level of errors than the acceptable level. The same as inherent risk, auditor can not interfere with the control risk but can only give assessments of their influence on the financial statements, thereby clearly identifying the content, scope, procedures of test of control. Therefore, auditors need to understand the unit’s internal control to be able to identify the weaknesses and accurately assess the level of control risk to propose recommendation, suitable advice for businesses.

Detection risk: According to VSA 200: “It is a risk that during the audit process, the procedures that auditors implemented to reduce audit risk to the low level can be accepted but still can not detect all the material misstatements when considering individual or aggregate”. Since then, we can understand the risk of detection is a combination of the effectiveness of audit procedures and the implementation of those procedures. This risk will exist when auditors apply audit procedures but do not detect all material misstatement in the financial statements. The risk of detection will be related to the procedures of the KTV and can change according to the judgment of the auditors.

The risk assessment process in the audit of the financial statements is made by external audit: According to VSA 315, the audit risk assessment is whether the auditor and the audit firm confirm that the level of audit risk may occur high or low, including the assessment of inherent risk, control risk and detection risk. The combination of inherent risks and control risks is also called risk that may have material misstatements. Therefore, audit risk assessment is also understood as identifying or adjusting the risks with material misstatements and the detection risk. The audit risk assessment process is carried out before planning and is adjusted appropriately throughout the stages of the audit.

Any audit has inherent limitations that lead to the ability to give inappropriate opinion about financial statements by auditors. In addition, the transactions arising in businesses are increasingly complicated, causing audit risk to increase, especially when businesses deliberately cheated. Meanwhile, auditors cannot check all but can only choose the sample of those transactions. Therefore, risk assessment helps auditors and the auditing company identify high-risk balances and transactions, thereby determining the key audit goals, choosing an effective approach and audit procedures and effective. That role is shown in detail in each stage of the audit:

Stage of audit planning: risk assessment helps auditors agree or refuse to provide audit services for customers, limit the scope of the audit work to the necessary level to save time and cost. but still ensure the quality of the audit process; Determine the item containing high risks from which to concentrate resources to achieve the audit goals.

Stage of audit implementation: risk assessment at the planning stage is the basis for the audit to achieve the best goal. The risk assessment in the implementation phase includes the corresponding audit tests that help the auditor to ensure reasonably that the violations have not been missed and are detected. When performing detailed test procedures, the auditor should adjust the sample size based on the auditor's assessment of the effectiveness and efficiency of the internal control system. Based on the general ledger and detailed books of the enterprise, the auditor needs to identify unusual transactions, transactions with large amounts of money, transactions occurring at the beginning and the end of the accounting period to check, they could check 100% of the above operations. As for the routine, repetitive or routine transactions, the auditor needs to conduct sampling. To increase the quality and efficiency of statistical sampling, auditors should apply information technology to assist. Based on the audit plan summary, the auditor can identify items that contain high risks to allocate time and personnel accordingly. During the period of performing the audit of financial statements, the auditor should perform substantive tests to examine the review with an expanded scope, such as considering events occurring after the balance sheet date, considering the possibility of business going concern, review related party transactions, etc.

Stage of reporting: risk assessment is the basis for reviewing the audit records and the work has been completed, thereby ensuring the quality of audit activities. The risk assessment has material misstatement in the audit of the financial statements of the auditor is a repetitive process with both new and old customers. The risk assessment process of auditors will be conducted during the audit process. The audit team leader needs to review all records and documents of team members to ensure that the members have fully performed the work steps as prescribed and that the opinions given by the members are reasonable. After that, the audit team leader makes a summary of the audit results, which is the basis for the auditor to prepare the adjusted financial statements, and give an audit opinion on the financial statements and management letters. The procedure for analyzing the overall financial statements after adjustment is an important procedure at this stage. This is a procedure that helps the auditor to assess the true and fair of the adjusted financial statements, whether pre-audit differences have been satisfactorily explained and whether there are any unusual fluctuations. perform additional audit procedures if necessary to provide a basis for the audit opinion. In this stage, the auditor needs to reassess the risk and redefine materiality to see if it is necessary to change back to the original materiality level, as well as issues related to the independence and professional ethics of the auditors. Then the auditor obtains a written statement from management and completes the audit opinion.

3. RESEARCH METHOD

About the data collection method: The study conducted a survey of the opinions of 30 businesses through a direct survey. Surveys are sent through public gmail of businesses. Data collection period is from December 2022 to March 2023. The questionnaire is in the form of multiple-choice questions, including 20 questions about risk assessment, corresponding to the 3 stages of the audit, namely planning, performing, and reporting.

About data analysis methods: The study uses descriptive statistical analysis, with the help of Excel, for the purpose of analyzing the contents related to the risk assessment process in the audit of financial statements performed by independent auditors presently.

Table 1. Summary of survey results on risk assessment process in financial statement audits performed by external auditors.

Stage		Content	Percentage of companies implementing	
Planning	Preparation	1. New customers allow companies to contact their predecessors to learn about the integrity of business managers	90%	
		2. Get to know the client to assess the contract risk before accepting the audit	100%	
		3. Assess the resources of companies to perform audit work appropriately or have sufficient skills and specialized knowledge to avoid risks during the audit	100%	
		4. Consider each specific client to come up with a suitable audit team	100%	
		5. Consult an expert to determine the risk	66,7%	
	Planning	Planning	6. Understanding the audited entity and the operating environment of the audited entity of the external audit	100%
			7. Searching the third party when understanding the entity and its operating environment	100%
			8. Preliminary understanding of the internal control system of the external audit	100%
			9. Procedures for preliminary analysis of financial statements of independent auditors	100%
			10. Find out about the accounting policy and business cycle of the audited entity by the external auditing company	100%
			11. The risk assessment has material misstatement at the level of the financial statements of the external audit firm	86,68%
			12. The risk assessment has material misstatement at the independent audit firm's database level	63,37%
			13. Using criteria to determine the overall materiality for the entire financial statements: - Total revenue - Total assets - Total profit before tax - Total cost - Total equity	43,29% 33,3% 16,65% 6,66% 0,1%
			14. Assess materiality by examining groups of transactions, account balances and disclosures of customers	100%
			15. Carry out the sampling procedure according to 2 methods of statistical and non-statistical sampling	100%
Performing	16. Evaluation of the focus on procedures for risk assessment of the external audit firm: - Estimated analysis - Ratio analysis - Trend analysis	100%		
		50%		
		50%		
	16a. The situation is based on the following factors to analyze the trends of the external audit firm: - Compare with other enterprises of the same size, territory, industry and the same type of production and business - Compare the actual unit with the industry average or the expected data of the auditor - Compare the actual figures of this period with the previous period - Compare reality with the norm plan, forecast	60%		
		0%		
		60%		
		40%		
16b. The situation focuses on the analysis of ratios; the ratio of Liabilities/Equity; long-term debt/equity ratio; inventory turnover ratio	100%			
16c. Evaluate and collect sources of business accounting information in different departments to serve for estimation analysis	63,37%			
Reporting	17. Test of controls in an audit of financial statements	100%		
	18. Consider adjusting the sample size based on their assessment of the effectiveness and efficiency of the audited entity's internal control system	100%		
Reporting	19. Re-assess risk and re-define materiality to consider a change in original materiality	66,7%		
	20. Audit team leader reviews all records and documents of team members	100%		

The survey results collected 50% survey votes out of 30 survey votes which were sent to the external audit firm. The survey data characteristics are presented in Table 1. In which, there are 15 questions about risk assessment in the planning stage (including 5 questions about the preparation stage); 3 questions about the performing stage and 2 questions about the reporting stage. From the survey results, we can make comments and solutions to improve the risk assessment process in the financial statements audit conducted by the external auditors of Vietnam in accordance with the current economic context.

4. RESULT AND DISCUSSION

4.1. Achievement

The audit process of financial statements in Vietnamese auditing firms is based on International Standards on Auditing (ISA) combined with Vietnamese Standards on Auditing (VSA) when performed in Vietnam. Questionnaires are designed to evaluate the accounting system and internal control system of audited entities. The audit work is conducted by experienced and qualified personnel, often the audit team leader, audit department head or company director for larger entities. The audit work is carried out by a team of young, dynamic, and highly qualified professionals from reputable universities. Vietnamese auditing firms always provide opportunities for internships to students to enhance their practical skills and knowledge. The results of the audit work are clearly documented in the audit file to support the auditor's opinion. The audit work is flexible, providing reliable advisory opinions for clients and serving the audit planning for the entire financial statement and specific account balances. Vietnamese auditing firms always update and disseminate new standards, regulations, and decrees to auditors to facilitate their updates of knowledge and skills for completing their work.

4.2. Limitations

In addition to the advantages mentioned above, the risk assessment process in independent financial statement audits in Vietnam still has the following limitations:

In the planning stage of the audit, audit firms often use common templates and questionnaires to assess risks, which leads to standardization in the audit process. However, each type of business has its own complexity and specific characteristics, which limits the flexibility of auditors and results in incomplete understanding and confirmation, affecting the quality of the audit. It is necessary to improve the auditing process and develop auditing procedures and methods for each type of business to address this issue. However, surveying and collecting information to assess risks still faces many difficulties due to the high level of judgment required by auditors and the massive workload. Assigning risk assessment tasks to senior auditors and neglecting audit assistants results in a lack of comprehensive knowledge about clients and risks when performing audit procedures. Auditors perform initial control risk assessments for each economic transaction objective of each business type. If the control risk is assessed as low or medium, the auditor needs to design control testing to confirm the initial assessment of the internal control system and reduce audit costs. However, there are cases where companies have not fully researched the details of their internal control system, affecting the accuracy and effectiveness of the system. Independent audit companies may investigate the internal control of clients, but have not yet provided specific criteria for evaluation, leading to scattered work, and affecting the quality and effectiveness of the audit. Tools such as flowcharts, questionnaires, and tables will help auditors have an overview of the internal control of audited businesses, but some audit firms do not use flowcharts because they find them difficult to use. Not using these tools will make it difficult to provide feedback and identify additional audit procedures, increasing the cost and time pressure for auditors.

In the performing stage of the audit, the execution of audit procedures and balance confirmations is sometimes not clearly defined, leading to many audit firms not performing basic procedures such as physical inventory counts, sending confirmation letters, and not evaluating the entity's ability to continue

as a going concern. Many audit procedures are also not documented as audit evidence. The audit work often focuses on verifying accounting transactions rather than performing auditing procedures. In addition, some auditors rely on the report figures provided by the audited companies instead of verifying the opening balances according to Auditing standard 510- Opening balances, and actual fieldwork is not fully performed, resulting in confirmation of inappropriate information, or issuing limited scope audit reports that impact the operations of the audited companies.

In fact, the auditing process is often disorganized and does not fully comply with auditing standards in the reporting stage of the audit. The detailed inspection procedures are not clear, some auditing firms do not perform basic procedures, and the preservation and organization of auditing documents is not up to standard. The preparation of audit reports and expressing opinions also does not comply with the regulations in auditing standards. Regarding auditing at companies, there is a great deal of work pressure, and many companies only compile results without evaluating existing risks. This leads to the risk of misconduct during the audit process and affects the overall quality and effectiveness of the entire auditing process.

4.3. Reasons of limitations

From the limitations mentioned above, the authors identify some specific causes as follows:

The storage and arrangement of audit documents not complying with auditing standards, violating regulations and professional ethics, along with the lack of professional competence and experience, increases the risk of errors during the auditing process, causing material losses and damage to the reputation of the audited entities.

Auditors face many issues due to the lack of professional competence, experience, and incomplete training. This directly affects the quality and reputation of the auditing industry. At the same time, audit organizations also lack flexibility in designing and applying audit procedures, without distinguishing between the types of audited entities. The use of audit methods and techniques also needs to be adjusted for each specific case.

Due to being a new profession in society, the State Audit Law has just been established, so not every organization or individual has a full understanding of this profession. Misunderstanding the nature, functions, and duties of auditors leads to loss and unproductive cooperation, delayed provision of information and documents. Many units are afraid of being detected for fraudulent management, operation, and use of common funds and assets, leading to uncooperative attitudes towards auditing activities. Internal disunity within the audited unit is also a cause of using audit results as a means of accusing and attacking each other.

In addition, some other causes of errors in auditing activities can be mentioned, such as: the existence of risks in the business sector, high pressure on time and quality, improper interference, inadequate and infrequent quality control activities, new auditing activities that have not been widely disseminated and valued, auditor training that is mostly theoretical and difficult to apply in practice.

Although the risk assessment process for independent audit firms in Vietnam has many advantages, there are also limitations that have not yet been overcome. This makes the gap between independent audit firms in Vietnam and those in the world still quite significant. In order to narrow the gap, the authors propose some suggestions to improve the risk assessment process in financial statement audit performed by independent auditors as follows:

5. CONCLUSION AND RECOMMENDATIONS

Although the risk assessment process for independent audit firms in Vietnam has many achievements, there are also limitations that have not yet been overcome such as a lack of comprehensive knowledge about clients and risks, disorganized the audit procedures, the deficiency of auditor in performing audit procedures... This makes the gap between external audit firms in Vietnam and those in the world still quite significant, and

also the quality of the audit. To narrow the gap, the authors propose some suggestions to improve the risk assessment process in financial statement audit performed by independent auditors as follows:

During the audit planning phase, it is necessary to have solutions to ensure the quality of the audit process. First and foremost, auditors need to pay attention to the quality of the contract risk assessment results and avoid situations that could negatively affect themselves and the auditing firm. Auditors also need to design and develop templates and questionnaires to serve the risk assessment process for each type of business to improve their understanding of the audited business as well as the quality of the audit.

Experienced members need to actively participate in the audit planning process to ensure effectiveness in evaluating audit risks. The participation of audit assistants is necessary to ensure a full understanding of the auditing process. In addition, auditors need to perform risk assessments on each transaction for each database, especially in assessing potential risks and control risks to design an effective audit program. Focusing on assessing potential risks on asset items, expenses, and accounts receivable, revenue will save time in the auditing process.

Regarding solutions in the audit implementation phase, completing risk management measures should be fully implemented to avoid errors in the database and financial reporting. Adjusting audit procedures after assessing risk will improve audit efficiency, adhering to standards and conducting control tests to collect appropriate audit evidence. Basic testing should be performed for each transaction group, as well as accounting lock-in processes, financial reporting adjustments, and confirmation with related parties.

Developing analytical techniques to assess risks is crucial. Audit firms need to establish detailed analysis procedures to assist auditors in assessing the overall financial condition of clients and applying appropriate auditing techniques to improve the quality of the audit. Audit firms should use trend analysis, ratio analysis, and estimation procedures to determine the scope and content of the audit.

In the final stage of auditing, to make appropriate adjusting entries, the auditor needs to evaluate the impact of the identified errors and summarize the adjusting entries based on the materiality of each account. The audit firm should require the reviewer to assess the materiality of the errors and improve the quality control system to establish an effective quality control system. This system includes policies and procedures regarding the responsibility of the board of directors for quality, standards, and ethical regulations, customer relations, human resources, contract execution, and monitoring.

Meanwhile, due to time constraints, the auditor should pay attention to obtaining explanations from the management, writing management letters, compiling and adjusting working papers, assessing the company's ability to continue as a going concern, and the significant accounting estimates. They should analyze and evaluate the quality of the audit, exchange information with the audit committee, and review events and procedures that were omitted after preparing the audit report.

Furthermore, storing and preserving audit records in accordance with Auditing standard 230 on Audit Documentation will make it easier to review the records in subsequent years, ensuring that the quality of the audits is improved.

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BARRIERS OF APPLYING IFRS IN VIETNAMESE ENTERPRISE

**Author: Nguyen Thi Minh Ngoc¹, Gian Thi Le Na², Le Thi Thuy Duong²
Mentor: Ms. Le Thi Yen Oanh³**

ABSTRACT: *The purpose of this study is to point out the difficulties and challenges when applying financial reporting standards, thereby proposing solutions to effectively apply Vietnamese financial reporting standards. In the context of economic integration and globalization, the application of IFRS is necessary in Vietnam. Through the synthesis of results of domestic and foreign studies on the application of IFRS as well as a number of specific factors affecting the application of IFRS discovered in studies such as: political environment, legal, Type of enterprises, Business sectors, Mandatory application of IFRS, Obstacles of IFRS application, Motivation to IFRS application, etc.*

The study used linear regression to test the hypothesis relationships established in the study. The research is carried out as follows: (1) First, we study 120 different companies to understand the industry, business areas, difficulties when applying IFRS; evaluate the motivation and readiness to apply IFRS of enterprises in the period before applying. (2) We use the SPSS linear regression method to evaluate the application of IFRS, determine and measure the influence of factors on the application of IFRS in Vietnam.

Keywords: *IFRS, VAS, Enterprises, Financial Statement, Accounting.*

1. INTRODUCTION

IFRS (International Financial Reporting Standards) consists of accounting standards issued by the International Accounting Standards Board (IASB) with the objective of setting general rules for the preparation of uniform financial statements, transparent and comparable worldwide, creating consistency and reliability from company to company, country to country. From there, it is possible to save the cost of converting financial statements for companies and enterprises with branches in many countries; helping all businesses, organizations, investors, auditors and accountants in the world can understand, use and have an overview of corporate and organizational finance.

According to the International Financial Accounting Standards Committee survey (IASB), out of 166 countries and territories 144 countries and territories have declared the request to apply IFRS to all or most companies, 12 countries and territories allow all or most companies to use IFRS, 09 countries and territories that have their own accounting standards or are switch to IFRS, 01 required country and territory IFRS application for financial institutions (IFRS Foundation, 2018). Vietnam is one of the few countries that has not yet fully applied IFRS, mainly applying Vietnamese Accounting Standards (VAS) to the preparation and presentation of financial statements. However, the application of VAS has increasingly revealed many limitations, some of which are not suitable for transactions of the market economy in the new period, especially in the context of strong development of the capital market, many types of complex financial instruments.

Along with that, in the past years, there have been many studies on the method of applying IFRS, the factors affecting the applicability of IFRS of Vietnam, thereby pointing out the advantages and barriers when applying IFRS in Vietnam. This is an opportunity for businesses to step into the world market, take

¹ Academy of Finance, CQ58/22.06 (email: ntmngocmit@gmail.com)

² Academy of Finance, CQ58/22.06

³ Academy of Finance.

advantage of the benefits gained from foreign investment, increase high profitability and avoid economic risks. Therefore, the application of IFRS is very important in Vietnam

Then, we decided to research this topic: “The barriers of applying IFRS in Vietnamese enterprises”. By collecting data from questionnaires, analyzing data from SPSS software, the article is done with the following contents: (1) The current situation of applying IFRS in Vietnamese enterprises, and overcoming the problems difficulties and challenges when applying IFRS, (2) Identifying and Measuring factors affecting the application of IFRS in Vietnam based on survey and theory (3) Proposing solutions.

2. THEORETICAL FRAMEWORK

2.1. Theory 1

Financial statement provides important information about a company’s financial position, performance, and changes in financial position that are useful to a wide range of users in making economic decisions. Positive accounting theory (PAT) explains that managers have incentives to influence revenues using various accounting decisions, and there are three theories behind earnings management: the bonus plan hypothesis, the debt hypothesis, and the political cost hypothesis. The authors developed a model of research variables based on the previous studies to investigate these issues.

2.2. Theory 2

The authors have set up 5 research hypotheses on the factors affecting the Level of IFRS application of enterprises in Vietnam.

A Deloitte survey in December 2020 on the readiness of enterprises to apply IFRS in Vietnam found that enterprises with foreign investment capital had the highest level of interest in IFRS application at 34%, followed by listed companies at 20%, and large-scale public companies and state-owned economic groups at 14% and 7% respectively. Hence, the first hypothesis formulated is that: X1 There is a significant correlation between the type of enterprise and the level of IFRS application.

According to Unerman and Bennett (2004) and Broberg et al. (2010), manufacturing companies disclose more voluntary information than healthcare and telecommunications companies in Sweden. Hence, study focused on the trend of voluntary adoption of IFRS among different groups of industries. From the above arguments, the hypothesis is that: X2 There is a significant correlation between business sectors and the level of IFRS application.

There are several enterprises applying IFRS due to the financial obligations, such as FDI enterprises have to send IFRS Financial Statements to its parent company. The authors understand that the higher the level of mandatory application of IFRS in Vietnamese enterprises is, the higher the level of applying IFRS in Vietnam. The hypothesis is given that: X3 Mandatory application of IFRS is positively correlated with Level of IFRS application

The adoption of IFRS by companies in Ethiopia analyzed by Simegn (2015) shows that lack of financial reporting guidance, difficulty in training, and inadequate information systems were found to be obstacles in applying IFRS. Environmental factors such as education level and the legal system also had a significant impact. Hence, the hypothesis is that: X4 Obstacles of IFRS application are negatively correlated with the level of IFRS application, which is relevant to Vietnam’s adoption of IFRS.

Finally, in accordance with Lambert (2007), the transparency helps to reduce the market estimated risks and capital cost, as well as promote the development of the financial market. Also, the adoption of IFRS is seen as a mechanism for reducing information asymmetry and enhancing the quality and comparability of financial reporting. Therefore, the authors conducted surveys to determine the motivations of Vietnamese enterprises for adopting IFRS and hypothesized that higher motivation would result in a higher level of adoption. the hypothesis is given that: X5 Motivation to IFRS application is positively correlated with Level of IFRS application.

3. RESEARCH METHOD

In this section, we evaluate and measure the factors affecting the application of IFRS in Vietnam. We had sent the survey questions to 200 businesses, and total of 120 responses were collected.

The baseline analysis was first performed to screen the sample, to eliminate observations that were too large, too small, or too different from the sample size. This basic analysis step helps to check the suitability of the sample before performing regression analysis OLS, One-way ANOVA, Independent T-Test to ensure the reliability of quantitative research results. Specifically, the author group conduct statistical description analysis, correlation analysis to eliminate multi-collinear phenomena between independent variables. After selecting the appropriate method to run the model, the author examines the variance, multicollinearity, autocorrelation, endogeneity of the model.

The study employs a quantitative research method using econometric models to analyze the factors affecting the level of applying IFRS in Vietnam. The method of analysis and comparison is used to compare the impact of different factors and point out the reasons for their increase or decrease. The combination of analysis and comparison methods helps to explain the different impacts of these factors on the level of applying IFRS in Vietnamese enterprises. Finally, a summary method is used to summarize the impacts and relationships of all factors to the level of applying IFRS in Vietnam, leading to conclusions and recommendations for companies to adopt IFRS in their operations.

4. RESEARCH METHOD

4.1. Research Variables

4.1.1. *Level of IFRS application of enterprises in Vietnam (APDUNGIFRS)*

The level of IFRS application of enterprise refers to the preparation and the presentation of their financial statements in accordance with IFRS. The authors use regression analysis – a statistical method that can be used to estimate the relationship between the dependent variable, which is the level of IFRS application by enterprises. In the case of the dependent variable, we can use an ordinal scale to measure the level of IFRS application on a scale of 0-3. . The authors ranked the level of IFRS application on a scale: The higher the level of IFRS application, the higher the score, which is as follows: No application of IFRS (0), Currently in the preparation of IFRS application (1), Application of conversion IFRS accounting entries (2), Full application of IFRS (3)

4.1.2. *Type of enterprises*

Accordingly, each type of enterprise has its own form of system building and development according to the provisions of law. Each of these categories is distinct and there is no inherent order or ranking among them. Hence, in order to measure the independent variable, the authors use a nominal scale (categorical scale) by simply ask survey respondents or collect data from company reports to indicate the type of enterprise. We can then code the responses as: Foreign invested company (LH1), Large unlisted public companies (LH2), Unlisted state company (LH3), Joint stock companies (LH4), Other types of enterprises. The variable only has types 1-2-3-4. Choosing 1 is coded as 1 and not choosing is coded as 0 (for Other types, all four columns are coded as 0)

4.1.3. *Business sectors*

There are multiple ways to classify businesses by sector. The authors use a nominal scale to measure the independent variable, which categorizes different sectors of enterprises without any inherent ranking. We can then code the responses as: Retail and Distribution (NGANH1), Manufacture (NGANH2), Transportation – Hotel – Tourism (NGANH3), Information Technology (NGANH4), Finance services (NGANH5). The variable has industries 1-2-3-4-5. Choosing 1 is coded as 1 and not choosing is coded as

0 (for Architecture – Construction companies, all five columns are coded as 0).

4.1.4. Mandatory application of IFRS

There are several enterprises applying IFRS due to the financial obligations. We can then code the responses as: No (0), Yes (1). The score increases as the level of IFRS application becomes higher. The authors code: The entity mandatorily applies IFRS (BB)

4.1.5. Obstacles of IFRS application

According to the authors' survey, these obstacles mainly come from:

Regimes and policies related to the preparation and presentation of financial statements (KK1): Enterprises in Vietnam face several challenges in adopting International Financial Reporting Standards (IFRS). These include incomplete policies and legal frameworks, leading to a lack of a legal basis for preparing financial statements, as well as complicated techniques for determining loss of assets and goodwill. The tax authorities' unfamiliarity with IFRS also leads to differences between taxable income and accounting profit, causing controversy. The cost of monitoring, compiling, and guiding the application of new IFRS standards is also a significant challenge, particularly when the accounting team has limited proficiency in the English language. Moreover, the co-existence of Vietnamese Accounting Standards (VAS), State Bank of Vietnam regulations, and Ministry of Finance regulations requiring IFRS adoption leads to additional difficulties for enterprises.

Capital markets and financial markets (KK2): IFRS requires presenting Financial Statements items at fair value based on the market economy. For this, a functioning market is required to provide reliable financial figures. IFRS aims to reflect transactions of developed economies with complex financial instruments, which are not common in Vietnam, causing certain shortcomings in the short term, especially for banks, securities, and insurance. Lack of information to determine fair value may lead to information errors in Financial Statements or fail to accurately reflect the Financial Position of entities.

Human Resources (KK3): The lack of systematic training on IFRS and shortage of knowledgeable lecturers in universities have resulted in a weak and insufficiently skilled accounting workforce in Vietnam. Applying fair value, asset impairment valuation, and other techniques require accounting judgments and estimates, which are challenging due to the lack of reliable financial parameters in the market. Expert support from assessors, practicing accountants, and auditors is necessary at the initial stage of IFRS adoption. Professional and technical skills are needed to apply IFRS, and the code of professional ethics of accounting is not always adhered to, which creates difficulties for enterprises. The lack of professional experts and qualifications is also a challenge for accounting and auditing.

Cost of investment in information technology system (KK4): Implementing IFRS requires significant investments in software systems to gather information required by the standards, which can cost millions of dollars for credit institutions and insurance companies. In addition, investing in IT infrastructure to support the transition to IFRS may be challenging for many enterprises in the short term.

Criteria for assessing financial position and operating results (KK5): Adopting IFRS can improve financial statement transparency, but the information may not always be positive compared to VAS. Implementation can be difficult if the board lacks ethical standards or refuses to disclose financial information. Some listed companies fear disclosing ineffective operations could harm their reputation, while some SOEs are reluctant to share information that could affect their ranking.

Each of these categories is distinct and there is no inherent order or ranking among them. Hence, in order to measure the independent variable, the authors use a nominal scale (categorical scale) as above.

4.1.6.. Motivation to IFRS application

The authors identified five motivations for IFRS adoption, and used a nominal scale to code them. The authors used dummy variables to analyze the impact of each motivation on IFRS application. The code is as follows: Attract foreign direct investment capital (MD1), Increase the transparency of information on Financial Statement (MD2), Mandatory regulations of the State (MD3), Competitive pressure (MD4), Sending IFRS reports to overseas parent company or foreign investors (MD5)

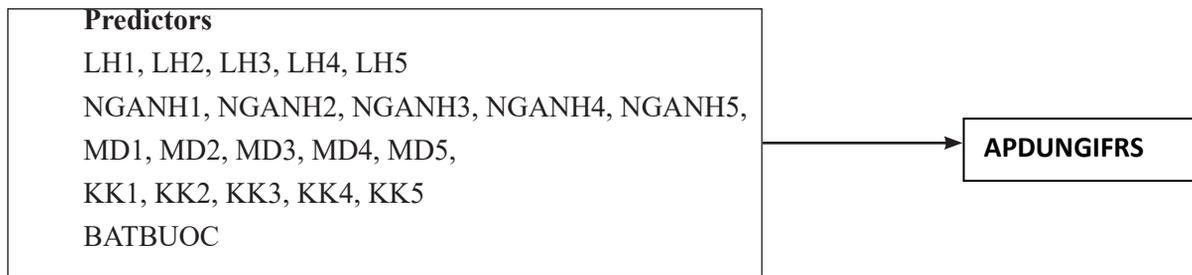
4.2. Research Model

The model can be expressed as below:

$$APDUNGIFRS = \alpha_1 LH1 + \alpha_2 LH2 + \alpha_3 LH3 + \alpha_4 LH4 + \alpha_5 LH5 + \alpha_6 NGANH1 + \alpha_7 NGANH2 + \alpha_8 NGANH3 + \alpha_9 NGANH4 + \alpha_{10} NGANH5 + \alpha_{11} MD1 + \alpha_{12} MD2 + \alpha_{13} MD3 + \alpha_{14} MD4 + \alpha_{15} MD5 + \alpha_{16} KK1 + \alpha_{17} KK2 + \alpha_{18} KK3 + \alpha_{19} KK4 + \alpha_{20} KK5 + \alpha_{21} BB + \alpha_{22} + \alpha_{21} BB + \alpha_{22}$$

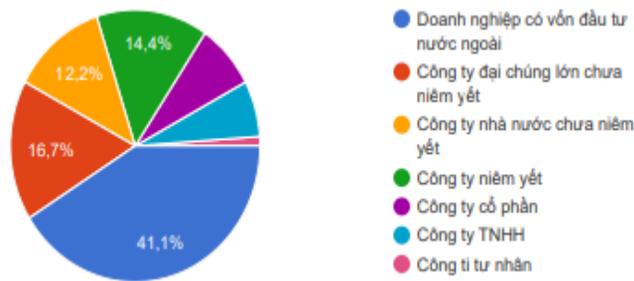
APDUNGIFRS is the value measuring IFRS application of enterprises in Vietnam, the authors took it as dependent variable in this paper. The higher the value of APDUNGIFRS is, the higher the level IFRS application of enterprises in Vietnam is.

Figure 1: Research model diagram



5. RESULTS AND DISCUSSION:

5.1. Results



To assess the current situation and application of IFRS in Vietnam, we conducted a survey of 90 enterprises of the following types: foreign-invested enterprises, enterprises listed on the stock market, unlisted enterprises. These businesses are in the fields of retail and distribution, manufacturing, transportation - hotel - tourism, information technology, financial and accounting service, etc.

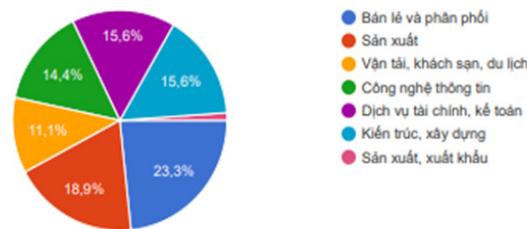


Figure 1.1: Sample description chart by type of business (n = 90) (Source: Author, year 2023)

Retail and distribution businesses account for the highest proportion (23.3%) of the surveyed enterprises, followed by manufacturing, architecture, construction, financial and accounting services, and information technology enterprises, with manufacturing and exporting sectors having the smallest proportion.

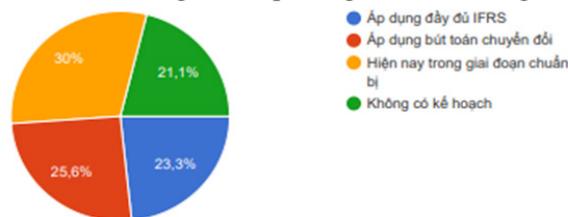


Figure 1.2: Sample description chart by business sector (n = 90) (Source: Author, year 2023)

The situation of applying IFRS in enterprises Application form IFRS

23.3% of enterprises currently apply full IFRS, and 25.6% have just implemented it. 30% of surveyed enterprises are in the preparation stage. The lowest proportion, 21.1%, have not planned to apply IFRS, possibly due to incompetent accounting staff or needing consulting services. The trend towards integration and internationalization is expected to increase the number of IFRS reports requiring auditing.

Figure 1.2: Sample description chart by business sector (n = 90) (Source: Author, year 2023)

Difficulties in applying IFRS to businesses

Among the businesses currently applying IFRS: Up to 75% of surveyed businesses believe that policies related to the preparation and presentation of financial statements when applying IFRS to businesses. Next is human resources (55.7%). Up to 44.3% of enterprises said that they faced difficulties in capital and financial markets; 33% of enterprises said that the indicators to assess the financial situation and business results are one of the difficulties for enterprises.

Motivation to IFRS application

According to a survey on the motivation to apply IFRS of enterprises: 73.3% want to increase the transparency of information on financial statements. There are 50% desire to directly attract foreign investment capital and increase competition, 20.9% apply for due date as required by the State regulations, apply the rate of 20.9% due to the submission of financial statements to the parent company.

4.2. Discussion:

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.863 ^a	.745	.673	.614	2.269
a. Predictors: (Constant), MD5, KK3, NGANH1, MD1, LH2, MD4, NGANH3, KK5, NGANH4, LH3, KK1, LH4, KK2, BATBUOC, MD2, NGANH2, KK4, MD3, NGANH5, LH1					
b. Dependent Variable: APDUNGIFRS					

R-squared (R²) is an important measure to evaluate the strength of a linear regression model. The R-squared result of this model is 0.745, which means that the independent variables used in the model have

the ability to explain 74.5% of the variation of the dependent variable. This shows that the model has a relatively good explanation for the variation of the dependent variable.

The model has an adjusted R-squared value of 0.673, indicating that 67.3% of the dependent variable's variation can be explained by the independent variables. The DW value of 2.269 suggests no significant autocorrelation between residuals, meaning the model can fit the assumptions of independence. A low degree of autocorrelation between residuals implies accurate prediction of the dependent variable based on the independent variables used. Overall, the model has a reasonably high adjusted R-squared value and low autocorrelation, indicating it can accurately predict the dependent variable based on the independent variables and fits the assumptions of independence.

Analysis of variance						
ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.248	20	3.912	10.384	.000 ^b
	Residual	26.752	71	.377		
	Total	105.000	91			

a. Dependent Variable: APDUNGIFRS
b. Predictors: (Constant), MD5, KK3, NGANH1, MD1, LH2, MD4, NGANH3, KK5, NGANH4, LH3, KK1, LH4, KK2, BATBUOC, MD2, NGANH2, KK4, MD3, NGANH5, LH1

The Regression section explains the variation of the dependent variable (APDUNGIFRS) using a set of independent variables (MD5, KK3, NGANH1, MD1, LH2, MD4, NGANH3, KK5, NGANH4, LH3, KK1, LH4, KK2, BATBUOC, MD2, NGANH2, KK4, MD3, NGANH5, LH1). The Sum of Squares for the Regression part is 78,248, the degrees of freedom (df) is 20, and the Mean Square is 3,912. The F value (F-statistic) is 10,384 and the Sig value. (p-value) is .000, showing that the Regression section explains the variation of the dependent variable significantly.

The model's Regression part is significant, with an F-statistic of 10,384 and a p-value of .000, showing that it explains the variation of the dependent variable more than the Residual part. This suggests the model is statistically significant and partially explains the variation of the dependent variable.

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.348	.309		1.126	.264		
	LH1	1.056	.233	.487	4.524	.000	.310	3.223
	LH2	.459	.244	.159	1.879	.064	.504	1.985
	LH3	-.008	.261	-.003	-.032	.975	.529	1.891
	LH4	.791	.273	.258	2.897	.005	.453	2.207
	NGANH1	.036	.233	.015	.156	.876	.403	2.483
	NGANH2	.191	.241	.071	.793	.430	.450	2.223
	NGANH3	.036	.279	.011	.130	.897	.542	1.846
	NGANH4	.303	.255	.099	1.190	.238	.520	1.923
	NGANH5	.115	.271	.039	.426	.672	.432	2.315
	BATBUOC	.520	.181	.235	2.865	.005	.534	1.874
	KK1	.201	.166	.083	1.208	.231	.767	1.303
	KK2	-.002	.155	-.001	-.013	.990	.698	1.434
	KK3	-.285	.169	-.132	-1.689	.096	.584	1.713
	KK4	-.593	.177	-.260	-3.351	.001	.596	1.678
	KK5	.173	.171	.075	1.012	.315	.648	1.543
	MD1	.604	.157	.282	3.854	.000	.669	1.495
	MD2	.155	.172	.067	.902	.370	.651	1.537
	MD3	-.199	.170	-.093	-1.173	.245	.570	1.754

	MD4	-.153	.179	-.059	-.857	.395	.755	1.325
	MD5	.510	.196	.200	2.607	.011	.608	1.644
Dependent Variable: APDUNGIFRS								

COMMENTS

The constant term has a coefficient of 0.348, which represents the predicted value of the dependent variable when all the independent variables are zero.

Among the LH-related variables (LH1 to LH4), LH1 has the highest normalization coefficient (0.487), which shows that it has the strongest relationship with the dependent variable among LH variables.

Among the variables related to NGANH (NGANH1 to NGANH5), none have significant normalization coefficients, since all of their t-values are relatively low and their p-values are insignificant.

BATBUOC has a positive coefficient (0.235) and a significant t value, showing that it has a positive and significant relationship with the dependent variable.

Among the variables related to KK (KK1 to KK5), only the variable KK4 has a significant normalization coefficient (beta=-0,260) that exhibits a negative relationship with the dependent variable.

MD1 has a relatively high normalization coefficient (0.282) and a significant t-value, indicating that it has a positive and significant relationship with the dependent variable. In addition, the VIF value for MD1 (1,495) is relatively low, indicating no significant multicollinearity problem.

The coefficients of MD2, MD3, MD4 and MD5 are relatively low and their t and p values suggest that they are not important predictors of the dependent variable.

SUMMARY

Overall, the results show that LH1, BATBUOC, KK4 and MD1 are the most important predictors of the dependent variable in the given model, while other variables may have less significant or negligible contributions. From this, we derive the following regression equation:

$$APDUNGIFRS = 0.348 + 1.056LH1 + 0.459LH2 - 0.008LH3 + 0.791LH4 + 0.036NGANH1 + 0.191NGANH2 + 0.036NGANH3 + 0.303NGANH4 + 0.115NGANH5 + 0.520BATBUOC + 0.201KK1 - 0.002KK2 - 0.285KK3 - 0.593KK4 + 0.173KK5 + 0.604MD1 + 0.155MD2 - 0.199MD3 - 0.153MD4 + 0.510MD5$$

In which, APDUNGIFRS is a dependent variable, LH1-LH4 is an independent variable on the type of business, NNGANH1-NGANH5 is an independent variable on business lines, BATBUOC is an independent variable on the mandatory use of standards. According to accounting standards, KK1-KK5 is an independent variable of difficulty in applying IFRS, and MD1-MD5 is an independent variable of purpose when applying IFRS.

ANOVA					
APDUNGIFRS					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.239	5	1.648	1.465	.210
Within Groups	96.761	86	1.125		
Total	105.000	91			

In the above ANOVA table, F-test value = 1.465 and p-value = 0.210 (or > 0.05) showed no significant difference between groups. This is supported by a Mean Square Between Groups value (1,648) which is not much higher than Mean Square Within Groups (1,125). Therefore, we cannot conclude that there is a significant difference between groups in the APDUNGIFRS variable. Therefore, there is no difference between businesses in different industries.

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
APDUNGIFRS	Based on Mean	1.830	4	87	.130
	Based on Median	.726	4	87	.576
	Based on Median and with adjusted df	.726	4	49.404	.578
	Based on trimmed mean	1.808	4	87	.134

The Levene Statistic values calculated based on different methods did not show significant differences in variance between groups, with p-values (Sig.) greater than 0.05. This indicates that there is not enough evidence to reject the hypothesis of homogeneity of variance between data groups.

ANOVA					
APDUNGIFRS					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	48.853	4	12.213	18.925	.000
Within Groups	56.147	87	.645		
Total	105.000	91			

The F-test value and p-value showed a significant difference between groups in the APDUNGIFRS variable, allowing us to reject H₀ and accept H_a. The higher Mean Square Between Groups value than Mean Square Within Groups indicates a significant difference between the groups. Therefore, we can conclude that there is a significant difference between groups in the APDUNGIFRS variable.

Industry analysis - one way ANOVA

Descriptives								
APDUNGIFRS								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	23	1.26	1.054	.220	.81	1.72	0	3
2	18	1.61	1.195	.282	1.02	2.21	0	3
3	10	1.40	.843	.267	.80	2.00	0	2
4	13	1.38	1.121	.311	.71	2.06	0	3
5	14	2.14	.770	.206	1.70	2.59	1	3
6	14	1.29	1.204	.322	.59	1.98	0	3
Total	92	1.50	1.074	.112	1.28	1.72	0	3

Variable 2 has the highest mean value, followed by variable 5. All variables have a minimum value of 0 or 1, while variables 2, 4, and 5 have the largest maximum value of 3. The NGANH5 variable has the highest mean value and the lowest standard deviation, indicating that samples achieve a higher score than the remaining variables. Enterprises in financial and accounting services apply IFRS the most, followed by manufacturing, with no significant difference between businesses in different industries.

RECOMMENDATION

Develop strategy and budget

The owner will determine the need for IFRS adoption; Determine specific plans and roadmaps applicable to their enterprises; Disclosure of information on the roadmap and applicable plans for investors To do this, the business leaders need to actively participate in the direction and administration throughout the process of applying IFRS; Establish communication channels with policy-making agencies, auditing firms, professional associations, and consultants. In addition, the owner needs to develop a clear and consistent accounting policy between the parent company and its subsidiaries; demarcation between financial statements and tax reports, internal management reports; calculate and provide adequate resources for the application of IFRS.

Human resource training

Most accountants and auditors in Vietnam do not have much experience in applying IFRS while IFRS contains many new and complex contents. Therefore, human resource training plays a very important role when enterprises decide to apply IFRS. Because accounting information does not come from the accounting department itself, but from other departments such as the finance department, sales department, administration department, etc. Therefore, it is necessary to develop a timely, methodical, continuous and long-term human resource training plan, not only training the accounting apparatus but also equipping them with basic financial knowledge and understanding, especially board of directors, key managers; change leadership thinking, raise awareness of compliance, organize a strong legal department at enterprises. At the same time, in order to train human resources effectively, enterprises need to take advantage of the knowledge, understanding, support and resources from auditing firms, consultants, foreign investors, and professional associations.

Organize the accounting apparatus and develop regulations on coordination between departments

The restructuring of the enterprise apparatus is also very necessary work, especially attention must be paid to the organization of the accounting apparatus appropriately and smoothly from the parent company to its subsidiaries and subsidiaries. Then entity should provide training to personnel on the accounting policies, procedures, and reporting framework to ensure that everyone involved in accounting understands their role and responsibilities. The finance, sales, and sales departments need to establish a close relationship with the accounting department to ensure the provision of information on business models, economic contracts, and financial data. At the same time, enterprises need to organize internal review, inspection and audit apparatus; prepare data to explain to State management and supervision agencies upon request as well as regularly review and update the regulations on coordination between departments to ensure that they remain relevant and effective

Building information technology system

To apply IFRS effectively, enterprises need to build a strong enough information technology system to ensure the efficiency and effectiveness of internal management; Ensure connection between accounting, finance and other departments; Ensure the connection between the parent company and its subsidiaries and affiliated units. Because IFRS is suitable for businesses in developed countries, where businesses have abundant resources and modern management capabilities, information needs to be responded quickly, accounting and business management software The industry needs a high degree of automation. On the other hand, IFRS aims to provide information on the basis of net assets, so the information technology system also needs to meet the needs of providing financial statements at any time to investors. M&A restructuring activities.

Developing a process to convert financial statements from VAS to IFRS

In the first stage of applying IFRS, enterprises may not be able to prepare IFRS financial statements from specific transactions. To overcome this limitation, enterprises can prepare financial statements under IFRS and convert to IFRS. However, the size and operation characteristics of enterprises are different, so each enterprise should build its own process of converting financial statements by identifying the difference between VAS and IFRS; Identify transactions and items on the financial statements that need to be converted; Make the necessary adjustments to conform to IFRS requirements; Building a system of legacy records and data; Regulations on responsibility for converting financial statements in accordance with the characteristics of their enterprises; Develop a set of rules for converting financial statements with specific instructions for your business; Provide training to relevant stakeholders on the IFRS requirements and the changes made to the financial statements

CONCLUSION

The application of IFRS in Vietnam is truly a challenge for enterprises and policy makers. Implementing IFRS is likened to a revolution in accounting and financial reporting, requiring great efforts from all parties involved to overcome challenges and obstacles. In the future, to be able to widely and popularly apply IFRS to meet the international requirements for economic and accounting integration, Vietnam needs to implement many urgent and long-term solutions, including solutions directly related to the accounting system and solutions related to the economic and legal environment.

Thus, the implementation of IFRS (International Financial Reporting Standards) helps Vietnamese businesses integrate and join international financial markets at a higher level. Despite the positive impacts of implementing IFRS for businesses, there are many challenges that lie ahead. Recognizing these difficulties will help relevant agencies find effective solutions to quickly apply IFRS in Vietnam. With the cooperation of financial institutions, government agencies, professional accounting and auditing associations, universities, pioneering organizations, and collaboration with experienced and reputable international organizations, the Ministry of Finance can bring Vietnamese accounting and auditing standards closer to international standards. Although there are still many obstacles and challenges in the process of moving towards IFRS, with its significant benefits, it will overcome these obstacles and ultimately achieve success.

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RESEARCH ON INNOVATING AND STRENGTHENING PRACTICAL ACCOUNTING TRAINING IN VIETNAM IN INDUSTRY 4.0 AND INTERNATIONAL INTEGRATION

Author: Nguyen Van An¹, Nguyen Duc Duy², Phan Ngoc Mai³

Mentor: Ph.D. Dang Thi Huong

ABSTRACT: The trend of the 4.0 revolution and international economic integration has taken place more and more strongly, affecting all industries and fields, including the accounting industry. Therefore, the issue of training high-quality accounting human resources in Vietnam is increasingly focused. In recent years, one of the pressing problems of the higher education sector in our country is that training has not been linked to the needs of society and businesses, universities are still heavy on “books” and lack practical education. Stemming from the above situation, the article conducts research on accounting practice training in the context of the 4.0 technology revolution and international integration.

The study focuses on analyzing the influence of Industry 4.0 on the requirements that businesses set for future accountants, in order to find a way to overcome the limitations in training students majoring in Accounting and making the most of the available advantages of current education in Vietnam. In order to achieve this goal, the article has relied on the assessment of the IAESB and CGMA Accountant competency frameworks to find out the advantages in building the capacity framework in countries around the world, thereby finding out strengths to strengthen the training of domestic accountants. At the same time, by collecting secondary data and descriptive statistics as well as using SPSS software to carry out research surveys, the authors have found the advantages and limitations of this issue. The work of educating accounting students in Vietnam and realizing that educational institutions need to make further strides in teaching content and human factors in teaching to bring learners closer to changes changed every hour in the Industrial Revolution 4.0.

The results of the research paper have brought an objective perspective from students studying Accounting in Vietnam and have contributed somewhat to the future change of accounting education in the Industrial Revolution 4.0 period.

Keywords: *the 4.0 technology revolution, international integration, the requirements of businesses in Industry 4.0, accounting practice training, training high-quality accounting human resources*

INTRODUCTION

The environment in which professional accountants work and function is subject to constant change. In the last decade, these changes were primarily attributed to advances in information technology and the globalization of economies on a large scale (Tan & Laswad 2018). More recently, due to the outgrown implementation of Industry 4.0, it is required that accountants apply practical skills in their profession if they want to effectively achieve their work goals.

Practical accounting operations training is one of irreplaceable standards in developing the work efficiency of accountants by providing them with knowledge and concepts, equipping them with appropriate skills, developing the ability of accountants, and adjusting their capacity and attitude to improve accounting quality in the era of technology 4.0 and international integration (Masa'deh, 2008, p. 8). Furthermore, practical training in accounting is of great importance and is considered a key foundation in development so that accountants can perform accounting tasks in the best way (Al-Khatib, 2006, p. 287).

Therefore, improving the quality of accounting practice training is a necessity in today's conditions. This study is launched with the hope that it will contribute an important part in evaluating the advantages,

¹ Academy of Finance. - CQ59/21.01CLC.

² Academy of Finance. – CQ59/21.02CLC.

³ CQ59/21.02CLC – gmail: ngocmai.work11@gmail.com

limitations and making recommendations to improve the quality of accounting practice training to meet the requirements of the accounting profession in practical demand.

Theoretical Framework

Currently, there are many ways to approach and offer innovative methods of accounting training at training institutions. However, the development of an educational framework for this accounting major should be based on relevant competency frameworks so that there is a basis for effective implementation and application on the target audience, which are future accountants - the main human resource for the accounting profession in Vietnam and also to ensure output standards that can meet the requirements of businesses in the 4.0 era. In Vietnam, there is currently no national competency framework for the field of Accounting and Auditing, but we can rely on approaches to the Accounting and Auditing competency framework in other countries and globally in order to build the core accounting training suitable for the new era in our country and from there, inherit and develop to create our own competency framework.

IAESB's approach

In 2019, the IAESB revised the International Education Standards Statement (IES) handbook. The IAESB has established a series of high-quality standards that reflect, measure, evaluate and develop professional accountants. In particular, the handbook has described the competency framework for professional accountants expressed in International Education Standards (IES) No. 2, 3, 4. The purpose of establishing technical professional competence techniques, professional skills, values, ethics and professional attitudes to create a basis is to help professional accountants with aspirations develop and serve many purposes. These competencies will help protect the public interest, improve the work of professional accountants, and enhance the reputation of the accounting profession.

According to the IAESB, occupational competencies can be described and classified in a variety of ways. Professional competence is the ability to perform a role according to a defined standard. Professional competence is the integration and application of (1) professional and technical competence, (2) professional skills, and (3) professional values, ethics and attitudes. Each competency area will have proficiency levels that professional accountants expect to achieve. The IAESB divides proficiency levels: Foundation, Intermediate, Advance.

CGMA's approach

The CGMA Competency Framework is designed to help management accountants, financial professionals and employers understand the knowledge requirements and assess the skills needed for both current and desired roles orienting in the future. The CGMA Competency Framework (Version 2019) was developed based on interviews and surveys of many people in different countries around the world, including: CGMA members, employers, students, financial communities and academics. Compared to the 2014 version, the 2019 version has added a new piece of knowledge required in the competency framework that is digital skills. Accordingly, the competency framework for management accounting includes 5 areas of knowledge: (1) Technical skills; (2) Business skills; (3) People skills; (4) Leadership skills; (5) Digital skills. The competency framework includes areas of knowledge and skills, and each of these includes a range of competencies identified at four levels: Basic, Intermediate, Advanced and Expert. Each proficiency level will be compatible with the organizational hierarchy. The importance of technical skills will remain high for employees but declines as they progress in their careers.

Accordingly, accountants in both approaches of the CGMA and IAESB competency frameworks are mainly being focused on training to improve professional skills, work ethics and soft skills related to the accounting profession; especially, the highlight is the need to be able to use foreign languages and be proficient in applying technology to professional work. From this, Vietnam also draws recommendations for the development of its Accounting and Auditing Competency Framework in the future. From our objective

perception of the two competency frameworks mentioned above, the study aims to analyze the development orientation of Accounting and Auditing training in the direction of enhancing practice activities, having practical approach to businesses to practice job skills as well as soft skills that directly affect learners' future work performance, improving computer and foreign language abilities to meet the increasingly fierce competition for accounting careers and at the same time strengthens the specialized theory to ensure that professional practice is carried out properly.

Literature review

Up to now, there have also been research articles on: “Improving the quality of accounting training in Vietnam in the period of international integration”. However, there are still quite a few studies on: “Innovation of accounting practice training in Vietnam in the digital age and international integration”. This research work is one of the topics contributing to perfecting the innovation and improving the quality of accounting training in Vietnam in order to bring high-quality human resources to serve the development of the country. Here are some typical projects domestic and international:

Research in our country

Research paper by MAc. Dương Thị Ngọc Bích “Một số vấn đề xung quanh việc giảng dạy thực hành kế toán trong thời đại công nghiệp 4.0” (Some issues surrounding the teaching of accounting practice in the industrial age 4.0) in “Tạp chí Công thương” (Industry and Trade Magazine) on May 3, 2020 has shown that the 4.0 technology revolution has been posing many challenges to the accounting field, the automation process may replace the finance - accounting department in many standardized accounting jobs. Therefore, the author has given the professional skills that an accountant must have in the 4.0 industry. The author also emphasized the urgency of training human resources in the field of accounting to ensure the quantity as well as the quality requirements. Although the author has made practical teaching requirements for accounting students in the digital age, it has not yet provided comprehensive solutions, but only focused on teaching methods of the lecturer.

In the report “Đổi mới công tác kế toán trong điều kiện ứng dụng công nghệ 4.0” (Innovating accounting work in the context of 4.0 technology application) of MAc. Nguyễn Thị Lương, published in the “Tạp chí Kinh tế và Dự báo” (Economic and Forecasting Magazine), issue 29 in 2021, wrote that: “The Industrial Revolution 4.0 is having a strong impact on all areas of production and business, including accounting. This requires accounting work to improve quality and adapt to changes in science and technology”. The study also mentioned the opportunities and challenges that the Industrial Revolution 4.0 brings to the accounting industry and made recommendations for accounting innovation in the coming time. However, this study has not yet deeply analyzed the innovation of professional accounting training - which is the key to the success of accounting work in the context of 4.0 technology application.

In the study on “Đổi mới đào tạo cử nhân ngành kế toán của các trường đại học khối kinh tế ở Việt Nam theo chuẩn quốc tế” (Renovating the training of bachelor's degrees in accounting from universities in the economic sector in Vietnam according to international standards) by Ph.D. Nguyễn Hữu Ánh (National Economics University) published in “Proceedings of the national scientific” conference, the author has provided a theoretical basis and researched the current situation of accounting training in Vietnam. The research has shown that universities have been developing accounting training programs with foreign elements such as advanced programs, high-quality programs, 2+2 or 3+1 associate programs on accounting. In addition, some domestic universities have also consulted and integrated the content of some subjects in training programs of international professional organizations such as ACCA, CPA, ICAEW,... Finally, the highlight of the study is that the author has made recommendations on reforming accounting training of universities in Vietnam on four aspects: innovation in training programs, innovation in learning materials, innovation in teaching methods and innovation in student assessment methods. However, the article only

mentions the innovation of training in the direction of international integration without mentioning the influence of the industrial revolution 4.0 on the accounting industry.

Status of foreign studies

The issue of innovation in accounting practice training in the 4.0 era is one of the topics that are deeply researched and discussed in the international context. In 2016, Dr. Roger Burritt and Dr. Katherine Christ with their research “Get ready for the fourth industrial revolution” appeared in the international issue of “Accounting and Business” magazine has commented on the definition of “Industrial Revolution 4.0” and discussed what the digital age means for the accounting profession. And since then, the two authors have made the necessary innovation requirements of the times in awareness, education and professional development goals so that accountants can keep up with the changes of the times, and then increase self worth.

Research “University accounting programs and the development of Industry 4.0 soft skills” on “Journal of economic and financial sciences” (Ben Marx, Ahmed Mohammed Ali-Haji, Peter A. Lansdell, 2020) provided analysis on the difficulties and challenges of the accounting profession in the digital age and international integration and solutions for that. The main goal is to develop the learning of soft skills in the accounting program at the university level, especially the soft skills required by Industry 4.0 with the desire to provide a solid foundation for the future before entering the labor market. But the authors only focus on developing soft skills for accounting students without mentioning other factors affecting the undergraduate accounting training program.

Orientation

Aiming to overcome the research gaps of previous studies, our research has focused on three broad topics: (1) the demands of Industry 4.0 towards accountants, (2) the impact of developing entry-level accountants skills set and (3) the importance of developing accounting training in educational institutions. To delve into the main research topics, the theoretical overview of the study is explained under two main ideas: Industry 4.0 and its impact on the education of accountants and changes in accounting training requirements towards future generation accountants.

Industry 4.0 and its impact on the education of accountants

The 4.0 technology era can be understood as the era of the fourth industrial revolution (Industry 4.0) with the impact scale of all professions, fields, societies and economies of mankind including: real-virtual cyberspace systems. We will use the internet to connect, communicate, and collaborate between people from reality through the virtual world.

According to Klaus Schwab, founder and executive chairman of the World Economic Forum: “The first industrial revolution used water and steam power to mechanize production. The second revolution took place thanks to the application of electricity to mass production. The 3rd revolution uses electronics and information technology to automate production. Now, the Fourth Industrial Revolution is sprouting from the third, which brings technologies together, blurring the lines between physical, digital and biological.” The focus of Industry 4.0 is technological breakthroughs in areas such as artificial intelligence (AI), cloud computing, Internet of Things (Internet of Things), Big Data (Big Data), block chain (Blockchain),... from which it is possible to optimize processes, production methods and improve productivity in the value chain.

According to Gartner, the world’s leading information technology research and consulting company, the 4th Industrial Revolution (Industry 4.0) comes from the concept of “Industrie 4.0” (Industrie 4.0) in a report of the German Government 2013. The concept of “Industrie 4.0” is to build an industry, which connects embedded systems and smart production facilities to create digital convergence between industry, business, functions, and processes within this system.

Consequently, the knowledge, qualities and skills of newly qualified accountants are also likely to change. In fact, the WEF’s Future of Jobs report suggests that approximately 35% of core skills of the

accountancy profession is likely to change between 2015 and 2020 in order to meet the demands of Industry 4.0, thereby ensuring the relevance of the profession globally (World Economic Forum 2016). The impact of Industry 4.0 will therefore need to be considered in such a way that the future generation of professional accountants is educated in order to maintain the relevance of the profession in the years to come (Craig 2015). Globally, accountancy professional bodies are well aware of the need to change in order to remain relevant and, as the institutions responsible for developing accountants’ professional competence, it has begun to ask critical questions to address the anticipated changes of Industry 4.0.

Changes in accounting training requirements towards future generation accountants

According to newly published research results of the prestigious job and recruitment network of Vietnam Navigos Group, the demand for accounting, auditing, and finance ranks third in the 5 functional departments with the highest recruitment demand (Nguyen Thi Thanh, 2019).

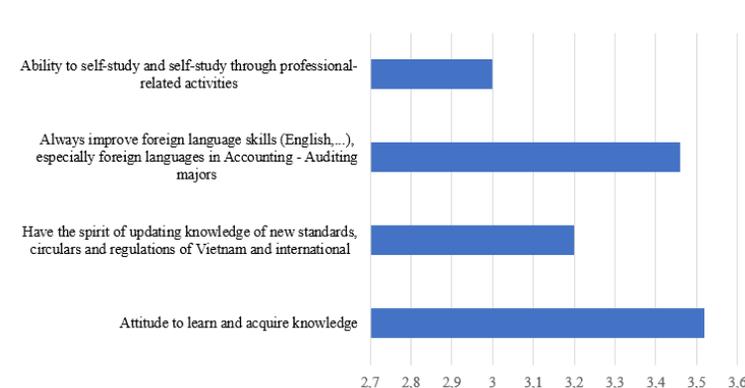


Figure 1: Recruitment demand for accounting, auditing and finance positions

According to Ms. Vu Thi Thanh Lieu, Deputy Director of the Hanoi Employment Service Center, said the registration quota is too much, while the recruitment of the accounting profession is too small. On average, each company recruits 1 accounting position, but there are about 5-6 applications. For well-known companies, there are even 30-40 resumes for interviews. “Most companies want to hire experienced people, so in order to get a job, many accounting students accept to work outside of the industry such as cashiers, office workers, market staff...” Mrs. Lieu said. At the same time, the fact that students have little contact with reality at the enterprise but only participate from an internship perspective, so the assessment of the level of understanding and practical approach to accounting work in the internship unit of students is still limited. In fact, trained employees in the field of accounting and auditing in Vietnam, although assessed as agile, creative and able to meet the needs..., but actually are lack of soft skills namely teamwork, foreign languages, critical thinking, creativity, technology compliance, and have poor discipline compliance, and so on.

Accordingly, the current situation of accountants not meeting most of the requirements of the business can be explained by the fact that training institutions still have orientations that are not up to date comparing with the times for the education of students majoring in Accounting.

It is the influence of the trend of international economic integration and the Industrial Revolution 4.0 making a stepping stone to create a driving force, changing accounting training in general and accounting practice in particular in the direction of overcoming the remaining weaknesses and aim to train high-quality human resources to meet the increasingly strict requirements of enterprises.

Research methodology

The research will use a methodology based on dialectical materialism and historical materialism to provide an in-depth opinion, explanation and assessment of the research content. The authors have also applied the method of collecting secondary data related to the Fourth Industrial Revolution and international

economic integration, as well as analytical articles on the current situation of professional accounting training via the Internet, scientific articles, magazines, seminars, etc. with related topics.

Next, using data from primary research methods through collecting actual data from survey implementation, then using descriptive, comparative, and synthetic statistical methods to present the current situation and find some solutions to improve the research content.

The study was used by the authors' descriptive statistical method through the implementation of an online survey via Google form and obtained 157 standard survey samples, of which female accounted for 104 people, which is respectively 66.2%, for male there are 51 people participating, respectively 32.5%, the rest are other genders.

The survey targets 3 main target groups: students studying accounting accounted for 71.3%, accounting human resource hunters accounted for 15.9% and finally, accounting staffs accounted for 12.7%.

Results and discussion

Results

Secondary research results

The research is carried out by the authors through the process of collecting and analyzing information from available sources.

Table 1: Summary of enrollment targets for accounting majors at some universities and institutes in 2022

School's name	Accounting major target	Total target	Proportion (*)
North			
Academy of Finance	1290	4000	32.25%
Banking Academy of Vietnam	620	3200	19.38%
National Economics University	470	6100	7.70%
Thuongmai University	440	4150	10.60%
Central region			
University of Economics - The University of Da Nang	455	3100	14.68%
Southern			
University of Economics and Law - VNUHCM	230	2230	10.31%
University of Economics Ho Chi Minh City	885	7650	11.57%

Source: Compiled from university websites

() Proportion of the target of accounting profession compared to the total enrollment target*

The results from Table 1 show that the summary table of enrollment criteria for accounting majors of some universities and institutes in 2022, in terms of quantity, we can see the training results of universities and academies has partly met the accounting human resources quite well in the recent period. The strong integration trend and the ongoing Industry 4.0 has had a positive impact on the development towards training high-quality accounting human resources to meet increasingly strict requirements of enterprise.

Accounting training programs of Vietnamese universities such as National Economics University (NEU), Academy of Finance (AOF), Thuongmai University (TMU), University of Economics Ho Chi Minh City (UEH), and Banking Academy of Viet Nam (BA) and the like are all about 130 credits. According to statistics, the professional education knowledge block of training institutions on Accounting professional practice account for between 58 and 70% of total credits. The block of professional education knowledge is divided into:

Basic industry and sectoral knowledge

In the knowledge base of the industry and the base of the industry, the training institutions with the Accounting training program all teach the modules Macroeconomics, Microeconomics, Finance and Money, Accounting Principles and Economic law.

Industry and in-depth knowledge

According to the research authors, the teaching contents and training plans of the training institutions about the practical training programs, these subjects usually account for about 30% ~ 35% of the credits of the subjects in the knowledge and expertise section of the Accounting major.

On the other hand, the number of credits related to the practical courses of Financial Accounting and other bookkeeping is statistically as low as 12 credits (BA) and the highest as 16 credits (AOF). The training contents of the Financial Accounting modules take up the largest amount of time in the curriculum (from 8 to 9 credits) and are broken down into different modules and combined with other international training programs such as ACCA, ICAEW with the name Financial Accounting I, Financial Accounting II, and so on.

Additional knowledge

In the current era of technology 4.0 and international integration, many training institutions are aware of the importance of supplementary knowledge such as soft skills for accounting students as well as accounting learners in the field of accounting which is about equipping knowledge to develop skills in banking administration, commercial banking, ... such as Academy of Finance (AOF), Thuongmai University (TMU), National Economics University (NEU) and University of Economics Ho Chi Minh City (UEH).

Primary research results

Through the survey of 157 lecturers and learners in the field of accounting and auditing of universities and colleges in Vietnam, it can be seen that in recent years, there have been fundamental innovations in the content of the curriculum and teaching methods in accounting practice training. The results of the assessment of the current status of the capacity of accounting teachers are summarized as follows:

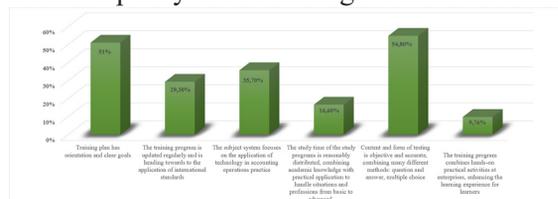


Figure 2: The assessment of the current status of the capacity of accounting teachers

Source: Author calculated from calculated data

Regarding the content of the training program, the survey has obtained more than 150 results from students, lecturers, as well as current accounting human resource trainers and has obtained results showing that 51% of participants give high marks on the program’s clear direction and goals. 29.3% agree that the program is regularly updated and aims to apply international standards. 35.7% agree that the program focuses on technology application in accounting practice. However, only 16.6% think that the study time is reasonably distributed and combines academic knowledge and practical application. 54.8% hesitated or disagreed about the content and form of objective and accurate examination and assessment. Only 9.76% highly appreciate the training program combining practical activities at enterprises.

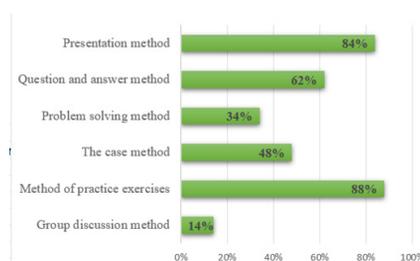


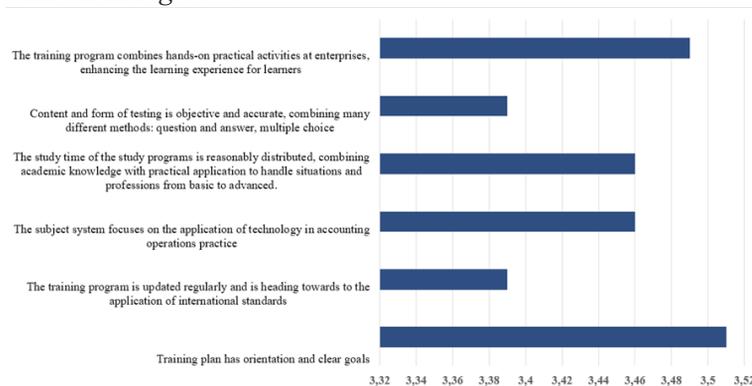
Figure 3: Teaching methods of accounting and auditing lecturers

Source: Author calculated from calculated data

Regarding training methods, lecturers majoring in accounting - auditing often use traditional teaching methods such as presentations (84%) and practice - exercises (88%). Some other methods were also used such as prompting, questioning and answering (62%), raising and solving problems (34%), learning by participating in built-up real life situations (48%) and group discussions (14%). However, the application of some methods such as group discussion is difficult due to the large scale of students but narrow class sizes.

Regarding the influence of factors affecting the quality of training, the authors conducted a survey based on a questionnaire and calculated the average scores of the influence of the factors affecting the accountants training in Vietnam:

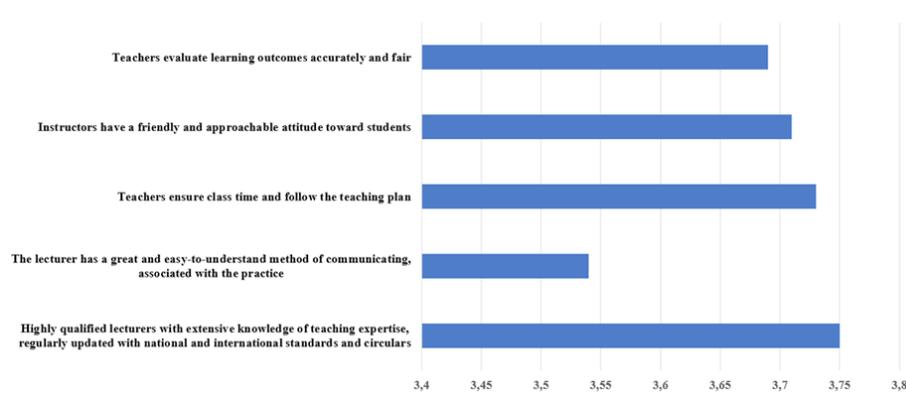
- *About the training program*, the results of the actual survey on the accounting practice training program in Vietnam are shown in *Figure 4*.



Source: Author calculated from calculated data

Thus, the survey results show that there are 6 contents about the quality of the accounting practice training program at training institutions in the 4.0 technology era and international integration. The most appreciated activity is “Training plan with orientation, clear goals” with a target average of 3.51. The remaining criteria are rated relatively low, such as: “The training program has not been updated regularly” (The average rating = 3.39) and “The content of the examination and assessment form is objective and accurate, combining many different methods such as question and answer, multiple choice.” (The average rating is 3.39).

- *With regards to the teachers factor*, the quality of the lecturers and training managers is considered a “core” factor reflecting the quality of training. Evaluation of the quality of lecturers of accounting practice training institutions is shown in *Figure 5*:

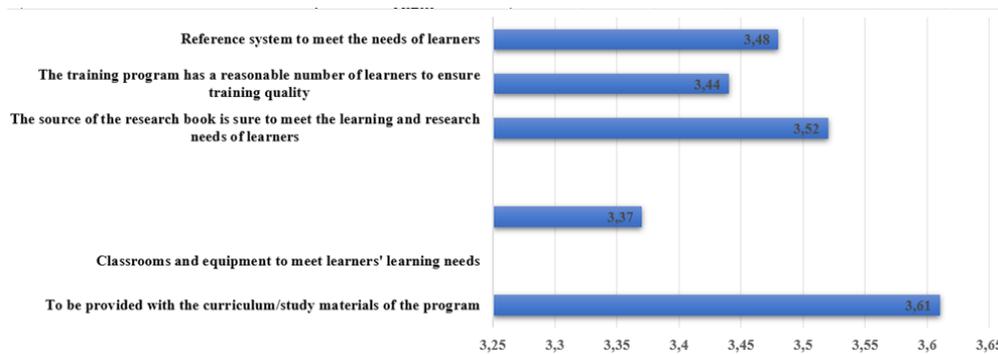


Source: Author calculated from calculated data

The survey results on the quality of teaching accounting practice teachers were rated with a rating of 3.69 to 3.75 (good level). The most favorable criterion with the highest average score of 3.75 is the

“Teachers are highly qualified, have extensive knowledge of teaching expertise, are regularly updated with standards and circulars nationally and internationally”. Some contents are still not having high marks such as: “Teachers have good communication methods and are easy to understand, linked to practice” with an average score of 3.54. It shows that some lecturers teaching accounting practice still has many limitations using teaching techniques.

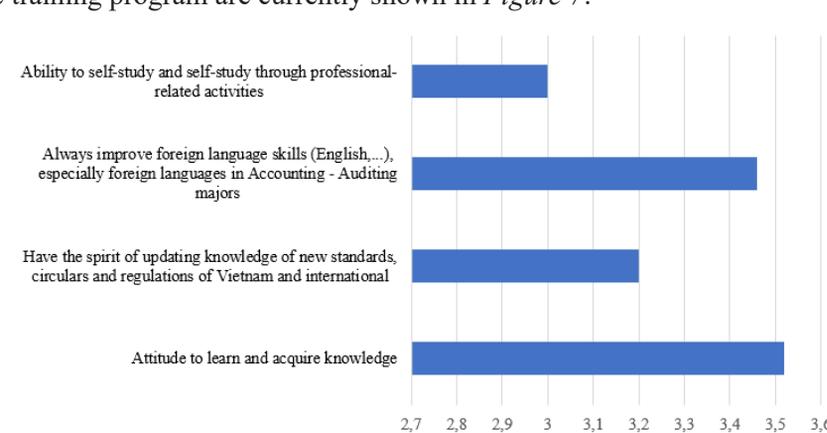
• *About the facilities*, the assessment of the quality of facilities at accounting practice training institutions is shown in *Figure 6*:



Source: Author calculated from calculated data

Through the research results, the activity that is actually evaluated with the highest result is “Provided with curriculum/learning materials of the program” with an average score of 3.61. With the accounting practice training, the main materials are papers and books and the consumption of supplies and raw materials is negligible compared to other industries. Some content is still limited such as: “Classrooms and equipment meet the learning needs of learners” with an average rating of only 3.37, “The training program has a reasonable number of learners and has quality assurance” and “Reference system that meets the needs of learners” had the average score of 3.44 and 3.48 respectively.

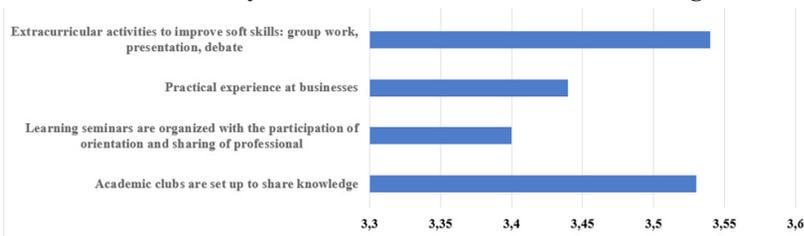
• *Regarding the learner's capacity and attitude towards the accounting practice training*, the assessment results which present the current status of the learners' capacity and attitude towards the accounting practice training program are currently shown in *Figure 7*:



Source: Author calculated from calculated data

The assessed content with the highest average score is “Attitude to study and acquire knowledge” with an average score of 3.52. Two contents: “Always cultivate foreign language skills (English,...), especially foreign languages in the Accounting - Auditing major; Having the spirit of updating knowledge about new standards, circulars and regulations of Vietnam and international” has not been given high marks with the average score of about 3 to 3.2.

● Concerning the learning environment factors affecting the practice of accounting training, the authors conducted a survey and obtained the results shown in Figure 8:



Source: Author calculated from calculated data

The above data shows the influence of the learning environment factor on the current accounting practice training program. The criteria are assessed in the average rating range from 3.4 to 3.54. The content rated with the highest average score is “Extra-curricular activities programs to improve soft skills: group work, presentation, debate” with an average score of 3.54. Two contents: “Academic clubs are established to share knowledge; Practical experience at businesses” was assessed with an average score of 3.44 to 3.53.

DISCUSSION

Based on the survey results in Section 3.1, the authors analyzed the advantages of accounting practice training in Vietnam in the era of technology revolution 4.0 and international integration. State management agencies have paid attention to the quality of accounting practice training by issuing documents and standards to improve training quality. Training institutions have expanded cooperation with international organizations and applied the virtual accounting room model to develop practical skills for learners, building virtual spaces to help learners have direct access to resources anywhere.

However, the accounting practice training still faces many difficulties and challenges in the training program as follows:

Firstly, the “wave” of shifting accounting human resources due to Industry 4.0 becomes a challenge for training institutions in developing appropriate content. Currently, the issue of accounting practice training has been recognized, unified and complied with common accounting standards, which are used by countries around the world in terms of the legal framework, revenue collection and accounting standards, leading to the narrowing of the difference gap. If the quality of domestic accounting practice training does not keep pace with other countries in the world in general and in Southeast Asia in particular, it may lead to a problem that is difficult to transfer qualified accounting human resources from other countries to Vietnam.

Second, the current accounting practice training has not met the requirements for the quality of education and training in accordance with international standards. When improved accounting practice training programs are delayed and lack of timely updates, it can have a negative impact on the ability of students to reason and develop practical skills. Accounting students in the period of Industry 4.0 and international integration are developing strongly.

Third, the current methods of accounting practice training are still passive and students have not yet formed the habit of self-study and professional development.

Fourth, when Industry 4.0 is popularized all over the world, it has been required to develop and innovate training methods for accounting practice in the direction of using information technology applications, digital technology, network systems.

Currently, the accounting profession is facing many difficulties and challenges for **reasons** such as:

● New training institutions only stop at intensive training on theoretical content and do not have many practical programs. The new training program only focuses on knowledge of accounting and auditing while in reality requires accountants to know a combination of all necessary skills needed.

- Some accounting trainers lack experience and practical knowledge.
- Accounting training in Vietnam still mainly uses traditional methods and has little interaction. Many students are not active and proactive in the learning and training process.

In order to improve the quality of accounting practice training in Vietnam in the era of technology revolution 4.0 and international integration in the future, the authors have made some **recommendations** for accounting training practice as follows:

Firstly, the training programs of training institutions should be appropriately redesigned, supplementing the teaching of foreign languages and specialized foreign languages so that students can more easily participate in the exam for international economic practice certificates and also add practical learning to the curriculum so that learners have more space to apply lessons to solve practical problems. Moreover, training institutions should apply technology in training students in accounting, and also have to inspire students about technology and the use of technology in the era of international integration.

Second, the school's technical facilities are the necessary means for students to study on their own. For accounting education and training institutions, it is necessary to have at least 1 computer room with full modern machinery and equipment and a library with specialized books.

Third, training institutions need to combine classroom training with practical practice at enterprises for learners. The cooperation between enterprises and schools in training accounting personnel will bring double benefits to both enterprises and training institutions. Learners need to have the right space and environment to put their professional knowledge into practice.

Fourth, learners need to be enhanced with practical access through extracurricular programs or competitions held in both training institutions and businesses. During the learning process, being rubbed and participating in professional practice environments will help learners enhance their ability to practice practical operations within their understanding.

CONCLUSION

The study has certain theoretical and practical contributions. Theoretically, the research has systematized theoretical issues of accounting practice training, the impact of Industry 4.0 and international economic integration on accounting practice training. In practical terms, the research has clearly shown the actual status of the content of the training program, the training method and the influence of 5 factors: training program, teaching staff, facilities, capacity and attitude of learners and the learning environment to the quality of practical training in accounting professional training in Vietnam.

However, this study still has some **limitations**. *First*, one of the limitations of the group's research is the construction of a research framework and survey design because the perspective of the survey as well as the research author's group is from students, so the article can non-representative and objective in many related subjects. *Secondly*, in fact, there are still a number of other factors affecting the practice of accounting practice that this study has not mentioned. *Finally*, there are limitations related to the survey sample, reflected in the quality and quantity of responses as well as the diversity of the surveyed subjects.

Future research can expand the scope of research in terms of sample number, sample diversity, sample space... to be more objective, representative and inclusive. At the same time, consider more factors affecting the practice of accounting training to give practical and appropriate recommendations and solutions to help improve the prestige and quality at training institutions. Thereby, a skilled and highly qualified accounting workforce can meet the increasingly demanding labor market in the context of Industry 4.0 and international economic integration.

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THE FOURTH INDUSTRIAL REVOLUTION - CHALLENGING OPPORTUNITIES FOR STUDENTS MAJORING IN ACCOUNTING

Author: Le Thanh Thanh¹; Vy Bach Thanh Thao¹

Mentor: Ph.D. Ngo Thi Thu Hong¹

ABSTRACT: The article makes comments on the influence of the industrial revolution 4.0 on the field of Accounting, especially accounting students in Vietnam. The application of technological products of the 4.0 technology revolution has improved the accuracy and transparency in data collection, storage and management as well as minimizing errors and overcoming limitations in the process. manual accounting process, gradually replacing traditional accounting methods. Accordingly, new opportunities and challenges for accounting students in Vietnam in the future will also be set to integrate with this digital economy trend.

Keywords: industrial revolution 4.0, students majoring in accounting, digital technology, big data.

1. INTRODUCTION

The explosive industrial revolution 4.0 (Industry 4.0) has been changing, affecting all aspects of social life. Klaus Schwab, founder and executive chairman of the World Economic Forum, offers a simpler view of “industrie 4.0” as follows: “The first industrial revolution to use water and steam power for mechanization The Second Industrial Revolution was brought about by the application of electricity to mass production. Now, the Fourth Industrial Revolution is emerging from the third, which combines technologies with each other, blurring the lines between physical, digital and biological.” And in Vietnam the term “Industrie 4.0” is known as “Industry 4.0” or “Industrial Revolution 4.0”.

The Fourth Industrial Revolution changes the foundation, spurring traditional economies to transition to a knowledge and innovation economy. Practice shows that the previous scientific and technological revolutions have made important contributions to promoting economic growth. Besides, there are still many negative impacts such as increasing the development gap between countries and reshaping the world economic map. Therefore, we need to learn to change and adapt to new things. This revolution has created opportunities for new occupations but also created a high risk of rejection for old occupations that no longer meet the needs of society. Therefore, we need to set a requirement to continuously and comprehensively innovate the approach and working way of the old professions. And the accounting profession is also in that rule. The breakthroughs of digital technology have helped accounting practitioners have the opportunity to access new knowledge easily and not limited by geographical distance. At the same time, it also requires accounting staff to equip themselves with the necessary knowledge and skills for that breakthrough.

Therefore, catching up with the trend of movement, development and seizing opportunities, as well as confronting challenges, improving the efficiency and quality of the accounting industry is currently an issue that receives a lot of attention. mind and research.

2. THEORETICAL FRAMEWORK

2.1. Theoretical basis

Industry 4.0 is the process of integrating all smart technologies to optimize production and business processes and methods. Accompanying the revolution is not only a big change that brings positive factors

¹ Academy of Finance.

but also breakthroughs compared to the industrial revolution 3.0. Industry 4.0 will take place in three main areas: biotechnology, digital and physical, in which the core elements of digital are directly impacted, also known as the skeleton. of the industrial revolution 4.0, that is: artificial intelligence (AI), Internet of Things (IoT) and Big Data.

+ **Artificial intelligence (AI):** or artificial intelligence (Artificial Intelligence, abbreviated as AI) is intelligence represented by any artificial system. Artificial intelligence has a broad meaning as intelligence in science fiction, it is one of the key parts of informatics. Artificial intelligence is concerned with the intelligent behavior, learning and adaptability of machines. Application examples include control, planning, and scheduling tasks, as well as the ability to answer questions about disease diagnoses, respond to customers about a company's products, and recognize letters. handwriting, speech and face recognition... Therefore, artificial intelligence has become a discipline, with the main purpose of providing solutions to real-life problems. Today, artificial systems are used frequently in economics, medicine, engineering and military industries, as well as in common household computer software.

+ **Internet of Things (IoT):** IoT is a system of interconnected computing devices, machines, objects, animals, or people, identified and capable of transmitting data over a network without No human intervention required. IoT includes the convergence to the pinnacle of wireless technology, microelectromechanical systems (MEMS), microservices (a type of software architecture that divides software into very small services), and the Internet. An object in the IoT could be a person with an implanted heart; a farm animal with a biochip set; a vehicle with built-in sensors that alerts the driver when a tire is flat or any natural or man-made object can be assigned an IP address and provide the ability to transmit data over a network.

+ **Big Data:** is a term used to refer to a set of data so large and so complex that traditional data processing tools and applications cannot handle it. Big data is at the core of IoT and AI usage and development. It is inevitable that when technology develops, data is generated more and more at a very fast rate. Therefore, the way big data is collected and exploited will make a difference between businesses implementing the technology.

Industry 4.0 drives the digital transformation of manufacturing through the integration of previously disparate systems and processes through interconnected computer systems across supply and value chains. Industry 4.0 is signaling a shift in the traditional manufacturing landscape that includes three technology trends driving this transformation: connectivity, intelligence, and flexible automation.

+ **Connectivity:** Connectivity is considered the most prominent feature and makes Smart Factory different from factory models in previous Industrial Revolutions. In particular, the industrial internet of things (IoT) network is considered as the backbone in connecting data from the operating machinery layer to the information technology layer. Along with OPC - UA (a standard protocol of 4.0 technology), the connection between machines - software is easily extended to process data into important information for monitoring - management purposes. manufacture. From here, each enterprise can connect and process data continuously from production and business activities as well as from suppliers and customers allowing a comprehensive view, promoting efficiency of the supply network. higher overall.

+ **Smart:** Smart devices are commonly used in factory 4.0 such as sensors, RFID, QR Code scanners, etc. to collect data directly in the process of production - operation, serving management Manage production line productivity, location of goods, warehouse, logistics chain...

+ **Flexible automation:** The industrial revolution 4.0 exploded with the introduction of intelligent machines combined with industrial robots and AGV self-driving cars, contributing to the expansion and improvement of automation capabilities in the industry. current manufacturing plants. From operating the production process automatically, humans do not have to participate or participate very little in the production process.

2.2. Research Methods

The article uses two research methods simultaneously, including: causal research method and descriptive statistical research method in analyzing this topic. In which: The causal research method is used in the article to show the influence of technology 4.0 on accounting students. Along with that, the article also uses the method of descriptive study to describe the current situation of the application of technology 4.0 for students majoring in Accounting today.

Besides the personal opinions of the authors, some information in the article is secondary information collected, selected, classified and arranged by the author from articles written on the topic of industrial revolution. 4.0 posted on specialized websites in Economics, Finance and Accounting.

3. RESULTS AND DISCUSSION

3.1. Tendency in the development of accounting profession in the 4.0 technology era

In the current context and before the stormy development of the scientific and technical revolution, it is necessary to forecast changes in the accounting industry in the future. The future of the Accounting industry is shaped by technologies that have developed and continue to develop such as accounting software, artificial intelligence...

In 2016, the Association of Chartered Certified Accountants (ACCA) conducted a survey of prospective professional accountants in 22 countries (including Vietnam). The results show that 55% of respondents predict that the development of automated accounting systems is rated to have the most impact, followed by the penetration of cloud computing in business... Trends These are all influences of the 4.0 Revolution on the accounting profession. The emergence of Cloud Computing, big data (Big data), blockchain technology (Blockchain)... has fundamentally changed and improved efficiency in the process of processing, synthesis and communication and supply. information, especially accounting information.

All of these things have, are and will have a very strong impact on the entire accounting and auditing work. It requires a very fundamental change in accounting and auditing processes and methods, radical innovation in methods of creating, collecting and processing information, methods of checking and evaluating information, and methods of transmitting, receiving, exploiting and storing information. Studies around the world show that the Industrial Revolution 4.0 with the applications of things, large-scale data storage, cloud computing, the development of artificial intelligence systems, connected things around the world. The world... will open up good opportunities for the accounting and auditing fields to access convenient and cost-appropriate software, help effectively use resources, save time, human resources, and access the system. international accounting and auditing.

In recent years, it has been a period of explosive development of information technology, all activities are associated with digital technology. Therefore, the accounting field is also oriented to develop in the direction of applying technology 4.0, in order to minimize human labor while still bringing the highest economic benefits to businesses. Specifically, in the field of accounting, the application of digital technology helps accounting work to be done anytime, anywhere while ensuring efficiency. Data collection, processing, calculation and reporting are done quickly and in a timely manner. In order for the application of technology to be effective, it is necessary for a team of accountants to grasp how to apply technology in accounting activities. The new development trend of the accounting field is to use increasingly intelligent and sophisticated technology (such as smart software with cloud computing, big data, ...) to replace the traditional way of processing. system. The specific trends of changes in the accounting industry in the future are as follows:

- + *The accounting software has been improved in many aspects.*

The accounting work that started from excel was previously improved when many specialized accounting software were born, all recording and calculation activities became fast and accurate. These software platforms have a wide range of software functions that accountants value most, such as optimizing processes and

minimizing manual tasks. This saves time for bookkeeping and ensures high accuracy. For example, online accounting software is one of the best software of the Industrial Revolution 4.0. It is the perfect combination between the power of information technology, website programming and financial - accounting - management system. Or Intuit's Turbo tax software is replacing accountants with tax administration jobs. Or Xero software does the job of classifying invoices... This software can check the mathematical data on the invoices as well as verify the information about the issuer, the value added tax code on the invoice.

+ *Support of AI Technology*

In Vietnam, previous accounting work had to be done entirely manually, depending heavily on the carefulness and meticulousness of accountants with many accounting books and tables according to certain standards. In recent decades, with the strong development of scientific and technical achievements and modern technology, AI has gradually been introduced into the accounting field. This allows businesses to cut costs, automate a wide range of processes, and boost their bottom line. At the same time, the impact of core technology in the industrial revolution 4.0 has drastically changed the accounting industry in enterprises. AI machines take on the burden of performing repetitive and time-consuming tasks. Artificial intelligence in accounting reduces human intervention. AI technology is capable of handling many standard accounting tasks faster and more efficiently. With AI technology handling a lot of manual, repetitive work, accountants will have more time to focus on other aspects of their work, like consulting and data analysis. Instead of spending hours completing manual tasks, accountants will be able to use and analyze AI-powered data to make the best decisions.

AI technology will improve data entry accuracy and reduce liability risk for accountants; more effective in detecting fraud; provide real-time data, allowing accountants to provide real-time solutions; the ability to analyze large amounts of data instantly; Evaluate past successes and failures to plan for the future. Specifically, one of the big applications of AI in accounting is machine learning. Machine learning can code entries, can analyze contracts. The new field of automation is a means of supporting useful decisions, such as through machine learning, it is possible to identify unusual transactions in the recording of arising economic transactions. It can help accountants access unstructured data, become an effective virtual assistant for accounting, auditing, transactions, tax work to identify areas of risk or need analysis. In addition, thanks to the function of recording the context, machine learning has smarter analysis.

+ *Automated accounting process*

Instead of doing a lot of manual work in the past, technology helps simplify complex processes. Accountants can focus on important tasks, requiring brains and meticulousness. As for other jobs, can be done by automated tools. For example, for invoicing at medium and large enterprises in Vietnam in the past, the number of input invoices per month can be up to hundreds or even thousands of vouchers. To complete a process of processing each input invoice requires an average of 3 minutes, for a skilled accountant, including operations such as verifying information with the General Department of Taxation; read and input invoices into excel statements; synchronize data on accounting software, store and arrange sets of documents in the right place and according to the standards of the business. Accountants always have to spend a large amount of time and energy to handle the above tasks manually, which always carries the risk of errors and causes fatigue during peak days. But in the future, existing software can integrate with your accounting and banking systems. This renders the invoicing methods of the past obsolete. Invoices are created perfectly with just a few clicks. Some customer information needs to be entered, but most importantly no errors occur.

+ *Cloud accounting system gradually replaces traditional system*

Traditional on-premises accounting systems require businesses to set up a physical data center. This means that businesses have to spend a large amount of money on hardware investment, personnel as well

as time and effort to install and maintain the solution. Meanwhile, cloud accounting stores business data on the cloud platform, in remote servers. As a result, users can quickly access important financial information anytime, anywhere. Users can tackle everyday tasks from any machine, at any time. All data is also automatically saved in the cloud and can be retrieved quickly.

Moreover, the solution can flexibly expand or shrink immediately depending on needs, without requiring businesses to spend on investment costs, so cloud accounting is an appropriate solution for businesses. industries of all sizes and sectors. At the same time, cloud accounting provides businesses with an overview of their most recent activities, automatically updates financial transactions, allows users to track business performance and helps management to make more informed decisions based on real-time financial information and facts. In addition, users can easily search invoices, contracts, track payment status, helping businesses maintain good relationships with suppliers, distributors, employees and business partners. business.

+ *Blockchain research trends for future application*

If in normal accounting activities, an accountant needs to make double entries, Blockchain only needs one entry to provide information to all parties without worrying about authenticity. Accounting records cannot be edited or changed once saved to the Blockchain, even if requested by the owner of the accounting system. Because on the Blockchain platform, every daily transaction is recorded and authenticated, so the integrity of financial records is guaranteed. Blockchain application helps to secure accounting information because it is a technology that allows the transmission of data securely based on an extremely complex encryption system, similar to the accounting ledger of a company, where Cash is closely monitored.

Thus, the application of science and technology is an inevitable trend in daily work, especially in fields that always require agility and accuracy like Accounting. As technology advances, it has a great influence on this field. Accountants will use increasingly intelligent, sophisticated technology to improve efficiency compared to the traditional way of working, and these technologies can replace the traditional approach. This makes the accounting process simple, accurate, secure and reduces time, costs, manipulations, etc.

In much of today's business landscape, technology plays a role in reshaping industries and businesses. It transforms systems and processes, converting manual tasks into automated functions. With technology, businesses are more efficient and productive. And this is where the latest accounting trends mostly revolve.

+ *Automate the accounting process*

Automating many accounting processes is an important trend in the industry. Automation eliminates confusion and minimizes errors, which is why companies tend to invest more in automated solutions. Since the process is largely computer-based, businesses face the risk of falling victim to fraud and compromised security. This leads to an increasing need for internal auditors to check for any data inaccuracies.

In the coming years, it will have the highest impact across several industries, enabling accountants to use data and optimize processes for both the best small business and large enterprise accounting software. Accounting automation also enables businesses to arrive at data-driven decisions faster than ever before.

+ *Outsourced accounting services*

Businesses are now outsourcing accounting functions and benefiting from this service. Outsourcing allows companies to focus more on their limited resources, increasing profits. It also helps to save costs such as payroll, taxes, salaries, benefits and training costs. As a result, outsourcing accounting functions is becoming a popular strategy for many companies.

This gives rise to the number of outsourced accounting service providers. This is one of the fastest growing areas in the accounting industry. Surveys show that businesses feel satisfied with the value and results of their outsourced accounting. Outsourcing is now an increasingly important method for CPA

companies to provide efficient services to their clients, as well as analyze business operations and add value to their business. Surname.

+ *The rise of accounting software*

The adoption of technology-based solutions in the accounting industry will increase in the coming years. As the need for computerized accounting grows, accounting software companies will address this need with powerful solutions. These software platforms have a wide range of software functions that accountants value most, such as optimizing processes and minimizing manual tasks.

+ *Cloud-based accounting*

Cloud computing is gaining popularity for accounting services. With this system, companies and businesses can access their system at any time allowing them to track inventory, sales and expenses. Furthermore, cloud-based solutions also enable workflow creation, saving businesses valuable time. As such, about 67% of accountants now believe that cloud technology can make their role easier.

According to a survey conducted by Sage, also found that 53% of respondents used cloud-based solutions for project management and communication with customers. This may be related to an increase in demand for advanced technology solutions from various industries. Among them is the accounting industry, which is taking a leap forward in terms of more comprehensive and effective financial reporting and analysis.

+ *From accountant to expert*

Experts are predicting a method that combines accounting technology and financial advisor input in the near future. This comes from discovering new solutions for analytics that allow accountants to focus more on decoding data for deeper insights. Unlike other tasks in the accounting process, decision making will always be in the hands of experts and people.

+ *Tendency of working remotely*

Employers today are having a hard time finding talent in the accounting field. Therefore, leaders are adapting to the trend of allowing employees to participate in remote work to ensure the best interests of candidates. According to a survey published by Convergence Coaching, about 43% of CPA companies are giving their employees the opportunity to work from home on a regular basis. This was not possible in the past. However, with the advancement of technology and the emergence of computerized accounting systems, accountants working from home can produce excellent results in their work as in the office.

It can be seen that the general development of socio-economic has given rise to many economic and financial problems. Therefore, an inevitable requirement is that the accounting field needs to have development and innovation to ensure good resolution of the above problems.

The development of the market economy as well as Vietnam's open-door policies have helped promote Vietnam's economic integration. Therefore, all issues arising related to professions, including accounting are planned to be changed in the direction of harmonization with common international practices. Specifically, the circulars and standards of Vietnamese accounting will be revised in the direction of harmonizing with international accounting standards and in the direction of reflecting the true nature of the arising accounting and financial operations. .

Moreover, recent years have been a period of explosive growth in the development of information technology. All activities are associated with digital technology. Therefore, the accounting field is also oriented to develop in the direction of applying 4.0 technology, in order to minimize human labor while still bringing the highest economic benefits to businesses. Specifically, in the field of accounting, the application of digital technology helps accounting work to be done anytime, anywhere while ensuring efficiency. Data collection, processing, calculation and reporting are done quickly and in a timely manner.

And for the application of technology to be effective, it requires a team of accountants to grasp how to apply technology in accounting activities. Or more specifically, the new development trend of the accounting field is towards the use of increasingly intelligent and sophisticated technology (such as smart software with cloud computing, big data, ...) to replace the traditional method.

Because the field of accounting is increasingly interested and developed, the career opportunities in this field are huge. Moreover, the opening of Vietnam's economic policy has created favorable conditions to attract the appearance of multinational companies in Vietnam, so that accountants have more opportunities to work in more professional and internationalized environments. Career opportunities in the accounting field are quite large because any business needs an accountant to handle arising economic and financial transactions, but it is also necessary to grasp the situation because the current supply For actual accounting work is more than the demand, so to get a good accounting job, it is also necessary to go through very stiff competition. And another fact is that supply and demand in the field of accounting have not met. That is, most businesses are mainly in demand for positions such as general accountant or chief accountant – positions that require high qualifications and qualifications, but the workforce in In the accounting field in Vietnam, experience and capacity only stop at the level of meeting basic requirements. Therefore, the reality is that in the accounting field, career opportunities are often in high positions such as general accountant or chief accountant.

3.2. Opportunities for students of economics school

The Industrial Revolution 4.0 (Industry 4.0) has brought to Vietnam a fundamental change in most fields and industries, including the accounting industry. The industrial revolution 4.0 brings many opportunities to the accounting profession in general and students of the economic school in particular, which requires us to grasp it in a timely and flexible manner. Specifically:

Firstly, the legal environment is formed relatively fully, clearly, in line with Vietnam's conditions and step by step in line with international practices and standards. The development orientation of Vietnam's accounting industry is shown more clearly in the direction of integration with the active participation of professional associations. Professional organizations operate more and more professionally, contributing to the development of the accounting service market, creating job opportunities for students of the economic school.

Secondly, students of the School of Economics have the opportunity to access international accounting technology, Industry 4.0 brings opportunities for Vietnam, especially creating opportunities for accountants to access technology. international accountant; facilitate data mining and improve the reliability of reporting. The influence of the Industrial Revolution 4.0, namely the Internet of Things, large-scale data storage, cloud computing, artificial intelligence, connected things... Smart software and systems will replace manual work, automate complex processes, support service trends outsourced and reuse some other services internally. The development of an artificial intelligence system, connecting everything around the world will open up opportunities for the Accounting industry to access convenient accounting software at an appropriate cost. This industrial revolution is based on a digital technology platform, integrating smart technologies to optimize production processes, business processes, business processes, production methods, including processing processes. and provide information to the accounting department. From there, it helps to effectively use resources, save time and human resources, and access the international accounting system.

Thirdly, students of the School of Economics have the opportunity to create motivation for individuals and organizations to practice accounting to develop: Advances from the Industrial Revolution 4.0 are the driving force for individuals, businesses, Organizations operating in the accounting field in developed countries grasp and promptly change to adapt to new technologies. The Industrial Revolution 4.0 affects the awareness and actions of each officer and employee in the field of accounting, encouraging individual students to strive to improve their scientific and technological level, to apply technical progress in professional work,

thereby improving labor productivity and work quality. According to experts, the Industrial Revolution 4.0 will fundamentally change the method of performing current accounting jobs by applying electronic vouchers, by using software for generalization, data processing, bookkeeping, etc. accounting as well as allowing the implementation of audit methods in a computerized environment. Accountants will no longer spend too much effort in classifying documents, handling each individual economic transaction, recording different types of accounting books, but the more important issue is to pay attention to the presentation of financial statements. financial statements according to standards, closer to the international accounting system. It is possible to extract data from huge data stores, serving all types of decisions, leadership levels, all types of decision-making information checkpoints and all stakeholders. mandarin; ... This can happen anywhere, anytime, as long as there is internet. This is possible thanks to cloud computing technology. This flexibility is especially convenient for auditors who serve many businesses at the same time, when they have to constantly move between the head office and the businesses that hire to do accounting.

Fourthly, thanks to Blockchain technology, which uses distributed ledger technology, it also helps to improve data quality through better schedules, greater accuracy, and more details to improve efficiency, assurance. data protection; Improve data transmission for planning and management, in particular within supply and value chains and across countries; Transactions, once stored in the ledger, cannot be changed. Each subject participating in the Blockchain network is kept a copy of the public ledger and this copy is always updated synchronously through a consensus mechanism, so any changes that occur, the subjects know. and have the right to accept or not. This operating mechanism ensures trust, transparency and security for transactions between entities in the network.

Fifth, students of the School of Economics have the opportunity to improve labor productivity and create competitive advantages: Thanks to the construction of big data centers (Big data) to help science analyze and manage data. There are more and more advantages in the field of accounting and auditing. The collection, analysis and processing of big data will create new knowledge, supporting quick and effective decision making, thereby contributing to reducing costs and creating competitive advantages for businesses, especially accounting work will become easier. . The application of technologies of the Industrial Revolution 4.0 has helped to improve the work productivity of accountants many times. Currently, a large enterprise may have dozens of accountants, but in the future it will only need a very small number of accountants. Improving labor productivity helps businesses or accounting service people to hire fewer workers and still increase sales by serving more customers. Expanding the scope of work and having many job opportunities, the Industrial Revolution 4.0 brings many job opportunities in the field of accounting for students of the school of economics.

Currently, the country has 400,000 micro enterprises and more than 5 million individual business households. Micro businesses often do not hire full-time accountants but hire service accountants due to limited workload and limited costs. With a large number of micro-enterprises and the trend that hundreds of thousands of individual business households will turn into businesses, accounting and auditing resources will hardly be enough to serve the entire market. To solve this problem, the application of artificial intelligence technology is an effective choice because it can help automate the entry of documents, accounting, and at the same time connect with tax authorities and banks. customers to be able to send tax reports, make payment transactions, receive statements, and compare with banks entirely on the software. This automation can help an accountant do accounting for several dozen to hundreds of micro enterprises a month, thereby helping to thoroughly solve the problem of accounting resources for micro enterprises in the future. .

Sixth, the achievements of the Industrial Revolution 4.0 with wireless networks and digitized data will help accounting work not be limited by geographical distance. Accordingly, an accountant in Vietnam can perform accounting work in any country around the world, if the individual who organizes the accounting work - meets the conditions for practicing accounting. . This is an opportunity but also a challenge for

Vietnamese accounting practitioners in general and students of the economic school preparing to enter the accounting profession in particular. They are forced to improve their capacity to meet the requirements of international practice, improve their status and expand the scope of practice in the period of globalization. Thus, due to the Industrial Revolution 4.0, the scope of work of Vietnamese accountants has been expanded.

3.3. Challenges for students of economics school

Currently, Vietnam is facing a shortage of high-quality labor resources, especially in the accounting industry: According to statistics of the Vietnam Association of Accountants and Auditors (VAA), as of December 31, 2015, the whole country there are 109 enterprises operating in the form of limited liability companies, private enterprises... providing accounting services and 254 registered accountants. Compared with other countries in the region, Vietnam has only the 6th highest number of professional accountants, with a rate of 5.45% compared to the ASEAN region, ahead of four countries such as Myanmar (0.32%) and Cambodia. 0.15%), Laos (0.1%) and Brunei (0.03%). It is forecasted that in the coming time, the number of business and production enterprises will increase, accordingly the number of accounting service businesses will also need to increase accordingly to be able to meet the demand. of the market. Especially, when the industrial revolution 4.0 becomes widespread around the world, the demand for accounting resources is increasing. The students of the school of economics need to make efforts to prepare the luggage to enter the accounting profession to meet the demanding needs of the industrial revolution 4.0.

In addition, one of the challenges for students of economics schools in Vietnam today is developing soft skills.

+ According to Mr. Dao Quang Vinh, director of the Institute of Science, Labor and Society: “In general, our trained workers can meet it. Completing soft skills such as teamwork, foreign languages, critical thinking, creativity, technology compliance, etc. of students at the Vietnamese economic school are still quite weak. The students of the economics school are often still considered to be fast and creative, but they do not comply with or break the requirements, affecting product quality.

+ At the APEC 2017 high-level policy dialogue on human resource development in the digital era held on May 17, 2017 in Hanoi, Ms. Nguyen Phuong Mai, executive director of Navigos Search said: “Energy The English proficiency of job seekers is always the top concern of employers.”

+ In the trend of economic integration, worldwide trade is taking place strongly, the need to use international languages, teamwork ability, communication ability, critical thinking - solving issue is getting more and more attention. In fact, when there is a need to recruit personnel, most reputable units and organizations at home and abroad give priority to recruiting staff who are good at foreign languages, have the ability to work in groups, and then recruit professionals. . Students in the business school are still limited in this requirement.

In Vietnam today, accounting work is done on records and papers. However, the industrial revolution 4.0 will transform all that data into electronic information, which is both diverse and elusive. If students in the economics school are not knowledgeable about digital technology, accountants will not be able to do their jobs. Meanwhile, the knowledge, understanding and level of information technology application of the students of the economic school are still limited and uneven. And the current training work only stops at imparting basic and basic knowledge according to the professional profession of accountants, but has not been trained in depth and in many fields, especially for knowledge that brings knowledge and skills to the world. technological peculiarities and artificial intelligence. That poses a great challenge for organizations, units, telecommunications service providers, and constantly innovating software to design useful and easy-to-use technology software to support the accounting field. maths. In addition, data made through an internet connection may leak from sending emails to the audited entity or outside organizations and individuals, exchanging via a shared network. Bad molecules can take advantage of unofficial accounting information

and results to accomplish purposes that are detrimental to individuals and organizations. Meanwhile, the quality of information technology infrastructure across the accounting industry in general still does not meet the requirements set forth and requires a better preparation of information technology infrastructure, especially in the field of accounting. network security issues.

4. CONCLUSION

With the development of science and technology, we see opportunities and challenges for students majoring in accounting. First, the Industrial Revolution 4.0 has helped accountants access convenient and cost-effective software, which helps to effectively use resources, save time, human resources, and save costs. In the condition that small and medium-sized enterprises account for the majority (more than 90%), the acquisition of some capital to invest in technology with benefits is not proportionate because the investment capacity cannot be fully exploited. technology of small-scale enterprises is not really large. Next, the Industrial Revolution 4.0 allows accountants to store large amounts of information systematically and scientifically. This technology is capable of processing large amounts of data (Big Data) and also performing many tasks at the same time, to achieve the desired results but is prone to risks in terms of Information security is a risk that accountants need to be aware of and be prepared for. From those opportunities and challenges, we can see the development trend and the skills that need to be equipped in the accounting profession for accounting students such as business acumen, technological expertise, Flexibility and adaptability,...

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THE FOURTH INDUSTRIAL REVOLUTION - OPPORTUNITIES AND CHALLENGES FOR ACCOUNTING IN VIETNAMESE COMPANY

Author: Le Thanh Thanh Vy¹, Le Doan Minh Hien², Nguyen Hoang Ngoc Nhat³

Mentor: PGS.TS. Ngo Thi Thu Hong⁴

Abstracts: Vietnam is on the way to enter a new phase of development and integration. In the period of 2016-2020, industrialization towards modernization has been identified as the focus of national development strategies. New production revolution can bring Vietnam many opportunities to accelerate industrialization and modernization; also lead to challenges to the development process. We need to take advantage of the available power and took the opportunity to participate in the Fourth Industrial Revolution to accelerate the process of industrialization and modernization of the country. To fulfill these objectives, it is advised for Vietnam to have a comprehensive and consistent vision of how technology affects and reshapes the environments of economic development, society, culture and the people's lives, namely: (i) As for Vietnamese enterprises, they need to focus on science and technology applications in manufacturing, and innovations in forms of business organization and styles of doing business; (ii) As for the management of science and technology, policies should be enacted to promote innovations and applications of science and technology in Vietnam's enterprises to take advantage of the opportunities opened up by the the Fourth Industrial Revolution; (iii) In terms of Education and Training, the revolutionary new production will pose new and higher requirements for workers; that requires employees must have adequate knowledge and skills to master new technologies. In order to meet the new requirements imposed on employees, besides the policies on labor system, employment, education sector. . . the economics policies in general and accounting policies in particular also need appropriate adjustments.

Keywords: Industrial revolution 4.0, accounting, blockchain, cloud computing, artificial intelligence.

1. INTRODUCTION

1.1. The reasons of the research:

a, Theoretical reasons

The fourth industrial revolution will bring fundamental change on most of the sectors, professions, including accounting & auditing. According to the experts, the industrial revolution are in the starting phase 4.0 but definitely in the future not far away will create a milestone for the field of accounting and auditing.

b, Practical reasons

The role of accounting in the era of industrial revolution 4.0 is the very issue to be of concern for financial economics students in general and the Academy of Finance students in particular. In fact, the number of students graduated annually from universities in the economic field especially in accounting growing. However, with the amount of input of such a large industry, not many graduating students can get a job. In this day and age, capturing changes in the economy, especially the change of the Industrial Revolution 4.0 comes to the field of the economy in general as well as the accounting sector in particular is an opportunity great help for the students to understand the actual situation after school, trend lines happen to have a clear development orientation. Besides, the application of IR 4.0 to the field of accounting is also an opportunity for domestic and foreign enterprises “standing” and adapt to technological change and globalization.

¹ Academy of Finance, – CQ59/21.01CLC.

² Academy of Finance, – CQ59/22.03CLC

³ Academy of Finance, – CQ59/11.10CLC

⁴ Academy of Finance.

1.2. Research questions:

While researching this topic there are some questions that need to be resolved: In theory: the concept of industrial revolution era 4.0? The accounting concepts? In terms of practicality: How can industrial revolution 4.0 impact on the accounting sector and on the economy? What are the vital methods to keep pace with the development? The reality of the ability to apply technology effectively 4.0 an enterprise? What are the solutions to improve efficiency in the application of technology in the field of accounting 4.0?

1.3. The purposes of the research:

- *Firstly*, recognizing the importance of understanding the Industrial Revolution 4.0 and the role of the accounting field in conditions that apply technology in this era 4.0.
- *Secondly*, analyze the trends, the working environment in the field of accounting auditing in the digital era, the direction to develop the competitiveness of individuals, organizations in the field of accounting-auditing when applying 4.0 technology.
- *Finally*, give some solutions to improve the quality of accounting - auditing, help individuals and organizations improve their competitiveness in the field of accounting - auditing in the era of the Industrial Revolution 4.0

2. RESEARCH METHODOLOGY

The research is applied the collecting & analyzing method:

- Using the method of comparison and analysis, integrated analysis of the theoretical basis of the role of accounting in the conditions applied technology 4.0.
- Using a secondary data source. Secondary data is data collected from available sources, whether through synthesis and processing. It's fast, cheap but sometimes less details and did not meet the research needs.

3. RESEARCH RESULTS

3.1. The role of accounting in businesses

Accounting is the work or process of keeping financial records. We also call it accountancy. It is the systematic recording, reporting, and analysis of the financial activity (transactions) of a person, business, or organization. In business, it allows companies to analyze their financial performance. Additionally, accounting allows businesses to examine their results regarding profits, losses, productivity, sales trends, costs, etc.

In a general sense, accounting can be defined as an information system that provides financial information to stakeholders: management, investors and creditors about the economic activities and condition of a business. Sometimes Accounting is called the "language of business." This is because accounting is the means by which business information is communicated to the stakeholders. We will focus our discussions in its role in business. Accounting measures and summarizes the activities of the company and communicates the results to management and other interested parties.

Managers need accurate and timely financial data to make intelligent decisions, and accountants are the ones who produce this information. While the accounting process collects the data and presents it in various types of reports, the accountants help interpret the meanings of the reports and suggest ways to use these details to solve business problems. As we described above, accounting serves many purposes for business. A primary purpose is to summarize the financial performance of the firm for external users, such as banks and governmental agencies. The branch of accounting that is associated with preparing reports for users external to the business is termed financial accounting. Accounting also can be used to guide management in making decisions about the business. This branch of accounting is called managerial accounting.

Internal Management Accounting: Managerial accounting produces internal reports that are designed for management and are used for decision-making. These reports are modified and adapted to the specific purposes and needs of individual managers and are not usually released to parties outside the company.

Accounting Data for Decision-Making: Running a business requires accurate data about the company's assets, liabilities, profits and cash position. Accounting provides this crucial information. Accounting plays a significant role in evaluating the viability of investments. Proper consideration of an investment demands a careful analysis of costs and projections of expectations for future cash flows. Certain criteria, such as determining hurdles to return on investment, must be met.

Accounting for Government Regulations: Businesses must comply with government regulations and pay taxes on corporate income, Social Security taxes and sales. Accountants make sure the filings are accurate and on time. Any mistakes made when reporting income can result in fines and penalties.

Accounting for Planning: Successful organizations create plans to achieve their objectives. These plans include cash flow projections, sales planning, purchases of fixed assets and projecting inventory levels. An accounting analysis of historical data will provide the basis for making forecasts and developing plans to meet those targets.

Using Accounting Data for Budgeting: Budgets are essential to running a successful business. Accounting uses historical data to form the basis for future budgets and cost controls. With this information, managers can prepare overhead expense budgets and sales plans, and create cash flow projections. Then they monitor the regular accounting reports to make sure costs stay within the budgets.

Cost Accounting for Products: Manufacturing companies use cost accounting to calculate the cost of making products, determine break-even sales volumes and set optimum inventory levels. Managers need to know how much it costs to make their products to develop pricing strategies that allow the company to make a reasonable profit. Accurate accounting of manufacturing costs for each product is essential to the development of a sales plan and a projected product mix. More than likely, each product will have a different gross profit contribution, and management must establish sales goals for each item to reach the overall gross profit level needed to cover overhead and produce the target net profit.

Financial Accounting for External Users: Financial accounting produces reports for external users, such as owners, investors, employees, creditors, unions and government agencies. These reports for external use are the profit and loss statement, balance sheet and cash flow statements. Unlike internal management accounting reports, financial statements prepared for outside users are compiled using Generally Accepted Accounting Principles. Financial accounting reports whether the company made an adequate profit and how likely it is to pay dividends to shareholders. Curious investors will examine the financial statements to gauge the safety of their investments and potential for future growth and increase in value. Employees will look at the statements and get an idea of whether they can expect raises or increased contributions to pension funds.

3.2. The impact of the fourth industrial revolution on businesses and society

The Fourth Industrial Revolution is a way of describing the blurring of boundaries between the physical, digital, and biological worlds. It's a fusion of advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing, and other technologies. It's the collective force behind many products and services that are fast becoming indispensable to modern life. Think GPS systems that suggest the fastest route to a destination, voice-activated virtual assistants such as Apple's Siri, personalized Netflix recommendations, and Facebook's ability to recognize your face and tag you in a friend's photo.

As a result of this perfect storm of technologies, the Fourth Industrial Revolution is paving the way for transformative changes in the way we live and radically disrupting almost every business sector. It's all happening at an unprecedented, whirlwind pace.

The fourth Industrial Revolution is not only the digitization, the internet of the device but also convergence, fusion technologies and their interaction in various fields with large scale such as: big data; Artificial intelligence; Everything connection, automation, chemical robots, unmanned vehicles; 3D printing technology, virtual reality technology in combination with biotechnology, nanotechnology ...

The biggest characteristic of the industry 4.0 is the connection between the subject and the economic cycle thanks to the development of the infrastructure of information technology and the Internet, which is the highest peak of all connectivity network. This connection is created a new trend which is often referred to with the concept of “sharing economy”. Accordingly, the model of sharing resources between individuals with others are realized thanks to the Foundation of information technology and the Internet, towards the goal of optimizing resources the whole society. In other words, industry 4.0 are delete argument between the real world with the virtual world through advanced technology, innovation. The influence level of this revolution takes place on a global scale with the faster speed of what has happened to date and the prediction will change the whole system of production, management around the world.

Industrial revolution 4.0 has many impacts on financial markets. The first impact is that the fourth Industrial Revolution can create advantages for those countries with fledgling development financial markets like Vietnam compared with other countries when there is opportunity and application technology results in management, and financial market development. The next one is that the fourth Industrial Revolution make healthy to the financial markets. Accordingly, the content of the work needn't the involvement of the people but thanks to the artificial intelligence is made, big data and new analysis techniques will help to enhance transparency standardized rules, automation and providing in-depth reports on financial and non-financial.

3.3. The situation on the effects of the Fourth industrial revolution to accounting sector in Vietnam

a. The impact of the Industrial Revolution 4.0 on accounting sector

The Internet of Things and Industry 4.0 will have a huge impact on the financial function of industries and businesses and on the financial industry itself. Every device that can be connected through the internet and is accessible to other devices would facilitate the accessibility and sharing of real-time financial data.

Meanwhile, the Industrial Revolution 4.0 is a revolution in smart production, based on the use of the internet to connect things to transform the entire real world into a digital world. This revolution has a strong and comprehensive impact on the economy, society, environment around the world and impacts all sectors and fields with unprecedented technological breakthroughs in history, including accounting and auditing. Vietnam is deeply integrated into the world economy, of course not outside this global revolution.

b. Opportunities and challenges of the Industrial Revolution 4.0 for the accounting sector in Viet Nam

The industrial revolution 4.0 has been changing the environment and working conditions of the accounting industry, which mainly affects the following four factors: accounting workers, enterprises, accounting training institutions, agencies State management. In addition, This industrial revolution 4.0 has been responding deeply to the pressing issues of society today and not far away, which will surely create a big buzz especially for the accounting and auditing industry. In the face of the advantages that this revolution brings, there are also many challenges. And in this regard, we will dive deeply into the benefits and challenges that this revolution brings.

For accounting workers

There are significant advantages this revolution can bring to accounting field. Firstly, the industrial revolution 4.0 with internet makes accounting work not limited by geographical distance. Accountants in Vietnam can perform accounting work in any country around the world, if the accountant meets the conditions for accounting, for example, ACCA International Accounting Practicing Certificate, CPA Australia,.... There is an irrefutable fact that with new technology, accounting employees have saved time

and effort when doing accounting work using accounting software such as: MISA, FAST, VACOM, ... If the former is Maths have to record accounting operations into books by hand, then synthesize data to make financial statements will take time and accuracy is not high, then the accountant has done the work Accounting and can make financial statements easily with high reliability. Another point in favor of this revolution is about cloud technology, which has been used extensively in enterprises to store accounting data, so it minimizes the risk for accountants to store accounting data.

In addition to the positive points that IR 4.0 brings to the accountants, there are also some challenges. The first challenge is that the IR 4.0 helps accountants in Vietnam to perform accounting work in any country around the world, whereas any accountant in any country can practice in Vietnam. This creates fierce competition in accounting labor, if Vietnamese accountants do not improve their own capabilities and conditions to be able to meet international practice conditions, enhance their status. and expanding the scope of practice will be eliminated. The second one is that with new technology, accounting workers must constantly improve the level of information technology to meet practical requirements, for example: Proficient use of accounting software, electronic tax declaration and payment, history Use electronic invoices. Last but not least, when expanding the scope of work in other countries, the linguistic factor is a necessary condition for the accountant to do his job, the main language used in most countries is English. Therefore, workers in addition to good communication in English must also cultivate specialized English knowledge.

For businesses

These are the advantages that the 4.0 revolution brought to Vietnamese enterprises in general and accounting service enterprises in particular. Firstly, thanks to IR 4.0, enterprises have applied high technologies to perform accounting work such as accounting software, tax declaration software, electronic invoice software, etc., which has saved many employees. accounting force, cost for enterprises. Secondly, Cloud computing has helped businesses to store data safely with large capacity.

However, 4.0 revolution also brought new challenges for businesses. Technology 4.0 creates fierce competition between domestic enterprises and foreign companies. For example, when two Uber and Grap taxi companies entered Vietnam market, it quickly dominated this market, leading to tens of thousands of taxi drivers of Vietnamese enterprises losing their jobs, including well-known taxi firms. Language such as Vinasun, Mai Linh, ... In the future, accounting service companies are no exception in this competition. Besides, Cloud computing and internet connection will lead to the risk of losing data information, so businesses need to pay attention to this issue. The accounting information will easily leak out due to network exchanges. Bad elements can accomplish the purpose of sabotaging, confusing public opinion, adversely affecting the business situation of enterprises.

For training institutions

One of the main advantages of Industry 4.0 is that it will require the world to produce a new kind of worker—a knowledge worker. Tomorrow’s industry leaders and managers must possess new skill sets to adapt, to manage, and to take advantage of Industry 4.0. They must be critical thinkers, problem solvers, innovators, communicators, and provide value driven leadership. They must be able to see beyond the technology at play to the implications for society for the use of that technology. These traits define the knowledge worker. They must know the technology but be able to meet and solve all aspects of the challenges engendered by this technology. This kind of leader requires a new approach to education.

The disadvantage of the fourth industrial revolution is that Vietnam’s higher education is facing the risk of competition when more and more corporations, businesses develop high-level human resource training institutions, not only to serve their own needs but also to meet meet the needs of society in the context of industrial boom 4.0. The university is not only a place for training and research but also a center for innovation, solving practical problems, bringing value to society, a place where businesses and

labor markets are combined. to become an educational ecosystem. With the current accounting industry, the training institutions are still training in the traditional direction, the training program has not been associated with the practical needs of enterprises, the specific training direction still focuses on theory. not going into practical practice. Many training institutions have not yet organized simulation accounting models, allowing students to access accounting work in practice.

3.4. The situation on applying industry 4.0 technologies in accounting sector

a. The application of Cloud Computing

Cloud Computing, which is mentioned as a revolution in technology, changes the appearance, methods and working habits for businesses. Therefore, Cloud Accounting is built on the development of Cloud Computing and stored on data center servers. One of the most popular names is online accounting software, or online accounting.

What does the cloud accounting software solve?

Problem 1: Outdated information

Solution: Keep up to date. Cloud software allows you and your customers to access data anytime, anywhere and on any device. This helps you get all the information about your business or customers and make decisions based on real-time information.

Problem 2: Loss of data due to computer failure

Solution: Data is stored remotely, “on the cloud”, not on any personal system. The cloud system is one of the safest ways to store your data. If your laptop is lost or damaged, you don’t need to worry about someone trying to access customer data when these data are not stored on the hard disk but on a remote server on the Internet

Problem 3: The data is only accessible from your workplace

Solution: Remote access allows more flexible work. When information is stored on the internet, you can work remotely flexibly.

Problem 4: Expensive accounting system

Solution: Affordable and expandable cloud software. Continuously updating when using traditional software is really expensive. In addition, this is complicated and time consuming to handle when the system fails; not to mention difficulties to ensure security and keep data safe

Cloud-based software is simpler to maintain and eliminate the need for an IT expert, saving budget to invest in other places more effectively. The cloud computing system is also flexible and extends according to the growth of the business so you can always choose the options that suit the needs of your business or customers rather than costing them too great services, too small for the current scale of the business.

Current situation of cloud computing in Vietnam

According to statistics, Vietnam is the country with the highest rate of increase in cloud computing spending in the period of 2010-2016 (64.4% / year), much higher than the average of the ASEAN region (49, 5%).

In Vietnam, IBM is the pioneer in launching the cloud computing center in September 2008. Then, Microsoft is the second unit of cloud computing in the Vietnamese market. By 2018, Vietnam reached 41/100 points and became the 14th ranking country in the Cloud service coverage rankings. This shows that Cloud model is becoming more popular and starting to dominate than traditional IT model. In the future, the application of this model in Vietnam is expected to increase more and more diverse.

However, in absolute numbers, Vietnam’s cloud computing spending is still very low (1.7 USD / year in 2016), 107 times lower than Singapore; 6.5 times more than Malaysia; 2.4 times more than Thailand; and 1.3 times the Philippines

b. The application of Artificial Intelligence

Artificial Intelligence (AI) is the intelligence was performed by any artificial system. Artificial intelligence is related to behavior, learning and adaptation capabilities of smart machinery includes the tasks of control, planning and scheduling, as well as the ability to answer questions about the diagnosis , answer the customer about the products of a company, handwriting recognition, speech recognition and face.

According to Daniel e. OLeary (1991), the artificial intelligence that can have significant influence to the accounting database has developed models of decision support and focus on the information needs of decision makers. Moreover, recent developments in AI has emphasized the integration of contextual information and icons facilitate wider understanding about accounting events, i.e. emphasizing the importance of logos and text data rather than the numbers to be able to understand the circumstances of the business. Besides, the integrated smart systems with accounting databases can support (or with the decision or independent decision) in the investigation of large volumes of data or no direct involvement of the decision. Thus, the system can analyze the data and support users to understand or interpret the transaction to determine the accounting event would be collecting system

Currently, the application of the automation technology and artificial intelligence to burn the books are becoming reality when the accounting software currently offers the ability to automatically import and adjust data. The company applies the input using optical character recognition (OCR) by the conversion of images, PDF, handwriting to text documents software, in addition the engineers did the application deep learning technology (machine learning) and decision tree to semantic analysis of sentences, from which to extract the important information and save in the database. This system can provide the report and clear advice on options to implement, concurrently all repetitive tasks, especially in accounting.

Besides, there is a tool that allows artificial intelligence can learn a quick activity called “Machine Learning”. This innovation is based on the algorithm allows the computer can interpret the data that they receive, to improve their knowledge and their function. The potential of this technology is the beginning of the ability to predict and analyze of artificial intelligence. The system like this can provide reports and specific advice about the choice to make for all the repetitive tasks.

c. The application of Blockchain

Blockchain is a hierarchical database storing information in the information blocks are linked together by encryption and expanded over time. With the ability to reduce the majority the possibility of errors, modify data protection, high security, Blockchain will become popular in the field of accounting, finance and banking.

According to the Blockchain report and the future of accounting of the ICAEW emphasized three main characteristics of Blockchain are:

- (i) A new transaction is done from a person and are transmitted to a network shared identical ones without control center;
- (ii) All transactions and records are stored permanently and is not capable of being falsified or deleted;
- (iii) Blockchain is programmed to allow automation and control transactions through smart contracts.

Blokchain provides two very important advantages for the accounting profession: transparency and immutable. It's great benefits for the integrity of a company's accounting records which they can easily reach out to stakeholders. Of course, there must be rules to adjust even the way objects can access financial records and Blockchain use contracts smart to meet the rules so (Contract intelligence is the code block written to automate certain processes in accounting). Meanwhile, the lower-level services such as the adjustment of accounts, bank regulators, validation, accounts receivable and accounts payable is authorized for Blockchain platform.

Also, Blockchain an active database in the cloud, including financial information and non-financial. Any information will be uploaded to the Blockchain were certified and approved by the existing members and then distributed to the members of the network in real time. That means that data is secure Blockchain

theoretically against stolen and adjusted data. At the same time, it reduces the ability of most errors occur when comparing the complex information and different from many different sources.

The technology experts evaluated Blockchain technology breakthrough creative thinking of people to ensure the absolute transparency of information, accurate, affordable and convenient in the digital era. Currently in the world, Blockchain has numerous applications in areas such as banking, finance, telecommunications, ... In Vietnam and was initially applied to the financial sector - accounting software Electronic invoice MeInvoice.vn of MISA Joint Stock Company - the proactive application of new technologies in products themselves.

Every month, businesses are required to issue thousands of invoices for purchases/sales. Issuing paper bills spend a lot of money, time and risk of storing and managing invoices. To solve all these problems, electronic bill MeInvoice.vn the optimal solution, simplifies operations send/receive and invoice management.

MeInvoice.vn is electronic billing services help customers manage, distribute and archive electronic invoices. Buyers receive instant email invoice, or lookup, online download via the Internet. This solution saves up to 80% of the cost issue invoices quickly, convenience and savings.

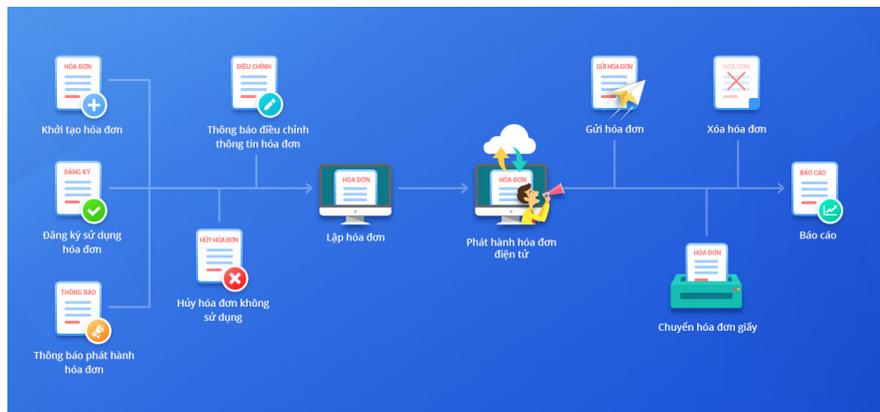
Outstanding features of electronic billing software MeInvoice.vn considering electronic invoice other products Blockchain to apply technology to ensure the safety, transparency and reliability of the electronic invoice. Technology Blockchain on MeInvoice.vn be construed as a ledger, record the entire state and fully updated information on the bill for the parties can check and validate information.

Since it began deploying in 2011, till now there has more than 3,000 enterprises using electronic invoices. According to the Ministry of Finance, apply electronic billing replace paper bills will help reduce the time of administrative procedures taxes, reduce costs for businesses, such as the cost of paper, ink, transportation and special the invoice storage costs. At the same time promoting the application of information technology in the work of business management, accounting, and accountant will help enterprises improve the efficiency of production and business, quality of service and increased competitiveness for businesses. In addition, the use of electronic invoice tax service also help build a database of invoices, invoices promptly stop businesses flee, overcome falsified invoices.

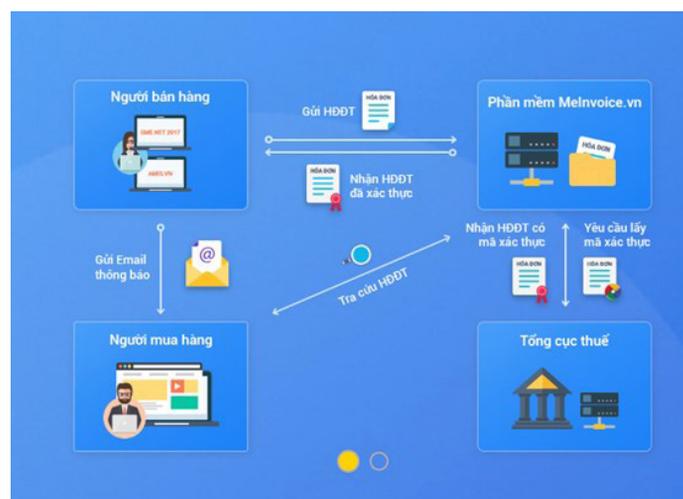
Not only successful application technology platform Blockchain also help increase security, safety and transparency for billing, electronic billing software of MISA MeInvoice.vn is integrated software available on the stand name of MISA such as MISA SME.NET accounting software, business Management software AMIS.VN consolidation ... this brings advantages for users, for example, all data from accounting software MISA SME.NET accounting of the business will be integrated ready on electronic billing software Meinvoice.vn help businesses save time, effort, just made the process of making, invoice and bill right on the software application.

The business processes:





The convenience and safety of MeInvoice.vn:



Electronic billing software of MISA MeInvoice.vn is one of the strong action of Blockchain technology application in the field of finance and accounting in Vietnam. In the coming time, the Vietnamese enterprises as MISA will accelerate to more widespread application Blockchain in many of its products to the general harmony with the development of the IR 4.0.

d. The application of Accounting software

Accounting software is an information system organized in the form of a computer program. Users of accounting software, namely accountants, storekeepers, managers and CEOs, ... input input data are invoices, accounting vouchers, etc. Based on the structures , commands, automated processes are available, accounting software will process input data and export accounting financial statements to users, helping them save time and cost as much as possible.

According to the research on private universities in Bangladesh, a five scale Likert technique has been used to investigate the interviewees’ opinion about the application of accounting software in the respective universities as well as to find the cause of differences between actual and expected level of use of accounting software. The study revealed that almost 80% private universities are now using accounting software. The result of the study shows that 100% of the respondents think maintaining record in accounting software is easier than manual systems, 97.87% of the respondents think chance of error and difficulties in identifying errors is much less in accounting software and 100% of the respondents showed their opinion in favor of accounting software that it is faster to apply. 65.96% of the respondents agreed that reluctance of the top management is the main barrier in the applications of accounting software while other two factors which create obstacles are reluctance of employees and initial cost of installations and training. The study also

revealed an alarming fact that some of the universities do not provide any special training on accounting software though they are using such software and almost 36% of the accounts personnel doesn't have academic background on accounting discipline

In Viet Nam, as we know one of the most used software and the largest market share in the software industry is accounting software. Businesses of all sizes, big or small, choose for themselves an accounting software. With incomplete statistics, there are about 130 vendors of accounting software. Thus can see the richness of accounting software. But to be able to choose for yourself an accounting software suitable for the size of the business will not be a simple problem. Currently, in addition to accounting software written by Vietnamese software writing companies, there are also some accounting software originating from the US such as Solomon, Sun System, Exact Software, Peachtree Accounting ... However, Vietnamese accounting software is still more selective than foreign software.

4. SOLUTIONS AND CONCLUSION

4.1. Solutions for efficient and accurate application of industrial revolution 4.0 technologies in accounting sector

With the powerful development of IR 4.0 in the fields of accounting, auditing, we need to take advantage of opportunities and overcome challenges and difficulties. Accordingly, there are some solutions needed to be concerned:

a. For management agencies

Focus consolidate the legal framework

In 2025, application of IFRS in 3 levels: Public company prototype IFRS implementation; other types companies apply VAS / VFRS; small and medium sized enterprises implement specific accounting regime.

The application of IFRS will help complete Vietnamese accounting, auditing opening a new era which changes the way of recognition, measurement and presentation elements of financial statements.

Investment, infrastructure development in information technology

Investment is needed, the infrastructure development of information technology in a coordinated and timely manner to satisfy the development trend of the global system.

In particular, focus on a building of security systems, ensuring high security data information of accounting and auditing.

Developing strategy building the field of accounting and auditing in both the short and long term. Strategy is built based on the status of accounting, auditing and the problems posed by the digital revolution; Focus on developing guarantee Accounting, auditing operated synchronously, operating efficiency, in line with the market mechanism and adapt to scientific progress and technical of the digital revolution.

Besides, effective studying and applying, methods appropriate of auditing, including basic methods and techniques, especially the collection methods, assessment of audit evidence, methods of technical analysis in the context of the accounting profession that use electronic vouchers, blockchain technology, cloud computing ...

Supporting policy businesses

Regulations to support businesses in the policy of training human resources accounting and auditing as well as building guidelines to orientation and encouraging movement of labor in the ASEAN economic Community.

Promote international cooperation

Continue to promote international cooperation, evolving constantly to accounting and auditing services markets which is healthy and sustainable

Development activities of accounting and auditing services in accordance with the development trend of countries in the region and internationally, to create and expand professional exchanges

b. For auditing and accounting services provision organisations and enterprises

Enterprises have to apply exactly policies and regulations of Government as well as develop skilled staff, professional knowledge and a capable of integration. In addition, they should strengthen the training and develop soft skills, group activities effectively and use mastering digital technology successfully according to market demand.

Promoting innovation and application of science and advanced technology, especially the achievements of modern technology was invented Industrial Revolution 4.0 through the development and strategic planning for the development of information technology in the field accounting and auditing. Prioritize resources to develop new technological solutions, encourages ideas and plans to apply innovative technologies and development techniques.

Developing wireless networking system, digital data to narrow the gap between countries. Accounting-auditing is not confined within a country that can expand worldwide. Career opportunities are extended to people with professional competence and knowledge of principal accounting of different countries.

c. For training institutions

For changes in the perspective training

Training does not come from what we have. It must come from the demand of the reality and requirement of the era of digital technology which is to provide quality human resources with high society.

Training Program

Focusing on training programs in accounting, auditing is suitable for the trend of world development.

The training institutions should review the training programs in accounting and auditing.

The training program should be built to ensure integration requirements and interference in quality with the program of the advanced countries in the region and the world, in accordance with the training programs of professional associations which aim to mutual recognition between training institutions and professional degrees and certificates.

Training content

Development training content to help students after school to adapt in time to the era of digital technology.

Besides teaching in specialist knowledge, training organizations should focus on training the necessary skills such as effective communication skills, working in different groups; critical thinking skills and solving problems on the basis of respect for professional ethics.

Training Methods

Switching from traditional teaching methods to applying active teaching methods is an effective way to develop teaching towards promoting positive, initiative and creativity of learners, learner-centered.

Establish relationships

Establish relationships between the training institutions with enterprises at home and abroad. In the era of IR 4.0, establishing relationships with companies is expandable not only with the units in the country but also abroad, because it makes training activities and research are cemented, the issues of practice, meet the requirements of businesses.

d. For accountants and auditors

Skills development requirements of professional ethics set out in the context of urgency. According to the Census of US fraud investigators made in 114 countries, including Vietnam, show that fraud adverse impact on the quality of financial statements affect the decisions of those who use information. The cause of this condition is due to the unstrictly control, the lack of professional ethics of those who manage and those

who do the work of accounting. Every accountant needs to understand and remember the ethical guidelines of their profession in all cases.

During the IR4.0, each individual operates in the field of accounting – auditing should be aware of the importance of technology to apply it which to suit trends, save resources and increase work efficiency. Moreover, an indispensable means for each accountants in the present and the future that is the international language.

To actively prepare the fullest advantage, as well as limit the impact of the IR 4.0, innovating and setting the accounting process are needed, from the collecting, processing and data entry vouchers to process information. Moreover, it is necessary to enhance the usefulness of accounting information through the application of information technology in the analysis and evaluation of accounting information.

Opportunities will increasingly extend to the accounting team – accountants who achieve international standard are recognized operating in many countries around the world such as: ACCA, CMA, CIA ...

These certifications can help accountants – Vietnamese accountants expanded the maximum range of their activities, improving the competitiveness of human resources in the field of accounting and auditing of Vietnam.

4.2. Conclusion

The application of new technologies, especially cloud computing, artificial intelligence and Blockchain has and will make drastic changes in the field of financial accounting. The quality of accounting information system when the application technologies will become faster, more accurate and timely, integrated information and extensive variety of information including financial and non-financial. This will help managers get the extensive information when analyzing and making decisions in business and enterprise management. Furthermore, basing on the application of smart sensors, device communications and management solutions integration, enterprises can digitize whole operation process from production, business management. Information from the manufacturing process, through digitized sensor data into real time and transmitted to the system processor and system administrators. Whereby the operating system of centralized management of data always full, and accurate updates to help managers make decisions promptly operator. The more it's fully digitized, more information is updated and accurate.

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BLOCKCHAIN TECHNOLOGY AND ACCOUNTING IN VIETNAM

Author: Tran Ngo Trung Nghia¹, Le Doan Nam Anh², Le Huu Binh³
Mentor: TS. Le Thi Yen Oanh

Abstract: *The article makes comments on the influence of Blockchain technology - a new technological achievement in the Industrial Revolution 4.0 to the field of Accounting in Vietnam. The application of these technologies has improved the accuracy and transparency in data collection, storage and management as well as minimizing errors and overcoming limitations in the manual accounting process, step by step. replace traditional accounting methods. Accordingly, new opportunities and challenges for the accounting profession in Vietnam in the future will also be set to integrate with this digital economy trend.*

Keywords: *blockchain, blockchain, database, digital technology, data storage, accounting, big data.*

1. INTRODUCTION

The 4.0 revolution is taking place more and more strongly and has a great influence on all fields of industry in society, and it is impossible not to mention Blockchain – a technological achievement that is changing industries all over the world. Blockchain, also known as blockchain technology, is being considered as a breakthrough scientific work, bringing great economic efficiency, providing a means to share hardware and software. This technology has created great turning points in the economic and financial fields in our country and it is impossible not to mention one of the areas that have been and are being strongly influenced by this wave of technology. Accounting field. Accordingly, Blockchain is definitely a technology trend that experts in the accounting industry cannot “ignore” in the future.

For a long time, the field of Accounting has always faced problems related to transaction security, risk of errors in the reconciliation and recording of transaction information. Like most public initiatives. In this field, the use of Blockchain in accounting and auditing is partly a response to the need to minimize the possibility of errors when comparing complex and different information from different sources. Besides, Blockchain has a profound influence on supply chain management and transaction accounting; This technology can also create opportunities for accountants to work with clients and colleagues to reap the benefits of technology.

On the website vaa.net.vn of the Central Association of Accountants and Auditors of Vietnam posted: How does Blockchain work? Some of the main contents are as follows:

“It is thought that blockchain can reduce accounting errors and fraud. Organizations such as the Australian Government research agency, the Australian Scientific and Industrial Research Organization (CSIRO) and the Securities Exchange The Australian Securities Exchange (ASX) is working on the application of this technology.”

“Blockchain is in its early days on the road, but if blockchain is developed as expected, the technology will dramatically change accounting and auditing functions.”

“Blockchain can make international payments and money transfers faster, and makes it more secure to

¹ Academic of Finance. – CQ60.21.01CLC.

² Academic of Finance. CQ60.21.02CLC

³ Academic of Finance. – CQ60.20.17

authenticate an individual's identity or a company's identity. That's why the organization is The Australian Government's scientific and research organization, CSIRO, is exploring how Blockchain technology can work in government agencies and the private sector. If blockchain is developed as expected, this technology will dramatically change accounting functions. Accountants will need to rethink how they work and may need to provide clients with work products that can work. higher values related to insight and strategic thinking".

Thus, it can be said that the development of Blockchain technology has a great influence on the field of Accounting. So let's explore and evaluate the effects of this technology.

2. THEORETICAL FRAMEWORK

2.1. Theoretical basis

Blockchain or ledger (translated into Vietnamese as block chain), is a database system containing information, used to store information in interconnected blocks of information, and managed by everyone participates in the system, instead of an individual third party like the state or central bank; while allowing data to be transmitted securely with a complex encryption system, which has expanded over time. The technology itself exists as a file that stores a lot of recorded transactions called a block. Each block contains a timestamp and a sequence of numbers leading to the previous block, known as a "fingerprint". Blocks that are linked together and expand over time are therefore called blockchains. Blockchain is designed to resist data change. Information in the Blockchain cannot be changed and can only be added when there is a consensus of all nodes in the system. Even if part of the Blockchain system collapses, other computers and nodes will continue to work to protect information.

In particular, Blockchain has the ability to transmit data without requiring intermediaries to confirm information. The Blockchain system consists of many independent nodes that are capable of authenticating information without requiring a "sign of trust". Essentially Blockchain is a chain of computers that all have to approve a transaction before it can be confirmed and recorded. Blockchain is designed to be non-retroactive and non-retroactive from data modification.

To understand Blockchain, it is necessary to understand the following five definitions: blockchain, distributed consensus mechanism (Decentralized Consensus), trusted computing (Trusted Computing), smart contracts (Smart Contracts) and public proof Proof of Work. This computational model is the foundation of creating distributed applications.

- Decentralized consensus mechanism

This mechanism is the opposite of the classical model of centralized consensus mechanism – that is, when a centralized database is used to manage transaction validation. A decentralized scheme that transfers power and trust to a decentralized virtual network and allows the nodes of that network to continuously store transactions on a public block, creating a unique chain: blockchain. Each successive block contains a "hash" (a unique fingerprint) of the code before it. Therefore, encryption (via hash) is used to ensure the authenticity of the transaction source and eliminate the need for a centralized intermediary. The combination of encryption and blockchain technology ensures that a transaction is never stored twice.

- Blockchain (The blockchain)

A blockchain is like a place to store semi-public data in a narrow container space (blocks). Anyone can confirm the input because the block contains the signature of the user, but only the user (or a program) can change the data of the block because only he or she holds the key. confidentiality for that data.

- Smart contracts (smart contracts)

Smart contracts are the blocks for building decentralized applications. A smart contract is equivalent to a small program that users can trust with a unit of value and manage that value. The basic idea behind smart

contracts is that escrow management for a transaction between two or more parties can be sequentially verified through the blockchain, rather than through a judge. concentrate.

- Trusted computing

When you combine the platforms behind blockchains, decentralized consensus mechanisms, and smart contracts, users will find that they support the propagation of resources and transactions on a single plane in a single plane. peer-to-peer way, and in doing so, they allow computers to trust each other on a deep level.

- Proof of work

Proof of work is the key building block of the blockchain because it cannot be “repaired” and is protected through the power of a cryptographic hash function.

2.2. Research Methods

The article uses two research methods simultaneously, including: causal research method and descriptive statistical research method in analyzing this topic. In which: The causal research method is used in the article to show the degree of influence of Blockchain technology on the economic future in society 4.0 in general and the future career in the field of Finance and accounting in particular. . In parallel, the article also uses descriptive research methods to describe the current situation of the application of Blockchain technology to the current accounting and auditing profession.

In addition to the personal opinions of the authors, some information in the article is secondary information collected, selected, classified and sorted by the author from articles written on the topic of Blockchain posted on various websites. Website specialized in Economics, Finance, Accounting.

3. RESULTS AND DISCUSSION

3. 1. Blockchain’s Impact on the Accounting Industry

When it comes to blockchain, the first property that will be mentioned is “reliability”. Transactions in the blockchain are digitally signed by the ECDSA algorithm – a digital signature algorithm that has a very small chance of forging signatures, because it requires large computational resources. In addition, the use of a cryptographic hash function during the entire process from transaction initiation to book entry is an added factor of trust. All transactions are summarized and stored in the block header. The process of checking blocks and transactions also happens many times with many layers.

Transaction data will be “irreversible” or changeable, after entering the confirmation book long enough, the transaction is stored in the block, the blocks are linked together. In the ID of a block there is a “trace” of all transactions from the beginning, plus random elements. Therefore, a huge resource must be used to calculate the redo, because it is related to the previous blocks and governs all the following blocks.

The blockchain system that forms and develops until it is big enough will become “unbreakable”. The principle of distributed consensus makes checking and validation more and more increased with the number of participating nodes. Moreover, the peer-to-peer network offers high computing power, there is no bottleneck, so DDoS attacks will be limited to the maximum. If there is a problem in one node, the remaining nodes can still function normally with synchronized data. These data also cannot be erased, only recorded and read data.

The “availability” of Blockchain technology is demonstrated by placing network nodes in many different locations and geographical areas. Meanwhile, joining the blockchain network does not require the permission of a centralized management unit, so it often leads to an increasing number of network nodes. When a machine fails and recovers, the system will automatically connect and re-sync data. Data is spread all over the world without incurring additional costs such as geography, transportation, saving considerable time and resources.

So how does Blockchain affect the accounting industry in Vietnam?

If in normal accounting activities, an accountant needs to make double entries, Blockchain only needs one entry to provide information to all parties without worrying about authenticity. Accounting records cannot be edited or changed once saved to the Blockchain, even if requested by the owner of the accounting system. Because on the Blockchain platform, every daily transaction is recorded and authenticated, so the integrity of financial records is guaranteed.

Defined as an open and decentralized “ledger”, Blockchain technology is capable of recording and verifying transactions without trusting an intermediary. The technology itself exists as a file that stores a lot of recorded transactions called a block. Each block contains a timestamp and a sequence of numbers leading to the previous block, known as a “fingerprint”. Blockchain is designed to be null and void from modification of data and cannot be retroactive.

Blockchain’s potential lies in its ability to create a ledger that records every transaction, of which all participants have an identical copy, which can be accessed and viewed in real time. Instead of companies storing and managing independent data records, Blockchain automatically records the transaction information of both parties simultaneously in a public ledger. When any of them more information, the ledger will automatically verify and correct the data. Each stakeholder does not need to maintain their own ledger, so that the accountants will not have to do all the processing and adjustment. Transaction customization. Blockchain is poised to end traditional accounting methods including invoicing, documentation, contract building, and payment recording for businesses large and small with its ability to record real-time transactions.

Some applications of Blockchain technology in the Accounting - Finance industry:

- Transaction validation
- Track property ownership
- Traceable audit evidence
- Automated audit process
- An inventory registration system for all assets.

Blockchain in accounting greatly reduces the possibility of errors when reconciling complex and disparate information from many different sources. Moreover, accounting records will not be able to be corrected or changed once saved to the Blockchain, even if requested by the owner of the accounting system. Because on the Blockchain platform, every daily transaction is recorded and authenticated, so the integrity of financial records is guaranteed. In addition to the impressive capabilities mentioned above, this technology has the potential to reduce or even eliminate the need for resource auditing and the accounting profession in general.

According to data from NASDAQ (short for “National Association of Securities Dealers Automated Quotation System” is the second largest stock exchange in the United States today), so far the world’s top 4 auditing organizations include: PwC, Deloitte, Ernst

3.2. Actual situation of Blockchain technology application in the field of Accounting in Vietnam

The approach to the international accounting system in the context of the current market economy is becoming one, which brings many troubles in requiring Vietnamese accountants to present and operate transparently. accordance with international accounting standards. Blockchain technology is a technology created according to international standards, so the operation as well as the standard used when applied to Accounting is the International Financial Reporting Standard (IAS/IFRS). Meanwhile, Vietnam Accounting Standards (VAS) although has been developed and updated according to the international standard framework, there is still a gap and significant difference. This makes it difficult for accountants to apply Blockchain technology to this field in state-owned companies.

The actual survey shows that the current knowledge, understanding and level of information technology application of Vietnamese accountants are still limited and uneven. Training has only stopped at imparting background knowledge, not in-depth, multi-disciplinary, especially for knowledge of specific technology and security such as Blockchain, Cloud computing or intelligence. artificial. In Vietnam, accounting work is currently mainly done on records and papers. While the 4.0 Revolution transforms all that data into electronic information, which is both diverse and elusive, in the long run, if accountants and auditors are not tech-savvy, it will be difficult to perform the part of the work.

In addition to the limitations and challenges for the accounting profession in the application of Blockchain technology, a number of Vietnamese businesses are also gradually transforming to integrate with the digital economy.

Vakaxa Technology Joint Stock Company - a leading company providing solutions and leading Blockchain technology applications in Vietnam with a team of experienced analysts and programmers has come up with solutions, developed Blockchain application in deploying this technology application service in accounting - finance (including: Electronic money payment system, smart contract, electronic trading floor, supply chain development, ...).

Always pioneering the application of technology of the 4.0 Revolution in products, MISA is the first and only unit that has successfully applied Blockchain to electronic invoice software - MeInvoice.vn helps increase safety, transparency transparency and accuracy of invoices. MISA's MeInvoice.vn e-invoice solution has received great appreciation from leaders of the Ministry of Finance, the General Department of Taxation, and the Ministry of Information and Communications.

Blockchain technology on MeInvoice is understood as a ledger, recording the entire status and fully updating information about the invoice for the participants to be able to check and verify the information. Currently, every month, businesses have to issue thousands of invoices for goods purchase and sale transactions. Issuing paper invoices consumes a lot of money, time and risk in storing and managing invoices. To solve all of the above problems, MeInvoice e-invoice is the ultimate solution that simplifies sending/receiving and managing invoices.

Outstanding achievements in Blockchain application have affirmed MISA's pioneering position in applying modern technologies of the Industrial Revolution to its products to support businesses to improve their competitiveness. In the coming time, with its inheritance and development, MISA will continue to research and apply many other modern technologies on MISA SME.NET accounting software to support businesses to integrate better before the current crisis. the powerful explosion of the Industrial Revolution 4.0.

4. CONCLUSION

Thus, the development of science and technology along with the advent of blockchain is bringing positive impacts to the economy in general and the field of Accounting in particular. However, in order to capture the opportunities presented by this development, accountants must stay up to date with the trends of these changes to the industry, familiarize themselves with new concepts such as big data and new concepts.), cryptography, ledger systems (blockchain), payment systems via mobile devices and new platforms connecting financial service providers and users. In addition to new opportunities, there are many worries about the impact of technology on the financial and accounting sectors such as the decrease in the demand for accounting personnel (persons acting as intermediaries). However, technology does not take away the jobs of accountants, but only helps to make their work more efficient. Accountants do not need to become a true technologist about blockchain technology, they need to understand blockchain and its impact on the accounting profession to quickly adapt to these changes.

Blockchain technology will become the future of e-commerce, finance, education and many other economic sectors in the next 5-8 years. We need to improve the application of blockchain technology to keep up with digital technology trends in the world. Even places like London take years or even decades to reach maturity. For ASEAN and Vietnam markets, this period may be even longer. That is not to say that we can relax and wait, because the potential changes are huge and we have to prepare now. It is possible that at present, Blockchain has not completely replaced the operation in accounting and auditing processes, but it's not too early for us to study this technology and from there build a reasonable strategy. In today's rapidly evolving technology landscape, open and proactive access to new sources of information is the only way to succeed.

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FACTORS AFFECTING THE AUDITOR'S INDEPENDENCE WHEN CO-PROVING NON-AUDIT SERVICES FOR AUDIT CUSTOMERS

Author: Vu Thi Nga, Le Ngoc Mai, Nguyen Linh Chi, Nguyen Thuy Hien

Mentor: TS Vu Thuy Linh

ABSTRACT: The independence of the audit is very important in the audit process because it ensures the quality and reputation of the audit organization. Surveys on related domestic and foreign research show that there has not been a comprehensive study on the factors affecting the auditor's independence when co-providing non-audit services for clients. audit and there are few studies in Vietnam. Therefore, the study aims to explore and measure the factors affecting the independence of auditors to meet the practical and scientific needs of the topic. This. At the same time, the study also clarifies the content of independence and its impact on the quality and effectiveness of audit and non-audit services in both theory and practice. Because the requirements of professional ethics in general and maintaining independence in particular in the provision of audit and non-audit services have become more urgent than ever, especially when the volatile units' operating environment potentially poses a high risk of material misstatement. In addition, the study also details the factors affecting the auditor's independence in the process of providing services, mentions the experience of applying independence, and gives orientations. develop independent audits in Vietnam in the future.

Keywords: Independence, audit, non-audit services, financial statements.

1. INTRODUCTION

The independence of the audit is very important in the audit process because it ensures the quality and reputation of the audit organization.

Roger W. Bartlett (1993) defined audit independence as “an objective mental attitude in making decisions about audit and financial reporting”. Accordingly, independence is understood as in the audit process, the auditor is not influenced or influenced by any material or emotional interests that affect honesty, objectivity, and professional independence. mine. Independence is the first and foremost principle of the auditor's professional ethics.

Independent audit plays a huge role in the audit process, its benefits such as improving resources, process, quality, and audit reputation, as well as its necessity to ensure success. of the audit.

However, major irregularities related to fraud on audited financial statements have raised concerns about audit quality and auditor independence - an important factor affecting the quality of the audit. enjoy audit quality.

Without independence, the reputation of the audit organization will collapse. Typically, the bankruptcy of Enron energy group in 2001 in the US and the bankruptcy of the auditing firm Arthur Andersen in 2002 due to loss of credibility. The Enron scandal, announced in October 2001, resulted in the bankruptcy of Enron Corporation, an American energy company headquartered in Houston, Texas, and the de facto dissolution of Arthur Andersen one of the five partners. longest-standing auditor and largest accountant in the world. Not only was the largest organization bankrupt in American history at that time. Enron is considered the biggest audit failure. Enron's complicated financial statements have confused shareholders and analysts. In addition, complex business models and unethical practices require the company to use accounting restrictions to show false earnings and modify its balance sheet to show favorable performance.

The combination of these problems resulted in the bankruptcy of the company and the majority of them were sustained by the indirect knowledge or direct actions of Lay, Jeffrey Skilling, Andrew Fastow,

and the directors. other executives like Rebecca Mark. Lay has served as president of the company for the past few years and is approved of Skilling and Fastow's actions. Although he did not ask about the details. Skilling only continued to focus on meeting Wall Street expectations, advocating for the use of market-based accounting (accounting based on market value then inflated and running Enron) pressure to find a way new to hide the debt. Fastow and other executives "created off-balance-sheet vehicles, complex financial structures, and bewildering transactions that few people could understand."

Following the scandal, new regulations and laws were enacted to improve the accuracy of financial reporting for public companies. The Sarbanes-Oxley Act increased penalties for destroying alterations or falsifying records for federal investigations or defrauding shareholders. The act also increases the responsibility of audit firms to be impartial and independent of their clients.

Many reasons were given, notably, Arthur Andersen audited Enron for quite a long time, 16 years, and also worked as a consultant.

Many studies have suggested that the fact that auditing firms perform audits of financial statements for a client for a long time and perform other non-audit services threatens the auditor's independence. Previous studies in many countries have addressed different factors that enhance as well as threaten the independence and have produced different and sometimes contradictory results.

In addition, the Vietnamese Standards on Auditing provide guidance on the quality of audit services and the auditor's obligations, including independence, objectivity and professional judgment. To ensure the quality and independence of audit services, Vietnam has adopted a number of measures such as the establishment of the National Financial Supervisory Commission, the adoption of the International Financial Reporting Standards and the implementation of the International Financial Reporting Standards. International Auditing Standards. These measures have helped to ensure the independence of auditors in Vietnam and contributed to the development of the financial industry in the country.

Research conducted by PT Nguyen and M Kend in the journal *Accounting & Finance* (2019) shows that the independence of auditors in Vietnam is frequently challenged. Through empirical research, the authors were able to better understand current practices related to auditor independence in Vietnam. Research shows that the majority of Vietnamese auditors are members of larger accounting firms that are related to the auditee. This is a conflict of interest that could lead to a biased or unreliable audit of financial statements. Furthermore, research indicates that auditing firms in Vietnam lack the necessary resources, such as technical expertise and professional experience, to audit businesses effectively.

In Vietnam, the legal framework on independent audit has been quite completed, including legal documents regulating the independence of auditors. At the same time, auditing firms are also applying this regulation in maintaining the independence of auditors.

However, at present, there is very little research on auditor independence. Auditors and auditing firms themselves have not identified specific factors that directly affect the independence of auditors, especially when co-providing non-audit services for audit clients, in order to There are effective solutions to not only supervise, and maintain but also improve the independence of auditors in the process of practicing.

In practical terms, auditor independence is a fundamental factor constituting audit quality and is of great interest after the collapse of large companies in the world. standardized in Standards or Manuals of Professional Ethics promulgated by all the professional associations of accountants and auditors in the world, so that research on this topic is practical and relevant. current trend. In terms of research, surveys of related domestic and foreign studies show that there is still a gap in research on this topic because there has not been a comprehensive study on the factors affecting the independence. of auditors when co-providing non-audit services for audit clients and there is little research in Vietnam.

Therefore, the research topic evaluates the views and opinions of those who are related to financial

statements and the independence of auditors in Vietnam today such as auditors, accountants, and credit officers. banks and investors on the factors affecting the independence of the audit members, and compare the views between these objects.

From the detection of factors that threaten independence or increase independence, this study offers some suggested solutions for regulatory agencies, Associations of practicing auditors, auditing firms, companies that use financial statement inspection services, and financial statement users to ensure and increase the auditor's independence in auditing financial statements.

2. LITERATURE REVIEW

Auditing is a specific industry, appearing according to social requirements to improve the reliability of financial statement information and being interested and researched by scholars. At the same time, auditing is managed practice, professional ethics, and quality control, and professional training by accounting and auditing professional organizations and associations. Auditing plays a role in increasing the credibility of the audited information, helping users to be more confident in that information and feel secure to use it to make their economic decisions. Two factors that make up the quality of an audit activity are the auditor's qualifications and their independence. In particular, the professional qualifications of auditors are necessary conditions to ensure the quality of audit opinions and the independence of auditors is a sufficient condition for users of audit information to trust that opinion. Thus, it can be said that independence is a prerequisite in auditing.

The independence of auditors is seen in 2 aspects: ideological independence and formal independence: Perceived independence is the fact that the auditor is recognized as independent by the user of the audit opinion. Namely, independent of the form of request. The auditor should avoid events and situations so seriously that a suitable and well-informed third party has assessed the facts and circumstances. It can be concluded that the integrity, objectivity, and professional skepticism of enterprises differ. audit or team members performing assurance services have been affected; Actual independence is the fact that the auditor gives the audit opinion in the most objective way. In particular, ideological independence is a state that allows the auditor to draw conclusions without being influenced by factors that affect expert judgment. Ideological independence allows auditors to act with integrity and apply their objectivity and professional skepticism. Thus, not only must the auditor ensure that the audit opinion is objective, but the auditor must also create confidence in users that they are independent during the audit process, otherwise users will not trust the audit opinion.

In general, the concept of independence is understood as being objective, independent of external factors when making a decision or an opinion. However, the concept of independence is also understood differently when there are differences in culture, society, politics, or field of activity. There are different views on auditor independence such as the ability to report findings of auditors (DeAngelo, 1981a); objective attitude when performing audits and reporting (Bartlett, 1993); state of mind (AICPA, 1992), or freedom to perform work within one's authority without pressure from anyone (ISB, 2000) and other definitions. Therefore, the independence of the auditor is the impartial and objective attitude of the auditor when performing the audit and disclosing the audit report, which is reflected in both the auditor's thinking and perception. users of the audit report. financial statements, and audit reports. Auditor Independence is an assessment based on ON two aspects, that is, IN truth and appearance. De facto independence is a state of mind that allows the auditor to conduct an audit with objectivity, honesty, and skepticism whereas ostensibly Independence requires avoiding such situations. may cause users of the audit report to doubt that the auditor can express an unbiased opinion. Therefore, in practice, auditors need to be independent of any clients to whom they provide audit services and must demonstrate to third parties that the auditor can maintain impartiality in their judgment. anticipating and resisting pressure from managers at client companies (Chrystelle, 2016). If the auditor is not considered independent, users will have less confidence in the financial statements, and as a result, the auditor's opinion

on the company's financial statements will not be valid (Firth, 1980). As such, the credibility of the auditor depends not only on the facts but also, even more importantly, on the perception of independence. both the practice as well as the independence of the auditors are recognized as important factors in maintaining public confidence in the audit profession (Pany & Reckers, 1980).

In Vietnam, independence is stipulated in the Standards of Professional Conduct of Accountants and Auditors (2015) and the Law on Independent Auditing (2011). Independence requires the auditor to be independent in substance and form when giving an opinion. The external independence mainly stems from the professional ethics of the auditor while the actual independence is mainly expressed through: financial; affinity; professional expertise. There have been many studies on the factors affecting the independence of auditors. Most of the research on auditor independence focuses on identifying factors that are likely to affect independence and assessing their impact on apparent independence because of independence on the part of auditors. reality is not observable (e.g. Imhoff, Jr., 1978; Firth, 1980; Shockley, 1981; Dykxhoorn & Sinning, 1982; Bartlett, 1993; Abu Bakar et al., 2005; Law et al., 2008; Omri & Akrimi, 2015). Some studies also show differences in perceptions and opinions of different groups of subjects: auditors, accountants, credit officers, lenders, investors, etc. on influencing factors. this (Reckers & Stagliano, 1981; Beattie et al., 1999; Alleyne et al., 2006; Al-Ajmi & Saudagaran, 2011; Nguyen & Ha, 2015). Based on previous studies, we present the results of our investigation of the variables used for the survey.

The variables used in the study

Variables name	The scale	Code	Bases for selecting variables
Audit tenure (TK)	Rotation of auditors (more than 3 years)	TK1	Shockley, 1981; Beattie et al., 1999; Sinnett, 2004;
	Rotation of audit partners (more than 3 years)	TK2	Abu Bakar et al., 2005; Al-Ajmi et al., 2011; Dart,
	Rotation of audit firms (more than 5 years)	TK3	2011; Omri & Akrimi, 2015; Nguyen & Ha, 2015
The provision of non-audit services (DV)	Auditing firms provides accounting, tax advisory, internal audit and financial services to audit clients	DV1	Reckers & Stagliano, 1981; McKinley et al., 1985; Beattie et al., 1999; Abu Bakar et al., 2005; Alleyne et al., 2006; Salehi, 2009; Al-Ajmi et al., 2011;
	Provision of executive search and appointment services by incumbent auditor	DV2	Omri & Akrimi, 2015; Nguyen & Ha, 2015; Twaha et al., 2017
	Non-audit services from incumbent \geq 50% audit fee	DV3	
	Non-audit services from incumbent \geq 25% audit fee	DV4	
Economic dependence (P)	Income of partner depends on the retention of a specific client	P1	Beattie et al., 1999; Craswella et al., 2002; Alleyne et al., 2006; Omri & Akrimi, 2015; Nguyen & Ha, 2015; Twaha et al., 2017
	Income from one client 10% of total revenues of the firm	P2	
Employment with audit clients (QH)	The rank of the ex-auditor who accepts employment with a client firm	QH1	
	The time lapse between auditing and working for a client firm (under 3 years)	QH2	Imhoff, 1978; Koh & Mahathevan, 1993; Parlin & Bartlett, 1994; Iyer & Raghunandan, 2003
	The time lapse between auditing and working for a client firm (over 3 years)	QH3	
Competition among audit firms		CT1	DeAngelo, 1981; Shockley, 1981; McKinley et al.,
	Being a Big Four international firm or an international firm	CT5	
	Small, local audit firm	CT6	
The risk to the auditor from the provision of poor-quality audit services (RR)	Risk to auditor of disciplinary action by professional body	RR1	Teoh & Lim, 1996; Beattie et al., 1999; Abu Bakar et al., 2005; Alleyne et al., 2006; Al-Ajmi et al., 2011; Nguyen & Ha, 2015; Twaha et al., 2017
	Risk to auditor of loss of practicing certificate	RR2	
	Risk of damage to reputation of auditors from public scandals	RR3	
	Risk of litigation against auditor	RR4	
The disclosure of financial relations (CK)	Disclosure of non-audit service	CK1	Beattie et al., 1999; Alleyne et al., 2006; Alajmi et al., 2011; Omri & Akrimi, 2015; Nguyen & Ha, 2015; Twaha et al., 2017
	Disclosure of audit fees	CK2	
	Disclosure of non-audit fees	CK3	

	Auditor has not familiarity involved with the client firm	DL1	IFAC, 2001; The Independent Auditing Law of
The auditor	Auditor has not financial interest in client	DL2	VietNam, 2011; Beckett, 2013; The Standard of
independence (DL)	Professional independence when auditing	DL3	Professional Conduct for Accountants and Auditors
	Auditors have certification of the independence when auditing	DL4	of VietNam, 2015

3. RESEARCH METHODOLOGY

3.1. Data collection method:

Through reference to relevant primary and secondary sources, the study synthesizes references from textbooks and monographs on Auditing, accounting auditing standards and regulations of professional ethics; guidelines of prestigious international auditing associations and organizations to synthesize data related to research subjects.

3.2. Data processing method:

Through interview method with survey and historical documents to synthesize appropriate data.

3.3. Qualitative research method

Qualitative research method is used to find out all the factors that are likely to affect the auditor's independence when co-providing non-audit services and argue about the correlation of these factors with the auditor's independence. independence of auditors when co-providing non-audit services. Taiwo Olalere (2011) summarized, classified, and evaluated different research methods used in accounting. Since then, Taiwo Olalere (2011) has proposed an appropriate empirical research methodology in the field of accounting, including research approach or research approach strategy; effective data collection and appropriate data analysis techniques; worldview (concepts and views of people about themselves and the world).

Due to the study of factors affecting the independence of auditors when co-providing non-audit services for audit clients, the empirical research methods in accounting by Taiwo Olalere (2011) can be best used for the research objectives. Therefore, the author applies a mixed research approach according to the research model proposed by Taiwo Olalere (2011).

3.4. Quantitative ANOVA method

Quantitative ANOVA method is used to test the theoretical model to discover and measure the correlation of factors that have an impact on auditor independence when co-providing non-audit services.

4. RESULTS AND DISCUSSION

4.1. Demographic characteristics

Among the surveyed subjects, the number of employees with 5-10 years of experience is the most, accounting for 31% of the total number of employees. This could indicate that this is a key moment in an employee's career, when they have gained enough experience to take up mid-level positions. The percentage of employees with no experience is quite low, accounting for only 6% of the total number of employees. This shows that the company has a recruitment policy towards experienced and specialized employees.

The percentage of employees with more than 15 years of experience is 30%, showing that the company has a large investment in experienced employees and long-term contributions to the company. The ratio of auditors and accountants both accounts for 40% of the total employees, showing that the company has a great demand for accounting and auditing services. The proportion of investors is quite low, accounting for only 15% of the total number of employees. This may indicate that the company is not a professional investment firm but mainly focuses on other financial services. As such, the table provides information about the accounting-related experience of those respondents are across different professions and it can be helpful to understand the skills and expertise of professionals in the accounting field.

Most of the positions in the company require a university or college degree, accounting for 70% of the total number of employees. This shows that the company is focusing on recruiting highly qualified employees to ensure the quality of work. The ratio of investors accounts for 15% of the total number of employees, showing that the company has a need for professional investment staff. However, this ratio is not too high compared to other positions, showing that the company has a diversity in personnel structure.

For the current income level in 1 month, it can be seen that the number of people with income from 10-20 million is the most in working positions. However, accountants have the same number of people with incomes from 10-20 million and over 20 million, showing the diversity of income levels in this position.

4.2. Analysis the factors affecting the auditor independence

Influencing factors		Average value			Standard deviation (Auditor)	Standard Deviation (Accounting)	Standard Deviation (User)
		Auditor	Accounting	User			
Audit fees		2,50	2,85	2,08	0,791	0,802	0,846
Audit tenure		2,33	2,29	2,05	0,763	0,794	0,806
The rotation of auditors/audit firms		2,67	2,51	2,34	0,757	0,749	0,771
Audit Committee		3,67	3,67	3,41	0,822	0,750	0,825
Demand group							
Enterprise Size		3,24	3,52	3,13	0,757	0,787	0,801
The understanding of business leaders about current laws, standards and legal regulations		4,17	3,82	3,46	0,795	0,796	0,825
Internal Control System		3,50	3,74	3,09	0,776	0,789	0,831
Socio-Economic Environment Group							
Macroeconomic environment		3,3	3,2	2,8	1,21	1,28	1,29
Cultural environment Businesses		3,2	3,0	2,8	1,17	1	1
Regulatory environment	The adequacy of the standard system and auditing regime	2,83	2,77	2,33	0,789	0,764	0,869
	Conformity of the system of auditing standards	3,47	3,51	3,09	0,757	0,759	0,831

Source: Summary of data from survey results

This table shows the mean and standard deviation of factors affecting the independence of auditors when co-providing non-audit services, classified into 3 groups: supply group, demand group, and socio-economic environment group. Standard deviation provides an indication of the degree of change in each group's responses.

We can see that there are several factors with relatively high standard deviations in all three groups, indicating a high degree of variability in reactions. For example, the standard deviation of "Corporate management's understanding of applicable laws, norms and regulations" was above 0.79 for all three groups, suggesting that opinions differ on this factor.

The table shows statistics on the influence of 3 groups of factors affecting the independence of auditors when co-providing non-audit services. Those three groups of factors are supply group, demand group and socio-economic environment group. The supply group includes audit fees, audit time, auditor/corporate rotation and audit committee.

Factors with an average value of less than 3 are considered risks to the independence of auditors when co-providing non-audit services.

- Audit fees (average = 2.50): Lower audit fees can reduce the auditor's effort and attention, which can threaten their independence.

- Audit tenure (average = 2.33): Longer audit lengths can cause auditors to become overly familiar with their clients’ activities and create a sense of complacency that threatens their independence.
- Auditor/Corporate Rotation (mean = 2.67): Auditors who are not rotated and unfamiliar with clients can lead to impaired independence and objectivity.
- Adequacy of the standards system and audit regime (mean = 2.83): A weak management system can lead to a lack of independence, as the auditor may not feel adequately supported in their role.

This suggests that these factors may affect the independence of auditors. For instance, low audit fees can lead to a reduction in resources allocated to the audit process. This can threaten independence, affecting the quality of the audit. Similarly, short audit tenures and frequent turnover of auditors can hinder the ability of auditors to conduct independent and thorough audits.

On the other hand, factors with an average value greater than 3 are considered to increase the independence of the auditor when co-providing non-audit services.

- Internal control system (average = 3.50): A strong internal control system can help auditors feel more confident in their role and reduce the risk of pressure from management affecting their independence.
- Audit Committee (average=3.67): Having an independent audit committee can provide a layer of oversight and support for auditors.
- Business size (average = 3.24): Larger businesses may have more resources and more commitment to maintaining independence, which can benefit auditors.
- Business management’s understanding of applicable laws, norms and legal regulations (average = 4.17): When business leaders have a clear understanding of regulations, they are less likely to pressure auditors to act in ways that compromise their independence.
- Audit standards system conformity (mean = 4.17): A well-regulated system tailored to the needs of auditors can help promote independence and objectivity.

Some factors had relatively low standard deviations, indicating more consensus among respondents. For example, the standard deviation for “Audit Committee” is below 0.83 for all three groups, suggesting that there is more consensus on the importance of this factor.

As such, this table provides a more detailed view of variability in feedback among different stakeholder groups, which can be useful for understanding the range of opinions and perspectives on factors affecting the independence of auditors when co-providing non-audit services.

Implement a one-way ANOVA to check the importance of each independent variable for the dependent variable. The ANOVA table is shown below:

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Value	P-Value
Supply group	0,223	2	0,111	10,56	0,001
Demand group	0,312	2	0,156	14,83	0,000
Socio-Economic Environment Group	0,191	2	0,095	9,05	0,002
Residuals	0.304	42	0.007		
Total	1.030	48			

The ANOVA one-way table shows that all three independent variables (Supply Group, Demand Group, and Socio-Economic Environment Group) have a significant influence on the dependent variable (Auditor’s Independence). The p-value of all three independent variables is less than 0.05, which suggests that the independent variable does not affect the dependent variable and can be refuted.

For further analysis of the relationship between these factors and the independence of the auditor, a regression model has been developed.

The dependent variable in this model is the independence of the auditor when co-providing non-audit services, while the independent variables are the factors identified in the table above: audit fees, audit duration, auditor/corporate rotation, audit committee, etc enterprise size, knowledge of business leaders about current laws, standards, and regulations related to quality, internal control system, adequacy of the system of standards and auditing regime, suitability of the system of auditing standards.

The regression model can be represented as follows:

$$\text{Independence of Auditors} = \beta_0 + \beta_1(\text{Audit fee}) + \beta_2(\text{Audit duration}) + \beta_3(\text{Auditor/Enterprise rotation}) + \beta_4(\text{Audit Committee}) + \beta_5(\text{Enterprise size}) + \beta_6(\text{Knowledge of business leaders}) + \beta_7(\text{System internal control}) + \beta_8(\text{Completeness of the Standards System}) + \beta_9(\text{Suitability of the Auditing Standards System}) + \varepsilon$$

Where: β_0 is the blocking coefficient β_1 - β_9 is the coefficient of each independent variable ε is the error term

The results of the regression model can be used to determine which factors have the greatest impact on the independence of auditors. The coefficients can be understood as follows: for every increase in one unit of the independent variable, the dependent variable will increase or decrease by an amount equal to the value of the coefficient.

The results of regression analysis can be used to determine the relationship between independent and dependent variables (the independence of the auditor when co-providing non-audit services). The coefficient of the independent variables in the regression equation represents the degree of influence of each variable on the dependent variable. For example, in our regression model, we found that auditor rotation within the business has a significant negative impact on the auditor's independence when co-providing non-audit services. This suggests that the more often auditors are rotated within the business, the less independent they are when it comes to providing non-audit services.

On the other hand, the adequacy of the normative system and the audit regime has a significant positive impact on the independence of auditors when co-providing non-audit services. This suggests that the more complete the standard system and audit regime, the more independent auditors there will be when providing non-audit services.

By analyzing regression models, we can also identify which factors have the greatest impact on the independence of auditors and focus on addressing these factors to improve the independence of auditors when co-providing non-audit services.

Next, to ensure the validity of the regression model, a deep test was conducted using the Bonferroni method. The results of the Bonferroni in-depth test are presented in the table below:

	Mean Difference	Std. Error	95% Confidence Interval	P-Value
S				
D	-0.187	0.065	(-0.322, -0.052)	0.002
And	-0.141	0.065	(-0.276, -0.006)	0.043
D				
S	0.187	0.065	(0.052, 0.322)	0.002
And	0.046	0.065	(-0.089, 0.181)	0.971
And				
S	0.141	0.065	(0.006, 0.276)	0.043
D	-0.046	0.065	(-0.181, 0.089)	0.971

The Bonferroni post-test test showed that the Supply Group and the Demand Group were significantly different from each other ($p < 0.05$), while the Demand Group and the Socio-Economic Environment Group, and the Supply Group and the Socio-Economic Environment Group were not each other statistically significant ($p > 0.05$).

5. CONCLUSION

The study presents in detail the factors affecting the independence of the auditors in the process of providing services, mentions the experience of applying independence, and gives the direction of audit development. independence in Vietnam in the future.

In practice, the auditor's independence is a fundamental factor constituting audit quality and is of great interest after the collapse of large companies in the world. Standards or Manuals of Professional Ethics are promulgated by all the professional associations of accountants and auditors in the world, therefore, research on this topic is practical and relevant to the current trends. current direction. In terms of research, surveys of related domestic and foreign studies show that there is still a gap in research on this topic because there has not been a comprehensive study on the factors affecting the independence. of auditors when co-providing non-audit services for audit clients and there is little research in Vietnam. Therefore, the selection and study of the topic "Factors affecting the independence of auditors when co-providing non-audit services" is timely, necessary, and theoretically meaningful. and practice.

The study has generalized the theoretical and practical basis of factors affecting the independence of auditors in the process of providing services performed by independent auditors. The study has explored and raised experiences on applying independence in the process of co-providing non-audit services at independent auditing organizations of different countries to see lessons learned for auditors. On the basis of theory, the research has presented the actual situation of factors affecting the independence of auditors in the process of providing services performed by independent auditors in Vietnam, clearly state the assessment of the current status of factors affecting the auditor's independence when co-providing non-audit services performed by independent auditors in Vietnam, including advantages, limitations, and causes. The theoretical basis and actual situation of the research paper have presented the development orientation of the independent audit in Vietnam in the coming time, outlined requirements and principles for perfecting the application of auditor independence so that Recommendations to apply the independence of auditors in the process of providing services performed by independent auditors in Vietnam

In terms of limitations, the article has comprehensively studied the factors affecting the independence of auditors when co-providing non-audit services from the perspective of awareness, attitude, motivation, and behavior of auditors. accountants in Vietnamese enterprises. The study has not conducted specific research on factors directly related to the independence of auditors from other angles such as awareness, attitude, motivation, and behavior of customers, stakeholders such as investors, government agencies...

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THE IMPACT OF THE STATE BUDGET AUDITING PROCESS ON THE EFFICIENCY AND TRANSPARENCY OF THE STATE BUDGET MANAGEMENT

**Authors: Cu Hoang Lam Vu¹, Nguyen Tam Nhu¹, Le Hoang Vu¹, Nguyen Nguyet Anh¹
Mentor: Nguyen Huu Tan¹**

ABSTRACT: Every year, the audit activities of the State Audit Office have pointed out and recommended to handle many problems and inadequacies in the use of the State budget, contributing to increasing revenue - reducing expenditure and tightening the discipline in State budget management, strongly affecting the truthfulness and correctness of the Budgetary Statement, and improving transparency in the use of the State budget. However, it is also necessary to propose solutions with a view to overcome the limitations and improve the efficiency of publicizing the State budget.

Keywords: Auditing, transparency, State Budget

1. PROBLEM STATEMENT

In the current process of innovation and integration in Vietnam, State Audit plays an effective role in enhancing the efficiency of allocation, management, and utilization of state finances and public assets. It contributes to budget transparency, anti-corruption, and waste prevention. The accounting books, documents, and financial data of enterprises, state agencies, or social organizations that utilize the state budget are all subjects to be inspected by the State Audit.

According to the State Audit Law of 2005, the State Audit is an independent institution established by the National Assembly, with the role of serving the state in inspecting and supervising the management and utilization of the state budget, money, and assets. It contributes to practicing the economy, combating corruption, losses, and waste, detecting and preventing violations of the law, and enhancing the efficiency of using the state budget, money, and assets.

The issue of budget transparency has been addressed in the 2013 Constitution and has become a constitutional principle. Budget transparency has become an indispensable requirement in public financial management, in particular, and in the management of the state budget in general. It not only helps enhance the effectiveness of utilizing the state budget but also strengthens the trust of the people in the Party and the State.

2. CURRENT SITUATION

The state budget auditing process, after undergoing several legal changes, has been enhanced and actively contributes to the transparency and efficiency in the management of the state budget.

One of the most important principles of state budget activities is the principle of budget transparency. According to Article 8, Clause 1 of the State Budget Law 2015, it is stipulated that “the state budget is managed in a unified, democratically centralized, efficient, economical, transparent, fair, and open manner”. On June 25, 2015, the National Assembly issued regulations about the state budget transparency (Article 15, Clause 1 of the State Budget Law 2015). Based on the State Budget Law 2015, on June 15, 2017, the Ministry of Finance issued regulations about the disclosure of the state budget estimates about budget revenues and expenditures for all budgeted entities and organizations supported by the state budget (Circular No. 61/2017/TT-BTC) and guidelines for the disclosure of the state budget at different levels

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(Circular No. 343/2016/TT-BTC).

The State Audit process has rectified or prevented the issuance of documents related to the management and utilization of the state budget that are not in line with practicality or contrary to existing regulations. It can be affirmed that the State Budget Audit agency has performed its role effectively in enhancing transparency in financial policies: transparency in determining budget revenues and expenditures, efficient utilization of people's tax money, and strengthening the national financial system, contributing to the socio-economic development of the country in the context of international economic integration.

Based on recent statistical data on the transparency of national and subnational budget indices, the Government and Ministry of Finance of Vietnam have made efforts to expand transparency and disclosure in the management and utilization of public resources. These efforts aim to enable citizens to participate in budget discussions and create greater transparency regarding legal reforms and budget governance arrangements. Reports are presented to the public in a simplified and easily understandable manner through images, tables, and charts, allowing ordinary citizens, including those with limited financial and budget knowledge, to access and grasp basic information about the state budget.

During the period from 2011 to 2020, the State Audit has recommended financial handlings amounting to 467 trillion Vietnamese dong. In particular, during the 5-year period from 2016 to 2020, the State Audit has recommended financial handlings of 365 trillion Vietnamese dong, of which recommendations for revenue increase and expenditure reduction accounted for approximately 40% of the total financial handling recommendations. In addition, the State Audit has provided 498 files, audit reports, and related documents to the agencies of the National Assembly, the Central Inspection Committee, investigative agencies, and other authorized state agencies to serve investigation, examination, and monitoring tasks; transferred 20 cases with signs of criminal offenses to the investigative police for further investigation, and reported 2 cases to the Prime Minister for directing the Ministry of Public Security to handle. During the same period, the State Audit also recommended amending, supplementing, replacing, abolishing 869 legal normative documents and improperly managed documents that did not comply with the General regulations of the State and practicality.

In general, the core values that the State Audit aims for are: "Transparency - Quality - Efficiency - Continuously increasing value". This is the confirmation of the transparency of Budgetary Statements, Financial Statements, and public investment capital Budgetary Statements; assessing the legality and effectiveness of public financial management and utilization; recommending improvements to inadequate mechanisms and policies; timely detecting corrupt and negative practices to ensure efficient and economical use of public financial resources.

3. SOLUTIONS TO ENHANCE THE EFFECTIVENESS OF STATE BUDGET AUDITING:

To enhance the effectiveness of state budget auditing, the following solutions can be implemented:

Firstly, Reforming the auditing process: Ensure that the auditing process is designed logically and comprehensively. Standardize the auditing steps and focus on crucial aspects of the state budget. This can be achieved through the following three perspectives:

1) Establish a rigorous auditing procedure: Ensure that the auditing process is detailed, clear, and continuously updated. Clearly define the auditing steps, responsibilities of relevant parties, and the time frame for implementation.

2) Promote public participation: Create opportunities for public involvement in the auditing process, such as receiving feedback, suggestions, and opinions from the public. This can be done through information disclosure, organizing public meetings, and establishing mechanisms for democratic oversight.

3) Strengthen accountability and appropriate sanctions: Ensure that there are clear mechanisms for

accountability and penalties for violations in the auditing process. This helps ensure the seriousness and transparency of the process, as well as motivates participants to comply with rules and regulations.

Secondly, Focusing on training and enhancing the capacity of auditors: Ensure that auditors receive comprehensive training in professional knowledge, laws, and auditing skills. Organize training courses and continuous learning programs to improve the capabilities and knowledge of auditors. To enhance professionalism, provide in-depth training on auditing processes, auditing principles, financial management, and relevant legal principles. Additionally, emphasize education on ethics and values to ensure that auditors remain objective, impartial, and dedicated to safeguarding national financial security and maintaining the objectivity and transparency of audit results.

Thirdly, Emphasizing the application of information technology: Utilize information technology to strengthen the auditing process and minimize manual work. Automated auditing tools and software can help increase the speed and accuracy of the auditing process, as well as enhance efficiency and accuracy in auditing. Information technology can be used to automate processes, quickly analyze data, and timely assess risks accurately.

Fourthly, Enhancing independent audits: Ensure the independence and non-reliance of auditors. Auditors need to be independent and not influenced by personal or group interests. This can be achieved by ensuring financial and organizational independence for auditing agencies and preventing interference from the government or other external forces. Additionally, establish mechanisms for feedback and handling complaints to ensure fair and non-interfering processes. These mechanisms may include setting up hotlines for auditors and staff to report violations and complaints safely and anonymously. Furthermore, enhance public participation to ensure their involvement in the state budget auditing process. This can be done by disclosing relevant information, providing opportunities for public opinions and suggestions, and promoting transparency and accountability of auditing agencies.

Fifthly, Strengthening transparency and objectivity: Ensure that auditing results are publicly disclosed and transparent. Audit reports should be widely published and easily accessible to the public. Enhancing the independence of auditing agencies: Ensure that auditing agencies are completely independent and not influenced by relevant parties. These agencies should be established with absolute independence, free from reliance on relevant parties, and able to operate freely and uninfluenced. Additionally, mechanisms for feedback and complaint handling should be established to ensure fair and non-interfering processes. These mechanisms may include setting up hotlines for auditors and staff to report violations and complaints safely and anonymously. Moreover, it is essential to enhance public participation to ensure their involvement in the state budget auditing process. This can be achieved by disclosing relevant information, providing opportunities for public opinions and suggestions, and promoting transparency and accountability of auditing agencies.

Sixthly, Enhancing Collaboration and Cooperation: Creating a collaborative environment among auditing agencies, ministries, sectors, and budget management units. Linking these entities can enhance the effectiveness of auditing and reduce duplication. Additionally, it is necessary to establish cooperation mechanisms between different auditing agencies to share information and experiences, thereby enhancing auditing efficiency. Auditing agencies can collaborate in task assignments, auditing standards and methods, and share auditing results to improve quality. Furthermore, emphasis should be placed on promoting international cooperation and peer review. Collaborating with international auditing agencies and applying international auditing standards and methods can enhance the independence of state budget auditing. Peer reviews from external auditing agencies can also provide an objective assessment of the independence and effectiveness of the auditing process.

Conclusion: In general, the state budget auditing in Vietnam during the current strong integration into the international economy presents numerous favorable opportunities but also gives rise to challenges.

However, enhancing the effectiveness of state budget auditing is of crucial importance for the budget management process, particularly in budget settlement, contributing to improving transparency, maintaining overall fiscal discipline and operational efficiency, and efficient allocation within the budget cycle, execution, and settlement of the state budget, as well as public resources in general. To continue harnessing the effectiveness of this work, aiming to ensure transparency in the national financial system and efficient and effective utilization of state budget resources in the future, Vietnam should continue implementing comprehensive and specific macro solutions and translating them into concrete actions. These actions should empower and assign more responsibilities to the state auditing agency, alongside improving policy mechanisms to facilitate the objective and truthful collection, processing, and evaluation of information. This approach will maximize the effectiveness of the auditing work in the state budget auditing process.

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THE RELATIONSHIP BETWEEN AUDIT ADJUSTMENTS AND AUDIT QUALITY AT LISTED REAL ESTATE COMPANIES IN VIETNAM

Author: Nguyen Thi My Hanh¹, Phung Phuong Nhung¹, Nguyen Ngoc Toan Thang¹

Mentor: Ph.D Ngo Nhu Vinh¹

ABSTRACT: This research aims to assess the potential impact of audit adjustments on the audit quality for the listed companies on the Vietnamese Stock Exchange. In other words, the research attempts to answer whether the audit adjustments can improve the audit quality. To achieve the objectives, a multivariate regression model was employed to test the hypotheses. The research hypotheses were tested using a sample of 30 real estate companies listed on the stock exchange over a 5-year period from 2017 to 2021 as the research sample, comprising 150 observations. The research findings reveal a significant and positive relationship between profitability ratio, total assets, accounts receivable discrepancy, and audit adjustments, as well as audit quality. This implies that higher levels of audit adjustments are associated with higher audit quality. The findings of this study can provide helpful information for the equity owners, board of directors, and audit firms, contributing to developing science and knowledge in the auditing field of study.

Keywords: audit adjustment; audit quality; real estate; Vietnam

1. INTRODUCTION

In today's business environment, financial reporting and financial auditing play a crucial role in providing comprehensive and accurate information about the financial position of companies. However, it is evident that the adjustment of financial reporting has become a prominent issue in businesses, particularly in the context where the quality of financial auditing is being questioned in terms of transparency and reliability. The quality of audit services has always been a concern for regulatory bodies, prompting standard-setters worldwide to make significant adjustments to audit reporting standards to enhance the transparency of audited financial reports and overall reporting process quality. For example, the Public Company Accounting Oversight Board (PCAOB) introduced a new audit reporting standard in 2017, requiring auditors to describe critical audit matters in the audit report (PCAOB 2017). Similarly, the Financial Reporting Council (FRC) in the UK issued a new standard in 2013, mandating audit firms to disclose materiality-related risks in their audit reports (FRC 2008). Both of these requirements highlight the importance of audit reporting quality, particularly in cases that could increase the risk of errors in financial reporting. This research holds significant significance in providing information about the state of financial reporting adjustments and audit quality in listed companies on the Vietnam Stock Exchange. The findings of the study can provide valuable insights for business managers, securities regulatory bodies, audit firms, and researchers in this field. The research can also contribute to improving the audit and financial reporting system in Vietnam, thereby enhancing the reliability of financial information and supporting the development of the stock market.

With the aim of gaining a deeper understanding of the relationship between financial reporting adjustments and financial audit quality in listed companies on the Vietnam Stock Exchange, this research topic was undertaken. This will provide business managers, audit firms, securities regulatory bodies, and researchers with an overall and accurate perspective on the actual situation of listed companies in Vietnam, thereby enhancing transparency, reliability, and the development of the Vietnam stock market. This study will focus on analyzing the relationship between financial reporting adjustments and financial audit quality of listed

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companies on the Vietnam Stock Exchange. The research methods will include quantitative analysis through data collection from financial reports and audit reports, as well as the use of statistical analysis tools to analyze the data. The results of this study will provide business managers and audit firms with additional information and knowledge to improve the quality of financial reporting and financial audits of listed companies in Vietnam.

The research will not delve into the detailed analysis of factors influencing financial reporting adjustments and audit quality. The value of the study will be limited to the context of the Vietnam stock market and cannot be directly applied to other countries. The research will not assess the impact of external factors such as economic conditions, political factors, market sentiment, and other variables on the relationship between financial reporting adjustments and audit quality.

2. THEORETICAL FRAMEWORK

2.1 Research Overview

Several studies have been conducted in Vietnam to investigate the relationship between audit adjustment and audit quality. An example of a research paper by Ms. Nguyen Ngoc Thuy Vy (2022) examined the relationship between financial reporting quality, management capacity, and investment efficiency of listed companies in Vietnam in the period 2012-2020. The results show that the quality of financial statements can improve the investment performance of the enterprise. Second, management capacity has a negative effect on investment efficiency. Third, management capacity also has an interactive effect that reduces the strength of the positive relationship between the quality of financial statements and the investment performance of enterprises. The reference of this study is to examine whether the impact of financial reporting quality on investment performance is a driver of financial reporting adjustment behavior and assessment of audit quality because audit quality is basically associated with the quality of financial statements. Another study with the topic “The influence of the quality of internal audit activities on earnings management behavior: An empirical study in companies listed on the Vietnamese stock market” by Tran Thi Giang Tan and Tang Thi Thanh Thuy (2018) evaluated the influence of the quality of internal audit activities on earnings management by governing accounting policies at companies listed on the Vietnamese stock market. Research results show that the quality of internal audit activities as measured by professional competence, objectivity, and scale for this activity negatively influences earnings management behavior. In addition, the study by Tran Minh Hieu and Nguyen Van Thanh (2019) on “The relationship between financial reporting quality and audit quality” used a data sample of 137 companies listed on the Vietnamese stock exchange in the period from 2011 to 2016. By using the linear regression method, this study analyzed the impact of factors related to the quality of financial statements such as company size, operating size, debt, financial ratios, governance, and financial audit quality. The results show that financial reporting quality has a significant impact on financial audit quality. Companies with higher financial reporting quality also tend to have better audit quality. This study also shows that firm size and operating size positively impact financial audit quality.

Besides the studies in Vietnam, this study was conducted in the Asian country, the study of Mahdi Salehi 1, Mohammed Ibrahim Jebur, Saleh Orfizadeh and Ali Mohammed Abbas Aljahnabi (2022) on “Relationships” between audit regulation and audit quality in Iraq”. This study aims to evaluate the potential impact of audit adjustments on audit quality for companies listed on the Iraqi Stock Exchange. Research results show a positive and significant relationship between audit adjustment and quality. The study uses a multivariable linear regression model to test specific hypotheses with the dependent variable being the audit quality calculated by the cumulative quality value from the adjusted model of Jones (1991) and Dechow. et al (1995).

Through the learning phase of studies that are directly or indirectly related to the research topic, our research team decided to inherit the research model of Mahdi Salehi 1, Mohammed Ibrahim Jebur, Saleh Orfizadeh, and Ali Mohammed Abbas Aljahnabi (2022) on “Relationship between audit regulation and

audit quality in Iraq". Because of the rigor in hypothesis testing and the selection of independent variables, it is relatively suitable for enterprises in Vietnam. However, some indicators are not really suitable, so adjustments have been made to objectively evaluate and give the most reliable results.

2.2 Theoretical framework

Audit quality

Audit quality refers to the degree of satisfaction of the users of audit results regarding the objectivity and reliability of the auditor's opinion. It also satisfies the expectations of the audited entity regarding the contributions of the auditor's opinion to enhance the effectiveness of business operations within a predetermined time frame and reasonable fees (according to Vietnamese Auditing Standard No. 220 - Quality Control for Audit Engagements).

To date, there have been various perspectives on audit quality. However, from an investor's point of view, Beatty (1989) argues that audit quality is reflected in the truthfulness of the financial information presented in the audited financial statements. The responsibility of auditors is to minimize errors and enhance the reliability of accounting data.

This perspective focuses on the outcome of the audit service, which is the truthfulness of the financial statements. When the information in the financial statements is not truthful and reasonable, the audit quality is not ensured, even if the auditors have complied with relevant standards.

Financial Statement Adjustments

Fundamental Causes of Financial Statement Adjustments. Financial statement adjustments made after an audit often involve items that contain accounting estimates, such as provisions for inventory, provisions for doubtful debts, and provisions for financial investments. Due to the nature of these items being accounting estimates, interpretations and opinions may differ in certain cases.

Subjectively, there may be certain limitations in the accounting/financial statement preparation of the audited entity that need improvement. Additionally, the exchange of information between the audited entity and the auditor may not be frequent and timely. If the management of the audited entity and the auditor timely discuss complex accounting issues, they can address differences in accounting treatment for specific issues before the audited entity publishes its unaudited financial statements.

Impact of Financial Statement Adjustments. For the audited entity, significant adjustments made after the audit with a high value can affect the implementation of business and financial plans, such as investment plans, dividend payments, and capital increases. Moreover, the trust of investors and lenders in the unaudited financial statements of the entity may decrease, leading to difficulties or higher costs in capital mobilization. For the audit firm, when working with clients facing such situations, auditors often have to perform a greater volume of work to achieve the audit objective of ensuring the truthfulness and reasonableness of the financial statements. Consequently, the cost for the audit firm, calculated based on the time spent on the engagement, will increase. As for investors, the impact can stem from relying on unaudited financial statements to make investment decisions without anticipating changes in the financial statements. Therefore, investors participating in the market should have a certain understanding of these risks. At the macroeconomic level, there may be indirect impacts from the aforementioned issues.

2.3. Audit quality measurement model

The model is based on the principle of accrual basis of accounting, profits in the period of enterprises (DN) are divided into two types: cash earnings and accrual earnings. In which, cash profit is formed from cash revenues and expenses that enterprises have collected and spent in the period.

Meanwhile, accrual profit is the profit calculated in the period of the enterprise but not yet collected in cash such as sales on credit to customers after deducting non-cash expenses such as payable expenses, redundancy costs, and depreciation of fixed assets.

Researchers around the world say that the profit adjustment behavior of companies comes from accumulated profits, also known as total accrual earnings (TA). TA is also known as an accrual accounting variable. The accrual in profit (TA) is calculated by subtracting net cash flows from operating activities from total accounting profit after tax:

$$TA = Profit\ after\ tax - Cash\ Flow\ from\ Operating\ Activity$$

However, the variable TA cannot be used as a profit adjustment measure because of the fact that there are accruals that are suitable for ND's business situation such as sales on credit in the period, provision for bad receivable debts, provision for devaluation of inventories, payable expenses. Therefore, it is necessary to divide the variable TA into two parts:

Non-discretionary accruals (NDA) are accruals made according to regulations and principles of accounting standards and regimes.

Discretionary accruals (DA) also known as abnormal accruals - accruals made by managers for the purpose of adjusting profits in the period.

The variable DA shows that there is a subjective adjustment from the manager to the profit of the enterprise, so it is a measure to evaluate the profit information and thereby evaluate the quality of the audit. To estimate the value of DA in TA, many researchers around the world have used the model of Dechow et al. (1995) improved from the original model of Jones (1991).

According to the model of Dechow et al. (1995), first, the coefficients are estimated according to the equation:

$$\frac{TA_{i,t}}{Assets_{i,t-1}} = \alpha_1 \left(\frac{1}{Assets_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{Assets_{i,t-1}} \right) + \epsilon_{i,t}$$

After estimating the coefficients, non-deterministic accruals (NDAs) are calculated using the third relationship:

$$\frac{NDA_{i,t}}{Assets_{i,t-1}} = \alpha_1 \left(\frac{1}{Assets_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta Sales_{i,t} - \Delta AR_{i,t}}{Assets_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{Assets_{i,t-1}} \right)$$

From there, determine the automatic accrual accounting variable (DA) as follows:

$$\frac{DA_{i,t}}{Assets_{i,t-1}} = \frac{TA_{i,t}}{Assets_{i,t-1}} - \frac{NDA_{i,t}}{Assets_{i,t-1}}$$

In the above three equations, we have TA as the accrual accounting; Assets as the indicator of total assets; Sales as the profit after tax, Δ Sales as the difference between the beginning and the end of the period of the profit after tax; AR is the balance of accounts receivable; PPE is a fixed asset; NDA is an indefinite accrual; DA is an autonomous accrual – representing the audit quality in the research model.

In addition, the residual (ϵ) in the above model represents an unrecognizable variable, including the automatic accrual variable (DA).

3. RESEARCH METHOD

In this study, to examine the relationship between financial statement adjustment and audit quality, relatively long time series data are needed. The study uses data from 30 real estate companies listed on the stock exchange for 5 years from 2017 to 2021 as a research sample with 150 observations, of which the

initial data has 35 companies including 175 observations. The financial statement data is not informative, so the study decided to exclude 5 companies and 25 observations from the database.

Research and collect data on financial statements including balance of accounts receivable from customers, residual value of fixed assets, total assets on the balance sheet; items of profit after income tax, net revenue in the period on the income statement; net cash flows from operating activities from the statement of cash flows. In addition, the study also calculates financial indicators including the ratio of return on equity (Return On Equity) and the ratio of net return on assets (Return on Total Assets).

Each data series will be calculated by Stata software to calculate the coefficient of total accumulated profit (TA), then calculated through the above research model to calculate automatic accruals (DA). Each data series, after calculating the necessary values, will be an observation to run regression on SPSS software to find the correlation between financial statement adjustment and audit quality.

Data Analysis Methods

The data survey method used is panel data, which is a combination of cross-sectional and time series data (data panel). The multivariable linear regression method was used to test the hypotheses, and descriptive and inferential statistical methods were applied to analyze the obtained data. Frequency distribution tables are used to describe the data. At the inference level, tests for multicollinearity, autocorrelation, normal distribution and residuals, fit and reliability tests, and multivariable linear regression models are used to test the research hypotheses on SPSS software.

Research models

From the model of Dechow and colleagues (1995), the audit quality variable was calculated.

$$\frac{DA_{i,t}}{Assets_{i,t-1}} = \frac{TA_{i,t}}{Assets_{i,t-1}} - \frac{NDA_{i,t}}{Assets_{i,t-1}}$$

The ratio $\frac{DA_{i,t}}{Assets_{i,t-1}}$ is high, which means the audit quality decrease. However, in reality, the value of DA

of each company could be positive or negative depending on the behavior of the companies' managers to increase profits (DA>0) or reduce profits (DA<0). Therefore, this paper used the absolute value of $\frac{DA_{i,t}}{Assets_{i,t-1}}$

to be dependent variable in the regression model to represent the audit quality. The symbol for the absolute value of $\frac{DA_{i,t}}{Assets_{i,t-1}}$ is |DA|.

Moreover, inheriting previous studies on “The relationship between audit regulation and audit quality in Iraq” by Mahdi Salehi et al (2022), this paper used the following research model to examine the relationship between audit quality variable and independent variables related to the level of earnings adjustment. The research model is as follows:

$$|DA| = \beta_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 Growthsales + \beta_4 SaleEnd + \beta_5 AssetBeg + \beta_6 Achange + \epsilon_i$$

In details:

|DA|: Audit quality (measured by the degree of profit adjustment through accruals)

ROA: Return on assets.

ROE: Return on equity.

Ags: Revenue growth index.

DeltaSale: Change in sales for the period.

DeltaAR: Change in accounts receivable for the period.

AssetBeg: The balance of the asset at the beginning of the period.

Achange: Financial statement adjustment (0: No post-audit adjustment; 1: There is an adjustment after the audit.)

4. RESULTS AND DISCUSSION

4.1 Results

Descriptive statistics

This research uses a model to examine the relationship between audit adjustments and audit quality at listed companies in the real estate industry in Vietnam. The present research includes panel data of 30 companies over a five-year period from 2017 to 2021.

The table below briefly presents information related to the variables in the model.

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
				Statistic	Std. Error	
DA1	150	-9.189E+19	1.930E+20	2.492E+18	2.143E+18	2.625E+19
ROA	150	-25.420000	24.8700000	4.66833333	.493527407	6.04445160
ROE	150	-71.850000	59.0200000	10.5109333	1.15332907	14.1253386
Achange	150	0	1	.79	.034	.411
InAgs	95	.39	7.70	3.5074	.13693	1.33468
InAssetbeg	150	19.36	26.77	21.8227	.12645	1.54865
DeltaAR	150	-1.E+10	2.E+10	822997336	303177939	3.713E+9
Deltasale	150	-3.E+9	1.E+10	288885263	137667844	1.686E+9
Valid N (listwise)	95					

Multicollinearity

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.451E+20	3.594E+19		-4.038	.000		
	ROA	1.365E+18	7.762E+17	.309	1.758	.082	.167	5.977
	ROE	-8.126E+17	3.229E+17	-.441	-2.517	.014	.168	5.944
	Achange	-1.712E+18	4.558E+18	-.028	-.376	.708	.939	1.065
	InAgs	-2.295E+18	1.451E+18	-.116	-1.581	.118	.963	1.038
	InAssetbeg	7.329E+18	1.597E+18	.456	4.588	.000	.522	1.914
	Deltasale	-9.409E+9	1.257E+9	-.727	-7.486	.000	.549	1.823
	DeltaAR	2.215E+9	537816319	.379	4.119	.000	.609	1.641

a. Dependent Variable: DA1

=> The VIF index of all variables is less than 10. Therefore, it could be deduced that the regression model does not have multicollinearity.

Autocorrelation

Model Summary^b

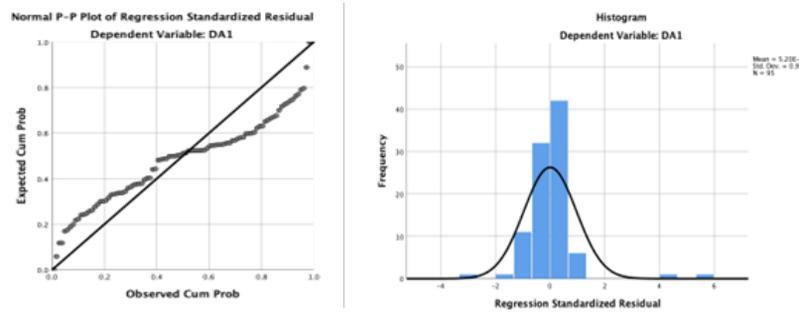
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.742 ^a	.550	.514	1.844E+19	1.253

a. Predictors: (Constant), DeltaAR, Achange, InAgs, ROA, InAssetbeg, Deltasale, ROE

b. Dependent Variable: DA1

=> The Durbin-Watson index with $r = 1.253$ in the range from 1 to 3. Therefore, it could be inferred that the model does not have autocorrelation.

Normal probability plot of residuals



=> As can be seen, it could be concluded that the residuals are close to the normal distribution.

Model fit and reliability

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.742 ^a	.550	.514	1.844E+19	1.253

a. Predictors: (Constant), DeltaAR, Achange, lnAgs, ROA, lnAssetbeg, Deltasale, ROE

b. Dependent Variable: DA1

=> With 95% confidence, the adjusted R2 value is 0.514, equivalent to 51.4%. Therefore, it could be concluded, with 95% confidence, that among the factors included in the model, the variables in the model could explain 51.4% of the change of the dependent variable (audit quality), and the remaining 48.6% could explain by other factors that have not been included in the model.

The existence of a regression coefficient

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.451E+20	3.594E+19		-4.038	.000		
	ROA	1.365E+18	7.762E+17	.309	1.758	.082	.167	5.977
	ROE	-8.126E+17	3.229E+17	-.441	-2.517	.014	.168	5.944
	Achange	-1.712E+18	4.558E+18	-.028	-.376	.708	.939	1.065
	lnAgs	-2.295E+18	1.451E+18	-.116	-1.581	.118	.963	1.038
	lnAssetbeg	7.329E+18	1.597E+18	.456	4.588	.000	.522	1.914
	Deltasale	-9.409E+9	1.257E+9	-.727	-7.486	.000	.549	1.823
	DeltaAR	2.215E+9	537816319	.379	4.119	.000	.609	1.641

a. Dependent Variable: DA1

=> With the 95% confidence, the regression coefficients of the variables: lnAssetbeg, Deltasale, DeltaAR are always different from 0 because Sig. $0.00 < \alpha = 0.05$, which meant that three variables have a significant influence on the dependent variable. Moreover, the regression coefficients of the variables ROA, Achange, lnAgs are larger than $\alpha = 0.05$, which could be concluded that these three variables have no significant influence on the dependent variable.

4.2. Discussion

This paper examined the relationship between audit adjustment and audit service quality among listed companies in the real estate industry in Vietnam.

The research results showed that there is a significant and positive relationship between returns on total assets, total assets, and the difference of accounts receivable with audit adjustments and audit quality, which means that the larger the audit adjustments, the higher the audit quality.

According to research by Lennox (2018) and Greenwood and Zhan (2019), audit adjustment and

financial reporting quality are strongly correlated. In particular, audit adjustments (modifications proposed by the auditor) could affect the models that output the automatic accrual cost item. Therefore, the adjustments proposed by the auditor could improve the quality of the accruals, a measure of audit quality in this paper, which could be consistent with the results obtained from research of Lennox in 2016 and 2018. According to the research results, in order to improve the audit quality as well as the trust of shareholders, auditors need to focus more on the necessary corrections in the year-end auditing period.

5. CONCLUSION

In conclusion, this research paper investigated the relationship between audit adjustments and audit quality for the listed companies on the Vietnamese Stock Exchange. Through an extensive analysis of financial data and audit reports, several key findings have emerged.

Firstly, the presence of audit adjustments indicates the existence of errors or irregularities in the financial statements of the listed companies. These adjustments serve as a crucial mechanism for auditors to rectify inaccuracies and enhance the reliability of the financial information disclosed by the companies. Therefore, it can be inferred that the identification and proper handling of audit adjustments contribute significantly to audit quality. Secondly, the research findings suggest that there is a positive correlation between the number of audit adjustments and the overall audit quality of the listed companies. This implies that companies with a higher number of audit adjustments are more likely to undergo rigorous and thorough auditing processes. It also signifies the auditors' commitment to upholding professional standards and ensuring the accuracy and completeness of financial reporting. Furthermore, the study highlights the importance of the audit committee's role in enhancing audit quality. Companies with a well-structured and independent audit committee tend to have a lower number of audit adjustments, indicating the effectiveness of oversight and internal controls in mitigating financial reporting errors. This emphasizes the significance of corporate governance mechanisms in promoting audit quality and investor confidence in the Vietnamese Stock Exchange.

In addition to the conclusions drawn from the research findings, it is important to consider relevant regulations and laws pertaining to accounting and auditing in Vietnam. These regulations provide a framework for ensuring audit quality and can offer additional recommendations for enhancing the overall effectiveness of the audit process. One significant regulation is the Law on Independent Audit, which outlines the legal requirements, auditing standards, and guidance for the audit of the listed company in Vietnam. It emphasizes the independence, objectivity, and professionalism of auditors, underscoring the importance of audit quality in safeguarding the interests of investors and stakeholders. Furthermore, the Ministry of Finance of Vietnam has issued various Circulars and Accounting Standards that establish specific guidelines and procedures for financial reporting and auditing. For instance, Circular No. 43/VBHN-BTC regulates the organization and implementation of quality control of audit services, financial statement review services, financial information, and other assurance services. Compliance with these circulars and standards ensures that audit engagements are carried out in a consistent and reliable manner, ultimately contributing to audit quality. Based on the research findings and the existing regulatory framework, several recommendations can be made to further enhance audit quality for listed companies on the Vietnamese Stock Exchange. *First*, it is crucial to continue promoting awareness and adherence to the established regulations and accounting standards among auditors, companies, and audit committees. Regular training and education programs can help strengthen the knowledge and skills of auditors and improve their ability to identify and address potential audit adjustments effectively. *Secondly*, the audit committees of listed companies should be encouraged to play a more proactive role in overseeing the audit process. They should ensure the independence and competence of the auditors, actively participate in the selection and evaluation of audit firms and promote a culture of transparency and accountability within the organization.

Additionally, regulatory authorities and professional accounting and auditing bodies should continue to monitor and enforce compliance with the existing regulations. Regular inspections and quality assurance reviews can help identify any deficiencies or areas for improvement and ensure that audit engagements are conducted in accordance with professional standards. In conclusion, by considering the relevant regulations and laws, such as the Law on Independent Audit and the circulars and standards issued by the Ministry of Finance, along with the research findings, it is evident that there is a strong connection between audit adjustments and audit quality for listed companies on the Vietnamese Stock Exchange. Adhering to these regulations, promoting effective corporate governance, and enhancing the competencies of auditors can contribute to maintaining high levels of audit quality, thereby fostering investor confidence and supporting the growth of the Vietnamese capital market.

However, it is crucial to acknowledge certain limitations in this research. The study focused solely on the Vietnamese Stock Exchange and may not be directly applicable to other contexts or markets. Additionally, the analysis relied on publicly available data, which may have some inherent limitations and may not capture all relevant factors influencing audit quality.

Overall, this research provides valuable insights into the relationship between audit adjustments and audit quality for listed companies on the Vietnamese Stock Exchange. The findings underscore the importance of effective auditing practices, robust internal controls, and strong corporate governance in ensuring the reliability of financial information. Further research in this area could explore additional factors that influence audit quality and expand the scope to include a more diverse sample of companies and markets. By continually refining and improving audit processes, stakeholders can work towards maintaining transparency, accountability, and investor confidence in the Vietnamese capital market.

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Part 5
MARKETTING

FACTORS INFLUENCING CONSUMERS' INTENTION TO USE BOPS SERVICE IN MOBILE PHONE RETAIL IN HO CHI MINH CITY

Authors: Nguyen Hoai Nam¹, Tran Thi Thuy An², Nguyen Thi Bich Ngoc²,
Hoang Le Tram Anh², Nguyen Thi Bich Ngoc²
Mentor: Nguyen Hoang Dung²

Abstract: *This research was conducted to analyze factors that affect the acceptance and usage of BOPS (Buy Online and Pickup in Store) delivery service by consumers in mobile phone retail in Ho Chi Minh City, Vietnam. The study proposed a conceptual framework, an extended UTAUT-TTF model. Additionally, authors reviewed related literature and theories to clarify the research questions. The results of a 400-consumers survey in Ho Chi Minh City showed that Facilitating conditions had the greatest influence on consumers' intention to use BOPS. In contrast, Social influence did not have any significant effect on BOPS usage in city. Based on the findings, the study provides some recommendations for mobile phone retailers to maximize the value that BOPS can bring to consumers and retailers.*

Keywords: BOPS; consumer intention; mobile phone retail; Ho Chi Minh City

1. INTRODUCTION

The Internet's growth has led to increased attention from customers towards omnichannel sales options. In 2022, Vietnam's consumer electronics market generated USD 8,130 million in revenue, with mobile phones being the largest segment, accounting for USD 4,131 million (Nepcon Vietnam, 2023). According to Counterpoint Research (2023), more than 95% of mobile handset shipments are smartphones and feature phones quarterly by more than 140 brands. The number of smartphone orders in the Vietnamese market increased by 34% year-on-year in Q3 2022 (Counterpoint Research, 2022).

Currently, customers tend to research products online and complete orders at retail stores or directly experience products at stores and order online (Fan et al., 2022). According to Forrester (2014), 47% of consumers used pick-up-in-store options to avoid shipping costs and 10% considered pickup from a store more convenient than receiving at home. Therefore, the "Buy Online and Pickup in Store" strategies have been introduced by retailers to enhance the customers' buying experience (Chen et al., 2016). In the omnichannel context, BOPS is an important order fulfillment method in business strategy and is widely adopted by many retailers (Jin et al., 2018; Kim et al., 2017).

In the modern digital age, mobile phone retail sector is adapting along with the rest of the retail industry. Some technology retailers, such as SK Telecom in Korea and FPT Shop in Vietnam have implemented BOPS services in their store chains. However, BOPS services are relatively new and different from traditional or pure online stores in the Vietnamese e-commerce market. Therefore, for traditional mobile phone retailers without online inventory information, examining the feasibility of adopting a BOPS model is crucial to adapt to changing consumer shopping behavior.

In addition, there are many theoretical limitations and empirical evidence when researching integrated BOPS, especially in the retail sector (Han et al., 2019; Kim et al., 2017; Kim et al., 2022), specifically mobile phone retail. Consumers prioritize in-store pickup when making online purchases for high-involvement products such as mobile phones. The higher the perceived risks of online shopping are, the more likely

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: namnh204021c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City

customers are to use BOPS services (Kim et al., 2017). This shows the importance of applying BOPS services in mobile phone retail as it allows consumers to physically touch and feel the products.

Kim et al. (2022) integrated the UTAUT-TTF model by extending the UTAUT model with Personal Innovation (PI) to predict consumers' acceptance and usage of BOPS (UI). The findings of this study also demonstrate the effectiveness of integrating TTF components with acceptance theories in assessing the predictors of consumers' behavioral changes towards omnichannel BOPS usage and other technologies. However, only a few studies have combined TTF and UTAUT (Abdekhoda et al., 2022; Kim et al., 2022; Wang et al., 2020). Moreover, there are very few studies on BOPS-related mobile phone retail using the UTAUT-TTF model, particularly in Vietnam and Ho Chi Minh City.

Therefore, this study attempts to reduce the knowledge gap from the previous literature and aims to incorporate perceived risks of online shopping factor into the extended UTAUT-TTF model and examine the moderating effect of the situational factor (location convenience) on consumers' intentions to use BOPS service in Ho Chi Minh City, based on the following research questions: (1) What factors affect omnichannel customers' intention to use BOPS in mobile phone retail in Ho Chi Minh City and how strong are their effects? (2) What are the managerial implications of the research results for mobile phone retailers? Subsequently, some recommendations are proposed for Vietnamese retailers on how to build a BOPS business model to optimize the omnichannel customer experience.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical framework

2.1.1. Omnichannel

Omnichannel shopping is the behavior of customers who access different channels to make purchasing decisions (Wallace et al., 2004) to maximize their benefits rather than using a single channel from the retailer (Verhoef et al., 2007).

According to Kim et al. (2017), adopting omnichannel can promote interaction between retailers and customers and limit customer abandonment in the future. Numerous studies have highlighted the benefits of omnichannel (Levy et al., 2013; Rigby et al., 2011). Therefore, retailers nowadays must be able to integrate channels to satisfy customers and maximize their operations and business activities in response to the complexity of consumer demands.

2.1.2. BOPS and mobile phone retail

Bell et al. (2014) indicates that consumers can gain a variety of benefits if they choose BOPS as their delivery method. As BOPS service is the combination of two forms, online and offline shopping, consumers can know exact information about the type of goods to buy without getting to store and they do not need to spend too much time waiting for the goods delivered but can arrive at the point of sale to receive products at any time.

However, not for any kind of product, consumers will also feel the benefit of using BOPS services. Kim et al. (2017) stated that products are commonly categorized based on the level of financial risk; specifically, when consumers feel a small mistaken choice leading to a large loss of resources, they will be willing to accept more effort to be able to make the most optimal choice.

Klarna's Q4 2021 survey conducted with NEPA explored the consumer mobile shopping habits of 18.000 participants across 11 countries. Accordingly, electronics is one of the highest online pre-search before buying in-store categories and is consistent across all generations. Specifically, at least 8 out of 10 shoppers say that they research information and evaluate items in this category before visiting a store to

make a purchase. Therefore, considering a new model of customer behavior in BOPS environment, within the context of mobile phone retails, which belong to the electronic goods category, is a necessary action. BOPS services are provided by many retailers (Forrester, 2014) and are likely to become more popular due to the highly competitive omnichannel retailing environment (Ishfaq & Raja, 2018).

2.1.3. Unified theory of acceptance and use of technology

The unified theory of technology acceptance and use (UTAUT) is a model proposed by Venkatesh et al. (2003) to study and explain the factors affecting consumers' intention to use new technology. UTAUT proposes four variables affecting behavioral intention: Performance expectancy (PE), Effort expectancy (EE), Social influence (SI), and Facilitating conditions (FC). Combined with eight research models related to the intention to accept consumers' technology usage by Venkatesh et al. (2003), this study uses UTAUT because it provides analytical abilities and overcomes a number of limitations compared to previous models including those that predict intention to use technology with higher precision across various contexts.

UTAUT has been widely applied in various fields of study, including logistics. This study focuses on consumers' intention to accept and use BOPS service, therefore, based on theory and practice, the UTAUT model will be applied and perform as a theoretical basis for this research. This study applies four variables from the UTAUT model and adds two more variables: Perceived risks of online shopping (PR) and Personal innovativeness (PI) to make it more comprehensive.

2.1.4. Task and technology fit model

The Task-technology fit model (TTF), developed by Goodhue & Thompson (1995), explains consumers' technology adoption intention by assessing how well the technology aligns with their tasks or needs. The importance of product quality and delivery time can be described as task characteristics of customers in a multi-channel environment where requirements are more complex than before. If BOPS features meet consumers' requirements, the technology-task fit increases. Conversely, if BOPS features can not satisfy consumers' complex tasks, the fit decreases. Therefore, understanding the task-technology fit will help predict and determine more accurately consumers' intention to use technology. Moreover, TTF has been widely applied in previous studies, especially in information systems field (Aljukhadar et al., 2014), so the use of TTF in this study holds theoretical and practical significance.

2.1.5. Integration of UTAUT and TTF

Tao Zhou et al. (2010) argued that integrating TTF and UTAUT can provide a more comprehensive understanding of how consumers accept and use technology by analyzing their needs and tasks and designing technology accordingly. However, so far, there have been very few studies that integrate UTAUT and TTF; moreover, some previous studies failed to find empirical evidence and evaluate the relationship between UTAUT and TTF (Wang et al., 2020). Therefore, this study will integrate UTAUT and TTF models to better analyze consumers' intention to use BOPS service in mobile phone retail in Ho Chi Minh City, Vietnam, and provide answer to the question: How does TTF affect consumers' intention to use BOPS when combined with UTAUT?

2.2. Hypothesis development

2.2.1. Performance expectancy (PE)

Performance expectancy (PE) represents the extent to which individuals believe that technology will help them achieve operational efficiency and benefit consumers (Venkatesh et al., 2003). In this study, PE is defined as the

belief that customers will benefit from using BOPS during the phone buying process. Kim et al. (2022) suggested that BOPS brings many benefits to consumers, in fact, consumers often compare and evaluate the usefulness of technology, the higher the technology is, the more likely they are to pay attention to use the new technology (Davis et al., 1989; Venkatesh et al., 2003). Therefore, based on the benefits that BOPS can offer, this study expects that PE has a positive effect on consumers' intention to use it and we propose the following hypothesis:

H1: Performance expectancy (PE) has a positive impact on consumers' intention to use BOPS (UI).

2.2.2. Effort expectancy (EE)

Effort expectancy (EE) is the ease of using technology effectively (Venkatesh et al., 2003). Consumers' intention for utilizing new technology can be influenced by how simple they think it is to use (Davis et al., 1989). Several prior studies demonstrated the positive influences of effort expectancy on consumers' intentions to utilize new products (Venkatesh et al., 2003; Wang & Wang, 2010). However, according to Kapsler et al. (2020); effort expectancy has no significant impact on consumers' intention.

In this study, consumers who perceive that using BOPS service is easy and effortless are expected to have a more positive intention to use this technology. Hence, this study expects that EE has a positive effect on consumers' intention to use BOPS. Therefore, the following hypothesis is proposed:

H2: Effort expectancy (EE) has a positive impact on consumers' intention to use BOPS (UI).

2.2.3. Social influence (SI)

Venkatesh et al. (2003) define Social influence (SI) as the degree to which an individual perceives that customers' intention to adopt new technology is influenced by their surroundings, especially by those who have a certain role in one's social circle. According to Kotler & Armstrong (2010), word-of-mouth marketing strongly influences consumers' intention to use, especially recommendations from friends and family. Moreover, Alalwan et al. (2016) also stated that consumers are often influenced by the opinions of those surrounding them (e.g., family, opinionators, colleagues, and friends). Therefore, this study believes that social influence does impact customers' intention to use BOPS; this, accordingly, leads to the third hypothesis as follows:

H3: Social influence (SI) has a positive impact on consumers' intention to use BOPS (UI).

2.2.4. Facilitating conditions (FC)

Facilitating conditions (FC) in UTAUT refer to how individuals perceive the support of organizational and technical resources for using a system and influence consumers' intention to use new products (Venkatesh et al., 2003). In context of BOPS, Kim et al. (2022) expanded FC to encompass the capability and essentials, such as competence and expertise, to effectively utilize technology system and environment.

Facilitating conditions is related to the current user's level of compatibility between the environment and innovative technologies (Kim et al., 2022). If consumers perceive facilitating conditions positively, they will reduce their feelings of rejection or fear that affect their intention to use. In particular, some studies have mentioned FC's impact on the initial usage intention (Escobar-Rodríguez & Carvajal-Trujillo, 2014). FC plays an important role in influencing consumers' intention to use BOPS, especially in new product or technology contexts. Therefore, we hypothesize that:

H4: Facilitating conditions (FC) has a positive impact on consumer's intention to use BOPS (UI).

2.2.5. Perceived risks of online shopping (PR)

The theory of perceived risk has been used to explain consumer behavior since the 1960s (Forsythe & Shi, 2003). In the case of shopping, Cox & Rich (1964) defined perceived risk as the level of risk that consumers perceive in their buying decision process. According to Forsythe & Shi (2003), consumers

perceive four types of risks when purchasing online: financial risk, product performance risk, psychological risk, and convenience risk. However, this study limits the scope of consumers' perception of product performance risk because customers lack opportunities to check the quality of the purchased product and have to conduct online purchases before deciding to use BOPS service (Kim et al., 2017).

Conversely, BOPS, with its unique advantage in allowing customers to check the quality of their products when picking them up in-store, is believed to be a realistic and optimal solution for reducing consumers' product performance risk. Therefore, consumers who are more sensitive to product performance risks in online shopping will be more likely to try BOPS service and we obtain the following hypothesis:

H5: Consumers who perceive higher risks of online shopping have a positive impact on consumer's intention to use BOPS (UI).

2.2.6. Personal Innovativeness (PI)

Characteristics of innovation are explained in detail with the consumer innovation process in the research on Innovation Diffusion Theory. Individuals' willingness to adopt and use new ideas or technologies is defined as innovativeness (Agarwal & Prasad, 1998). The tendency toward innovativeness is related to the ability of each factor and the search for novelty (Dabholkar & Bagozzi, 2002), while positively influencing the acceptance of innovation (Chen et al., 2009; Dabholkar & Bagozzi, 2002). Kim et al. (2022) defined PI as an individual's voluntary will to use new technologies. Moreover, several studies have identified innovativeness as important to consumers' intention to use online channels or omnichannel (Alalwan et al., 2017; Venkatesh et al., 2003). In other words, high innovation can drive consumers' intention to use BOPS services. From previous literature, this study hypothesizes that:

H6: Personal innovativeness (PI) has a positive impact on consumer's intention to use BOPS (UI).

2.2.7. Location convenience (LC)

Situational variables are contextual factors unrelated to consumers' personal characteristics or service attributes (Belk, 1975). These situational variables can temporarily affect the consumers' preferences, attitudes, or intentions toward a certain service and influence their long-term preferences and behaviors (Simon & Usunier, 2007). As BOPS requires consumers to visit stores for pickup, situational factors can affect their usage intention. Prior studies have considered the distance to brick-and-mortar stores as an important variable affecting consumer decisions (Chocarro et al., 2013; Kim et al., 2017). According to Kim et al. (2017), location convenience is the perceived effort and time required to get to the pickup store. The ease or difficulty of reaching the store depends on the location convenience. The more/less convenient the location is, the less/more effort and time it takes to get there. Therefore, this study includes the situational factor of location convenience in exploring consumer intention to use the BOPS service.

When using BOPS, consumers can choose to pick up their purchases at any store they want. Directly receiving products at the nearest offline stores makes it possible for BOPS users to feel and experience relative advantages such as lower shipping costs and faster delivery (Kim et al., 2017; Kim et al., 2022). With easier store accessibility, visiting a store will help customers better understand the retailer's in-store products (Avery et al., 2012) and reduce the perceptual complexity of using BOPS services (Kim et al., 2017). Therefore, the positive relationship between performance expectancy, effort expectancy, and intention to use BOPS will be directly proportional to location convenience (see hypotheses 7a, 7b).

Upon offline store pickup, consumers can interact with social supports (e.g., salesperson, security) to get more information, to feel that they have made the right choice (Raghunathan & Corfman, 2006; Chocarro et al., 2013), and to minimize risk, anxiety, and stress simultaneously (Borges et al., 2010).

Therefore, greater location convenience strengthens the relationship between social influence and BOPS usage intention (see hypothesis 7c). Besides, customers prefer the convenience of a store close to home or work over a remote store (Song et al., 2020). During the purchase process, consumers can easily receive goods quickly if the offline store is in the area where they live, thereby increasing the advantage of accessing BOPS services (Kim et al., 2017). Therefore, the augmentation of location convenience will reinforce facilitating conditions as determinants of intention to use BOPS services (see hypothesis 7d).

In addition, it is much more convenient to return products when approaching offline stores. Customers do not have to evaluate perceived risks of online shopping (Kim et al., 2017). Therefore, we anticipate that the augmentation of convenience locations will reinforce the positive association between perceived risks of online shopping and the intention to use BOPS services (see Hypothesis 7e). BOPS users benefit from accessing a diverse product portfolio while retrieving goods at offline stores (Song et al., 2020). Consequently, customers can touch and experience more products displayed in the store (Balakrishnan et al., 2014). Some customers intend to go to the nearest store to purchase a certain set of products or pick up and leave, but in-store stimuli (product offers, advertising, display,...) cause them to swiftly change their minds, which in turn stimulates unplanned purchases (Balakrishnan et al., 2014; Song et al., 2020). Therefore, the positive correlation between personal innovativeness and BOPS usage intention can be strengthened through an enhancement of location convenience (see hypothesis 7f). In sum, this study hypothesizes that:

H7. Greater perceived location convenience will strengthen the positive relationship between:

- (a) Performance expectancy (PE) and consumers' intention to use BOPS (UI);
- (b) Effort expectancy (EE) and consumers' intention to use BOPS (UI);
- (c) Social influence (SI) and consumers' intention to use BOPS (UI);
- (d) Facilitating conditions (FC) and consumers' intention to use BOPS (UI);
- (e) Perceived risks of online shopping (PR) and consumers' intention to use BOPS (UI);
- (f) Personal innovativeness (PI) and consumers' intention to use BOPS (UI).

2.2.8. Usage intention (UI)

Behavioral intention is the intention to adopt BOPS, and user behavior is the actual frequency to use (Kim et al., 2022). Hypotheses that state the Usage intention (UI) influences the actual behavior have been tested in the TRA, TAM, TPB, and UTAUT2 models. Attitude affects behavioral intention, and behavioral intention might drive the motivational factors that affect the use of the existing system. Previous research in e-commerce also found a significant correlation between usage intention and actual use. Kim et al. (2022) define Usage intention (UI) as the intention to use BOPS continuously. Therefore, it is critical to assess the concept of usage intention in this study.

2.2.9. Control variables (age, gender, income)

Control variables such as age, gender, and income were outlined in research by Venkatesh et al. (2003). In addition, demographic factors (age, gender, income) were analyzed as control variables to assess their influence on channel selection decisions (Kushwaha & Shankar, 2013). Kim et al. (2017) also state that demographic variables such as age, gender, and income have an impact on BOPS usage intention. Therefore, to examine the different effects of individual attribute variables (age, gender, and income) on the intention to use BOPS services in the Vietnam omnichannel context, we hypothesize as follows:

H8: There is a significant difference in the effect of the control variables (age, gender, and income) on the intention to use BOPS (UI).

2.2.10. Task and technology fit

Based on the task-technology fit model (TTF), consumers’ willingness to adopt technology will be ascertained through the process of evaluating the compatibility between technology and consumers’ tasks (Wu et al., 2017). Previous studies have demonstrated that TTF has a significant and direct impact on the relationship between consumers’ intention to use and technology, but these conclusions are different (Yen et al., 2010), so some researchers such as Yoon & Cho (2016); Kim et al. (2022) have suggested further studies.

Moreover, Tao Zhou et al. (2010) argued that integrating UTAUT - TTF model explains consumer acceptance better than operating them separately. In addition, integrating both models will produce different research outcomes compared to each research perspective. Therefore, this study hypothesizes that: the factors in UTAUT affect TTF and TTF directly affects the intention to use BOPS services in the context of mobile phone retail as follows:

- H1a: Performance expectancy (PE) has a positive impact on Task-technology fit (TTF).**
- H2a: Effort expectancy (EE) has a positive impact on Task-technology fit (TTF).**
- H3a: Social influence (SI) has a positive impact on Task-technology fit (TTF).**
- H4a: Facilitating conditions (FC) has a positive impact on Task-technology fit (TTF).**
- H5a: Perceived risks of online shopping (PR) has a positive impact on Task-technology fit (TTF).**
- H6a: Personal innovativeness (PI) has a positive impact on Task-technology fit (TTF).**
- H9: Task-technology fit (TTF) has a positive impact on consumer’s intention to use BOPS (UI).**

2.3. Research framework

Kim et al. (2017) verified the significance of the location convenience factor and how the perceived risks of online shopping affect consumers’ intention to use BOPS service. The level of access to BOPS services in the study by Kim et al. (2022) for consumers is quite low, so it is essential to incorporate perceived risks of online shopping into the research model of intention to use BOPS services in the current digital economy. Therefore, we will develop from the model of Kim et al. (2022) by adding perceived risks of online shopping, the moderating variable of location convenience, to investigate the acceptance and usage of BOPS services by consumers in mobile phone retail in Ho Chi Minh City. (Figure 1)

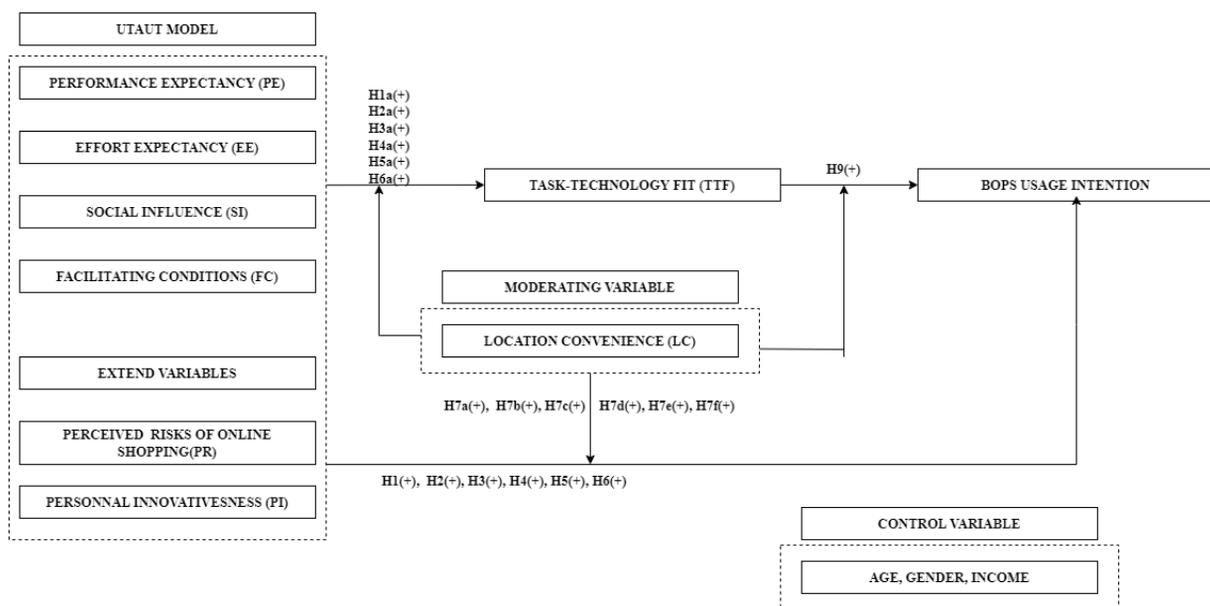


Figure 1. Research model

3. RESEARCH METHOD

3.1. Sample and data collection

The data was collected from customers who have had experience shopping online or have the potential to use the BOPS service in Ho Chi Minh City. The survey questionnaire was then sent to customers in Ho Chi Minh City in the form of a Google form. After screening, 400 responses were used in this research. The demographic information of respondents is shown as below:

Category		Sample (N=400)
Gender	Male	34.25%
	Female	65.75%
Age	<18 years old	4%
	18 – 30 years old	78.5%
	30 -40 years old	11.25%
	> 40 years old	6.25%
Income per month	< 4 million VND	53%
	4 – 10 million VND	21.25%
	10 – 20 million VND	21%
	> 20 million VND	4.75%
Have you ever used BOPS?	Used	45.25%
	Not yet	54.75%

Figure 2. Sample demographic information

3.2. Measurement scale

The study uses a 5-point Likert scale to measure the observed variables. Each variable in the survey questionnaire is based on previous studies and adjusted to fit the Vietnam market. The UTAUT model factors, such as PE and EE, are built based on Kim et al. (2022) and Venkatesh et al. (2003). Four observed variables of SI are referenced from Kim et al. (2022), and Venkatesh et al. (2012). FC is constructed based on the research of Escobar-Rodríguez & Carvajal-Trujillo (2014), and Venkatesh et al. (2012). Expanded variables such as PI are referenced and partly built from Lu et al. (2005) and Agarwal & Prasad (1998), while PR is built based on the study of Cho (2004). The TTF variable is referenced by Kim et al. (2022). In this study, LC is presented as a dummy which has two different forms: a short distance of less than 5 minutes and a long distance of over 20 minutes. To collect survey data on this observed variable, we used a randomized redirect survey form, which placed participants in one of two contexts with different LCs in a random manner.

3.3. Data analysis

We analyzed data with SPSS 20 and AMOS 24 to test the proposed model and hypotheses. The methods of testing used in this research are Cronbach's Alpha, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM). The reason for using SEM is that this method allows for the estimation of all elements in the overall model, the causal relationships of latent constructs through composite indices of both measurement and structural aspects of the theoretical model, and the measurement of direct and indirect effects, including measurement error and residual distance (Hair et al., 2019).

4. RESULTS AND DISCUSSION

4.1. Cronbach's Alpha Test

According to and Hair et al. (2009), the Cronbach's Alpha coefficient should be at least 0.7 to ensure unidimensionality and reliability. However, according to Nunnally & Bernstein (1994), a coefficient value

of 0.6 or higher may be acceptable in cases where the concept under study is new or new to respondents in the research context. In addition, observed variables with a corrected item-total correlation coefficient greater than or equal to 0.3 meet the requirements, while those with a coefficient less than 0.3 will be excluded (Cristobal et al., 2007).

The result of the reliability test of Cronbach’s Alpha coefficient shows that all variables are greater than 0.7, and all values of the corrected item-total correlation are greater than 0.3, so all variables are used for further analysis without excluding any observed variables.

4.2. Exploratory Factor Analysis (EFA)

According to Hair et al. (2009), factor loadings must be greater than 0.5 for the factor to have a significant contribution to the observed variables. The analysis results show that except for variable EE1 with a factor loading of $0.383 < 0.5$, all other factors meet the above condition. Therefore, the authors removed variable EE1 and reran the model. The subsequent analysis results show that there are no factors with loadings less than 0.5.

4.3. Confirmatory Factor Analysis (CFA)

Hair et al. (2009) discussed the acceptable thresholds for various indices in CFA analysis as follows:

The Chi-square adjusted for degrees of freedom (CMIN/df) should be less than 5, with less than 2 being good.

The Goodness of Fit Index (GFI) should be greater than 0.8, with over 0.9 being good and over 0.95 being very good.

The Comparative Fit Index (CFI) should be greater than 0.8, with over 0.9 being good and over 0.95 being very good.

The Root Mean Square Error of Approximation (RMSEA) should be less than 0.08, with less than 0.03 being very good.

According to the model fit test results, all indices meet the requirements (Chi-squared/df = 2.741 < 5; GFI = 0.86 > 0.8; CFI = 0.917 > 0.9; RMSEA = 0.066 < 0.08). (Figure 3)

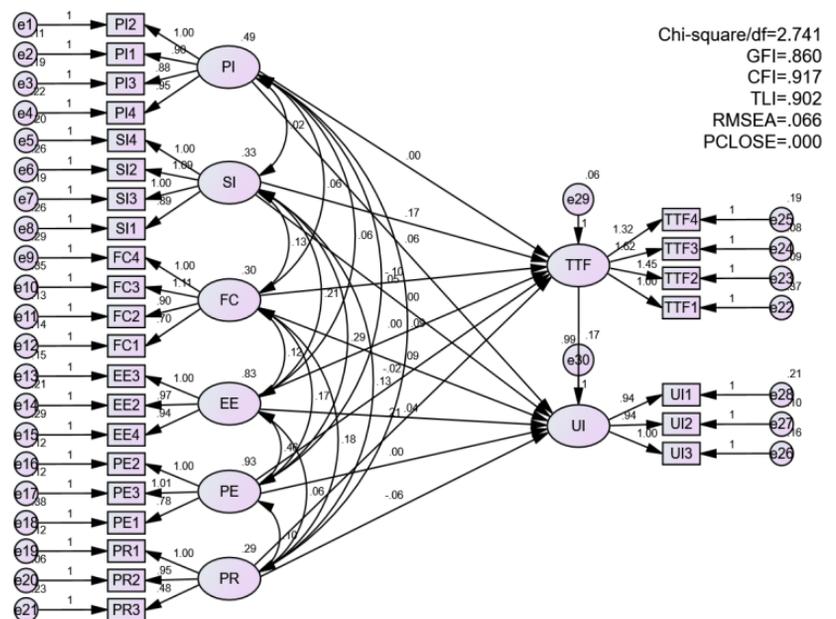


Figure 3. Results of CFA analysis

Regarding the standardized factor loadings, the authors considered the observed variables with standardized factor loadings of at least 0.5 to be appropriate and kept them for further analysis. The analysis results showed that all standardized factor loadings were greater than 0.5, so they were all kept for subsequent analysis steps.

The results of the convergent and discriminant validity testing were confirmed through the Fornell and Larcker matrix. The convergent validity indices indicated that the Composite Reliability (CR) was greater than 0.7 and the Average Variance Extracted (AVE) was greater than or equal to 0.5, indicating that the model's convergence was ensured. The discriminant validity indices showed that the Maximum Shared Variance (MSV) values were smaller than AVE, and the Square Root of AVE values were greater than Inter-Construct Correlations, indicating that the model's discriminant validity was ensured. After performing the CFA, the results showed that the model met the requirements of reliability, convergence, and discriminant validity, and could be used for further analyses.

Table 1. Reliability and convergent validity

Construct	Indicator	Standardized Regression	Cronbach's Alpha	CR	AVE	MSV
PE	PE1	0.775	0.915	0.919	0.791	0.277
	PE2	0.942				
	PE3	0.941				
EE	EE2	0.889	0.852	0.916	0.783	0.277
	EE3	0.920				
	EE4	0.845				
SI	SI1	0.707	0.850	0.852	0.591	0.268
	SI2	0.777				
	SI3	0.797				
	SI4	0.789				
FC	FC1	0.715	0.818	0.828	0.546	0.386
	FC2	0.810				
	FC3	0.716				
	FC4	0.710				
PR	PR1	0.838	0.774	0.796	0.581	0.386
	PR2	0.902				
	PR3	0.732				
PI	PI1	0.882	0.917	0.919	0.591	0.268
	PI2	0.924				
	PI3	0.815				
	PI4	0.546				
TTF	TTF1	0.521	0.764	0.796	0.508	0.317
	TTF2	0.821				
	TTF3	0.856				
	TTF4	0.660				

UI	UI1	0.727	0.823	0.829	0.618	0.317
	UI2	0.838				
	UI3	0.790				

	PI	SI	FC	EE	PE	PR	TTF	UI
PI	0.860							
SI	0.038	0.768						
FC	0.162	0.412	0.739					
EE	0.095	0.393	0.243	0.885				
PE	0.077	0.518	0.322	0.526	0.890			
PR	0.229	0.423	0.622	0.123	0.202	0.762		
TTF	0.076	0.388	0.172	0.101	0.131	0.399	0.713	
UI	0.128	0.258	0.176	0.144	0.130	0.241	0.563	0.786

Figure 4. Discriminant Validity

4.4. Structural Equation Modeling (SEM)

With SEM and Bootstrap analysis with 2000 iterations, the variables TTF, EE, FC, PR, PI have direct effects on usage intention with coefficients of 0.184, 0.134, 0.261, 0.173, 0.142 respectively. For indirect effects, the variables TTF, EE, FC, PR, PI have indirect effects on usage intention through the TTF variable with coefficients of 0.275, 0.123, 0.215, 0.115 respectively. The variable SI does not show any impact on usage intention. (Table 2)

Table 2. Accepted hypothesis result

Hypothesis		Support
H1	Performance expectancy has a positive impact on Usage intention	Indirectly
H2	Effort expectancy has a positive impact on Usage intention	Yes
H4	Facilitating conditions has a positive impact on Usage intention	Yes
H5	Consumers who perceive higher risks in online shopping have a positive impact on Usage intention	Yes
H6	Personal innovativeness has a positive impact on Usage intention	Directly
H7a	Location convenience strengthens the positive relationship between Performance expectancy and Usage intention	Yes
H7d	Location convenience strengthens the positive relationship between Facilitating conditions and Usage intention	Yes
H8	There is a considerable effect of control variables (age, gender, and income) on Usage intention	Partially
H9	Task-Technology Fit has a positive impact on Usage intention	Yes
H1a	Performance expectancy has a positive impact on Task-technology fit	Yes
H2a	Effort expectancy has a positive impact on Task-technology fit	Yes
H4a	Perceive of online shopping risk has a positive impact on Task-technology fit	Yes
H5a	Facilitating conditions has a positive impact Task-technology fit	Yes

4.5. Multigroup and Control Variables Analysis

With 400 survey samples, 191 were conducted in a context of over 20 minutes, and the remaining 209 were conducted in a context of under 5 minutes. After testing the hypothesis to evaluate the discrepancy in Chi-square value and degrees of freedom between the two invariant and variant models, the invariant model

was chosen for multi-group structural analysis. The multi-group structural analysis showed that the impact of PE, FC on usage intention of BOPS differs between the two contexts. Among them, the variable PE had the most significant difference between the two contexts (the normalized coefficient of the under 5-minute context was 0.134 while that of over 20 minutes was only 0.054).

For control variables in the model including gender, income, and age, the authors considered the impact of each variable on the usage intention of consumers. The results showed that only the gender variable had an impact on consumers' usage intention, with a coefficient of 0.123 ($p < 0.05$).

Table 3. The result of multigroup analysis

	Under 5 minutes	Above 20 minutes
	Standardized Coefficient	
UI ← PE	0.134*	0.054
UI ← EE	0.317***	0.266***
UI ← SI	0.104	0.043
UI ← FC	0.153*	0.094
UI ← PR	0.203**	0.147*
UI ← PI	0.166**	0.124*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5. DISCUSSION

With the development of a new theoretical framework based on the combination and extension of the UTAUT and TTF theoretical models, this study aims to determine which factors truly influence consumers' intention to use BOPS technology in mobile phone retail in Ho Chi Minh City. The results showed that, except for the Social Influence (SI) variable, which had no effect on the intention to use, all other variables had a certain impact on the intention to use BOPS.

The research findings suggest that PE (Kim et al., 2022) directly impacts TTF but does not directly impact UI. Meanwhile, EE (Venkatesh et al., 2003) has a direct impact on consumer technology usage intention and also impacts TTF. This result is consistent with previous studies that show a positive relationship between EE and PE with UI (Juaneda-Ayensa et al., 2016; Kim et al., 2022). The reason why EE and PE become important factors that affect consumer UI is that in the context of users becoming more familiar with omnichannel retail, they tend to use multiple channels to search for information that benefits them.

The impact of FC on UI plays the most important role among all variables affecting the intention to use BOPS. The research results show that FC has the second largest influence on the mediating variable TTF and has the greatest impact on the intention to use BOPS in the model. This result is consistent with previous studies (Kim et al., 2022; Han et al., 2019). This can explain that proficient use of technologies related to BOPS such as accessing websites, ordering and payment processes, and using information in a multichannel environment effectively will contribute to increasing consumers' acceptance of using BOPS. Conversely, SI did not show a significant impact on Usage intention. This result is consistent with some previous studies, which suggested that SI has no significant impact on UI (Juaneda-Ayensa et al., 2016; San Martin & Herrero, 2012). As the omnichannel shopping environment becomes increasingly widespread, individuals can access more information and make smart choices that are suitable for them, reducing the

influence of opinions from others on their intention to use new technologies.

Research on the expanded variables of the UTAUT model shows that Personal innovativeness has an impact on the usage intention of consumers. This result is consistent with previous studies that suggest that personal innovativeness has a positive effect on the intention to use new technology (Kim et al., 2017; Han et al., 2019).

Besides, the analysis shows that consumers' risk perception of online shopping significantly affects their technology acceptance and usage. PR directly affects Usage intention and indirectly affects UI through TTF. This explains that when an individual perceives a new technology as suitable for their shopping behavior and less risky than other technologies available in the market, they are more likely to choose to use the new technology.

The study examined the impact of control variables such as age, gender, and income on the intention to use BOPS, but the results were not significant. Only the gender variable had an impact on UI in Ho Chi Minh city. This result differs significantly from previous studies, as Kim et al. (2022) and Leon (2018) found that both age and gender have an impact on the acceptance of new technology.

This study confirms the moderating effect of the additional variable in the research model, which is the location convenience on the intention to use BOPS. This reflects that when the pickup location is closer to the customer, they will perceive BOPS as more convenient. The proximity to the pickup location will further encourage consumers to use BOPS as they will have the right to pick up their orders quickly, inspect the products, thus increasing the chances of purchasing through BOPS. The results of this study are consistent with the previous study by Kim et al. (2017) on the impact of location convenience on the likelihood of using BOPS.

6. CONCLUSION

6.1. Managerial implications

The authors of the study provide some recommendations to help implement this service more quickly in practice for mobile phone retailers in Ho Chi Minh City. Firstly, they suggest providing real-time pricing, inventory, and nearby store locations, along with clear BOPS process instructions. This can help consumers feel more comfortable using the BOPS service and increase their confidence in the effectiveness of the service in their shopping experience.

The second recommendation is to develop an approach strategy for each target group (specifically for men and women) and consider store locations. If consumers feel that the pickup location is too far away and takes too much time to pick up the goods, the intention to use the service will decrease significantly. Retailers should conduct deeper research on the scale of customers and the geographical characteristics of each target group in order to distribute store density appropriately to maximize consumers' needs when using BOPS and limit high costs when opening too many stores.

6.2. Limitations

The study only focuses on one retail industry, namely mobile phone industry, while in reality, the type of product is one of the important intermediate variables in evaluating consumers' intention to adopt new services (Kim et al., 2017).

In terms of the research scope, the authors only focus on Ho Chi Minh City, and these results may not be applicable in different geographical environments where there may be cultural and customer behavior differences.

Regarding the research subjects, the authors have not investigated the internal factors of businesses that affect the BOPS service delivery process through interactions with consumers.

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THE EFFECT OF ENVIRONMENTAL CORPORATE SOCIAL RESPONSIBILITY ON CORPORATE IMAGE AND CUSTOMER LOYALTY: THE MODERATING ROLE OF CORPORATE SOCIAL RESPONSIBILITY COMMUNICATION

Author: Huynh Thi Phuong Duyen¹, Vu Thi Hanh Dung², Phan Thi Thuy Duyen²,
Ha Nguyen Huy Hai², Do Thi Thanh Truc²
Mentor: Nguyen Hai Quang³

ABSTRACT: Aviation activities have produced negative consequences, so socially responsible activities for the environment in general play a very important role. Therefore, this paper focuses on studying the impact of environmental corporate social responsibility (ECSR) on corporate image (CI) and customer loyalty (LOY) as well as conducting a review of the moderating role of corporate social responsibility communication (CSR communication). This paper used a linear structural model (PLS-SEM) analysis method with data collected from 292 valid responses from customers who have been using aviation services. The analysis results support the proposed hypotheses; environmental social responsibility affects the corporate image and customer loyalty, corporate image affects customer loyalty; CSR communication plays a positive moderating role in the relationship between the corporate image and customer loyalty, CSR communication plays a negative moderating role for the relationship between environmental social responsibility and customer loyalty and the relationship between environmental social responsibility and corporate image.

Keywords: environmental corporate social responsibility, corporate image, customer loyalty, corporate social responsibility communication (CSR communication)

1. INTRODUCTION

In the new era - the digital age is gradually developing and covering widely as today, competition between businesses in most sectors is becoming more intense. Therefore, businesses need to research new ways to improve their ability and competitiveness in the direction of sustainable development, making a difference compared to other businesses in the same industry or field (Porter and Siggelkow, 2018).

Now, to attract customers, businesses will prioritize the use of methods to build corporate culture, and ethics in business. And above all, the new trend has been growing in the world, becoming a seemingly “key” factor for all businesses in the integration process that is the need to implement corporate social responsibility (CSR) (Tsai et al., 2012), especially environmental corporate social responsibility (ECSR).

The aviation industry with a central role in the value chain, is considered one of the great drivers of development for economic sectors. Corporate social responsibility (CSR) in aviation has a spillover effect on other economic sectors and enhances the country’s image among international friends.

The activities of the aviation industry have created negative consequences (Kim, Lee & Roh, 2020; Hwang & Choi, 2021). Corporate activities can adversely impact the natural environment, therefore socially responsible activities towards the environment in general play an important role (Murshed, Sen et al., 2021). In addition, companies with a high reputation for environmentally responsible operations are more likely to improve the corporate image to customers (Han et al., 2019a). Besides, among the various components of CSR (including social, economic, and environmental), ECSR is the most important

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: duyenthp20407c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City

³ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: nhquang@uel.edu.vn

factor which determines the level of competition among different service providers (Park et al., 2016). This may be because the number of customers interacting and reacting to CSR initiatives is increasing rapidly (Chomvilailuk & Butcher, 2021; D'Acunto et al., 2020). Customers increasingly choose airlines with a combination of environmentally friendly activities (Niu et al., 2016). In addition, airlines are required to promote environmental practices to establish strong and lasting relationships with their travelers (Vatankhah, Sepehr Manesh et al., 2023). Therefore, airlines must emphasize the need for social responsibility for the environment and building a green image (Vatankhah, Sepehr Manesh et al., 2023).

Moreover, in the context of an increasingly polluted and degraded environment, the Government has also introduced specific environmental protection policies for the aviation industry, such as Circular No. 52/2022/TT-BGTVT - Circular regulating environmental protection in civil aviation activities for airlines to follow and implement environmental protection. For the above reasons, we selected the environmental component in the three economic, cultural and social sectors to consider the impact of ECSR on the corporate image (CI) and customer loyalty (LOY).

There were many studies about CSR, corporate image and customer loyalty, but the identification of components still has gaps that need to be exploited. Firstly, studies in Vietnam about the relationship between CSR, corporate image and customer loyalty in the aviation industry are limited, only Hoang's study (2020), which researched the impact of CSR on corporate image and customer loyalty in the aviation industry in Vietnam. In addition, Thu's study (2020) surveyed of foreign studies on the impact of CSR on corporate image and customer loyalty. Secondly, with the development of the industrial revolution 4.0, the implementation of corporate social responsibility communication (CSR communication) can help increase purchasing intentions (Sen and Bhattacharya, 2001). Moreover, by communicating to be a good business can increase customer loyalty and positive word-of-mouth (Du et al., 2007). There is also an increase in customer satisfaction and corporate reputation as well as consumer brand equity (Page & Fearn, 2005). Besides, CSR communication plays an important role in building corporate image (Parguel et al., 2011).

Therefore, we conduct this research to consider the impact of ECSR on corporate image and customer loyalty, the impact of corporate image on customer loyalty as well as to see the moderating role of CSR communication.

2. THEORETICAL FRAMEWORK

2.1. Theoretical foundation

2.1.1 .Social Exchange Theory - SET

According to Blau (1964), social interactions in which individuals believe that from social exchange actions, they will receive certain benefits are called social exchange theory (SET). According to Redmond (2015), Homans considers action in society as the exchange of activities, physical or intangible, valuable or cheap, between at least two people, the user and the company. SET has been used in the research of Gürlek, Düzgün and Uygur (2017) to better understand the impact of communication aspects of CSR on customers in shaping a favorite corporate image. Although companies do not directly benefit their customers through CSR communications and activities, as members of society, customers pay to respond to socially responsible actions by businesses because individuals are concerned with their interests, the public interest and welfare (Gürlek et al., 2017). As a result, if a company engages in socially responsible activities, customers as members of society can perceive the company well. Corporations have a long-term and sustainable competitive advantage and as a result they have a marketing advantage over their competitors. Moreover, this theory is also applied in the study of Vuong (2023) studying the impact of CSR on the loyalty of customers using Vietjet Air, Pacific Airlines and living in Ho Chi Minh City. The author concludes that this theory is used to shed light on how customers perceive CSR and organizational trust.

2.1.2. Stimulus-Organism-Response Model

The research team used the SOR model proposed by Mehrabian & Russel (1974). This model consists of three parts: stimulus (S), subject (O) and response (R). This model assumes that stimuli (S) lead to perception (O), which in turn produces a response (R) of the customer. The customer response has two possible responses: approach or avoidance (Mehrabian & Russel, 1974). The SOR model is an effective approach to investigate the complex nature of customer decision-making (So and Li, 2020). The main strength of the S–O–R framework is that it is flexible (Jacoby, 2002) and includes opportunities to test different internal and external stimuli; tangible and intangible stimulation includes attitudes, emotions, perceptions/feelings, judgments, beliefs, motivations and thoughts, and many response factors, including, intentions, behavior, avoidance...

2.1.3. Expectation - Confirmation model

To help explain the process of effective social responsibility communication, this paper applies the theory of validation of expectations (ECT). ECT has been used to explain why consumers decide to repurchase or continue using a company's product or service. While already widely used in the psychology and consumer behavior literature (Oliver, 1980), ECT has also been applied in information science (Bhattacharjee, 2001). In theory, consumers tend to have certain expectations about an entity. When their expectations are met after using the entity, their expectations are confirmed, leading to positive customer satisfaction and continued support of the entity. Thus, in the literature on consumer behavior and information systems, ECT seems to be able to explain how consumers demonstrate continued support for a product or information technology (Bhattacharjee, 2001).

Thus, by applying this theory to the CSR communication context, we can also demonstrate how consumers support socially responsible companies through communication about their social responsibility. Today's organizations increasingly face strong expectations and demands from stakeholders regarding social responsibility and better communication practices (Pomeroy and Dolnicar, 2009). To meet these growing stakeholder expectations, CSR communication needs to be continually assessed as to whether stakeholder expectations are being met. Therefore, to demonstrate the communication process based on ECT, this paper measured CSR communication through factors of consumer expectations in previous studies (Kim and Ji, 2017; Afandi, Jamal et al., 2021; Chua and Chan, 2022).

2.2. Hypothesis development

2.2.1. The relationship between Environmental corporate social responsibility (ECSR) and Corporate image (CI)

ECSR is a concept of a business's complementary endeavor involving a combination of environmental or ecological concerns in business operations as well as interactions with stakeholders, and, a key aspect of ECSR is to protect the environment by minimizing harmful impacts (Rashid, Khalid et al., 2015). Corporate image (CI) is the result of a process (MacInnis and Price, 1987). This sensory process arising from the customer's ideas, feelings, and previous experiences with a business is retrieved from memory and transformed into mental images (Yuille and Catchpole, 1977). As a rule, people are exposed to the reality created by the enterprise and can consciously or unconsciously choose events that are compatible with their formation of attitudes and beliefs. These facts are retained and then retrieved from memory to reconstruct the image of the business operating (Nguyen and Leblanc, 2001).

Previous studies have demonstrated the influence of ECSR on corporate image. Based on signaling theory, Dögl and Holtbrügge (2014) conducted an empirical study among 215 firms in China, Germany, India and the USA and concluded that ECSR had had an impact on corporate image. Lee, Kim et al. (2019), in the study of Korean consumers who only visited Incheon International Airport in South Korea, based on

company and consumer congruency, stretched from person-organization fit, organizational identification, and I-sharing theory also came to the same conclusion. Based on the triple bottom line and social exchange theory, Vuong et al. (2023), when researching customers over 18 years old who have used services of Vietjet Air and Pacific Airlines and are living in Ho Chi Minh City, demonstrated the influence of ECSR on corporate image. Thu (2021) uses the sustainable development perspective to research the impact of ECSR on corporate image of airlines in Vietnam after the Covid-19 pandemic.

Therefore, our hypothesis is:

H1. Environmental corporate social responsibility has an impact on corporate image.

2.2.2. The relationship between Corporate Image (CI) and Customer loyalty (LOY)

Customer loyalty (LOY) refers to a customer's commitment to a particular business, and the strong relationship between the customer and the business is unlikely to change under normal circumstances (Stanisavljević, 2017). True loyalty should be measured by customer retention, customer commitment, positive word of mouth and willingness to pay higher prices for services (Thu, 2020).

Corporate image is believed to have more impact on customer loyalty in intangible services than in tangible goods (Zeithaml, 1981). Studies show that corporate image directly affects customer loyalty (Ball, Coelho et al., 2006; Wang, 2010; Richard and Zhang, 2012) as well as significantly and positively indirectly. Based on theory of consumer behavior and cognitive psychology (Andreassen and Lindestad, 1998) proved that corporate image directly affects customer loyalty for customers with varying degrees of service expertise.

Kijpanjasub & Jitkuekul (2019) when studying the case of customers using low-cost airlines at 4 Northeastern Upper airports, concluded that the better corporate image the airlines have, the more loyalty the customers will have to the airline. Based on company and consumer congruency, stretched from person-organization fit, organizational identification, and I-sharing theory, Lee, Kim et al. (2019), in the study of Korean consumers who only visited Incheon International Airport in South Korea, concluded that corporate image has a positive influence on customer loyalty.

Therefore, our hypothesis is:

H2. Corporate image has an impact on customer loyalty.

2.2.3. The relationship between Environmental corporate social responsibility (ECSR) and Customer loyalty (LOY)

Previous studies conducted in different industries have indeed shown that a positive perception of CSR can lead to higher customer loyalty (Öberseder, Schlegelmilch et al., 2014). Based on stakeholder theory, Nik Ramli et al. (2014) concluded that ECSR also increases customer loyalty. Moisescu (2018) started from the theory-based premise that the CSR has three main dimensions consisting of economic, environmental and social sustainability, concluded that ECSR had an impact on customer loyalty in four important industries (mobile telecommunications services, retail banking services, dairy products and personal care products) in a developing country. Thu (2021) uses the sustainable development perspective to research the impact of ECSR on customer loyalty at airlines in Vietnam after the Covid-19 pandemic.

Therefore, our hypothesis is:

H3. Environmental corporate social responsibility has an impact on customer loyalty.

2.2.4. The moderating role of Corporate social responsibility communication (CSR communication)

Corporate social responsibility communication (referred to as CSR communication) has been defined as communication information designed and distributed by an enterprise itself about its CSR efforts (Kim

& Ferguson, 2016). Since it is difficult to measure CSR communication by itself, Kim and Ferguson (2018), previous studies have often explored consumer expectations for this communication to determine possible aspects of effective communication.

Based on previous studies by Kim and Ji (2017); Kim and Ferguson (2018); Afandi, Jamal et al. (2021); Chua and Chan (2022), we choose aspects to measure the effectiveness of communication about CSR based on consumer expectations, in this paper, we inherit Kim and Ji (2017), Kim and Ferguson (2018) and measured CSR communication by factors: (i) factual tone, (ii) self-promotional tone, (iii) frequency, (iv) consistency.

One of the main reasons why CSR fails is the lack of awareness among consumers about this activity (Maignan & Ferrell, 2004; Du et al., 2010). Therefore, the implementation of communication is necessary to raise consumers' awareness of CSR. When an organization does CSR communication through social media with customers, they will feel positive and want to respond positively to the organization (Zhang, Mahmood et al., 2021). CSR communication through social media impacts consumer loyalty in the banking industry (Ahmad, Naveed et al., 2021). CSR communication through social media increases customer loyalty (Zhang, Mahmood et al., 2021).

Communication plays an important role in building corporate image (Parguel et al., 2011). When the tone of the message (factual tone and self-promotional tone) is based on facts, less skepticism is generated. Companies will be seen as open and honest in their efforts to share information (Chua and Chan, 2022). In addition, according to Wan Afandi et al., (2021), the act of communicating a positive message about CSR to all stakeholders will reduce inconsistencies in information, improve corporate image. Companies should continuously communicate their CSR goals consistently, if a company is communicating arbitrarily and their socially responsible messages are constantly changing over time, it will increase public skepticism and distrust, leading to a bad corporate image in the public eyes.

Furthermore, combining SOR model (communication CSR plays a stimulating role), social exchange theory (considering the impact of communication aspects of CSR on customers in the formation of a favorite corporate image) and confirmation-expectation model (measurement of communication based on four aspects) with the basis of hypothetical arguments H1, H2 and H3.

Therefore, our hypothesis is:

H4. CSR communication moderates the relationship between environmental corporate social responsibility and corporate image.

H5. CSR communication moderates the relationship between corporate image and customer loyalty.

H6. CSR communication moderates the relationship between environmental corporate social responsibility and customer loyalty.

3. RESEARCH METHOD

3.1. Measurement

Drawing upon the SOR model, the confirmation-expectation model, the social exchange theory, and prior research, the research team developed measurement scales to analyze the effect of ECSR on corporate image and customer loyalty and consider the moderating role of CSR communication through four dimensions: (1) environmental corporate social responsibility, (2) corporate image, (3) customer loyalty, (4) the moderating role of CSR communication. These scales were designed to assess the influence of ECSR on corporate image and customer loyalty in the context of the airline industry. Based on the research model shown in Figure 1 survey items were crafted for a quantitative approach.

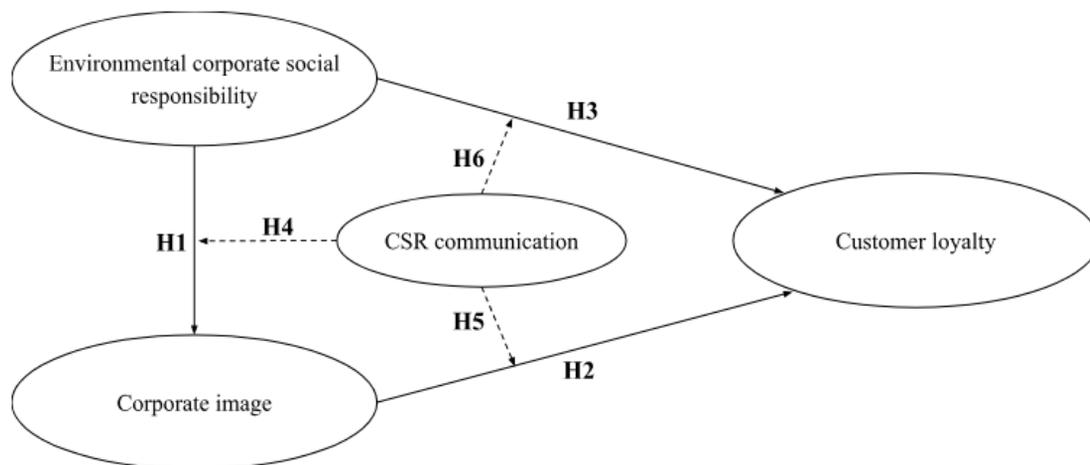


Figure 1. Proposed research model

All questionnaires were revised to fit the purpose of this paper using the 5-point Likert scale and translated into the Vietnamese language with support from the professional translator to clearly articulate the questions for the survey participants. Convenience sampling, which was based on the non-probabilistic and self-participation sampling method, was applied under the guidelines provided by Tarhini.

3.2. Collecting and processing data

Data was collected using a convenience sampling through an online survey form on Google Forms, which was sent via email to the survey participants, as well as through the paper questionnaires to 100 individuals in the waiting area of Tan Son Nhat International Airport. The survey participants were selected based on their prior experience with airline services as the users of four major companies: Vietnam Airline, Bamboo Airway, VietJet Air, Jetstar Pacific Airlines; and some of them possessed certain knowledge in the field of aviation. After eliminating responses that did not meet the criteria or had incomplete information, a total of 292 valid responses were included in the quantitative analysis. Furthermore, the research team took special care to ensure that the survey participants represented a diverse range of backgrounds and experiences in the airline industry.

3.3. Data analysis

The data were analyzed using the partial least squares structural equation modeling (PLS-SEM) method, non-parametric bootstrapping with 2,000 repetitions. The study comprised a measurement model and a structural model. The measurement model was used to build a valid and internally consistent model that contains convergent and discriminant validity. The structural model and its hypotheses were tested using path coefficients (β) and their significance level by applying PLS path modeling with asymmetrical bootstrapping procedure. Three criteria were used to evaluate the path system, including effect size (f^2), determination coefficient (R^2), and cross-validation (Q^2) (Hair et al., 2014). The loading of these indices met the following requirements: (1) all loadings > 0.7 , (2) composite reliability (CR) > 0.7 , (3) average variance extracted (AVE) > 0.5 . Subsequently, to test the relationships among variables in the study, the structural model was used with a t-value > 1.96 , indicating statistical significance at the 5% level.

4. RESULTS AND DISCUSSION

4.1. Descriptive statistics

Table 1 illustrates the results of surveying 292 customers that had consumed airline services.

Table 1: Descriptive statistics

Information	Categories	Numbers	Ratio %
Age	18-30	185	63.36%
	31-40	76	26.02%
	Above 40	31	10.62%
Gender	Male	109	37.33%
	Female	183	62.67%
Number of trips per year	Below 3	215	73.63%
	3 to 5	44	15.07%
	Above 5	33	11.30%
Favorite airline	Vietnam Airline	165	56.51%
	Bamboo Airway	56	19.17%
	VietJet Air	66	22.60%
	Jetstar Pacific Airlines	5	1.72%
Total		292	100%

Source: Authors's calculations

Firstly, the majority of respondents belong to the 18 - 30 age group, at 63.36%, the younger group of between 31 to 40 years old accounted for 26.02% and the rest of 10.62% of answers are derived from the above 40 age group. Secondly, passengers participating in the survey accounted for a high proportion of females with 183 people (62.67%) and males accounting for 37.33%. Thirdly, passengers with a frequency of below 3 trips per year make up a higher proportion of 73.63% with 215 respondents. Lastly, most of the people reply to prefer Vietnam Airlines for traveling with 56.61%, Jetstar Pacific airline has the lowest fraction of only 1.72%.

4.2. Partial least squares structural equation modeling method

The PLS - SEM method is performed through Smart-PLS to test for the effects of 4 factors: (1) environmental corporate social responsibility, (2) corporate image, (3) customer loyalty, (4) CSR communication.

4.2.1. Measurement Model

The research team used Cronbach's Alpha coefficient, Composite Reliability (CR), Average Variance Extracted (AVE), and outer loading to evaluate the measurement model. To ensure the acceptability of the measurement model, the Composite Reliability coefficient must be > 0.7 , the outer loading > 0.4 (Hair et al., 2014), and the AVE > 0.5 .

According to the results in Table 2, Cronbach's Alpha and the Composite Reliability of all factors are greater than 0.7. Thus, the reliability of the measurement scales is ensured. Therefore, the conclusion is that the measurement scales are appropriate.

The AVE values of the latent variables in Table 2 meet the requirement (>0.5). According to Hair et al. (2017), the total variance extracted (AVE) of the factors should be greater than 0.5, which means that half of the observed variable variance is explained by the factor. Thus, with the AVE values meeting the requirements, it can be concluded that the measurement scales have good convergent validity.

Regarding the evaluation of the outer loading or Composite Reliability of the observed variables: from the results in Table 2, the calculated values for the outer loading of the observed variables are all greater than 0.7. This means that the observed variables are capable of explaining more than 50% of the latent variables (Hair et al., 2016). However, there is one observed variable, LOY5, that has a loading below this threshold (0.635). Nevertheless, according to Hair et al. (2019), an outer loading of the factors greater than 0.4 is acceptable. Thus, it can be concluded that the observed variables explain the factors well.

Regarding the discriminant validity between variables, the HTMT values according to the results in Table 3 are all less than the recommended threshold of 0.9. According to Henseler et al. (2015), latent variables with HTMT values below 0.9 will ensure the necessary discriminant validity for estimation. Therefore, all variables in the model adequately ensure the differentiation necessary for accurate estimation.

In summary, the results of the analysis of composite reliability, outer loading, and variance extraction of the component measures indicate that the measurement scales for the concepts all meet the requirements for reliability and convergent validity.

Table 2: Confirmatory factor analysis result

Construct	Code	Outer loading	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	VIF
CI	CI1	0.765	0.822	0.823	0.883	0.653	1.552
	CI2	0.831					1.832
	CI3	0.845					2.155
	CI4	0.788					1.825
COM	PT	0.829	0.901	0.904	0.917	0.702	1.958
	FT	0.802					1.75
	CONS	0.892					2.727
	FREQ	0.825					2.169
ENV	ENV1	0.752	0.857	0.861	0.898	0.637	1.629
	ENV2	0.811					1.837
	ENV3	0.796					2.025
	ENV4	0.842					2.324
	ENV5	0.787					1.884
LOY	LOY1	0.803	0.819	0.83	0.874	0.584	1.819
	LOY2	0.737					1.708
	LOY3	0.798					1.782
	LOY4	0.831					1.978
	LOY5	0.635					1.427
PT	COM1	0.85	0.812	0.815	0.889	0.727	1.77
	COM2	0.883					2.027
	COM3	0.824					1.672
FT	COM4	0.816	0.748	0.75	0.856	0.665	1.55
	COM5	0.817					1.435
	COM6	0.813					1.517

CONS	COM7	0.814	0.808	0.809	0.887	0.724	1.555
	COM8	0.878					2.035
	COM9	0.858					1.908
FREQ	COM10	0.844	0.822	0.825	0.894	0.738	1.696
	COM11	0.886					2.108
	COM12	0.847					1.889

Source: Authors's calculations

Table 3: HTMT value for discriminant validity

	CI	COM	ENV	LOY	COM x ENV	COM x CI
CI						
COM	0.528					
ENV	0.51	0.512				
LOY	0.789	0.54	0.523			
COM x ENV	0.118	0.06	0.29	0.166		
COM x CI	0.049	0.145	0.121	0.055	0.634	

Source: Authors's calculations

The variables converge to the correct factors as in the initial research model and ensure reliability and necessary differentiation. Therefore, it can be concluded that the scales used for the entire study are appropriate and SEM analysis can be carried out. Thus, it can be said that the process of building the research model, scales, and survey questionnaire used for the study has been conducted meticulously and ensures effectiveness. The observed variables have representative values for the factor they converge to, and performing linear structural equation modeling (SEM) based on these factor groups is statistically meaningful.

4.2.2. Structural model assessment

From Table 4, the results show that the VIF values among the independent variables are all less than 3. According to Hair et al. (2019), a VIF value less than 3 has a very low likelihood of multicollinearity. Therefore, it can be concluded that multicollinearity is not present in the model.

The test of determination coefficient (Table 5) shows that the corporate image variable is explained by the model at 32.9%, and similarly 49.4% for the customer loyalty variable. With a very small p-value (approximately 0), it can be concluded that the model fits the data well.

Table 4: Test for multicollinearity (VIF)

	CI	COM	ENV	LOY	COM x ENV	COM x CI
CI				1.422		
COM	1.248			1.465		
ENV	1.343			1.474		
LOY						
COM x ENV	1.085			1.885		
COM x CI				1.811		

Source: Authors's calculations

Table 5: Deterministic coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
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CI	0.329	0.343	0.060	5.471	0.000
LOY	0.494	0.508	0.048	10.383	0.000

Source: Authors's calculations

The values of the effect size coefficient indicates the strength of the relationships in the model. According to Cohen (1988), the value can be classified into three levels of weak, medium, and strong corresponding to threshold values of 0.02, 0.15, and 0.35, respectively. From the results in Table 6, the moderation effect of communication on the relationship between the corporate image and customer loyalty is at a moderate level (= 0.15). Communication also has a moderate moderating effect on the relationship between environmental corporate social responsibility and customer loyalty (= 0.19). Similarly, the direct effect of environmental corporate social responsibility on customer loyalty is at a decent level (= 0.16). The direct relationship between the corporate image and customer loyalty is the strongest (= 0.332). The moderating effect of communication on the relationship between environmental corporate social responsibility and the corporate image is weak (= 0.125). Finally, the direct impact of the environmental corporate social responsibility variable on the corporate image is small (= 0.088).

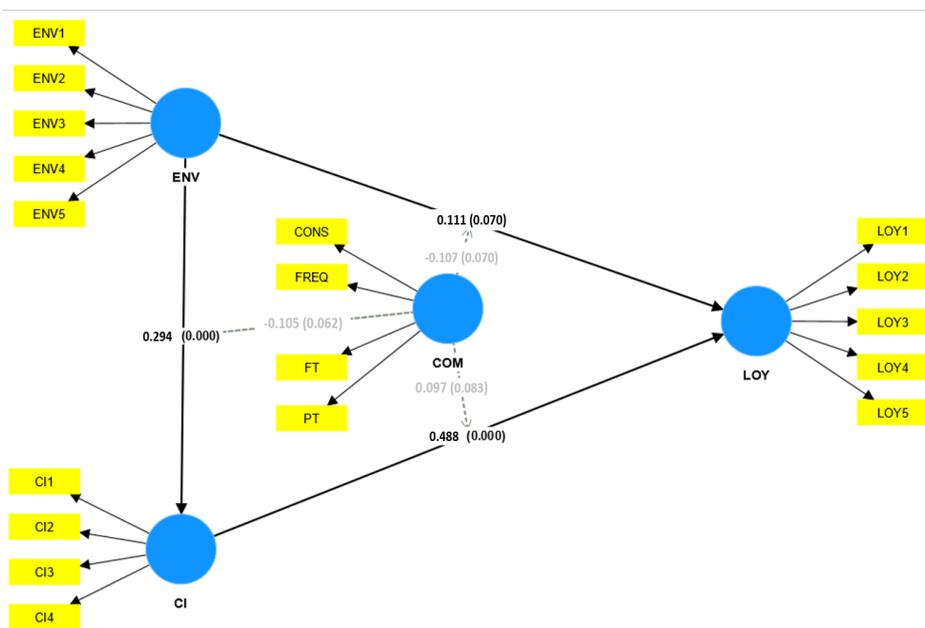


Figure 2: Results of PLS - SEM

Source: Authors's calculations

Table 6: Effect size

	CI	COM	ENV	LOY	COM x CI	COM x ENV
CI				0.332		
COM	0.109			0.064		
ENV	0.088			0.16		
LOY						
COM x CI				0.15		
COM x ENV	0.125			0.19		

Source: Authors's calculations

4.2.3. Affect assessment

After conducting the measurement model assessment, the bootstrap technique was used to test the

relationships between the latent variables estimated. Bootstrap is a resampling method based on the original data to provide confidence intervals for the estimated parameters, allowing for statistical hypothesis testing. The results from the repeated data sampling provide mean values, standard deviations, and t-test values for each coefficient of the model. In this study, bootstrap was used with a sample size of 1000 observations compared to the original sample size of 292 observations. The estimated results from the software provided p-values less than 0.001 for all coefficients, except for the impact coefficients corresponding to hypotheses H3, H4, H5, and H6, which had p-values with a significance level of 10%. Thus, from the bootstrap estimation method, the conclusion is that the model is reliable, with most of the coefficients being statistically significant.

Table 7: Results of path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
CI -> LOY (H2)	0.488	0.491	0.052	9.400	0.000 (***)
COM -> CI	0.315	0.315	0.062	5.101	0.000 (***)
COM -> LOY	0.218	0.219	0.057	3.849	0.000 (***)
ENV -> CI (H1)	0.294	0.298	0.062	4.742	0.000 (***)
ENV -> LOY (H3)	0.111	0.108	0.061	1.814	0.070 (*)
COM x ENV -> CI (H4)	-0.105	-0.101	0.056	1.868	0.062 (*)
COM x ENV -> LOY (H6)	-0.107	-0.103	0.059	1.816	0.070 (*)
COM x CI -> LOY (H5)	0.097	0.098	0.056	1.732	0.083 (*)
ENV -> CI -> LOY	0.143	0.147	0.036	3.961	0.000 (***)

(*) p-value < 0.1, (**) p-value < 0.05, (***) p-value < 0.001

Source: Authors's calculations

From the statistical estimation results, hypothesis testing, presented in the following table 8, is conducted for the research hypotheses:

Table 8: Hypothesis testing

Hypothesis	Effect	Result
H1: Environmental corporate social responsibility has an impact on corporate image.	Positive	Accepted
H2: Corporate image has an impact on customer loyalty.	Positive	Accepted
H3: Environmental corporate social responsibility has an impact on customer loyalty.	Positive	Accepted
H4: CSR communication moderates the relationship between environmental corporate social responsibility and corporate image.	Negative	Accepted
H5: CSR communication moderates the relationship between corporate image and customer loyalty.	Positive	Accepted
H6: CSR communication moderates the relationship between environmental corporate social responsibility and customer loyalty.	Negative	Accepted

Source: Author's calculations

4.2.4. Discussion

The results of testing the relationships in the research model show that ECSR has a positive impact on the CI. This is consistent with the studies by Lee, Kim, et al. (2019) when researching customers at Incheon International Airport in South Korea. The study is also consistent with the study of Thu (2021) in Vietnam's aviation industry. Thu (2021) conducted research in the context of Vietnam as a developing country (different from studies in developed countries). The study also implied that businesses should carry

out CSR communication but did not consider the role of this variable, therefore, we have studied the role of this variable. Increasing ECSR enhances CI.

Furthermore, CI is positively related to LOY. This is in agreement with the studies of Andreassen and Lindestad (1998); Kandampully and Suhartanto (2000); Bloemer and De Ruyter (1998); Nguyen and Leblanc (2001); Ball, Coelho, et al. (2006); Wang (2010); Richard and Zhang (2012). The research results are consistent with the study of Kijpanjasub & Jitkuekul (2019) when studying the case of customers using low-cost airlines at 4 Northeastern Upper airports as well as the study of Lee, Kim et al. (2019) in the study of Korean consumers who only visited Incheon International Airport in South. Lee, Kim et al. (2019) suggest that further studies should consider the impact of CI on LOY in different contexts to reinforce the results. CI increases LOY.

ECSR has a positive impact on LOY. This is consistent with the studies of Nik Ramli et al. (2014); Rashid, Rahman, et al. (2014). The study of Thu (2021) in the context of Vietnam as a developing country. Increased ECSR leads to increase LOY.

With the acceptance of hypothesis H4, CSR communication plays a moderating role, reducing the relationship between ECSR and CI. The presence of communication reduces corporate image through ECSR. This is explained as follows: CSR communication is measured based on the self-promotional tone, factual tone, frequency, and consistency. First, consider the self-promotional tone, knowing that businesses need to actively communicate their social responsibility to target customers to increase their awareness, but when they try to advertise their good deeds, customers tend to doubt their sincerity, leading to negative reactions to the corporate social responsibility (Webb & Mohr, 1998). Next, when considering frequency, extensive communication about a corporate social responsibility may backfire as the public may become more skeptical about the company's sincere commitments (Morsing and Schultz, 2006; Stoll, 2002). Furthermore, when considering consistency, if a company communicates its social responsibility in a haphazard manner, such as "what the company is saying constantly changes", then communication about the corporate social responsibility will fail due to increasing skepticism and loss of public trust (Coombs and Holladay, 2011; Schlegelmilch and Pollach, 2005). ECSR has a positive impact on corporate image (H2). Therefore, due to the above reasons, CSR communication plays a negative moderating role, reducing the relationship between ECSR and corporate image.

The CSR communication factor plays a moderating role, increasing the relationship between corporate image and customer loyalty. This is supported by research conducted by Zhang, Mahmood, et al. (2021). The involvement of communication helps to strengthen the impact on loyalty through corporate image.

Finally, CSR communication has a moderating relationship that reduces the influence ECSR on customer loyalty. This finding differs from previous studies. The involvement of communication reduces customer loyalty through social responsibility. This can be explained as follows: CSR communication plays a moderating role in reducing the relationship between ECSR and corporate image, as explained above, while ECSR has a positive impact on customer loyalty. Therefore, CSR communication has a moderating relationship that reduces the influence of ECSR on customer loyalty.

5. CONCLUSION

Research results show that ECSR has a positive impact on corporate image, corporate image has a positive impact on customer loyalty. CSR Communication plays a moderating role, increasing the relationship between corporate image and customer loyalty. However, CSR communication reduces the impact of ECSR on customer loyalty and reduces the influence of ECSR on corporate image.

Based on the research results of the impact of ECSR on corporate image and customer loyalty as well as the moderating role of CSR communication, we propose the following managerial implications:

Firstly, ECSR helps to improve the corporate image and customer loyalty. Therefore, it is necessary to take socially responsible actions, including: Implementing energy consumption in a reasonable volume in the use of fuel for aircraft, other vehicles as well as operations in the office. Water sources used on aircraft, aircraft cleaning activities also need to choose a responsible supplier, use the right amount of water, and need to ensure proper discharge and treatment of wastewater. Comply with the provisions of the law on environmental protection; Circulars of the Ministry. In addition, airlines also need to control and use chemicals to kill insects or clean aircraft.

Secondly, in order to improve customer loyalty, it is also necessary to increase the corporate image because corporate image has an impact on customer loyalty, therefore: Airlines need to perform well on social responsibility for the environment to be able to receive customer support (Park et al., 2015; Alvarado Herrera et al., 2017; Park, 2019). Programs that can be mentioned include: recycling, reducing resource consumption and pollution, conducting annual environmental audits.

Third, to increase customer loyalty, airlines need to retain their customers. This should be done through the above environmentally responsible actions. Moreover, corporate image also has an impact on customer loyalty, which is a very important factor because it creates positive emotions for customers (Asatryan and Asamoah, 2014), so businesses also need to take the above actions to improve the corporate image, thereby strengthening customer loyalty.

Fourth, about CSR communication. If we have a better understanding of what customers expect from the media, organizations can better plan to communicate their social responsibility initiatives and meet public expectations, they will lead to better communication outcomes (Kim and Ferguson, 2018). In general, airlines need to actively communicate about their social responsibility efforts for the environment so that customers and the public understand and stay informed about the business. The information should be widely disseminated in the annual report and official website of the enterprise, in other mass media. To ensure effective communication, it is important to note that: Enterprises need to pay attention to the factual tone and self-promotional tone, when making the communication, it should be based on the truth, the tone is gentle, it should not be the self-promotional or congratulatory message because the customer doesn't like this (Pomeroy and Dolnicar 2009; Schlegelmilch and Pollach, 2005), if an airline is self-promoting, self-congratulating, or based on false information, the public will perceive the airline to be insincere and hence may not select the airline.

The study has some limitations on the demographics of the survey subjects: Of the subjects, 62.67% were female, and the age group from 18 to 30 accounts for the majority. In addition, the number of people who fly less than 3 times a year accounts for 73.63%, so they do not have too much experience to evaluate even though 100% of them have been on an airplane flight, know and understand CSR. Therefore, the effectiveness of communication may not be fully measured through these aspects. Finally, the authors only measure ECSR due to limited resources, unable to measure all three concepts from the point of view of sustainable development because of the difficulty in surveying business owners.

Finally, future research can measure CSR from the point of view of sustainable development (including 3 components) to see the impact of CSR on corporate image and customer loyalty. Research should be done online and offline, with an even distribution of age and gender to be representative.

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THE MODERATING ROLE OF GENDER IN THE RELATIONSHIP BETWEEN GAMIFICATION OF MOBILE MONEY PAYMENT AND CUSTOMER VALUE

**Author: Huynh Le Phuong Hang¹, Mai Ngoc Dung², Nguyen Thi Yen Nhi²,
Nguyen Thuy Linh², Nguyen Huu Phu Thinh²
Mentor: Nguyen Hoang Dung³**

ABSTRACT: *This study aimed to investigate the gender differences in the relationship between gamification of mobile money payment (Gmmp) and customer value, focusing on the social impact among Generation Z in Ho Chi Minh City. The research utilized cross-sectional data collected from 273 Generation Z users of mobile money payment in Ho Chi Minh City. Structural equation modeling (SEM) was employed to test the first twelve hypotheses, while multigroup analysis (MGA) was used to examine the remaining twelve hypotheses. The findings revealed that females exhibited a higher level of compliance, whereas males demonstrated a stronger influence of internalization during their Gmmp experience. Based on these results, Gmmp providers can enhance the effectiveness and efficiency of their mobile payment systems by incorporating gamification elements and implementing appropriate design and operational strategies.*

Keywords: *Gamification; mobile money payment; social impact; customer value; gender.*

1. INTRODUCTION

In recent years, the increasingly modern development of technology has created a new trajectory for technology-mediated payments and multi-channel financial services companies (Lai & Liew, 2021). Moreover, the global payment network has witnessed a significant boost due to the COVID-19 pandemic, which has accelerated the adoption and development of alternative payment methods. Research by Visa on consumer payment attitudes in 2021 shows that developing countries in Southeast Asia, especially Vietnam, have the fastest-developed e-wallet market, gradually replacing cash and bank cards (VISA, 2021). Therefore, the mobile payment market in Vietnam has plenty of room for solid growth in the upcoming time. In the Shopee e-commerce platform, 80% of transactions using cashless payment methods are made by young users, and the growth of females' non-cash payments increases strongly, 30% higher than that of males (Hai Dang, 2020). Furthermore, according to the findings of Visa's survey, it can be observed that generation Z consumers play a pivotal role as the primary target audience in social commerce, they have the ability to adopt new ideas, accept changes, and appreciate technology, simultaneously have a tendency to combine creativity, imagination, and curiosity when exploring new services (Lestari, 2019). As consumer preferences and habits constantly change, businesses can respond to consumer satisfaction with digital promotion strategies in commerce and payments. Therefore, gamification on mobile payment platforms has contributed to narrowing the gap between service providers and consumers while leveraging that interaction to encourage user engagement (Hofacker et al., 2016).

In general, gamification is used in various industries, however, it has recently been used for mobile payments (Dzandu et al., 2022). Hence, research on gamification's effects on mobile payments is still restricted (Putri et al., 2019; Wong et al., 2022), especially regarding its social impact. Gamification significantly influences customers' willingness to accept and use mobile payments (Bayuk & Altobello, 2019; Dzandu et al., 2022; Putri et al., 2019; Qian et al., 2022). While gamification has a positive impact

¹ University of Economics and Law, Vietnam National University of Ho Chi Minh City; Email: hanghlp204022c@st.ucl.edu.vn

² University of Economics and Law, Vietnam National University of Ho Chi Minh City

³ University of Economics and Law, Vietnam National University of Ho Chi Minh City; Email: dungnh@uel.edu.vn

on social influence and a complex influence on customer value, Koivisto & Hamari (2014), Polo-Peña et al. (2021) have shown that demographic groups will have different motivations and attitudes when using gamified services. More specifically, in the study of Hamari & Koivisto (2015b), gender is considered as a moderating variable to re-systematize the form or strength of potential relationships and influence the overall effectiveness of gamification.

In addition, demographic factors haven't been studied on gamification in the context of financial technology solutions in general and mobile money payment in particular (Dzandu et al., 2022). Therefore, the research team decided to investigate the **“THE MODERATING ROLE OF GENDER IN THE RELATIONSHIP BETWEEN GAMIFICATION OF MOBILE MONEY PAYMENT AND CUSTOMER VALUE”** in the hope that the research findings will help managers and providers recognize the differences in adoption and facilitate the appropriate development trends for gamification in applications.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Theoretical background

The theory of social impact describes an individual's awareness of the importance of what others think about their specific actions and whether they expect them to be completed (Ajzen, 1991). It is the extent to which various forms of social networks influence each other's behavior. Additionally, Argo argues that social impact can affect consumers actively or passively: active influence comes from interactive exchanges such as recognition and sharing, whereas passive influence relates to social experiences in a unidirectional manner, such as through information in the retail environment. Social impact, in general, alters the usage patterns of technology and intentions to continue using it. Therefore, an individual may unintentionally use a specific technology based on the influence and perspectives of others. Individuals who use mobile applications and engage in social interactions maintain their habits and attitudes (Hamari & Koivisto, 2013). Moreover, it can even partially change human behavior due to the human tendencies of “competition, challenge, and social interaction” (Zichermann & Cunningham, 2011).

The theory of customer value is considered the “fundamental foundation for all marketing activities” (Woodruff, 1997). Understanding and recognizing customer value is vital to achieving a competitive advantage (Torkzadeh et al., 2021), especially in the technology sector. When an individual experiences a high level of interaction (Huotari & Hamari, 2012; Landers et al., 2019; Leclercq et al., 2020), satisfaction, engagement and loyalty of users in mobile money payment gamification increase steadily (Basaran, 2022; Roncone & Massari, 2022).

2.2. Gamification, mobile money payment

Gamification is an informal and general term that refers to the use of game elements in non-game systems to enhance user experience and interaction (Deterding et al., 2011). Its purpose is to support value creation and encourage beneficial behaviors for individuals or groups (Hamari & Koivisto, 2015a, 2015b; Huotari & Hamari, 2017), promote service delivery, and encourage value-generating customer behaviors (Basaran, 2022; Hofacker et al., 2016; Huotari & Hamari, 2012), increase user engagement with products or services, and stimulate behavioral intentions (Deterding et al., 2011).

Gamification of mobile money payment refers to the integration of game-like design features into mobile money payment, particularly for transactions involving mobile transfers, payments, and receipts (Bayuk & Altobello, 2019).

2.3. Hypotheses development

2.3.1. Social impact theory of Gmmp

Social impact occurs in three forms: internalization, identification, and compliance (Kelman, 1974). Internalization describes the process by which an individual adopts a belief or behavior because it aligns with their personal values (Kelman, 1958), wherein an individual's behavior, to some extent, will change based on the behavior of other members within the group (Manski, 1993). Identification reflects how others influence an individual within the same social group (Cheung et al., 2011; Kelman, 1974), wherein an individual's behavior, to some extent, will be influenced by the distribution of external characteristics within the group (Manski, 1993). Compliance is the process in which individuals agree with the viewpoints or behaviors of others (Kelman, 1974), wherein individuals within the same group tend to exhibit similar behaviors because they share similar traits or are in an environment with similarities (Manski, 1993).

H1. The gamified mm-payment has a significant impact on internalization.

H2. The gamified mm-payment has a significant impact on identity.

H3. The gamified mm-payment has a significant impact on compliance.

2.3.2. Social impact of Gmmp and customer value

Customer value refers to the “customer's cognitive preference and evaluation of product attributes, attribute performance, and consequences arising from use facilitating (or impeding) the attainment of goals and purposes” (Woodruff, 1997).

User engagement is described as associated with the quality of the experience characterized by challenge, positive affect, persistence, aesthetics, fascination, attention, feedback, interactivity, and perceived control (O'Brien & Toms, 2008). The level of user interaction with mobile money payment is influenced by the fact that individuals with social relationships tend to exhibit higher levels of interaction by observing the thoughts and behaviors of others and then thinking and acting similarly, unlike those without social relationships (Poirier & Cobb, 2012).

H4. Internalization has a significant impact on user engagement for the gamified mm-payment.

H5. Identity has a significant impact on user engagement for the gamified mm-payment.

H6. Compliance has a significant impact on user engagement for the gamified mm-payment.

Customer satisfaction is described as a personal experience based on emotional and psychological states White & Yu (2005) and an interesting fulfillment (Oliver, 2010). According to social impact theory, the beliefs, attitudes, and thoughts of individuals can change when interacting with society (Kelman, 1974). In the field of Gmmp, social impact has a greater impact because new users rely on the satisfaction of other users within their social circle who have used the app (Bhatt & Nagar, 2021).

H7. Internalization has a significant impact on user satisfaction with the gamified mm-payment.

H8. Identity has a significant impact on user satisfaction with the gamified mm-payment.

H9. Compliance has a significant impact on user satisfaction with the gamified mm-payment.

Customer loyalty is conceptualized as a sincere commitment to repurchase or endorse a preferred product or service consistently in the future (Oliver, 2010). Individuals will continue to use Gmmp based on the perspectives, attitudes, and behaviors of other users in the social environment (Dzandu et al., 2022).

H10. Internalization has a significant impact on user loyalty to gamified mm-payment.

H11. Identity has a significant impact on user loyalty to gamified mm-payment.

H12. Compliance has a significant impact on user loyalty to gamified mm-payment.

2.3.3. Gender as a moderator

The study conducted by Hamari & Koivisto (2015a) demonstrates that gender serves as a control variable in shaping the pattern of implicit relationship strength and its overall impact on the effectiveness of gamification. Furthermore, the interaction with gamification is considered to, directly and indirectly, influence customer attitudes and behaviors. Within this study, gender is regarded as a personal control variable that may affect the intention to use Gmmp.

Gender differences have been found to impact the process of internalization among users, as they consider gamification use to be “useful for problem-solving or aligned with their needs” (Kelman, 1958). This influences the level of acceptance of participating in gamification among users with gender-related disparities.

H13. Gender differences significantly impact the relationship between gamified mm-payment and internalization.

H16. Gender differences significantly impact the relationship between internalization and user engagement of gamified mm-payment.

Regarding identification - how others influence an individual within their social circle (Cheung et al., 2011; Kelman, 1974), individuals tend to conform socially to maintain relationships with others or a group (Kelman, 1958). They tend to exhibit higher levels of satisfaction when interacting with individuals of the opposite gender (Adamovic & Molines, 2023). Social impact theory suggests that high identification tends to yield positive outcomes such as performance and pride. Specifically, males with high gender awareness may be less authentic, whereas females with high gender awareness may be more authentic, but this diminishes their inclination to engage in desired service usage behaviors (Shum et al., 2020).

H14. Gender differences significantly impact the relationship between gamified mm-payment and identity.

H19. Gender differences significantly impact the relationship between identity and user engagement of gamified mm-payment.

Gender disparities exhibit a significant correlation with compliance intentions, with females demonstrating higher policy compliance than males (Herath & Rao, 2009). Males show greater interest in technological applications compared to females (Ardies et al., 2015). Consequently, it can be understood that the frequency of engagement in gamification-related activities within mobile payments is lower among females than males.

H15. Gender differences significantly impact the relationship between gamified mm-payment and compliance.

H22. Gender differences significantly impact the relationship between compliance and user engagement of gamified mm-payment.

Regarding satisfaction levels between males and females, Koivisto & Hamari (2014) suggests that females tend to evaluate the social aspects of gamification more cautiously and perceive the gamified community as more benevolent than males. This implies that females exhibit higher satisfaction with gamification services compared to males. User loyalty to a product or service partially depends on the impact of the user’s gender on their perception of customer value. Specifically, males perceive value based on the quality of information, while service quality has a more significant influence on females (Molinillo et al., 2021).

H17. Gender differences significantly impact the relationship between internalization and satisfaction with gamified mm-payment.

H20. Gender differences significantly impact the relationship between identity and satisfaction with gamified mm-payment.

H23. Gender differences significantly impact the relationship between compliance and satisfaction with gamified mm-payment.

User loyalty to a product or service is partly influenced by the impact of the user’s gender on their perception of the customer value they receive. Specifically, males perceive value based on the quality of information, while service quality has a more significant influence on females (Molinillo et al., 2021). The more loyal customers are to a gamified mobile payment application, the more willing they are to use it repeatedly (Dzandu et al., 2022). From the perspective of Xue’s social impact theory (2019), this study posits that individuals will continue to use Gmmp and become loyal to them based on the influence of others within their social circle.

H18. Gender differences significantly impact the relationship between internalization and loyalty to gamified mm-payment.

H21. Gender differences significantly impact the relationship between identity and loyalty to gamified mm-payment.

H24. Gender differences significantly impact the relationship between compliance and loyalty to gamified mm-payment.

2.4. Conceptual framework

The authors adapted the model and theory of Dzandu et al. (2022) and expanded it with the moderator variable gender to study the gender differences in the relationship between Gmmp and customer value of gen Z using mobile payment service in Ho Chi Minh City (Figure 1).

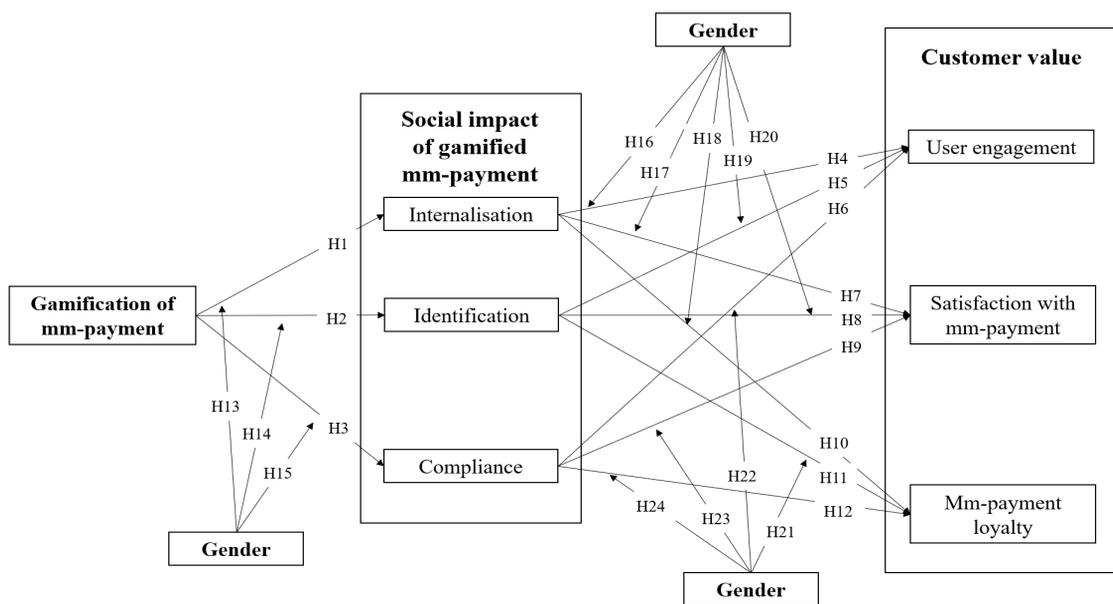


Figure 1. Conceptual framework

3. RESEARCH METHOD

3.1. Sample and data collection

The research team collected primary data by conducting an online questionnaire survey sent to generation Z (14-27) who were living and working in Ho Chi Minh City and using mobile money payment. The questionnaire used the 7-point Likert-type scale, including 26 questions for 7 variables (Table 1).

Table 1. Survey questionnaire

Constructs	Code	Statement	Source
Gamified m-payment	Gmp1	I will use an m-payment system with features that gives me points for using the service.	Eppmann et al. (2018), Putri et al., (2019), and Högberg et al. (2019)
	Gmp2	I will use an m-payment system with features that has a sort of a league table to show my performance position compared with others in using mobile payment services.	
	Gmp3	I will use an m-payment system with features that allows me to interact with other people.	
	Gmp4	I will use an m-payment system with features that has options for which I can customise images to represent my persona.	
	Gmp5	I will use an m-payment system with features that has a progress bar to show me how I am using the mobile payment services.	
	Gmp6	I will use an m-payment system with features that shows my points on a diagram when using the services.	
	Gmp7	I will use an m-payment system with features that rewards me for using the services.	
Internalization	IN1	I know the importance of an app with games for m-payment systems.	Cao et al. (2021)
	IN2	I reason I would prefer an app with games for m-payment systems is because of the value it offers me.	
	IN3	I would like apps with games for m-payment systems because they are similarity to my values and use.	
Identification	ID1	I would feel a sense of personal control when using gamified m-payment systems.	
	ID2	I would recommend the use of an app with games for m-payment to my friends and/or colleagues.	
	ID3	I will be proud about using an app with games for m-payment systems.	
Compliance	CM1	My private views about apps with games for m-payment systems are different than those I express publicly.	
	CM2	If I am rewarded for using an app with games for m-payment systems, I see no reason not to spend extra effort in using it.	
	CM3	For me to get rewarded by my m-payment company, it is necessary to use mobile payment system that has game features.	
	CM4	I would often use m-payment systems that has game features often if I am rewarded by my m-payment service provider.	
User engagement	CE1	I will continue supporting my mobile payment service provider.	Wu and Li (2018)
	CE2	I will let the mobile payment service provider know how to improve the brand experience.	
	CE3	I will let the mobile payment service provider know of ways to better serve my needs.	
Satisfaction	SA1	I am satisfied with my total experience with my mobile payment service provider.	Klaus and Maklan (2013)
	SA2	I am content with the services of my mobile payment service provider.	
	SA3	I am pleased with the overall quality of service of my mobile payment service provider.	
Loyalty	LO1	I intend to remain loyal to this mobile payment service provider in the future.	Hollebeek et al. (2014)
	LO2	I think of myself as a loyal customer of this mobile payment service provider.	
	LO3	I would continue to use a mobile payment system with game features in order to support my mobile payment service provider.	

The total sample collected was 356, of which 273 participants in Gen Z used gamified mobile payments in Ho Chi Minh City. Therefore, the valid number of samples is 273.

According to statistical primary data collection, the rate of males is 48,7% and females is 51,3%. There are nearly 90% of the participants, ranging between the ages of 18 and 25. In addition, the most favorable mobile payment is MoMo, accounting for over 49%, followed by Internet Banking with 21,6%, ZaloPay (13,2%), VNPAY (10,6%) and Viettel Money (5,5%) (Table 2).

Table 2. Sample demographic information

	Category	Sample (N=273)
Gender	Male	48,7%
	Female	51,3%
Age	14 - 17	10,6%
	18 - 27	89,4%
Favorite mobile payment	Momo	49,1%
	Internet Banking	21,6%
	ZaloPay	13,2%
	VNPay	10,6%
	Viettel Money	5,5%

Data analysis methods

The proposed model and hypotheses were examined using rigorous research methods, including Confirmatory Factor Analysis (CFA) to assess the adequacy of the measured variables in representing the constructs. Structural Equation Modeling (SEM) was employed to analyze the structural relationships among the variables. Additionally, Multigroup Analysis (MGA) was conducted to investigate whether there were significant differences in the parameter estimates between pre-defined data groups. Furthermore, Importance-Performance Map Analysis (IPMA) was utilized to assess the importance (total impact) and performance (average latent variable score) of the identified factors.

4. RESULTS AND DISCUSSION

4.1. Common Method Bias

According to the Harman single-factor analysis results, the only dominant factor accounting for most of the variance is 47,923% < 50%. Thus, common method variance did not exist in this research (Table 3).

Table 3. Harman single-factor analysis results

Total Variance Explained					
Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
12,460	47,923	47,923	12,460	47,923	47,923
1,861	7,159	55,082	1,861	7,159	55,082
1,456	5,600	60,682	1,456	5,600	60,682
1,063	4,088	64,770	1,063	4,088	64,770
,940	3,615	68,385			
,751	2,887	71,272			
,677	2,605	73,877			
,593	2,281	76,158			
,568	2,184	78,343			
,521	2,005	80,347			
,500	1,921	82,269			
,492	1,891	84,159			

,453	1,742	85,901		
,387	1,490	87,391		
,362	1,393	88,784		
,353	1,360	90,143		
,342	1,316	91,459		
,322	1,237	92,696		
,296	1,137	93,833		
,292	1,121	94,955		
,262	1,009	95,964		
,253	,971	96,935		
,249	,959	97,895		
,206	,792	98,687		
,184	,707	99,394		
,158	,606	100,000		
Extraction Method: Principal Component Analysis.				

4.2. Confirmatory Factor Analysis

4.2.1. Scale Reliability

Cronbach’s Alpha (CA) reliability test is the basis for this study to eliminate inappropriate variables and limit unnecessary variables in the research process. All the CA results of the variables CE, CM, GMP, ID, IN, LO, SA were between 0.7 and 1.0. Thus, the scale is reliable (Nunnally & Bernstein, 1994) (Table 4).

Table 4. Cronbach’s Alpha results

	Cronbach's alpha
CE	0,865
CM	0,850
GMP	0,876
ID	0,823
IN	0,832

4.2.2. Convergent Validity

The AVE is the degree to which the research variable explains the variability of its observed variables. The results indicated that the variables respectively received values greater than 0.5, reaching the acceptable threshold (Fornell & Larcker, 1981) (Table 5).

Table 5. Average Variance Extracted results

	Average variance extracted
CE	0,787
CM	0,690
GMP	0,573
ID	0,739
IN	0,749

LO	0,772
SA	0,838

4.2.3. Discriminant Validity

The square root coefficient AVE (\sqrt{AVE}) of each latent variable is greater than the absolute value of its correlation coefficients with the remaining latent variables in the statistical table, so the scale ensures discrimination (Table 6).

Table 6. Coefficient \sqrt{AVE} results

	CE	CM	GMP	ID	IN	LO	SA
CE	0,887						
CM	0,653	0,831					
GMP	0,634	0,618	0,757				
ID	0,587	0,739	0,604	0,860			
IN	0,621	0,657	0,626	0,686	0,865		
LO	0,703	0,670	0,617	0,661	0,572	0,878	
SA	0,712	0,608	0,525	0,559	0,497	0,696	0,916

4.3. Structural Equation Modeling (SEM)

To test the proposed hypotheses, this study used structural equation modeling (SEM) (Table7).

Table 7. SEM results

	Original sample	Sample mean	Standard deviation	T statistics	P values
CM → CE	0,383	0,381	0,075	5,096	0,000
CM → LO	0,359	0,361	0,089	4,019	0,000
CM → SA	0,394	0,395	0,085	4,631	0,000
GMP → CM	0,618	0,618	0,052	11,810	0,000
GMP → ID	0,604	0,603	0,049	12,290	0,000
GMP → IN	0,626	0,626	0,052	11,945	0,000
ID → CE	0,094	0,098	0,074	1,270	0,204
ID → LO	0,312	0,311	0,078	3,989	0,000
ID → SA	0,198	0,199	0,084	2,356	0,019
IN → CE	0,304	0,302	0,066	4,608	0,000
IN → LO	0,122	0,120	0,069	1,760	0,078
IN → SA	0,103	0,099	0,080	1,284	0,199

According to the results, the hypotheses H1, H2, H3, H4, H6, H8, H9, H11, H12 were accepted; the hypotheses H5, H7, H10 were rejected.

4.4. Measure Invariance Assessment (MICOM)

According to the results, all permutation p-values were greater than 0.05. Therefore, measurement

invariance was established into 2 groups, which were eligible to continue analyzing MGA (Table 8).

Table 8. MICOM results

	Original correlation	Correlation permutation mean	5.0%	Permutation p value
CE	1,000	1,000	0,999	0,463
CM	1,000	0,999	0,998	0,777
GMP	0,999	0,999	0,998	0,662
ID	0,999	0,999	0,998	0,382
IN	1,000	1,000	0,999	0,675
LO	0,999	1,000	0,999	0,138
SA	1,000	1,000	1,000	0,165

4.5. Multigroup Analysis (MGA)

In order to analyze the impact of gender differences on observed variables in the model, this study used MGA (Table 9).

Table 9. MGA results

	Difference (Female - Male)	t value (Female vs Male)	p value (Female vs Male)
CM → CE	0,264	1,708	0,044
CM → LO	0,091	0,494	0,311
CM → SA	-0,063	0,352	0,362
GMP → CM	-0,145	1,410	0,080
GMP → ID	-0,105	1,100	0,136
GMP → IN	-0,282	3,022	0,001
ID → CE	-0,113	0,684	0,247
ID → LO	-0,125	0,739	0,230
ID → SA	0,236	1,314	0,095
IN → CE	-0,224	1,793	0,037
IN → LO	0,074	0,566	0,286
IN → SA	-0,226	1,436	0,076

The PLS-MGA test results between males and females showed that hypotheses H13, H16, and H22 were accepted while the remaining hypotheses were rejected, in which only hypothesis H13 showed the impact on males was stronger than on females.

4.6. Importance – performance Map Analysis (IPMA)

The study conducted IMPA to determine the importance and performance in the relationship between the CE variable and the independent variables CM, GMP, ID, and IN between males and females in the research model by using the importance-performance graph (Figure 2).

Females

Males

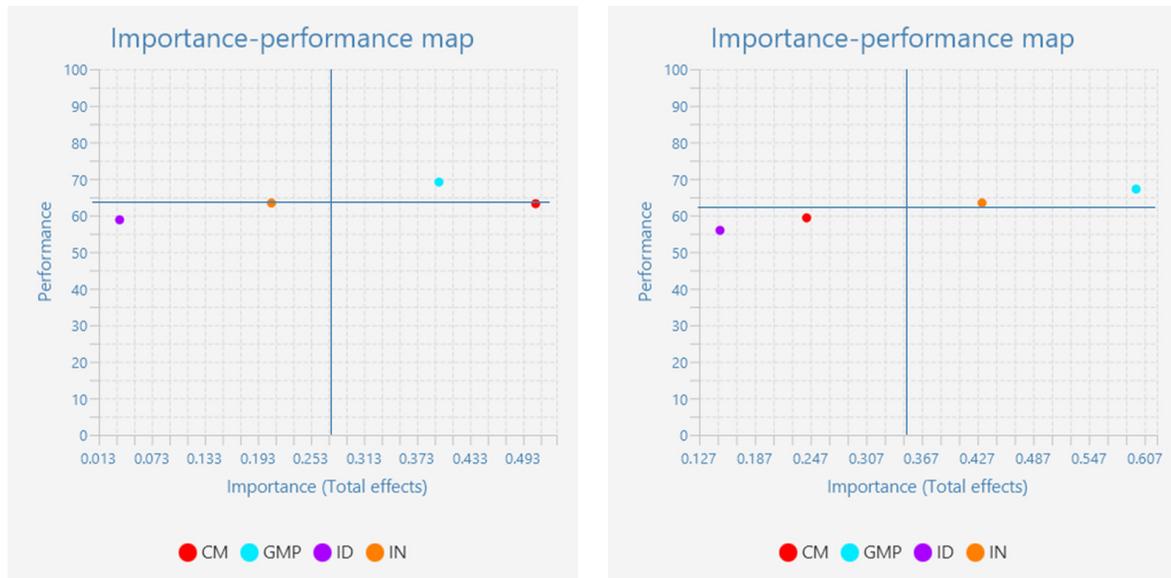


Figure 2. IPMA graph of CE factor

The results showed that only the relationship between CE and CM, IN of females consistently represented both performance factors and total impact were higher and lower, respectively, than that of males. Further assessing each relationship among the variables, the impact of the CM on CE in females showed the highest level of importance, however, the performance was relatively low. The effect of IN on CE of males represented relatively high importance but it was still not maximal (Table 10).

Table 10. IMPA results of CE factor

	Female		Male	
	Importance	Performance	Importance	Performance
CM	0,507	63,223	0,243	59,354
GMP	0,397	69,138	0,598	67,224
ID	0,036	58,823	0,150	55,939
IN	0,208	63,409	0,432	63,430

4.7. Discussion

Statistically, the majority of people who have used gamification belong to generation Z because they have more access to modern apps, one of which is mobile payment.

Overall, the impact of gamification on the social aspect of gamified mobile payment is found to be positive, aligning with the findings of Dzandu et al. (2022). Customer satisfaction remains crucial, as emphasized in previous research articles like Kelman (1974) and Dzandu et al. (2022). Therefore, service providers should not only focus on incorporating gamification features into mobile money payment development but also aim to facilitate a co-created customer value experience. This approach will effectively increase customer loyalty to the company. However, there are differences in the research groups’ articles. Dzandu’s study primarily analyzed the social impact variable, encompassing engagement, satisfaction, and customer loyalty. In contrast, our research specifically focuses on the gender variable and its components. The obtained results highlight the variations between genders in terms of their engagement, satisfaction, and loyalty towards Gmmp.

When examining the impact of the aforementioned factors on user engagement, it is evident that only internalization and compliance have a positive effect. Similar to the findings of (Dzandu et al., 2022),

satisfaction positively influences identification and compliance when the values of gamification align with customer value (Kelman, 1974). Consequently, customer satisfaction increases. Moreover, loyalty is strongly influenced by identification and compliance, indicating that users who are influenced by their social group (Cheung et al., 2011) or demonstrate a propensity to conform to social norms are more likely to maintain engagement with gamification. These research findings suggest that payment service providers should consider incorporating gamification elements into their mobile payment systems to enhance customer satisfaction and attract potential customers, thus increasing competition and revenue in the electronic payment industry.

These research findings highlight the importance for payment service providers to consider integrating gamification elements into their mobile payment systems. By doing so, providers can enhance customer satisfaction and attract potential customers, ultimately leading to increased competition and revenue in the electronic payment sector. Moreover, the collected data in the research model demonstrates significant gender-related effects. Specifically, the impact of gamification on internalization is higher among males, indicating the potential for targeted strategies to engage male users. Additionally, high levels of internalization can attract greater male participation, while females exhibit higher compliance with the process of gamification. These findings not only contribute to theoretical research by providing insights into the influence of gender factors on the social impact theory and customer value theory but also offer practical implications for service providers. The research results can guide providers in innovating and operating payment applications more effectively to attract a larger customer base.

Thus, gender factors and proven hypotheses have important contributions to theoretical research. Therefore, the research has contributed from the gender perspective to social impact theory and customer value theory. In practical terms, the research results provide useful information to help service providers have more awareness to innovate and operate payment applications effectively, attracting more customers.

5. CONCLUSION

5.1. Practical implications

Based on the research results, this study proposes for enterprises to issue mobile payment towards the development of Gmmp as follows:

Firstly, to effectively cater to Generation Z, the largest user group of mobile payment, it is essential to focus on their characteristics, needs, and trends. Conducting in-depth market research will provide valuable insights into their preferences, values, and behaviors. Armed with this knowledge, the mobile payment platform can be tailored to meet their expectations and attract their attention.

Secondly, to improve customer satisfaction and usage habits through gamification, providers should incorporate gamified elements into the app, specific tasks can be turned into engaging challenges that users can enjoy. Rewards and achievements can be offered, motivating users to interact with the app and each other. This sense of competition and connection will enhance the overall user experience and foster loyalty.

Thirdly, to promote the active participation of female users, it is recommended to design a gamified experience that encourages daily check-ins. Users can be rewarded with shopping vouchers or discount codes for their consistent engagement. This approach taps into the motivation of female users to adhere to the process and increases their involvement in the gamified mobile payment application. By providing tangible incentives aligned with their preferences, the aim is to enhance female engagement and create a sense of value and enjoyment.

Finally, for male users, it is crucial to develop a gamified system that fosters interactive experiences among participants. This can be achieved by incorporating features that allow users to connect and engage with each other, such as leaderboards, challenges, or multiplayer options. Additionally, integrating practical

aspects into the game can enhance male participation. For instance, offering cashback rewards for each money transfer made within the application or introducing a daily walking feature where users can earn virtual coins. These coins can then be exchanged for virtual gifts or exclusive perks, providing a sense of achievement and motivation for male users to actively utilize the mobile payment application.

5.2. Limitations and Suggestions for future studies

The present study has several limitations that should be acknowledged. Firstly, it primarily focuses on a single demographic variable, namely gender. Additionally, the study's scope and participant selection are limited to Ho Chi Minh City and Generation Z. Furthermore, an important aspect that remains unexplored is the negative impact of gamification on user health.

Therefore, it is recommended that future research may consider expanding the scope of the investigation to include a more diverse range of demographic variables or samples. Moreover, exploring the detrimental effects of gamification on user health would contribute to a more comprehensive understanding of the topic.

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CLASSIFYING DEMAND PATTERNS AND PROPOSING SALES FORECASTING TECHNIQUES IN THE RETAIL INDUSTRY

Author: Le Quang Bao¹, Nguyen Thi Ai Nhi², Le Minh Thu, Tran Tu Tu²

Mentor: Nguyen Phuc Son³

ABSTRACT: *The research aims to classify products and forecast demand in the retail sector to support more efficient demand planning and inventory management. In terms of classification methods, initially ABC analysis is used to categorize SKUs into three groups: A, B, and C, based on their revenue contribution. Next, the research employs the method and criteria for classifying past demand data proposed by Syntetos and colleagues, which divides demand patterns into four types: smooth, erratic, intermittent, and lumpy. Four algorithms ranging from classical statistics to machine learning are used to generate sales forecasts, including ARIMA, Croston, Croston TSB, and Random Forest. The effectiveness of these models will be compared based on evaluation metrics such as RMSE, WAPE, and SMAPE so that retailers can choose the suitable method for their requirements. The classification and forecasting methods in this research can be widely applied to large retail corporations in Vietnam, contributing to improving efficiency in demand planning and supply chain management.*

Keywords: *retail industry; ABC analysis, demand patterns classification; sales forecasting.*

1. INTRODUCTION

In the retail industry, investment in inventory requires a significant amount of retailers' resources. Since the 18th century, resolving inventory issues has been the subject of many discussions and studies. The common objective of retailers is to reduce inventory levels while achieving high inventory turnover. High levels of inventory cause low liquidity for a business, and insufficient inventory affects the purchasing experience of buyers due to decisions or planning in inventory management. Gaining advantages such as effective inventory control are factors that contribute to enhancing a company's competitiveness. Efficient demand forecasting plays a significant role in helping companies address this challenge, particularly those operating in the retail sector. Data in the retail sector is often vast and diverse, which is a clear distinction from other industries. The large scale and variety of products present a challenge in building an efficient and fast demand forecasting system to support purchasing decisions and inventory management.

Demand forecasting is an essential aspect of inventory management. Accurate demand forecasting can improve an organization's competitiveness and is necessary for proper decision-making, creating a basis for additional planning, distribution, and supply chain management. According to Kostenko et al. (2006), the effectiveness of specific product demand forecasting methods depends on the shape of past sales data. Therefore, time series data on demand needs to be analyzed and classified into specific groups to produce appropriate forecasting methods. The idea of classifying demand patterns was initiated by Williams TM (1984).

Syntetos, Boylan, and Croston (2005) proposed a new approach to this problem with the SBC method that classifies demand based on the expected mean square error of each forecasting method under specific assumptions. SBC compares the Croston method (CRO) and an adjusted model of CRO called SBA (Syntetos, A.A. & Boylan, J.E., 1999). From this comparison, Syntetos, Boylan, and Croston propose four

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: baolq20413@st.ucl.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City

³ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: sonnp@ucl.edu.vn

patterns of demand data, including erratic, lumpy, smooth, and intermittent.

In the past decades, many demand forecasting models have been proposed and developed based on specific real-world requirements. Previous studies have attempted to find a common criterion for selecting appropriate methods to forecast different types of demand, especially intermittent demand. Scholars have recognized that forecasting intermittent demand is a challenging task in many fields (Chau, 2020).

While intermittent demand appears mostly in retail sales data, typically accounting for around 60% of total products (Chau, 2020), it has received little attention in the retail industry. Fildes et al. (2019) extensively reviewed retail forecasting and revealed that “Intermittent demand is a key problem where current research has not been adopted.”

Ramos et al. (2015) compared the forecasting performance of two methods, ARIMA and state space models, on retail sales data from the Foreva brand. The results showed that their performance based on evaluation metrics such as RMSE, and MAPE were quite similar. Syntetos, Boylan, and Croston (2005) stated that for fast-moving consumer goods, data analysis leads to choosing one model (or a group of models), and coefficient optimization is guided by minimizing mean squared errors (MSE), Bayesian recursion, or some residual autocorrelation analysis. For the rest, Moving Average, simple Exponentially Weighted Moving Averages, or Croston’s method are the most frequently used methodologies.

Nikolopoulos (2020) pointed out that much attention has been paid to modeling rapidly changing time series data but there has been little focus on intermittent time series. CRO and SBA methods, as mentioned above, are prominent studies for forecasting intermittent demand and have been proven useful in practice. Prestwich et al. (2014) have also proposed alternative models that combine the Croston method with Bayesian inference. Intermittent demand forecasting is further complicated by the topic of obsolescence, which has drawn the attention of numerous academics (Prestwich et al., 2014).

In recent years, with the remarkable development of machine learning, some literatures have applied machine learning algorithms to demand forecasting. Punia et al. (2020) proposed a new forecasting method that combines the LSTM deep learning method and Random Forest on a dataset of food products from a multichannel retail company. The results showed that when merging demand on a weekly basis and with additional features, Random Forest algorithm outperforms other methods. This is also consistent with current literature that proposes Random Forest for retail demand forecasting (Qu et al., 2017).

To assist retail businesses in better managing customer demand and necessary inventory levels in the retail industry, the research will conduct an analysis of demand classification and test sales forecasting models in the retail sector using various statistical algorithms ranging from traditional approaches to more recent methods like machine learning. Subsequently, we will propose a suitable model selection based on the purpose and requirements of the business through evaluation criteria for forecasting models. Consequently, the paper seeks to make the following contributions to the existing literature:

First, the research suggests a method that combines technical and economic factors to classify and forecast demand in the retail industry. In terms of the economic aspect, ABC analysis has been incorporated by the well-known 80/20 rule in inventory management. Applying ABC analysis helps retailers save time and money by focusing only on the products that generate significant revenue rather than analyzing all products extensively, which requires considerable effort but does not yield much improvement. Regarding the technical aspect, the team has leveraged the advantages of mathematics, statistical knowledge, and modern analysis tools to classify and generate forecast. The combination of ABC analysis and demand classification helps identify product groups that have specific demand patterns and contribute a significant portion of revenue. This allows businesses to focus on those products and make appropriate demand planning, leading to higher business efficiency and enhancing their competitive capabilities. The integration of the economic and technical fields creates synchronization and enhances effectiveness in research and the

application of new technologies, enabling retailers to improve their operational efficiency.

Second, the research implement advancements in statistical and machine learning methods to improve demand forecasting accuracy compared to basic econometrics model. Starting from the concept of classification and forecasting, retail businesses can establish forecasting systems to meet customer demands promptly at the enterprise level and, furthermore, to provide benefits such as minimizing inventory and logistics costs in the national economy. Research in this area could have a source of reference on statistical and machine learning algorithms, or ensemble methods specifically designed for demand forecasting tasks. Comparative studies evaluating the performance of these techniques against traditional methods would also be valuable.

Third, demand classification and sales forecasting play a crucial role in risk management of retailers. By having a clear understanding of future demand, businesses can proactively manage potential risks and uncertainties. This includes identifying potential market fluctuations, seasonality, economic factors, or external events that may impact demand. Organizations can then take appropriate measures to mitigate risks and make informed business decisions by leveraging big data sources to improve forecasting accuracy.

Fourth, demand classification and sales forecasting methods provide retail organizations with valuable insights into future customer demand patterns. This information allows businesses to plan their production, inventory management, and supply chain operations more effectively. By understanding customer demand in advance, companies can optimize their resources, reduce costs, and minimize stockouts or excess inventory. With the growth retail industry in Vietnam, there is a need for research on demand forecasting specific to these domains.

2. THEORETICAL FRAMEWORK

2.1. Demand Forecasting

Demand forecasting is the basis for most planning activities in any retail corporations. Unless a forecast of future demand is estimated, organizations cannot commit to staffing levels, production schedules, inventory replenishment orders, or transportation arrangements. It is demand forecasting that sets the entire supply chain in motion (Syntetos, A. A., & Boylan, J. E., 2021).

Demand prediction is at the forefront of most retailers priorities. Being able to accurately predict future demand for each product in each time period (e.g., day, week) can be instrumental for guiding retailers with their operational decisions (e.g., inventory and supply chain management) and, ultimately, boosting profitability. Recent advances in information technology and computing provide tremendous opportunities for demand prediction (Cohen et al., 2022).

An important retail application of demand prediction is to improve inventory management decisions. An accurate forecast offers the ability to anticipate and be prepared for unexpected demand surges. Specifically, accurate demand prediction can help avoid stockouts, which can have adverse effects in terms of customer satisfaction and retention. At the same time, accurate demand prediction can mitigate excessive stock levels, which are often cost prohibitive for retailers. Furthermore, having a good demand prediction system in place can help retailers sharpen their understanding of consumers in terms of preferences, substitution patterns, seasonality, and elasticities to price discounts. It can thus be used to guide marketing campaigns and promotion strategies. Overall, being able to accurately predict demand will often translate into both increasing revenue and decreasing costs (Cohen et al., 2022).

2.2. ABC Analysis

ABC analysis is an inventory control method which utilizes the Pareto law, discovered by Vilfredo Pareto. Pareto observed that a small portion of the population had a large percentage of land in use, and this

same principle was noticed in other economic and natural contexts (Rusanescu, 2014). During the 1940s, General Electric employee Ford Dickie utilized the Pareto principle to establish the ABC concept as a method for categorizing inventory items. ABC analysis is a common inventory management tool that can be found in different fields such as production, logistics, and supply chain management. It is a method used for categorizing inventory items based on their importance and value using either their monetary value or frequency of use. The items are then divided into three categories called A, B, and C, with A being the most important or valuable items, B being intermediate, and C representing the least important or valuable items. ABC analysis can help companies prioritize inventory management efforts and allocate resources more effectively (Grzybowski, P. D. & Tainsh, R. C., 1977).

2.3. Average Demand Interval and Square of Coefficient of Variation

A common demand pattern classification scheme is suggested by Syntetos and Boylan. The proposed scheme is based on average demand interval (ADI) and the squared coefficient of variation of demand sizes when demand occurs (CV^2). Average Demand Interval (ADI) is used to measure the regularity of demand over time. This parameter is period based which is calculated as average interval time between two demand occurrences (Kaya et al., 2020). Square of Coefficient of Variation (CV^2) is used to measure the variability of demand quantity. This statistical parameter is calculated as standard deviation of the demand divided by the average demand for non-zero demand periods. The squared coefficient of variation represents variability of demand size (Kaya et al., 2020). Based on these 2 dimensions, the study classifies the demand patterns into 4 different categories: Erratic, Intermittent, Lumpy and Smooth.

2.4. Demand pattern

2.4.1. Erratic demand

Erratic demand has relatively consistent demand patterns over time. However, the quantity of products sold in each sale fluctuates greatly, with a low average demand interval (ADI) and a high coefficient of variation (CV^2).

(Silver, 1979) defines an erratic demand pattern as “one which has occasional very large demand transactions interspersed among a majority of small transactions.” In this paper he discusses the reasons for this type of behavior but points out that whatever the reason for erratic behavior of demand, it is useful to interpret total demand in a period as being composed of two components: (1) the number of transactions in a period, and (2) the size of the individual transactions (Vincent, P., 1985).

2.4.2. Intermittent demand

Intermittent demand has minimal fluctuation in the amount of demand, but there is significant variation in the time span between two instances of demand. ADI is high and CV^2 is low.

Intermittent demand for products appears sporadically, with some time periods showing no demand at all. Moreover, when demand occurs, the demand size may be constant or variable, perhaps highly so, leading to what is often termed ‘lumpy demand’ (Syntetos, A. A., & Boylan, J. E., 2021).

Intermittent demand patterns are very difficult to model and forecast. It is the genuine lack of sufficient information associated with these items (due to the presence of zero demands) that may preclude the identification of series’ components such as trend and seasonality. Demand histories are also very often limited, which makes things even worse. Demand arrives sporadically and, when it does so, it may be of a quantity that is difficult to predict (Syntetos, A. A., & Boylan, J. E., 2021).

Intermittent demand items dominate service and repair parts inventories in many industries (Boylan and Syntetos 2010). More accurate forecasting of intermittent demand presents organizations with a distinct

opportunity to reduce costs and address major issues on their environmental agenda. In the after-sales context, intelligent intermittent demand forecasting is of paramount importance, as many items have demand patterns that are intermittent in nature. Other inventory settings that are dominated by spare parts (e.g. the military, public utilities, and aerospace) would also benefit directly from more accurate intermittent demand forecasting methods (Syntetos, A. A., & Boylan, J. E., 2021).

2.4.3. Lumpy demand

Lumpy demand data appears in many periods with no demand, and when demand does occur, sales also have strong and irregular fluctuations. Both ADI and CV^2 are high.

Lumpy demand patterns are very common, particularly in organizations that hold many spare parts. In the aerospace, and automotive sectors, for example, organizations may have thousands or tens of thousands of stock keeping units (SKUs) classified as intermittent or lumpy (Boylan, 2005).

However, many of the forecasting methods may perform poorly when demand for an item is lumpy (Nasiri Pour, A., Rostami-Tabar, B., & Rahimzadeh, A., 2008).

2.4.4. Smooth demand

Smooth demand has relatively regular sales over time and the quantity sold per transaction is also relatively consistent and not highly variable. Both ADI and CV^2 are low.

The smooth demand pattern is often found in essential services or in packaged consumer goods such as instant noodles, household cleaning products, etc. These products have stable demand and usage levels over time.

Managing smooth demand can be easier for retailers as they can rely on data and historical trends to make more accurate forecasts and better plan for production and inventory levels. This can help retailers use resources more efficiently and reduce waste. However, it is important to note that even with stable demand, it can still be influenced by external factors such as economic conditions or changes in consumer behavior, so businesses should remain vigilant and adapt to changes in the market.

2.5. Accuracy measurements

2.5.1. RMSE

The root-mean-square error (RMSE) is the square root of the average of squared errors. RMSE is a frequently used measure of the differences between values predicted by a model and the values observed. RMSE is a measure of accuracy, to compare forecasting errors of different models for a particular dataset and not between datasets, as it is scale dependent (Hyndman, R. J., & Kuehler, A. B., 2006).

$$RMSE = \sqrt{\frac{\sum_{t=1}^n \epsilon_t^2}{n}} = \sqrt{\frac{\sum_{t=1}^n (A_t - F_t)^2}{n}}$$

A_t is the true value; F_t is the prediction.

RMSE is always non-negative, and a value of 0 (almost never achieved in practice) would indicate a perfect fit to the data. In general, a lower RMSE is better than a higher one. The effect of each error on RMSE is proportional to the size of the squared error; thus larger errors have a disproportionately large effect on RMSE. Consequently, RMSE is sensitive to outliers (Pontius et al., 2008).

2.5.2. WAPE

The weighted absolute percentage error (WAPE) is a crucial component in computing forecast error, as it represents the average absolute error in relation to the actual quantity demanded (Auppakorn, C., &

Phumchusri, N., 2022, April). By contrast, WAPE offers a more balanced estimation of the effect of predictions on sales and profits than MAPE, which is better suited for measuring forecast errors but not as informative when sales are intermittent or close to zero (Chase, C. W., 2013; Louhichi, K., Jacquet, F., & Butault, J. P., 2012). WAPE resolves this issue by factoring in the error across total sales through a weighting system.

$$WAPE = \frac{1}{n} \cdot \frac{\sum_{t=1}^n |A_t - F_t|}{\sum_{t=1}^n |A_t|} \cdot 100\%$$

A_t is the true value; F_t is the prediction.

2.5.3. SMAPE

The symmetric mean absolute percentage error (SMAPE) was introduced as a more recent metric to address certain issues with MAPE, and has been proposed by several authors (Makridakis S., 1993). However, there is ongoing debate about the most appropriate formula for SMAPE, with various authors employing slightly different versions (Hyndman, R. J. , 2014), it is increasingly gaining popularity in the machine learning field due to its appealing characteristics (Maiseli, B. J., 2019).

$$SMAPE = \frac{100\%}{n} \cdot \sum_{t=1}^n \frac{|A_t - F_t|}{(|A_t| + |F_t|)/2}$$

A_t is the true value; F_t is the prediction.

3. DATA AND METHODS

3.1. Data

The dataset is taken from the Kaggle platform, in particular focusing on Walmart’s retail sales data from 29-01-2011 to 24-04-2016. This dataset encompasses a grand total of 12196 unique stock keeping units (SKUs). To be more specific, it includes 5748 SKUs for Food products, 4188 SKUs for Households, and 2260 SKUs for Hobbies. Demand data was split into two parts: the training set including records of the 222 weeks and the test set including the remaining 55 weeks.

Average quantity of sales for each product category by year was analyzed. In particular, for the Food category, the average number of SKUs sold between 2011 and 2016 was 12.38. Similarly, for the Hobbies category, the average number of SKUs sold during the same period was 5.02; for the Household category, the average number of SKUs sold from 2011 to 2016 was 5.77.

Table 1. The average quantity of sales.

Category	2011	2012	2013	2014	2015	2016
FOODS	9.78	12.46	12.73	12.84	12.61	13.86
HOBBIES	4.37	3.90	5.12	5.06	5.81	5.90
HOUSEHOLD	3.76	4.85	6.02	6.02	6.85	7.14

Furthermore, an analysis of the average revenue for each product category annually was conducted. Specifically, for the Food category, the average revenue achieved between 2011 and 2016 was \$30.96. Similarly, for the Hobbies category, the average revenue generated during the same period was \$17.85. Additionally, for the Household category, the average revenue obtained from 2011 to 2016 was \$23.72.

Table 2. The average revenue.

Category	2011	2012	2013	2014	2015	2016
FOODS	23.25	29.46	29.86	32.03	33.27	37.87

HOBBIES	11.44	13.03	17.61	17.98	22.79	24.26
HOUSEHOLD	16.52	19.62	23.41	24.57	27.97	30.21

3.2. The method of demand classification

To classify the demand pattern, we used a common classification scheme proposed by Syntetos and Boylan (2005). This classification method is based on evaluating two indices: ADI and CV². In this study, we referred to previous research and decided to use values for the two indices as follows: ADI = 1.32 and CV² = 0.49.

$$ADI = \frac{\sum_{i=1}^N t_i}{N}$$

t_i is the time period between two consecutive demand periods and N represents the number of all periods (Kaya et al., 2020).

$$CV^2 = \left[\frac{\sqrt{\frac{\sum_{i=1}^N (\varepsilon_i - \varepsilon)^2}{N}}}{\varepsilon} \right]^2$$

$$\varepsilon = \frac{\sum_{i=1}^N \varepsilon_i}{N}$$

N represents the number of periods having non-zero demand

ε_i represents the demand in period

ε represents the average demand considering only periods with non-zero demand (Kaya et al., 2020).

The specific values of ADI and CV² for classifying SKU are as follows:

Smooth demand: The condition ADI < 1.32, CV² < 0.49.

Intermittent demand: The condition ADI ≥ 1.32, CV² < 0.49.

Erratic demand: The condition ADI < 1.32, CV² ≥ 0.49.

Lumpy demand: The condition ADI ≥ 1.32, CV² ≥ 0.49.

3.3. Demand forecasting methods

The following algorithms to forecast demand including: ARIMA, Croston and Random Forest.

3.3.1. ARIMA

The ARIMA model uses the input which is the past signals of the forecasted series to forecast it. These signals include: the auto regression (AR) and the moving average (MA). The characteristic parameters of the model are described by 3 parameters ARIMA(p, d, q). The ARIMA model is a commonly used type of model in econometrics.

3.3.2. Croston

In 1972, J.D. Croston introduced a new technique for forecasting products with intermittent demand. His idea can be summarized in three main steps: (1) estimate the average level of demand when it occurs; (2) estimate the average time between two occurrences of demand; (3) forecast demand by multiplying the level of demand (when it occurs) with the probability of occurrence.

3.3.3. Croston TSB

Ruud Teunter, Aris Syntetos, and Zied Babai suggested an enhancement to the Croston model in their

2011 publication “Intermittent demand: Linking forecasting to inventory obsolescence.” Their proposal involved enabling the model to adjust its periodicity estimate, even in the absence of demand observation, which addressed the primary limitation of the original Croston model.

3.2.4. Random Forest

The Random Forest algorithm consists of multiple decision trees. Each tree is built on different datasets and using different attribute sets. Then, the prediction results of the Random Forest algorithm are aggregated from the decision trees, so the information from the trees complements each other, leading to a model with low bias, low variance, and minimized overfitting.

Due to their operational nature, ARIMA, Croston, and Croston TSB models only utilize past sales data to forecast future sales. On the other hand, the Random Forest model requires variable creation methods to increase the number of variables in order to improve the model’s accuracy via feature engineering. Feature engineering in time series analysis involves creating new features from the existing time series data to improve the predictive power of the models. Two techniques used are incorporating lags and window statistics. After that, feature selection with Recursive Feature Elimination (RFE) is implemented to recursively eliminate features with the least importance or contribution to the model’s performance. Feature selection is typically performed before running models for several reasons such as improving model performance, reducing computational complexity and enhancing interpretability.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. ABC analysis

ABC analysis is used in inventory management to categorize items based on revenue contribution. It helps businesses prioritize their inventory management efforts by identifying items that have the highest impact on sales.

Table 3. The statistics on ABC analysis results.

Group	Proportion of Quantity	Proportion of Revenue
A	27.30%	71.32%
B	12.90%	10.71%
C	59.80%	17.96%

The analysis reveals that the number of SKUs belonging to Group A accounts for 27.2958% of the total quantity, but contributes to 71.32% of the total revenue. Therefore, Group A is the category of products that require careful analysis and forecasting methods in order to allocate resources effectively for the retail companies.

The number of SKUs belonging to Group B and C is 12.90% and 59.80%, respectively. The revenue share of Group B products is 10.71%, while Group C products contribute significantly less at 17.96%. It can be observed that Group C represents the majority in terms of quantity, but the economic importance of the products in this group is considerably lower compared to Groups A and B.

4.1.2. Demand Pattern Classification

Based on statistical analysis, the quantity of SKUs belonging to different demand patterns is as follows:

Table 4. The quantity of SKUs belonging to different demand patterns.

Demand pattern	Quantity		
	A	B	C
Smooth	2676	1155	3194
Intermittent	360	274	3012
Lumpy	60	50	699
Erratic	233	95	388
Sum	3329	1574	7293

When categorizing SKUs into ABC groups based on demand patterns, the distribution percentages are as follows:

For Group A: Smooth demand pattern accounts for 80.38%, intermittent accounts for 10.81%, lumpy accounts for 1.8%, and erratic accounts for 7.01%.

For Group B: Smooth demand pattern accounts for 73.38%, intermittent accounts for 17.5%, lumpy accounts for 3.18%, and erratic accounts for 5.94%.

For Group C: Smooth demand pattern accounts for 43.8%, intermittent accounts for 41.3%, lumpy accounts for 9.58%, and erratic accounts for 5.1%.

As we can see, in Group A, the smooth demand pattern has a significant proportion of 80.38%, and this proportion gradually decreases through Group B and Group C.

In Group B, the proportion of smooth demand pattern remains high but lower than in Group A.

Notably, in Group C, the proportion of intermittent demand pattern significantly increases to 41.3%.

4.1.3. Sales Forecasting

a) Erratic

Table 5. Algorithm performance comparison among metrics for Erratic pattern.

	WAPE	SMAPE	RMSE
ARIMA	128.74	92.77	21.20
Croston	76.08	99.52	14.28
Croston_TSB	50.81	76.72	13.46
Random Forest	9587	77.54	14.52

The Croston TSB algorithm produces the best results for SKUs in Group A with erratic data pattern when using all three evaluation metrics: WAPE, SMAPE, and RMSE.

b) Intermittent

Table 6. Algorithm performance comparison among metrics for Intermittent pattern.

	WAPE	SMAPE	RMSE
ARIMA	104.72	101.93	14.03
Croston	88.26	95.61	11.99
Croston_TSB	49.56	95.12	8.25
Random Forest	65.12	91.86	9.26

In general, the Croston TSB algorithm produces the best results for SKUs in Group A with intermittent data pattern. Specifically, for each metric:

- The Croston TSB algorithm performs the best when using WAPE and RMSE as evaluation metrics.
- The Random Forest algorithm achieves the best results when using SMAPE as the evaluation metric, with a value of 91.859. This value is not significantly different from the value of the Croston TSB algorithm, which is 95.12.

c) Lumpy

Table 7. Algorithm performance comparison among metrics for Lumpy pattern.

	WAPE	SMAPE	RMSE
ARIMA	119.22	114.45	22.12
Croston	64.24	95.22	12.48
Croston_TSB	52.36	98.36	11.24
Random Forest	67.18	94.56	11.65

In general, the Croston TSB algorithm produces the best results for SKUs in Group A with lumpy data pattern. Specifically, for each metric:

- The Croston TSB algorithm performs the best when using WAPE and RMSE as evaluation metrics.
- The Random Forest algorithm achieves the best results when using SMAPE as the evaluation metric, with a value of 94.558. This value is not significantly different from the value of the Croston TSB algorithm, which is 98.36.

d) Smooth

Table 8. Algorithm performance comparison among metrics for Smooth pattern.

	WAPE	SMAPE	RMSE
ARIMA	49.14	51.05	10.46
Croston	27.74	28.95	7.84
Croston_TSB	32.82	42.21	7.21
Random Forest	40.77	43.01	8.05

In general, the Croston algorithm produces the best results for SKUs in Group A with smooth data pattern. Specifically, for each metric:

- The Croston algorithm performs the best when using WAPE and SMAPE as evaluation metrics.
- The Croston TSB algorithm achieves the best results when using RMSE as the evaluation metric, with a value of 7.209. This value is not significantly different from the value of the Croston algorithm, which is 7.84.

4.2. Discussion

Compared to previous studies, this research implement the classification of revenue contribution through ABC analysis and demand data patterns, which is a crucial step before establishing a sales forecasting model to achieve better effectiveness. The advanced statistical model Croston TSB and the machine learning model Random Forest have shown improvements in forecasting capabilities compared to the classical ARIMA model.

The experimental study based on the dataset from Walmart demonstrates that real-world data aligns well with the theory and concept of ABC analysis. Group A comprises high-value items that make a

significant contribution to the overall revenue. Group B includes items of moderate value and revenue contribution, while Group C consists of low-value items with a minimal impact on revenue.

The most noteworthy observation from the Demand Pattern analysis is that SKUs belonging to the group that generates significant revenue (Group A) often exhibit a predictable demand pattern (Smooth). Conversely, SKUs belonging to the group with insignificant revenue (Group C) often exhibit a challenging-to-predict demand pattern (Intermittent). Therefore, conducting the ABC analysis beforehand is a crucial step to avoid allocating resources and computational costs to unnecessary groups. Instead, retail corporations can focus their analysis on the dominant segments.

The research has discovered the specific characteristics of sales data in the retail industry compared to other sectors. The intermittent demand for products in the retail industry leads to uneven historical data with zero values and outliers. Advanced demand forecasting methods such as Croston, Croston TSB, or modern machine learning techniques like Random Forest demonstrate better forecasting capabilities than traditional quantitative econometrics models like ARIMA when dealing with volatile and difficult-to-model data in the retail sector. Additionally, the research found that updating and monitoring the performance of classification and forecasting models regularly becomes crucial for demand planning and inventory management tasks. In practice, when selecting evaluation metrics, retailers should consider the nature of their products and their specific purposes to choose the most appropriate forecasting model evaluation metric based on practical requirements.

5. CONCLUSION

The classification and forecasting methods in this research can be widely applied to large retail corporations in Vietnam, contributing to improving efficiency in inventory planning and supply chain management. According to McKinsey's analysis report titled "Seizing the fast-growing retail opportunity in Vietnam" in September 2019, the retail sector in Vietnam is experiencing robust growth in the Southeast Asian region, with the dominant segment being consumer goods, accounting for 44% of the retail market share. The retail industry in Vietnam is undergoing rapid modernization.

If retail businesses adopt and implement classification and forecasting methods in practice, the group proposes several points to consider in order to achieve higher effectiveness:

Firstly, from a management perspective, the executive board needs to consider the possibility of grouping products together to facilitate the monitoring of analytical models, supply chain planning, and overall logistics management. The research group suggests several options, including:

- (1) Geographical segmentation considering factors such as regions, provinces, sales points, and delivery points.
- (2) Product attribute segmentation considering factors such as brand, category, and item.
- (3) Sales activity segmentation based on distribution channels, marketing channels, and transportation methods."

Secondly, from a deployment perspective, the team responsible for building the analytical models needs to pay attention to the following factors:

- (1) Segment products that experience significant seasonal fluctuations and holiday factors into separate groups to adjust the analytical models to suit those conditions. For example, the demand for fruits and vegetables can vary significantly depending on the seasons throughout the year. Chocolate often sees high sales during Valentine's Day, while the demand for air conditioners tends to increase during the summer.
- (2) Integrating external factors into the analysis can enhance the forecasting outcomes of machine learning models when these external factors can be used as independent variables. For instance, incorporating

marketing factors can include marketing activities and product promotions, market research data, product life cycle information, customer feedback, or prioritized development products.

(3) It is important to consider qualitative factors such as culture, consumer trends on social media, and information from competitors before building analytical and forecasting models to ensure effectiveness and stability across multiple scenarios.

(4) In addition to providing point forecasts for sales figures, the analytics department should develop methods for forecasting ranges or probabilities based on the results of point forecasts. Retailers need to estimate the overall probability distribution of sales values in the future, which is particularly useful in minimizing cases of stockouts due to point forecasts falling below the actual customer demand.

(5) Collaboration with other departments is crucial to gather strategic information. Evaluating and forecasting demand requires cooperation with departments such as marketing, production, finance, and accounting to provide comprehensive solutions and execute them based on multiple scenarios or through building simulation models related to demand planning. Furthermore, the coordination of operations helps the demand forecasting department link the effectiveness of analytical models to key performance indicators such as operational profitability.

The research conducted by the group is one of the pioneering studies in Vietnam on the topic of demand classification and forecasting in the retail sector. However, certain limitations arise due to objective constraints such as time and resources. The dataset used is limited to retail stores within Walmart in the state of California, consisting of over 12,000 stocked products. Subsequent research with more time and resources could explore different methods on larger datasets and prioritize studying data from retail corporations in Vietnam.

By using ABC analysis, the analytics department can identify the product group that generates significant revenue for the business and focus on that group to achieve more efficient analysis when time and computational costs are a concern. Retail corporations, both in general and in Vietnam specifically, often have large-scale operations with hundreds of thousands or even millions of stocked products. Conducting ABC analysis method before undertaking classification and forecasting methods helps retail companies achieve the goal of balancing the application of forecasting analytics technologies and maximizing economic benefits.

In summary, the results from the empirical research on demand classification and sales forecasting methods have demonstrated their practical applicability to retail businesses, particularly in the rapidly growing retail sector in Vietnam, which includes supermarkets, convenience stores, and shopping centers that are expanding and developing nationwide. The research has proposed suitable methods to assist large-scale retail corporations in automating the process of demand classification and sales forecasting quickly, thereby supporting production planning and inventory allocation to optimize supply chain management efficiency. The research recognizes that continuing, improving, and promoting further research on similar topics will contribute to finding effective and stable solutions to enhance the efficiency of inventory planning and supply chain management for large-scale retail businesses in Vietnam, especially in the context of increasing globalization and Vietnam's vibrant trade and import-export activities.

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A METHOD OF CUSTOMER BEHAVIOUR ANALYSIS TO SUBSCRIPTIONS INCREASE THROUGH MOBILE APPLICATIONS IN FINTECH FIELD

Author: Tran Ngoc Bich Tran¹, Nguyen Huyen Trang², Nguyen Thanh Loi²,
Mai Thi Thu Quyen², Tran Phuong Nhi²
Mentor: Ho Trung Thanh³

ABSTRACT: Many companies struggle with the continuous challenge of understanding and predicting their customers' needs. Fortunately, the advent of subscription-based services and the emergence of machine learning has provided some successful solutions for analyzing customer behavior. Despite its many benefits, getting customers to sign up for subscriptions can be challenging. This study aims to determine the user demographics, usage patterns, and in-app events that best predict subscription signups by analyzing data from a fintech app using supervised machine learning methods. The study discovered that app behavior is a significant predictor of subscription sign-up rates. This study highlights the importance of understanding app behavior in directing customers toward subscription options and suggests strategies for increasing subscription sign-ups.

Keywords: App behavior analysis, Subscription app, supervised machine learning

1. INTRODUCTION

For the past many years, the amount of data that has been digitalized or gathered through digital environments has been significant. According to estimates, the amount of data kept doubles every 20 months (Rokach, L. and Maimon, O. Z., 2014). In that growth, machine learning, which is a field of artificial intelligence that involves the development of algorithms, can learn patterns without explicit programming to support people to get insights from data. Therefore, it has played an important role in a variety of industries, including healthcare, finance, and e-commerce.

The FinTech industry has experienced a rapid growth in recent years, and with the surge in the use of mobile apps for financial transactions, there is a need to analyze customer behavior through these apps. In which, app behavior analysis refers to the technique of analyzing the usage pattern of the customers or clients in the app ecosystem. This includes tracking the types of actions that the customer makes on the app, such as the pages visited, links clicked, products purchased, etc. Besides, the use of machine learning in fintech has been steadily increasing in recent years, with a focus on areas such as fraud detection, risk assessment, and customer behavior analysis (Girasa, R., & Kumar, R., 2021). Researchers have found that machine learning can be highly effective in prediction of fintech applications. For example, an article titled "Statistical Fraud Detection: A Review" published in the Statistical Science journal provides a review of statistical fraud detection in the financial industry. The article discusses various statistical approaches and techniques that have been used to detect fraud, including regression models, time-series analysis, and outlier detection. It also explores the limitations and challenges of these approaches and suggests directions for future research in the field (Richard J. Bolton, et al., 2002). Another study published in the Journal of Banking and Finance in 2021 examined the use of machine learning algorithms to predict bank failures.

¹ University of Economics and Laws, Vietnam National University Ho Chi Minh City; Email: trantnb21411c@st.uel.edu.vn

² University of Economics and Laws, Vietnam National University Ho Chi Minh City

³ University of Economics and Laws, Vietnam National University Ho Chi Minh City; Email: thanht@uel.edu.vn

The researchers found that their model achieved high accuracy in predicting bank failures up to two years in advance. (Huang, Y., et al., 2021). These studies suggest that machine learning has the potential to significantly improve the efficiency and accuracy of fintech applications.

However, the potential of machine learning for predicting customer app behavior is still limited. Although subscription-based services offer benefits to both businesses and consumers, it remains a challenge for companies to persuade customers to sign up. Moreover, data must be preprocessed and compared using machine learning models to achieve the best results. This study aims to utilize supervised machine learning techniques to identify the user demographics, usage patterns, and in-app events that best predict subscription signups and support businesses come up with the right strategies. The study analyzed a dataset of around 50,000 records from a fintech app and found that app behavior is a significant predictor of subscription sign-up rates. Users who completed specific in-app events or interacted with the app more frequently and for longer durations were more likely to subscribe.

The study underscores the significance of comprehending app behavior in guiding customers toward subscription options and proposes strategies to increase subscription sign-ups. The research objectives are twofold: to determine user behavior patterns that correlate with subscription-based services, to identify the functions that customers who are most likely to subscribe to the premium version app tend to use and to provide actionable insights that can assist fintech companies in directing customers towards subscription-based services using app behavior analysis.

2. THEORETICAL FRAMEWORK

2.1. Subscription-based business models:

Business models that are commonly used today are Free Model, Freemium Model (Salehudin, I., & Alpert, F., 2021), Subscription model, Paid Model and Paymium Model (Ash, D., Shahar, D. B., & Dorfman, A., 2021). Most of their monetization strategies are Charging users and Advertising (Kesler, R., 2022). This research focuses solely on the Subscription model. It is a business model where customers pay a recurring fee, typically on a monthly or yearly basis, in exchange for access to a product or service. Best examples of it are Netflix and Spotify. The model has become increasingly popular in recent years due to changes in consumer behavior and the rise of digital technologies. One of the greatest sources of income for mobile applications is subscriptions (Pauwels and Weiss, 2007), it is unquestionably a thriving trend (Gohil, Dalvadi, 2015).

2.2. Machine learning and predictive analytics:

Keeping churn, or customers canceling their memberships, to a minimum is one of the keys to success in a subscription-based company model. The digitalization of the world has made data collection to integrate Machine learning simpler than ever. Machine learning algorithms are used to analyze user data and predict subscription sign-up rates. There are potential challenges, such as the need for high-quality data and the risk of biases in algorithmic decision-making. Various machine learning models were used, both separately and collectively, to carry out the testing (Tomas Hermansson, 2018). Many algorithms have been applied to study subscriptions, such as logistic regression (Andrés Ramírez-Hassan, 2019), decision trees (Ardytha Luthfiarta, 2019), random forest (Karlhede, 2020), supporting vector machines (Kristof Coussement, 2006), and neural networks (Pablo A. Estévez, 2005). Andrés Ramírez-Hassan extended the dynamic

model averaging framework for dynamic logistic regression proposed by McCormick et al. (Biometrics, 2012) to incorporate variable selection. This paper uses a machine learning approach to analyze customer switching behaviors using Logistic regression, XGBoost, Neural network and an ensemble model to choose a number of independent variables among many of them, to improve accuracy and efficiency in predicting user behavior.

2.3. User behavior and engagement:

There is a significant body of research from various regions around the world that has extensively explored user behavior and engagement using machine learning methodologies such as “Customer switching behavior analysis in the telecommunication industry via push-pull-mooring framework: A machine learning approach” by Mohammed Al-Mashraie was compare the performance of different churn prediction models based on the real data and identify the factors that affect the churn the most (Al-Mashraie, 2020). In the study “A Machine Learning Based Method for Customer Behavior Prediction”, Jing Li (2019) analyzes customer characteristics and attributes using historical purchase data using decision trees, cluster analyses, and the Naive Bayes algorithm. It then analyzes the critical elements influencing potential customers’ purchase behavior by choosing models with high promotion degrees through promotion graphs, resulting in accurate marketing.

This framework examines the factors that influence subscription sign-up rates based on previous research and industry observations. Multiple studies have highlighted the significance of user demographics, usage patterns, and in-app events in driving subscription conversions. For example, it can be inferred from research by Zhao, S., Xu, F., Xu, Y., Ma, X., Luo, Z., Li, S., ... & Pan, G. (2019) that user demographics, such as age and income level, play an important role in customers’ purchase behavior. It could also discuss the role of user engagement in promoting subscription options, such as the importance of providing personalized recommendations and incentives for frequent app usage.

3. RESEARCH METHOD

3.1. Overview

In this paper, supervised machine learning method is applied to predict customers enrolled through fintech_app dataset. This study uses “FinTech App Behavior Analysis” which is collected from a financial application, for the purpose of analyzing user behavior and finding information needed to improve the user experience on the application. This data includes the following information: the date and time the users first opened the app; the hours, the age and the comma-separated list of screens of customers. Besides, the method is used to make predictions when knowing the input data and output targets, the output is used to label the classes for the inputs. For the above article, the main output objective is the customer registration (Yes/No) and the important index of the characteristics affecting that status. Figure 1 shows the process of solving business problem using machine learning.

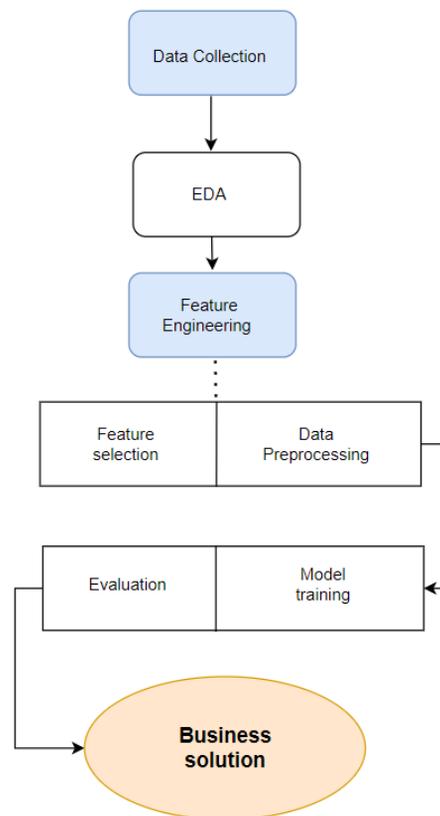


Figure 1. The research process

3.2. Data collection

The dataset used for this analysis was obtained from Kaggle and consists of information on the actions performed by 50,000 customers within a fintech app. It includes details such as the pages visited and the duration of time spent on each page. The authors conducted a thorough review of the dataset, utilizing various machine learning approaches. To gain a comprehensive understanding of the dataset, the authors employed exploratory data analysis techniques. They visualized the data to identify patterns, trends, or outliers present. Additionally, they conducted descriptive statistical analysis to obtain summary statistics and insights into the data distribution. Furthermore, the authors explored the dataset using machine learning algorithms, evaluated the performance and accuracy of these algorithms in predicting outcomes. Moreover, the authors employed dimensionality reduction techniques to reduce the complexity of the dataset while preserving important information to visualize and understand the relationships between variables more effectively. Overall, the authors gained valuable insights into the dataset and extracted meaningful patterns and trends. The aim was to visualize the data and gain a comprehensive understanding of each feature. Furthermore, the authors intended to identify areas that could be enhanced or optimized. Through their meticulous approach, the study effectively presented compelling arguments that significantly contributed to the field.

3.3. Data description

The time it takes for a user to register for the premium package is determined using the `first_open` and `enrolled_date` variables and unnecessary variables are removed from the data set. One-hot encoding (Hancock et al., 2020) is then used to transform the `screen_list` variable into binary features with values of 1 or 0. This encoding process helps the ML algorithm make more accurate predictions by constructing a

“screen_list” containing all possible values of each class data item. The rest of the screen_lists, which are less interactive, are put into a separate column named “Others.” The top_screen set is used to determine the most frequently accessed features of the application, leading to more accurate predictions. Screens with similar values are then combined into one group to identify funnels, which are collections of screens from the same set. The “user” column is moved to another place for later analysis and removed from the current dataset because it is not considered a feature. The features are scaled to convert quantitative features into a common scale, making data representation easy and analytical models, especially Machine learning models, work more efficiently. Finally, the initial training and testing sets are converted into new sets in the last stage of the data preprocessing process.

3.4. Feature Selection

Boruta (Tang et al., 2020) introduced a powerful feature selection algorithm that can identify important features in large datasets with multiple variables. It is particularly useful because it offers a robust approach to feature selection, which is less prone to overfitting and can handle various data types. Compared to other methods, Boruta provides a more comprehensive ranking of feature importance. Based on the Boruta feature ranking, features with low importance ranked higher than 1 will be removed from the dataset as they may be irrelevant or noisy. The features that will be used to build the model are ‘minigame’, ‘location’, ‘Institutions’, ‘VerifyPhone’, ‘VerifyDateOfBirth’, ‘VerifyCountry’, ‘idscreen’, ‘Finances’, ‘Alerts’, ‘VerifyMobile’, ‘ProfileEducationMajor’, ‘NetworkFailure’, ‘Other’, ‘credit_screens_count’, and ‘loan_screens_count’.

3.5. Model Training

To clearly describe the “optimal” approach for a specific objective, it is typical to employ a variety of potential models in the modeling process, along with testing and comparative evaluation. The algorithms are used to solve the problem that the topic is aimed at: XGboost, logistic regression, neural network, support vector machine and Ensemble Model. In the context of directing customers to subscription through app behavior analysis, the choice of which model to use will depend on factors such as the size of the dataset, the complexity of the problem, and the desired level of interpretability. Logistic Regression may be a good choice if the dataset is small and the problem is relatively simple, while SVM or XGBoost may be better suited for larger and more complex datasets. Neural Networks may be a good choice if the problem is highly nonlinear and requires the ability to learn complex patterns. Therefore, with the fintech_app dataset we chose, these models are expected for this case problem. Moreover, regarding the literature or previous

Model Type		Confusion Matrix				Accuracy (%)	Specificity (%)	AUC	Recall (%)	F1 Score (%)
		TP	FP	TN	FN					
Individual Models	LR	4808	955	198	254	81.40%	21.00%	78.00%	96.00%	89.30%
	XGB	4844	963	162	246	81.90%	20.30%	79.00%	97.00%	90.00%
	SVM	5006	1209	0	0	81.90%	0.00%	73.00%	100.00%	89.00%
	NEURAL	4936	1065	70	144	82.10%	11.90%	79.00%	97.90%	89.80%
Ensembles	SV	4921	1030	85	179	81.96%	14.80%	78.00%	98.30%	89.80%
	HV	4927	1031	79	158	82.13%	13.10%	78.00%	98.40%	89.70%

Figure 2. Model Evaluation

Figure 2 shows that both Logistic Regression and XGBoost achieved high accuracy rates of 81.4% and 81.9%, respectively. The AUC values for these models were also relatively high at 78% and 79%, respectively, indicating that they performed well in terms of both true positive and true negative rates. Additionally, both models achieved high recall rates of 96% and 97%, respectively, indicating that they were able to correctly identify a high percentage of customers who are likely to subscribe to the premium version of the app. The F1 score, which is a measure of the balance between precision and recall, was also high for both models, with values of 89.3% and 90%, respectively.

The Support Vector Machine (SVM) achieved a perfect recall rate, which is impressive, as it means that the model was able to correctly identify all customers who are likely to subscribe to the premium version of the app. However, the specificity of the model was 0%, which is a concern. This means that the model is predicting a positive outcome (i.e., subscription) for all customers, which is not ideal. Further optimization of the SVM model could potentially improve its specificity and overall performance.

The Neural Network achieved an accuracy rate of 82.1%, which is slightly higher than that of logistic regression and XGBoost. However, its specificity was quite low at 11.9%, indicating that the model is more likely to predict a positive outcome (i.e., subscription) even when it's not warranted, which could lead to false positives and unnecessary marketing efforts. The recall rate of the neural network was high at 97.9%, but its F1 score was slightly lower than that of logistic regression and XGBoost, at 89.8%.

Among the ensembles, both Soft and Hard voting achieved similar accuracy rates of around 81.96% and 82.13%, respectively, but their specificity was quite low at around 14.8% and 13.1%, respectively. This means that while these models correctly identify a high percentage of positive cases, they also have a high false positive rate, which could lead to wasted marketing efforts and resources. The AUC values for both ensembles were also good, at 78%, indicating that the ensembles have a reasonable ability to distinguish between positive and negative samples. However, compared to the individual models in this case, the ensembles' AUC values are relatively low, indicating that they may not perform as well as the individual models in terms of true positive and true negative rates.

4.2. Results

Based on the experimental results obtained, the article will answer 3 questions of enterprises as follows.

4.2.1. Identifying the percentage of customers who subscribes to the premium version app every month

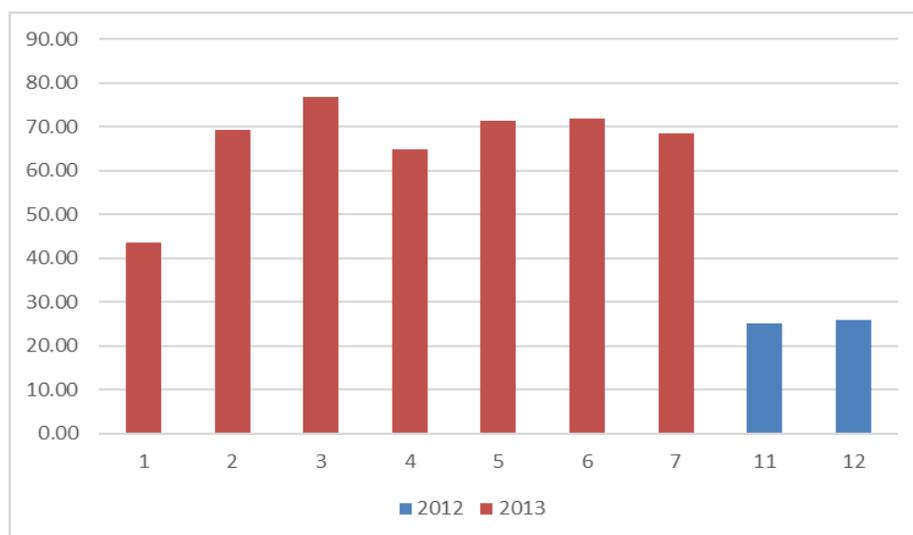


Figure 3. The percentage of customers who subscribe to the premium version app every month

It can be seen from figure 3 that the customer registration in November and December 2012 remained relatively stable at 25.19% and 25.98%, respectively. However, there was a significant increase in registrations in January 2013, which jumped to 43.58%. This trend continued into February and March 2013, where customer registrations rose to 69.26% and 76.71%, respectively. While there was a slight dip in April 2013, with registrations falling to 64.93%, customer registrations remained high in May, June, and July 2013, with percentages hovering around the 70% mark. These results suggest that there was a significant increase in customer registrations in the early part of 2013, with a sustained level of registrations for the following months.

4.2.2. Identifying customers who are most likely to subscribe to the premium version app based on age, days of week, hour of their first open

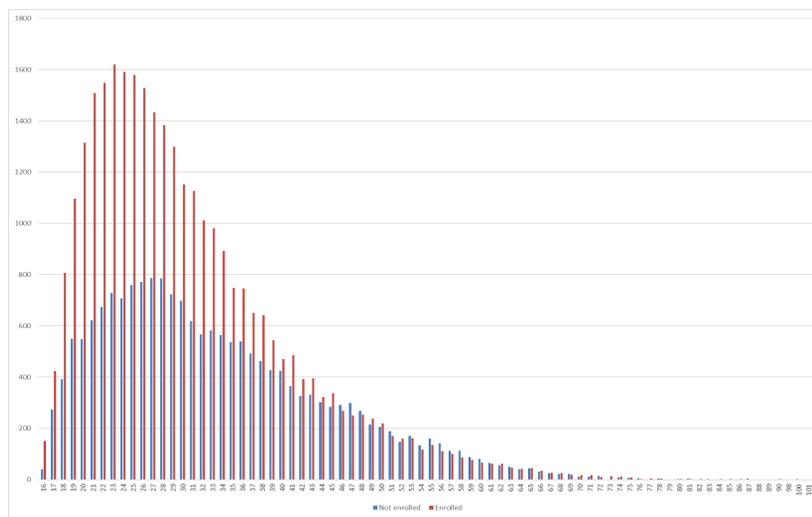


Figure 4. The difference between the number of registered and unregistered based on age

From figure 4 above, the age group most interested in this fintech app is from 19-32, the difference between the number of registered and unregistered people is also the largest, which means that the registration rate is the highest. Most of the ages have a higher number of premium version subscriptions than no subscriptions, however there are exceptions for some ages like 46, 47, 48. It should be noted that there is some invalid data, when ages 100 and 101 appear. This may be because some customers have entered incorrect information.

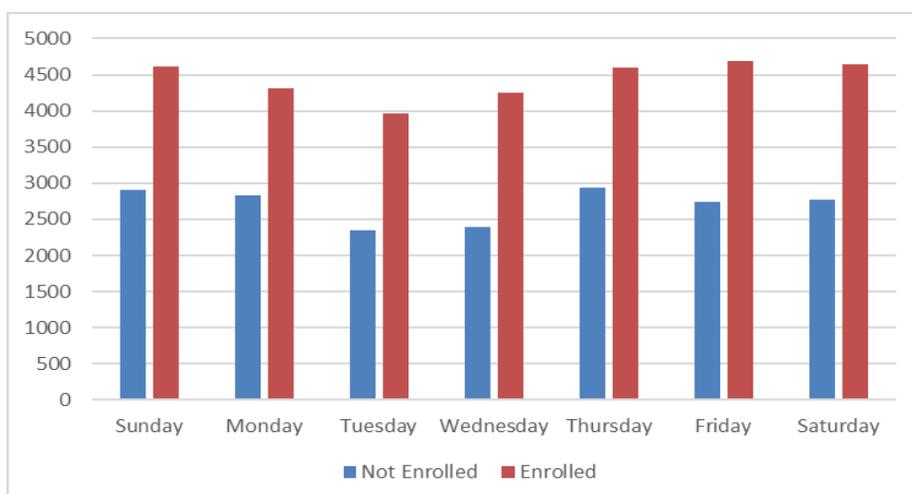


Figure 5. The difference between the number of registered and unregistered base on day of week

It can be concluded from figure 5 that there is not too much difference between days of week in the number of people using the app for the first time, as well as the difference between the number of people who sign up for the premium version of the app and the number of people who don't, although the number increases a bit more on weekends like Friday, Saturday, Sunday.

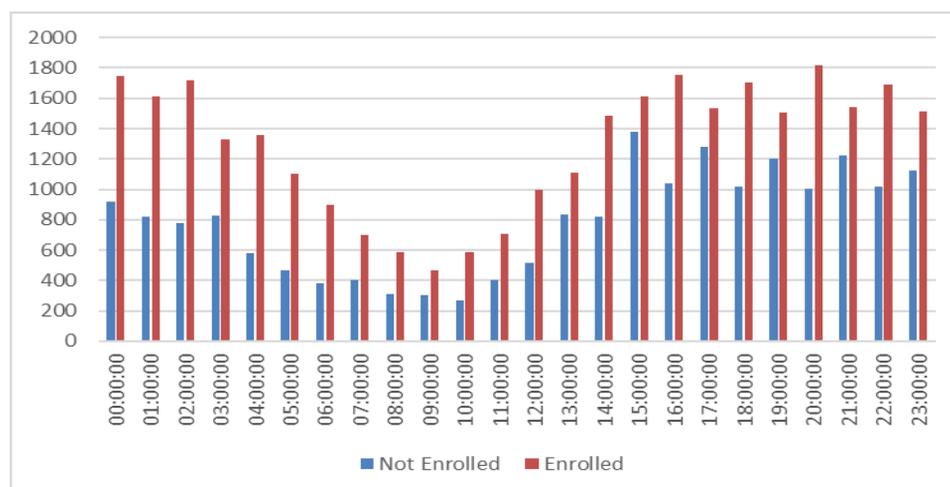


Figure 6. The difference between the number of registered and unregistered based on the hour of a customer's first open

According to figure 6, it can be seen that the number of people opening the app for the first time decreases during office hours, and increases during normal hours. This is understandable because during office hours, the age group most interested in the app who is 19-32, is already busy with study or work. In addition, people who use the app for the first time during the 0-5 AM are more inclined to sign up for the premium version than the rest of the time slots. In short, although the above three features are not important features, according to the results of Boruta feature selection, they nevertheless show certain signs that some customers are inclined to subscribe to the app premium version greater than the rest.

4.2.3. Identifying the functions that customers who are most likely to subscribe to the premium version app tend to use

Based on the Ensemble model, it can be seen that some variables have a positive effect, while others have a negative effect. Variables with a positive effect show that the more customers use the functionality they represent, the more likely customers are to sign up for the premium version of the fintech app. In contrast, for variables with negative effects, the more likely customers are to sign up, the less likely they are to use those functions. This suggests that these variables might not be providing enough value or engagement to the customers. By identifying these variables, the fintech app can prioritize improvements and optimizations to those functionalities to increase customer engagement and retention. It's also important to note that the results of the Ensemble model should be interpreted with caution, as the model may not capture all the complex relationships between variables and the target variable. Therefore, further analysis and experimentation may be necessary to confirm the findings and identify actionable insights.

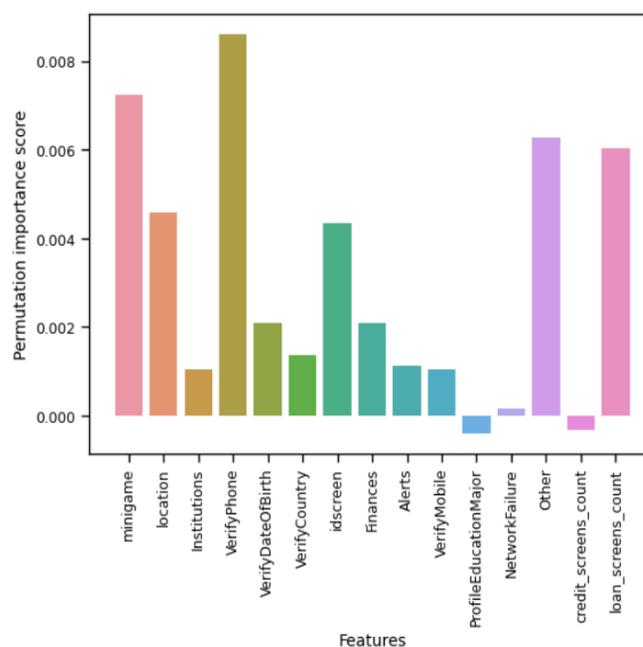


Figure 7. Permutation importance score

In order to identify the functions that customers who are most likely to subscribe to the premium version app tend to use, the sequence of 15 variables which have been made in the Permutation importance score can be looked at. The procedure produces significant P-values for each feature after normalizing the skewed measure based on a permutation test. For the significance of the feature relevance provided by MI, permutation tests have already been proposed (François et al, 2006). In this paper, these variables represent the importance of different app functions in sequence, based on how frequently they were used by users who subscribed to the premium version of the app.

The first variable in the sequence is “Minigame”, which suggests that users who are likely to subscribe to the premium version of the app may be interested in gamified features that provide a fun and engaging user experience. The second variable, “Location”, may indicate that users value features that are personalized and tailored to their specific location or context. The next few variables in the sequence, including “Institutions”, “VerifyPhone”, and “VerifyDateOfBirth”, suggest that users who are likely to subscribe to the premium version of the app may be interested in features related to verifying their identity and accessing financial services from trusted institutions. This is further supported by the variable “VerifyCountry”, which indicates that users may also value features related to verifying their location and accessing financial services in their country of residence. Besides, the variable “Idscreen” suggests that users may value features related to accessing and viewing their account information and activity, while “Finances” and “Alerts” indicate that users may also value features related to managing their finances and receiving important alerts and notifications. In addition, the variables “VerifyMobile” and “ProfileEducationMajor” suggest that users who are likely to subscribe to the premium version of the app may also value features related to verifying their mobile phone number and education background, respectively. The variable “NetworkFailure” may indicate that users value features that are reliable and stable, while “Other” suggests that there may be additional features or functionalities that users find valuable. Finally, the variables “Credit_screens_count” and “Loan_screens_count” suggest that users who are likely to subscribe to the premium version of the app may also value features related to accessing and managing credit and loans.

By analyzing the sequence of variables provided in the dataset, businesses can gain insights into the types of app functions and features that users who are likely to subscribe to the premium version of the app tend to use and value. This information can be used to inform the development of new features and

functionalities that cater to the needs and preferences of premium app users, as well as to target marketing and promotional efforts towards these users.

5. DISCUSSION

One of the other studies using a similar dataset, *Directing Customers To Subscription Through Financial App Behavior Analysis*, conducted by the Indian AI Production research group, gave prediction results with a lower accuracy rate, with only 78.87%. The preceding study also did not employ methods for determining feature importance (Indian AI Production, 2019). After conducting k-fold cross validation, the accuracy of the research article *Directing App Users to Paid Subscriptions using Machine Learning* by (Peter Foy, 2020) is constantly between 76-77%. Thus, compared with some typical studies using the same dataset, this study has higher accuracy results (Foy P, 2023).

Calculating the percentage of customers registering by month can provide valuable insights for decision-making. By analyzing the percentage of customers registering by month, fintech businesses can identify the months with the highest and lowest registration rates. This information can help optimize resources and improve operational efficiency. If they find that registration rates are consistently low during certain months, they can investigate potential causes, such as seasonal trends or competing offers from other companies. Alternatively, if they identify months with high registration rates, they can allocate more resources to marketing and customer acquisition, product development during those months.

Identifying customers who are most likely to subscribe to an app can contribute to achieving the following six strategic business objectives of information systems. Fintech companies can focus their resources and efforts on marketing and promoting the app to the right audience. This can help to streamline the company's marketing processes and reduce costs while increasing efficiency. Moreover, fintech app providers can gain a competitive advantage by offering a product or service that meets their needs better than the competition. This can help the companies to differentiate themselves and attract more customers.

Knowing which functions premium subscribers tend to use in a fintech app can provide valuable insights into customer behavior and preferences. This information can be used to improve the app's user experience and increase customer engagement and satisfaction and help the fintech company optimize those features to make them even more valuable and appealing to customers and involve improving the user interface, adding new functionality, or addressing common pain points.

As concluded in the previous section, the percentage of people who signed up for the premium version of the app in the first seven months of 2013 averaged 66.58%. This is a rather high number, but it also clearly shows that the business strategy of the fintech app provider still has a lot of room for improvement. Some suggestions given by the group are as follows.

Personalized Messaging Based on User Data: To persuade customers to upgrade to the premium version of a fintech app, personalized messaging based on user data can be used. Variables like age, location, and user activity can be used to identify potential premium users. By customizing messages to users' interests and activity, such as highlighting financial features for those interested in finance or extra games for those enjoying minigames, the app can increase the likelihood of users upgrading (Rebeka, 2023).

Incentives and Discounts: To encourage users to upgrade to the premium version of a fintech app, providing incentives and discounts is another effective approach. Additionally, users who complete a certain number of credit or loan screens could be offered a free trial of the premium version. By providing such incentives, the app can persuade users to upgrade, as they would feel like they are receiving a better deal.

Social Proof: To persuade customers to upgrade to the premium version, social proof can be utilized by sharing positive reviews and testimonials from existing premium users, demonstrating how it has helped them financially. Additionally, showcasing the number of users who have already upgraded to the premium version can create a sense of FOMO (Fear of Missing Out) among potential customers, increasing the likelihood of them upgrading too (Suliagina, 2022).

Feature Limitations: Limiting the features of the free version of the app is a strategy that can motivate users to upgrade to the premium version to access additional features. The number of minigames or financial tools available in the free version can be limited, while all features are accessible in the premium version. The app can create a sense of incompleteness in the user's experience by restricting the features, which can encourage them to upgrade to the premium version.

Educational Content: Providing educational content on financial literacy, such as budgeting tips or credit score information, is another way to persuade customers to upgrade to the premium version of the fintech app.

Personalized Recommendations: To promote the premium version, the app can use the user's data and activity history to provide personalized recommendations that demonstrate how it can better serve their needs. By emphasizing features that align with the user's interests, the app can increase the likelihood of them upgrading to the premium version (Koetsier, 2022).

Referral Program: Introducing a referral program can motivate existing users to refer friends and family to sign up for the premium version in exchange for rewards like discounts or free access to premium features. This can expand the user base and encourage current users to upgrade to access referral rewards.

Limited-Time Offer: Create a sense of urgency by offering a limited-time discount or promotion for the premium version. By setting a deadline for the promotion, the app can create a sense of urgency and encourage users to take action before the offer expires.

Customer Support: Offering premium users priority support, including faster response times, personalized assistance, and access to dedicated customer support representatives, can promote upgrading to the premium version. Exceptional customer support can build trust and loyalty, leading to an increased likelihood of users upgrading to access these benefits (Hancock, 2020).

However, there are still some limitations about our model and project. The limitations of the machine learning model report on directing customers to subscription through app behavior analysis must be carefully considered. One major limitation is the accuracy of the data provided by customers in the app. While the model can use app behavior to make predictions, if the information provided by the customers is inaccurate, the predictions may not be reliable. Moreover, short data collection and research time can be considered other limitations. Machine learning models require large amounts of high-quality data to be trained effectively, and this process can be time-consuming. With limited data collection time, the dataset may not be comprehensive enough to capture all the necessary features for accurate model predictions.

This research on directing customers to subscription through app behavior analysis offers an excellent starting point for future work in this area. One possible area for further research is to expand the dataset used in the report. The dataset should have more information about the specific country, job title and other qualitative variables about their background, not only verify whether they enter the information into their profile. Additionally, while the dataset used in the report is useful, it may not be representative of the entire customer population. By collecting data from more customers and including more diverse personal information, future studies can improve the accuracy of the machine learning model and provide more robust insights into customer behavior.

Another possible area for future work is to develop more sophisticated machine learning models that incorporate more complex features and algorithms. The report indicates that only 15 out of 48 variables were essential for building an effective machine learning model. By exploring additional variables and using more sophisticated algorithms, researchers may be able to develop more accurate models that can make better predictions about customer behavior. Additionally, future studies can focus on developing models that can adjust and adapt as customers change their behavior or preferences over time (Valène Jouany, 2023).

Furthermore, the report could be extended to investigate how different marketing strategies or pricing models impact customer behavior and subscription rates. By analyzing the impact of various marketing

tactics on customer behavior, businesses can develop more effective marketing strategies that increase the likelihood of customer subscription. Similarly, analyzing how different pricing models influence customer behavior can help businesses develop pricing strategies that encourage more customers to subscribe.

6. CONCLUSION

The machine learning project report explored the use of machine learning models to direct customers to subscribe to fintech apps by analyzing their app behavior. Through the use of the Boruta algorithm, the study was able to identify that only 15 out of 48 variables were crucial for building an effective machine learning model. This approach was crucial in reducing the dimensionality of the dataset and allowed the team to focus on the most important features.

After evaluating multiple models, the Ensemble model was selected as the most accurate, achieving an accuracy of 81.75% for hard voting and 82.13% for soft voting. The Ensemble model combines several machine learning algorithms including SVM, Logistics Regression, XGBoost, Neural Network to provide a more robust and accurate prediction. Its function is to predict whether a customer will subscribe to the fintech app or not. This information can be used by businesses to develop personalized strategies that can lead to increased subscription rates.

The study also provides valuable insights on how businesses can enhance their subscription numbers. Along with its findings, the report offers nine actionable measures that can help companies increase their subscriber base. By implementing these measures, businesses can not only improve their subscriber numbers but also build better relationships with their audience and drive long-term growth.

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FACTORS AFFECTING BRAND AWARENESS OF UNIVERSITY OF ECONOMICS AND LAW AMONG STUDENTS IN THU DUC CITY, HO CHI MINH CITY

**Author: Pham Thi Be¹, Nguyen Thi Thuong Hoai¹, Phan Thi Quynh Nhu¹,
Dang Thi Ngoc Anh¹, Huynh Thi Ngoc Luy¹
Mentor: Nguyen Thi Hong Gam²**

ABSTRACT: *The purpose of the study is to determine the factors affecting university brand awareness and the level of impact of each factor. The study was conducted through sending questionnaires to 280 students and we obtained 225 valid answers. After the analysis process, the team found that there are 4 factors affecting brand awareness, respectively: media activities, social activities, electronic word of mouth and training quality. The results also show that there is a role of the intermediate variable “reputation” in the relationship between the dependent variable and the independent variables. At the end of the study, the team discussed the results and made some recommendations to improve brand awareness of the University of Economics and Law - our case study.*

Keywords: *brand awareness, university brand, reputation.*

1. INTRODUCTION

When the market becomes competitive, the brand is always the leading factor for organizations to focus on differentiating themselves from the competition, so it gradually becomes popular in the market with the name of Brand Awareness. Research on brand awareness has also formed very early, typically the research of Wayne D. Hoyer and Steven P. Brown in the 1990s on the influence of brand awareness on product use behavior customers’ products. In addition to concerns about how branding affects the quality of the products and services an institution produces, the branding of a Higher Education institution has also become an essential issue for many interested people in today’s society.

University of Economics and Law is one of the leading institutions in the training of Economics and Law - the two fields with the highest student attraction in recent years with the major of Business - Management. accounting for nearly 32.77% of the whole country. Although it has just been separated from the Faculty of Economics of Vietnam National University, Ho Chi Minh City since 2000, it has continuously improved its core values through activities to improve training quality as well as strengthen advertising activities. promote on social media. Realizing the new points along with the development potential of the university in two key fields of Economics and Law, the research team decided to choose a scientific research topic:

“Factors affecting brand awareness of University of Economics and Law among students in Thu Duc City, Ho Chi Minh City”

The study sets out the objective of determining the factors and the extent of their impact on the brand awareness of a higher education institution in the case of the University of Economics and Law and from the results obtained can suggest solutions to improve the brand awareness.

Some typical studies both at home and abroad were collected by the group such as: Bikash Barua and Sayaka Zaman (2019) investigating “*Role of social media on brand awareness in private university of Bangladesh*” marked a step forward in applying media to academic research, and pointed out the limitations of universities as well as the number of users in this method; Research by Adrian Pratama Putra and Heri Kuswanto 2022 on “*The influence of eWOM, e-marketing, promotion, brand awareness and service*

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City

Email: bept21407c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: gamnth@uel.edu.vn

purchasing decision on GRAB startups” indicates Grab directly influence consumer perception more than by social media. Domestically, the topic “*Strategic solutions for university brand development based on impact factors and students’ brand awareness*” by Trieu Thai Duong and Nguyen Phuoc Quy Quang pointed out. 7 factors affecting the university’s brand awareness, thereby proposing 10 strategic solutions to develop brand image from 2021 - 2025, 8 strategic solutions to develop brand reputation.

Inheriting the above research topics, the specific goal of the group is to study the brand in general and the brand of the University of Economics and Law (VNU-HCM), followed by determining the factors affecting influence on the brand awareness of the University of Economics - Law, based on that to analyze the influence of the factors on the brand awareness of the university, finally from the results of the research group conducted to propose the following recommendations: solutions to raise brand awareness of the University of Economics and Law. To clarify the above issues, the authors posed research questions including: What factors affect the brand awareness of the University of Economics and Law (VNU-HCM) among students. Thu Duc city? How are the factors affecting the brand awareness of the University of Economics and Law (VNU-HCM)? What solutions can increase the brand awareness of the University of Economics - Law?

2. THEORETICAL FRAMEWORK

2.1. Theory

2.1.1. Brand

Aaker (1991) stated that: “Brand can be understood as a name, term, sign, symbol or stamp,...or a combination of all these factors to identify the goods or services of one seller or group of sellers”. Morel (2003): “The brand is more than just a logo, name, symbol, trade mark, or the name attached to a product, brand is a promise”. Thus, the brand is understood as a component of the product and the main function of the brand is used to distinguish its products from competing products of the same type. Several other researchers have come up with similar definitions of brands (Keller, 2003; Keller và Lehmann, 2006; Ambler và Styles, 1996; Du preez, 2015).

2.1.2. University Brands

Bennett & Ali-Choudhury (2007) stated that: “The University brand is the expression of characteristics that distinguish one institution from another, reflecting its ability to meet the needs of its students the ability to provide higher quality education and enable new students to make the right decisions for themselves in the future.” McNally và Speak (2002) stated that: “ A university brand is the feelings or feelings of a person who has purchased or intends to purchase in the future, retains and describes experiences associated with exposure to the product and the services of an educational training institution.” Several other researchers have come up with similar definitions of brands (Bulotaite, 2003; Balmer & Liao, 2007; Goia và cộng sự, 2014; Tolbert, 2014).

2.1.3. Student-based university brand

Sharma et al (2013) stated that: “Higher education institutions are increasingly seeing students as customers of the educational experience as the service becomes less and less differentiated globally”. Hemsley-Brown and Oplatka (2006): “In the context of increasing competition among universities, universities have realized the need to market themselves to attract students”. Tolbert 2014: “Students are currently the top target audience for universities for branding messages”.

2.1.4. Brand awareness

Keller, 1993: “Brand awareness refers to the associative power of a brand in the consumer’s memory”. Aaker (1991) stated that: “Brand is not only a measure of consumers’ understanding of a brand’s presence,

but also its ability to identify specific products that are brand belongs”. Aaker (1995): “Brand awareness forms an anchor for other components to attach over time, creating familiarity and liking, followed by the basis for brand preference for consumers.”

2.2. Applied theoretical model

2.2.1. Brand Identity Prism - BIP

The brand prism was first introduced by J.Kapferer in 1986, including 6 main elements that create the brand’s identity. According to Kapferer (1986, 2008), brand characteristics are divided into two parts: internal part and external part. The inner part includes 3 elements related to the mission, core values, structure, and strategy of the brand which are formed in 3 dimensions: personality, culture and self-image. The external part includes factors such as the nature of the brand, the relationship between the customer and the brand, the reflection of the brand image to the customer.

2.2.2. Customer - Based Brand Equity - CBBE

Around the year 2000, the brand equity model, also known as Customer Based Brand Equity, was first introduced by Kevin Lane Keller in a famous book. Strategic Brand Management”. This model consists of 4 branding steps and 6 must-do blocks and is described in pyramid form. This is a customer-based model, so it is important for businesses to manage how consumers think and make comments about the brand?

2.3. Research overview

2.3.1. Role of social media on brand awareness in private universities of Bangladesh

The study conducted by Bikash Barua and Sayaka Zaman (2019) investigates the role of media in brand awareness of a group of private universities in Bangladesh. They believe that social media is the biggest platform to connect with students as well as achieve maximum benefits in enhancing the brand of private universities in particular and universities across the country in general, especially the opportunity to connect with the community through the school’s exciting activities such as seminars, scientific research projects, etc., which are posted on social platforms.

The results of the research process show that each communication activity has an impact on brand awareness. Accordingly, cross-device access has the greatest impact, followed by engagement, trends, relevant content, and consistency. Therefore, social networking is considered an important factor in developing students’ brand awareness.

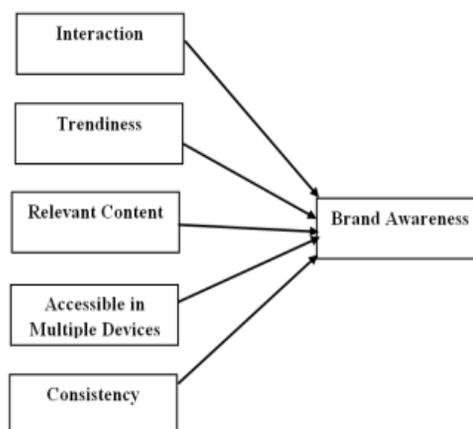


Image 3: Model about the role of social platforms for brands

Source: Bikash Barua and Sayaka Zaman (2019)

2.3.2. Brand awareness and decision making to buy services through eWOM influence, e-marketing, promotion, brand awareness

Adrian Pratama Putra and Heri Kuswanto (2022) point out the impact of eWOM, e-marketing, publicity, brand awareness and service purchasing decision on GRAB startups. The conclusion of the analysis shows that promotional factors and brand awareness have a positive and significant influence on purchasing decisions. Grab. While service purchase decision-making is not affected by eWoM and E-marketing variables, it proves that Grab has a large direct influence on consumer perception more than by social media.

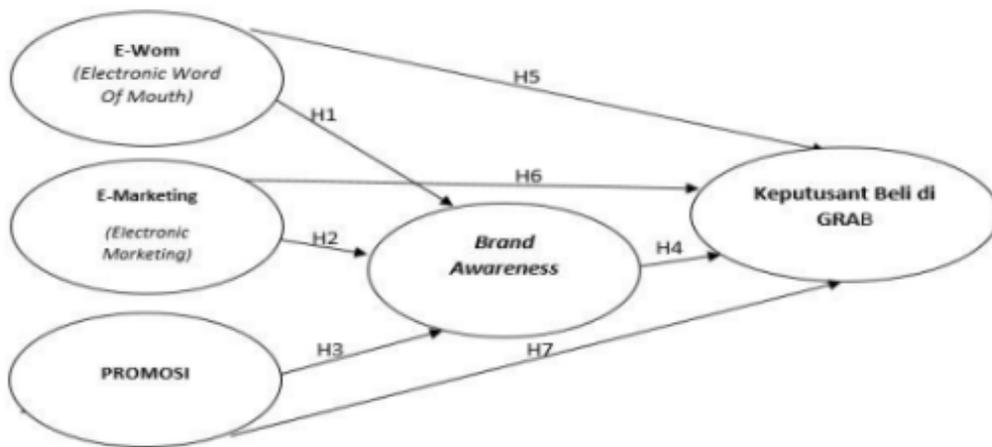


Image 4: Model of factors affecting Grab brand awareness.

Source: Adrian Pratama Putra, Heri Kuswanto (2022)

2.3.3. Strategic solutions to develop the University’s brand based on impact factors and students’ awareness of the brand

The topic was conducted by two authors, Trieu Thai Duong and Nguyen Phuoc Quy Quang, published in the “Journal of Scientific Research and Economic Development at Tay Do University” on January 1, 2021 with the main research goal of analyze the factors affecting students’ awareness of the brand of Tay Do University, and at the same time propose solutions in strategic short-term and long-term brand development, satisfying the needs of customers. competitive trends and maintain the stability of the school’s brand.

The research results have identified seven factors affecting the brand, including Media advertising, Quality of lecturers, Quality of training, Facilities, Culture and style, Image position, Translation. service and entertainment.

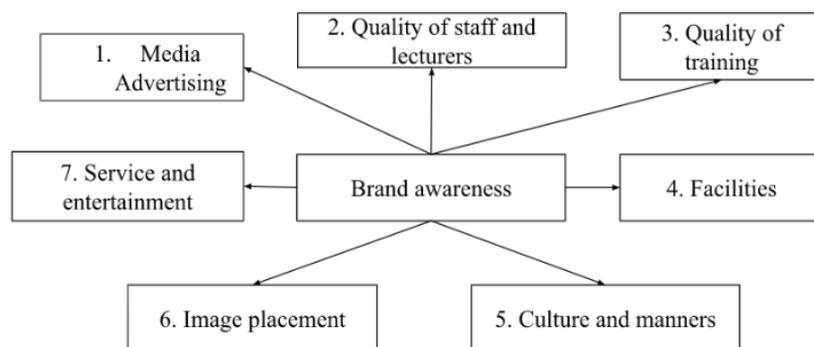


Image 5. Model of factors constituting the level of brand awareness.

Source: Trieu Thai Duong and Nguyễn Phước Quý Quang (2021)

2.4. Proposed research model

Based on the BIP and CBBE models as a basis, inheriting research results from previous authors such as Bikash Barua and Sayaka Zaman (2019), Adrian Pratama Putra and Heri Kuswanto (2022), Trieu Thai Duong and Nguyen Phuoc Quy Quang (2021) and the analysis and evaluation of the group, the research team proposes a model of factors affecting the brand awareness of VNU University of Economics and Law for students in The City. Duc Ho Chi Minh City includes 5 factors as follows: (1) communication activities, (2) social activities, (3) electronic word of mouth (eWOM), (4) training quality, (5) reputation. The model is shown below:

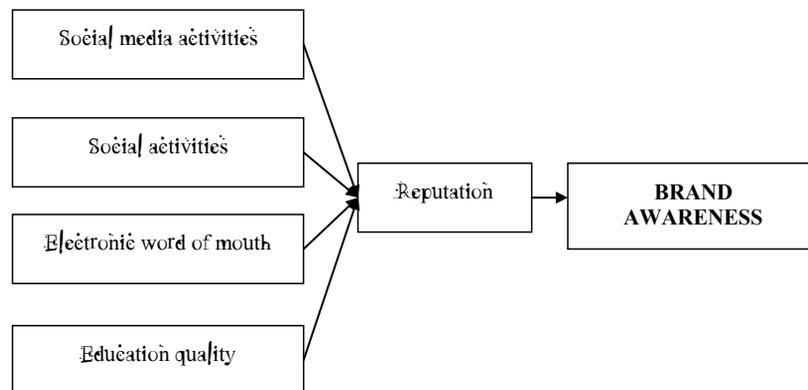


Image 6: Proposed model of factors affecting brand awareness of University of Economics and Law (VNU) for students in Thu Duc city (2023).

Nguồn: Research team

Communication activities are the process of transmitting, sharing information and orienting behavior change in order to convince a certain person or community to agree and follow (Vietnam Red Cross Society). Social media provides organizations with a new way to spread content, deliver services, co-create products or services, and build relationships with the public (Hanna, Rohm, and Crittenden, 2011). The worldwide popularity of social media does not make information spread in a few days, but only in a few hours or seconds. Therefore, social media has a significant impact on the reputation level of an organization, especially in today's information technology environment. Therefore, the team hypothesized H1:

H1: Effective social media activities have a positive impact on the university's reputation.

Social activities are actions that benefit society beyond corporate interests and are not required by law (McWilliams and Siegel, 2001). A 2012 survey by the Reputation Institute showed that 42% of an organization's reputation is based on how people feel about the social activities the organization performs (Smith, 2012). In 2004, Brammer and Millington found a positive relationship between social activism and reputation. Therefore, the group hypothesized H2:

H2: Effective social activities have a positive impact on the university's reputation.

Electronic word of mouth can be conceptually defined as "any positive or negative statement by a potential customer, or past customer, about a product or company, made available to a wide range of people and organized via the Internet" (Hennig-Thurau, et al. 2004). Several studies have shown that eWOM is an important tool through which customers can obtain information about products and services (Chevalier & Mayzlin, 2006) and messages from eWOM can be significantly reduced. uncertainty or risk to the customer. Therefore, the team wants to clearly study the impact of eWOM on reputation in the context that eWOM can become an effective form of Marketing today. The group proposed hypothesis H3:

H3: Positive eWOM messages have a positive impact on the University's reputation.

“Training quality is the result of the training process, which is reflected in the characteristics of the graduate’s quality, personality value, and the value of labor force or practice capacity corresponding to the objectives, program, etc. training programs according to specific occupations” (Tran Khanh Duc - Institute for Research and Development of Education). Wang et al. (2016) found that providing high quality products and services enhances reputation. Dehghan et al (2014) suggest that there is a significant and positive relationship between training quality and educational reputation. Therefore, the team proposes hypothesis H4:

H4: Good training quality positively affects the university’s reputation.

The most important public relations factor any organization really needs is its reputation. Reputation is a term that takes a long time to build, creating a pioneering cognitive and affective connotation that can affect all members, stakeholders and even the general public. all messages and behaviors (Demir, 2010). Reputation has a broader influence on consumers’ perceptions of consumer value and loyalty (Cretu and Brodie, 2005). Therefore, the team hypothesized H5:

H5: A university with a good reputation has a positive effect on university brand awareness.

A brand is defined as a symbol that distinguishes one brand from others. With this statement, a brand is simply a name, term, symbol, design, or combination thereof (Schiffman et al., 2005). Research (Hossler and Gallagher, 1987) shows that there exists a strong relationship between brand perception of an educational provider and the decision-making process of students’ future. Brand awareness is the biggest determining factor for students when choosing a university (Astin and Solmon, 1981).

3. RESEARCH METHOD

3.1. Qualitative research methods

3.1.1. Methods of consulting experts

The method uses the qualifications and competence of experts to collect opinions on the issue to be researched. During the discussion with some teachers from the Faculty of Business Administration of the University of Economics and Law, the research team raised questions about the content of the proposed research model and the scales. Measurement related to factors affecting brand awareness of University of Economics - Law with students in Thu Duc city. The teachers proposed the research team to make references from previous studies. After collecting opinions, the research team calibrated the scale to suit the topic by referring to the original scale from previous studies and applying it to the group’s research model.

3.1.2. Group interview method

The research team interviewed a group of 20 students who are studying and living in Thu Duc city. The research team posed a number of questions about the scale, then, the group proposed the scales of each factor for the group of students to answer, considering the relevance of the question, the relationships of the factors. variables and scales affecting the brand awareness of the university. After consulting experts and interviewing focus groups, our group has determined a theoretical model, how to adjust the language in the scales accordingly, thereby serving as the basis for completing the questionnaire. to prepare for the formal study.

3.2. Formal Research Methods - Quantitative Research

3.2.1. Selection of research samples

The survey subjects of this topic are students of universities in Thu Duc, Ho Chi Minh City. The team carried out the sampling by sending questionnaires over the Internet. The number of samples collected is 280 of which 225 are valid.

3.2.2. Questionnaire design

Based on the calibrated scale and reference to previous studies, the group has built a suitable questionnaire. The questionnaire includes the following sections:

Part 1: Personal information, including: gender, age, school attending.

Part 2: General information on yes/no questions about brand recognition University of Economics and Law, VNU.HCM.

Part 3: Survey on factors affecting brand awareness of University of Economics and Law, VNU.HCM.

3.2.3. Survey method

- Target audience: students studying and living in Thu Duc City.

- Survey period: 30 days (starting from January 25, 2023 to February 25, 2023).

-Information collection: information is collected by sending survey questionnaires via Email and Facebook to students studying and living in Thu Duc City. Responses were screened by entering data into SPSS 22.0 and AMOS 20.0 software, removing unsatisfactory samples before using them for statistics and data analysis.

3.2.4. Data Analysis Methods

Data analysis steps:

Step 1: Perform descriptive statistics with the collected samples.

Step 2: Evaluate the reliability of the scale using Cronbach's Alpha coefficient.

Step 3: Evaluate the value of the scale using exploratory factor analysis (EFA).

Step 4: Test the scale by confirmatory factor analysis CFA.

Step 5: Analyze linear structure SEM.

(1) The research team conducted Cronbach's Alpha test to test the reliability of the scale. Cronbach's Alpha reliability coefficient shows the association between measures but does not clearly show the reliability of each observed variable. Therefore, the group performs an additional calculation of the variable-total correlation coefficient. The calculation of this coefficient helps the group to eliminate observed variables that have little or no contribution to the concept description.

(2) EFA analysis is a method to examine the relationship between variables in all groups of factors. difference in order to detect observed variables in many factors or observed variables that are different from the original.

(3) The method of factor analysis confirms that CFA is a kind of linear structural model. (SEM) focuses on measurement models, specifically the relationship between observed variables or indicators with latent variables or factors.

(4) Linear structural model, also called SEM (Structural Equation Modeling) is a second generation statistical analysis technique developed to analyze multidimensional relationships between multiple variables in a model (Haenlein & Kaplan, 2004). This model is used to test the relationship between concepts.

4. RESULT AND DISCUSSION

4.1. Result

Descriptive statistics

After removing and filtering the data, the team received 225 valid answer sheets and included in the analysis. Females account for 71.11%, the rest are males. The age group who participated in the survey

the most were second-year students with 51.56%. The students participating in the survey studying at the Vietnam National University in Ho Chi Minh City were 63.11%.

Table 1: Descriptive statistics

	Frequency	Percentage (%)	Cumulative percentage(%)
Sex			
Male	65	28.89	28.89
Female	160	71.11	100
Age			
Freshman	45	20	20
Second year student	116	51.56	71.56
Third year student	36	16	87.56
Fourth year student	28	12.44	100
University			
Belonging to the national university	142	63.11	63.11
Not belonging to the national university	83	36.89	100

Cronbach's Alpha Analysis

Through the analysis results, the Cronbach's Alpha value of the scales is greater than 0.8, the "communication activity" scale has the highest reliability of 0.91. It can be concluded that the scales meet the requirements of reliability. The variables of the scales all have a total correlation coefficient > 0.3 , so all variables meet the requirements and are kept for the next analysis.

EFA Analysis

EFA analysis results show that KMO coefficient = 0.878 > 0.5 ensures exploratory factor analysis, or it can be said that EFA results can be used. This is completely statistically significant expressed by the Sig coefficient. = 0.000 < 0.5 .

Table 2: KMO and Bartlett test results

Kaiser-Meyer-Olkin		.878
Bartlett's Test	Chi.square	2954.444
	df	276
	Sig.	.000

The table of total variance extracted shows the results of EFA analysis stopping at the 6th line, which shows that the analyzed input variables are arranged into 6 separate factor groups. In the 6th line, the eigenvalue is 1,086 > 1 and the total variance extracted is 70.335% $> 50%$, so all groups of factors are accepted.

Table 3: The results of the table of total variance extracted

Components	Eigenvalues			Total exploitation of load squared factor			Total rotation of the squared load factor
	Total	% variance	% cumulative	Total	% variance	% cumulative	Total
1	7.983	33.261	33.261	7.983	33.261	33.261	6.126
2	2.651	11.046	44.307	2.651	11.046	44.307	4.544
3	2.193	9.136	53.443	2.193	9.136	53.443	4.829
4	1.586	6.609	60.052	1.586	6.609	60.052	4.334
5	1.381	5.755	65.808	1.381	5.755	65.808	2.755

6	1.086	4.527	70.335	1.086	4.527	70.335	4.914
7	.879	3.662	73.997				
8	.683	2.844	76.841				
...				

Based on the factor pivot table, it is found that the factor weights are all > 0.5 , which ensures satisfactory analysis results and no variables. The variables are arranged in 6 groups of factors, the research team conducts the construction of factors to conduct CFA analysis.

Table 4: The results of factor pivot table analysis

	1	2	3	4	5	6
TT3	.890					
TT2	.867					
TT3	.848					
TT5	.836					
TT1	.774					
CL6		.842				
CL5		.795				
CL4		.721				
CL3		.695				
CL2		.666				
CL1		.652				
TM4			.872			
TM3			.835			
TM1			.755			
TM2			.755			
NB3				.913		
NB2				.876		
NB1				.829		
DT2					.898	
DT1					.833	
DT3					.817	
XH1						.888
XH2						.879
XH3						.795

CFA Analysis

Evaluate the fit of the model:

The results of CFA analysis of the model show that the coefficient $CMIN/DF = 1.546 \leq 5$ (satisfactory), $CFI = 0.954 \geq 0.95$ is very good), $GFI = 0.878 \geq 0.8$ (acceptable), $TLI = 0.946 \geq 0.9$ (good), $RMSEA = 0.049 \leq 0.05$ (very good). According to Hair et al. (2010): “The data obtained and based on the criteria, the measurement model is compatible with the market data”.

Assess the overall reliability of the scale:

The analysis results show that the factors confirm the composite reliability coefficient $CR > 0.7$ and the total variance extracted $AVE > 0.5$ (satisfactory). Combined with the evaluation results of Cronbach's Alpha system in Section 4.2.1, it can be concluded that the scale of "communication activities", "social activities", "electronic word of mouth", "training quality", can be concluded. "reputation", and "brand awareness" are trustworthy.

Convergence value test:

"Convergence value refers to the degree of correlation between observed variables that measure for the same concept" (Cooper et al., 2014). "The scale is considered to have converged value when the normalized weights of the scales are greater than 0.5 and are statistically significant" (Gerbing & Anderson, 1988; Hair et al., 1992). From the analysis results, all the standardized and unstandardized coefficients are greater than 0.5, so the scales are considered convergent.

Discrimination:

"Discriminatory value refers to the degree of non-correlation between one set of indicators used to measure one concept and another set of indicators used to measure another" (Cooper et al., 2014). The P-values of the correlation coefficients show that the P-values are all less than 5%, so the correlation coefficients for each pair of concepts are quite different with 95% confidence. The concepts thus gain distinctive value.

SEM Model test result

The results of analyzing the SEM model between the scales in the factors showed that chi square = $2,376 < 3$ (satisfactory), $GFI = 0.806 < 0.9$ (acceptable), $CFI = 0.881 < 0.9$ (acceptable) received), $TLI = 0.864 < 0.9$ (acceptable), $RMSEA = 0.078 < 0.1$ (good). Therefore, it can be concluded that the model is compatible with market data.

Hypothesis Testing

According to the analysis results, the dependent variables all have a positive impact on the dependent variable. Specifically as follows: communication activities, social activities, electronic word of mouth and training quality all have a positive impact on the university's reputation, in which electronic word of mouth has the strongest impact and media activity has the weakest impact. Reputation has a positive impact on university brand awareness, but the level of impact is not strong.

Hypothesis H1: effective communication activities have a positive effect on the university's brand reputation, reaching the standardized estimation coefficient = 0.013 with P - value < 5%, so hypothesis H1 is accepted.

Hypothesis H2: effective social activities have a positive effect on the university's brand reputation, reaching the standardized estimation coefficient = 0.052 with P - value < 5%, so hypothesis H2 is accepted.

Hypothesis H3: positive eWOM messages have a positive effect on the university's brand reputation, reaching the standardized estimation coefficient = 0.275 with P - value < 5%, so hypothesis H3 is accepted.

Hypothesis H4: good training quality has a positive effect on the university's brand reputation, with standardized estimation coefficient = 0.049 with P - value < 5%, so hypothesis H4 is accepted.

Hypothesis H5: The university has a good reputation that positively affects the university's brand reputation, reaching the standardized estimation coefficient = 0.379 with P - value < 5%, so the hypothesis H5 is accepted.

Role of the intermediate variable

After testing the hypothesis, the group tested the role of the intermediate variable. The group's result is that the "reputation" factor plays an intermediary role in the relationship between the independent variables and the dependent variable, specifically as follows:

There is an indirect relationship between the factor “communication activities” and “brand awareness” with the value $\text{sig} = 0.005 < 5\%$ and the impact factor is 0.005.

There is an indirect relationship between the factor “social activity” and “brand awareness” with the value $\text{sig} = 0.02 < 5\%$ and the impact coefficient is 0.024.

There is an indirect relationship between the factor “electronic word of mouth” and “brand awareness” with the value $\text{sig} = 0.04 < 5\%$ and the impact coefficient is 0.104.

There is an indirect relationship between the factor “training quality” and “brand awareness” with the sig value = $0.018 < 5\%$ and the impact coefficient is 0.003.

4.2. Discussion

After analysis, the results indicate that university reputation has a positive impact on university brand awareness. And there are 4 factors that positively affect brand awareness including (1) “social media activities”, (2) “social activities”, (3) “electronic word of mouth” and (4) “education quality”. This result is similar to the proposed model and group hypothesis.

The group believes that this result is said to reflect the reality of the University of Economics and Law and the characteristics of the survey subjects. There are 4 factors affecting reputation, in which “communication activities” have the smallest beta value, the weakest impact on brand reputation. The school’s communication activities are mainly transmitted through social networks, so only students who are interested in the school will pay attention to the school’s fanpage on social networks. “Electronic word of mouth has the highest beta coefficient, the strongest impact on brand reputation. In the period of strong development of information technology, all news is spread to everyone at a rapid rate. Therefore, “word of mouth” has a great influence on the reputation of the school.

The research results obtained have some similarities as well as differences compared to previous similar studies. Firstly, on the impact of media activities, in the study of Bikash Rarua and Sayaka Yaman, communication activities have a strong impact on brand awareness in private universities of Bangladesh, especially on the platforms. social networking platforms like Facebook, Instagram. In the study of Trieu Thai Duong and Nguyen Phuoc Quy Quang, the factor of communication activities has an impact on brand awareness, but the level of impact has not been determined because these two authors did not mention it in the article. With the group’s research, the factor of communication activities has an impact but is still relatively weak. The reason is that the University of Economics and Law has not exploited the relevant issues well. Specifically for internal communication, the school has not had many activities to introduce and provide information to learners, thereby reducing the awareness of students in the school. Regarding external communication, the system of fanpages and websites has not been utilized optimally, the information provided is incomplete and the frequency is not much.

Regarding the impact of electronic word of mouth, in the study of Adrian Pratama Putra, Heri Kuswanto on the Grap case, the results showed that electronic word of mouth has no impact on brand awareness. The reason is that from 2020, the Indonesian government will apply a number of regulations to social networking sites operating in this country, thereby limiting the use of social networks by people. For the team’s study, electronic word of mouth was the most influential factor due to the popularity of social networking platforms as well as the openness to technology among students.

Regarding the quality of training, in the study of Trieu Thai Duong and Nguyen Phuoc Quy Quang, the quality of training has an impact on brand awareness, but the level of impact has not been specified. With the group’s research, the impact of training quality is still weak due to some limitations on the school’s facilities as well as the poor communication about the training quality.

In addition, the research model of the group also shows the impact of the mediating factor “brand reputation”. Reputation has a relatively strong impact on brand awareness and plays a mediating role in the relationship between factors such as media activities, social activities, electronic word of mouth and training quality on brand awareness.

5. CONCLUSION

Currently, society is constantly developing and that is why the need for education becomes more urgent than ever. Higher education has become popular with the number of schools and the number of disciplines constantly increasing. With such fierce competition, in order to become the first choice for students, universities have constantly built and improved their brand awareness. Inheriting the university’s research on brand, brand awareness and brand, this study aims to find the factors that are affecting the brand awareness of a co-educational university. indicate the extent of the impact of those factors on the school’s brand. The study was carried out in the case of the University of Economics - Law.

The research paper has provided a theoretical system to have a clearer view of the brand, the university’s brand and the level of brand awareness. To obtain the results of the factors affecting the school’s brand awareness, the study used both qualitative research methods and quantitative research methods. In which, quantitative research methods include Cronbach’s Alpha reliability test, EFA exploratory factor analysis, CFA confirmatory factor analysis and SEM linear model analysis. Research results show that the hypotheses are accepted, the proposed model is reliable and applicable.

From the factors affecting the level of brand awareness have been identified, the research has proposed solutions to improve the brand awareness level of the University of Economics and Law. However, because there are still certain limitations, the study has also proposed a number of further research directions to perfect the model of the factors affecting the brand of a university.

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RESEARCH ON THE FACTORS AFFECTING THE DECISION TO CONTINUE USING SHOPEEPAY OF STUDENTS AT VIETNAM NATIONAL UNIVERSITY HO CHI MINH CITY

Author: Nguyen Thanh Loi¹, Tran Ngoc Bich Tran¹, Lam My Ngoc¹, Chau Tue Minh¹

Mentor: Pham Manh Cuong²

ABSTRACT: *This paper researches the impact of online payment methods, with a specific focus on ShopeePay, on the shopping behavior of students at Vietnam National University. It highlights the increasing trend of online shopping on e-commerce platforms and the growing importance of online payment methods. Despite this growth, cash on delivery (COD) remains a popular payment option among customers. The study aims to provide valuable insights into the Technology Task Fit (TTF) model and the Technology Continuance Theory (TCT) model. It is grounded in the theoretical foundations of payment acceptance, and continued usage. An experimental survey was conducted among students in the area, and the collected data were analyzed using SPSS, SmartPLS, and Excel software. The analysis aims to identify the key factors influencing students' continued use of electronic payment methods, with a specific emphasis on ShopeePay. The results indicate that satisfaction is the most influential factor, and security perception emerges as a new influential factor compared to previous models. Based on these findings, the paper proposes essential solutions for businesses to enhance their operations and innovation processes, ultimately driving the growth of Shopee in the e-commerce industry and promoting the comprehensive development of electronic wallet ShopeePay.*

Keywords: *E-commerce, ShopeePay, E-wallet, E-Payment*

1. INTRODUCTION

E-commerce is experiencing robust growth in Vietnam and is playing a vital role in the country's digital economy's sustainable development, especially after the COVID-19 pandemic era. This growth has led to a rapid expansion of the electronic payment market, driven by changes in consumer shopping behavior. Shopee, as a leading player in the competitive e-commerce market, offers the convenience of its payment aggregation feature through ShopeePay. Consequently, ShopeePay has emerged as one of the most popular e-wallets not only in Vietnam but also in other markets like Indonesia and Singapore. The remarkable growth of the e-commerce and e-payment sectors in Vietnam presents immense potential and acts as a driving force for the country's economic development. Therefore, it is crucial to study the effects and behaviors related to the utility of ShopeePay in order to advance e-commerce and non-cash payment methods.

However, existing scientific research papers in Vietnam, such as “Nhung yeu to tac dong den chuyen doi phuong thuc thanh toan COD sang Vi dien tu tren cac Website/App Thuong mai dien tu cua sinh vien Dai hoc Quoc gia Thanh pho Ho Chi Minh” (Thao et al., 2021), have primarily focused on the factors influencing the adoption of ShopeePay or “Nhung yeu to tac dong toi viec tiep tục sử dụng dịch vụ thanh toán bằng Fintech - Nghiên cứu đối với sinh viên các trường Đại học ở Việt Nam” (Tue, 2020), which explore the intention to continue using electronic payments in general, rather than focusing specifically on an e-wallet like ShopeePay. Thus, this study aims to investigate the factors influencing the decision to continue using ShopeePay among students at Vietnam National University in Ho Chi Minh City. This paper gives three main research questions: What factors influence the decision to continue using ShopeePay on the Shopee shopping platform and other transactions? How much influence does each factor have? and

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: loint21411c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: cuongpm@uel.edu.vn

Which factors have the highest impact on user behavior change? The research subjects comprise students aged 18-22 from Viet Nam National University Ho Chi Minh City.

The study employs both qualitative and quantitative research methods, utilizing a theory and data analysis framework which include Technology Task Fit Model and Technology Continuance Theory. Statistical analysis will be used to measure the relationships between variables. The research will also involve gathering information from relevant books, internet sources, and other scientific studies to build theories and support arguments. Additionally, the research will employ hypothesis testing and a structural equation modeling (SEM) approach using partial least squares SEM (PLS-SEM) to determine the relationships between input variables and dependent variables in a structural model. SmartPLS software will be used for its simplicity and visual nature.

Consequently, the current paper seeks to make the following contributions to the existing literature. First, this paper provides knowledge about online payment and related theories; Second, aiming to provide insights into the factors influencing the continued use of ShopeePay; Third, finding which factor influence the most on continuing using ShopeePay, Fourth, proposing solutions to drive its usage among the targeted student group, leading to overall growth in e-commerce and the specific development of ShopeePay in Vietnam; and so on. The paper is structured as follows: Section 2 illustrates the literature review, section 3 describes the study methodology, section 4 discusses the results, and section 5 contains the conclusion.

2. THEORETICAL FRAMEWORK

2.1. Literature review

Numerous studies have been conducted to examine the factors that influence the use and loyalty of e-wallet users. Devona and Chrisanty (2021) conducted a study to examine the impact of service innovation (SI), service delivery (SD), and customer satisfaction (CS) on customer loyalty (CL) among ShopeePay users in Indonesia, particularly during the COVID-19 outbreak. The results indicated that SI and SD, through CS as a mediator, as well as CS itself, have a positive and significant impact on the CL of ShopeePay users in Indonesia.

Maulita and her colleagues (2021) conducted a study on the factors influencing Gen Z's use of e-wallets during the Covid19 pandemic. The experimental research results showed that perceived usefulness and perceived enjoyment significantly influence Gen Z's intention to use ShopeePay as their e-wallet. The study also revealed that promotion and perceived satisfaction have an impact on Gen Z's trust.

Samar and his colleagues (2020) conducted a study aimed at investigating the intention to continue using Internet banking by integrating two models, Technology Continuance Theory (TCT) and Task Technology Fit (TTF). Findings revealed that customer satisfaction significantly influences the prediction of Internet banking users' intention to continue, thus confirming expectations as the second important variable to determine the intention to continue using Internet banking. In terms of practical significance, this study examined the importance and performance of the structures using Importance Performance Matrix Analysis (IPMA). IPMA indicated that satisfaction, perceived usefulness, and confirmed expectations are the most important factors in determining the intention to continue using online banking services for users.

Danarto and colleagues (2021) conducted a study that revealed the continuous usage intention of e-wallet applications in Indonesia is not only influenced by perceived usefulness but also significantly affected by trust and satisfaction.

Nurul-Ain and colleagues (2021) found that users' behavioral intention to continue using e-wallets does not rely on trust and perceived usefulness.

In Vietnam, electronic and mobile payments have become increasingly popular, and numerous studies have been conducted to investigate the factors that influence the intention to use digital wallets and mobile

payments. Ha (2021) indicates that among the three factors of compatibility, promotional benefits, and social influence, compatibility is considered the strongest factor influencing the intention to use mobile wallets. Similarly, Hau and colleagues (2021) identified 5 factors influencing the usage intention of digital wallets among consumers in Vietnam: performance expectancy, expectation, social influence, facilitating conditions, and perceived risk. In addition, they also found that perceived risk has a significantly negative impact on consumer usage intention. Based on the results of this study, service providers are encouraged to improve the usefulness and ease of use of their systems.

2.2. Overview of Theory

- Electronic payment

Electronic payment is defined as any form of money transfer conducted through electronic devices. Payment through this system may be made via the Internet, Electronic Funds Transfer (EFT) systems, interbank clearing systems, and Financial Electronic Data Interchange (EDI) systems. (Wikipedia)

According to the WTO, electronic payments are payment modules that are readily integrated into e-commerce websites and markets, and comply with regulations on exchange rates.

The Electronic Payment System (EPS) can be divided into two main types: Wholesale EPS and Retail EPS.

- Current payment methods on Shopee

ShopeePay e-wallet: ShopeePay e-wallet allows users to make online payments on Shopee, pay bills, top up mobile phones, transfer money, and pay by scanning QR codes at stores. Customers only need to link their bank account to easily and quickly deposit/withdraw money into/from the wallet.

SPayLater: SPayLater is a payment method provided by reputable partner banks, allowing users to buy now and pay later on the Shopee e-commerce platform through a virtual credit card. Once SPayLater is activated successfully, users can shop within the credit limit granted and pay later in installments as selected (01, 02 or 03 installments). The credit/debit card payment method only applies to orders with a payment value (including shipping fees and other additional costs) of VND 100,000 or more.

Shopee Coins: Shopee Coins is considered a separate reward point on the Shopee e-commerce platform. Each 1 unit of Shopee Coins has a payment value equivalent to 1 VND and can be used to support payment for transactions. Shopee Coins is collected through Shopee Coins cashback, promotional program or other special offers on Shopee.

- The situation of using ShopeePay e-wallet.

In the Indonesian market, the number of ShopeePay sellers has increased fourfold compared to 2020, making it the market leader in the context of the e-commerce boom during the COVID-19 pandemic. ShopeePay has the highest market penetration rate at 68%, surpassing other e-wallets such as OVO (62%), DANA (54%), GoPay (53%), and LinkAja (23%).

In Malaysia, ShopeePay has partnered with the Ministry of Finance through the eBelia program, a support program aimed at easing the financial burden for youth and promoting cashless spending. In 2021, the program received nearly 500,000 requests processed through ShopeePay on the first day alone. Nearly one million young people have requested their eBelia credit through ShopeePay.

In Thailand, ShopeePay has collaborated with various partners such as Traveloka, EasyPass, and Bangkok Expressway and Metro to provide users with a fast and convenient online payment method for their transportation needs.

According to a recent survey by Visa in Vietnam, the number of people using e-wallets and cashless payment apps has increased significantly in recent years, especially since the pandemic. Over 85% of consumers own at least one e-wallet or payment app, and over 42% of consumers use mobile payment.

Among them, 71% of users use e-wallets or payment apps at least once a week. From the above situation, we can see that there is a huge opportunity for ShopeePay in this vibrant market. However, it is also a significant challenge as in the Vietnamese market, the top 3 e-wallets that account for 90% of the market share are Momo, Moca, and ZaloPay. Most consumers use ShopeePay mainly to pay for their Shopee purchases, although it also offers many other functions such as topping up mobile phones, paying bills, buying airline tickets, and booking hotels.

2.3. Theory and related models

2.3.1. Technology Task Fit (TTF) theory

TTF includes five constructs that represent the model, namely, task characteristics, technology characteristics, task-technology fit, technology utilisation and performance impact. While task characteristics and technology characteristics reflect the specific dimensions of the technology and its utilisation, the general task-technology fit factor captures individuals' perceptions of task-technology fit (Goodhue & Thompson, 1995; Goodhue, 1992). Tam and Oliveira (2016) utilized the TTF model to examine the effect of mobile payment on individual performance, which demonstrated that TTF has a substantial impact on both individual satisfaction and performance. Another study conducted by Oliveira et al. (2014) validated that the factors supporting the Unified Theory of Acceptance and Use of Technology and TTF have a significant impact on user behavior in adopting electronic banking services. In this model, we have selected the Technology Characteristics construct to serve our research purposes.

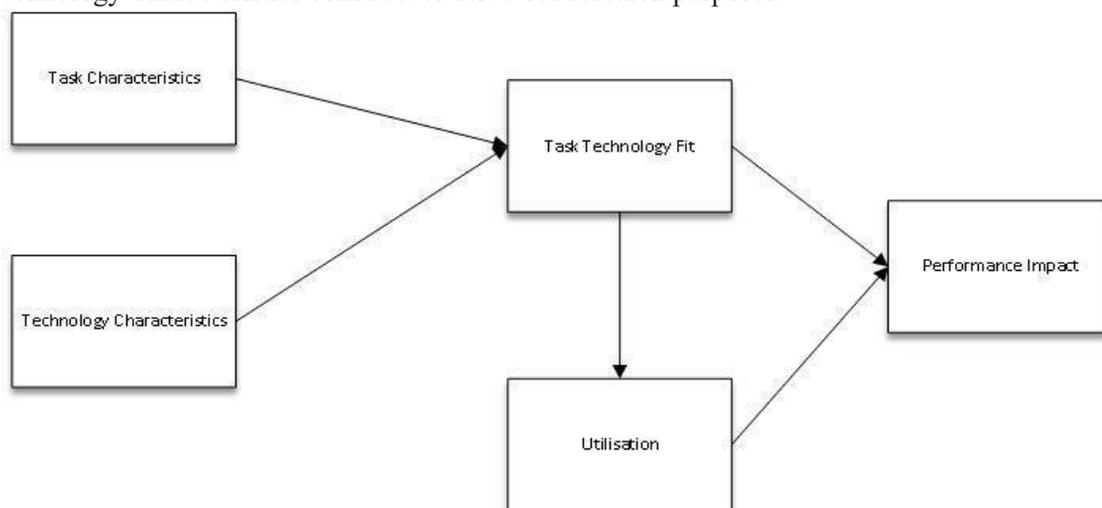


Figure 1. Technology Task Fit (TTF) model

2.3.2. Technology Continuance Theory (TCT)

The Technology Continuance Theory combines factors from other models such as Technology Acceptance Model (TAM), Cognitive Model (COG), and Expectation Confirmation Model (ECM) to investigate users' intention to continue using technology. TCT asserts that the success of a service depends on long-term use rather than initial acceptance. According to a study by Alraimi et al. (2015) in the context of online learning, it was found that perceived usefulness and user satisfaction have a positive effect on the intention of users to continue using technology. Foroughi et al. (2019) conducted a study which revealed a significant relationship between technology continuance factors and users' intention to continue using m-banking services. In this model, we have selected the Perceived Usefulness, Perceived Ease of Use, Satisfaction and IS Continuance Intention to serve our research purposes.

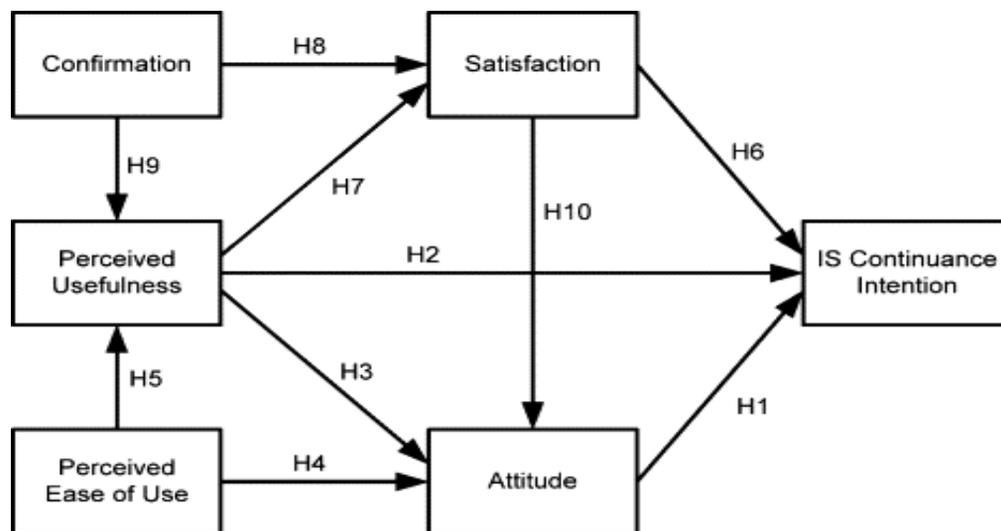


Figure 2. Technology continuance model

3. RESEARCH METHOD

3.1. Process

This section reports the methodology followed in this research. Table 2 illustrates the study’s research questions. Authors applied their searches in the following well-known databases for related studies:

- Google Scholar
- IEEE
- SpringerLink

Following the determination of the research objectives, the group proceeded to locate theoretical bases such as previous studies as well as the current situation and previous experimental models in order to construct a research model and propose a scale. A small sample of 20 students who used the ShopeePay Wallet were polled for the qualitative research. Based on the survey results, the group altered several observed factors in the scale and conducted a formal interview. The official interviews’ data was sifted and coded. The researchers then ran a test run with 174 student samples to fine-tune the model. Fig. 3 presents the selection process of this study.

Table 1. Research Question

No.	Research Question	Rationale
RQ1	What are the factors affecting the decision to continue using ShopeePay for the Shopee shopping platform and other transactions?	Identifying the various factors that influence the decision of users to continue using ShopeePay for their transactions on the Shopee platform.
RQ2.	What is the level of influence of each factor and which is the decisive factor that has the highest impact on the change of consumer behavior?	Identifying the various factors that affect users’ decisions to continue using ShopeePay and Determining the level of influence of each factor and which factor has the highest impact on changing consumer behavior.
RQ3.	What are the essential solutions that can contribute to promoting the continued use of ShopeePay e-wallet?	Identifying the strategies and solutions that can help promote the continued use of ShopeePay e-wallet among users.

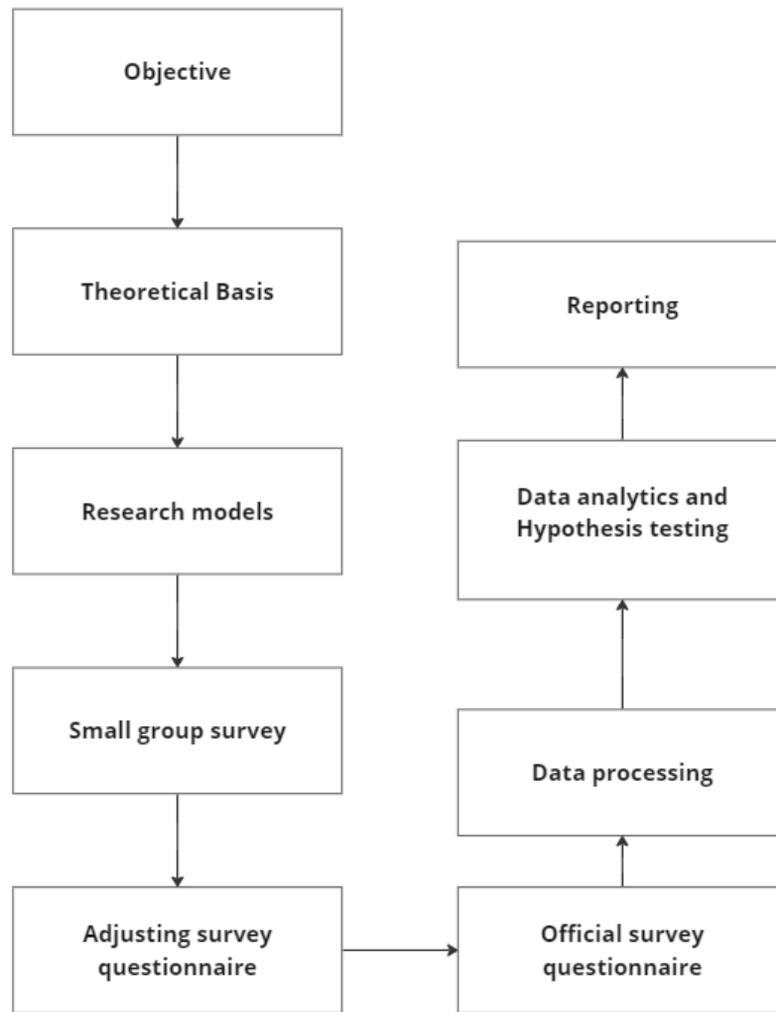


Figure 3. Research Process

This study utilizes a 5-point Likert scale to assess the relationship and impact of factors on the continued use of ShopeePay e-wallet by students at Vietnam National University Ho Chi Minh City. The 5-point Likert scale has been found to be a reliable and commonly used measurement tool in various research studies. Sclove (2001) emphasized its effectiveness in constructing questions with consistent, inconsistent, or polarizing tendencies. The scale’s simplicity and ease of use allow participants to provide their evaluations accurately.

Table 2. Likert Scale

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
(1)	(2)	(3)	(4)	(5)

3.2. Methodology

Based on previous theoretical frameworks and proposed models, the research team developed a specific research process. Previous studies have indicated that, for the success and sustainability of an organization, it is more important to continue using critical Internet services rather than adopting them for the first time (Bello-Pintado et al., 2018; Kumar et al., 2018b). Similarly, Bhattacharjee (2001) argues that in the retail industry, the cost of acquiring a new customer is five times higher than retaining an existing customer.

Building upon these arguments, the current study focuses on post-acceptance behavior of users of ShopeePay e-wallet and fills a research gap in this context. After analyzing the relevant models of Technology-to-Task Fit (TTF) and Task-Continuance Theory (TCT), the research team integrates both theories to propose a combined model. This integration “provides a comprehensive explanation of causal mechanisms as the basis for relationships and unique insights that cannot be obtained from single-theory models” (Samar and Mazuri, 2019). The TTF model does not include IS continuance factors such as confirmation, perceived usefulness, satisfaction, and attitude. Therefore, integrating the TTF and TCT models in the continuous context of electronic banking users contributes to both theory and practice. Perceived security and trust, which are relevant to the technological context of the ShopeePay e-wallet, are studied to extend the research model of the research team.

Qualitative Method: Utilizing theories and analytical frameworks from relevant previous studies, combined with the results of group discussions, to construct evaluation criteria and support the formulation of survey questions that address the research topic’s behavioral aspects. The research outcomes related to the research topic are also presented.

Quantitative Method: Analyzing primary data collected from a survey of students currently studying at the National University in Ho Chi Minh City, obtaining data on usage rates, gender, age, and income. Measuring and examining the statistical relationships between variables. The expected sample size is 211 samples from 6 universities affiliated with the National University in Ho Chi Minh City.

Data Collection Method: Searching for information in relevant literature, conducting internet searches, and referencing the findings of other scientific studies. From these sources, constructing theories and providing evidence for the arguments.

Hypothesis Method: Formulating research hypotheses (which may be true or false) and conducting tests to demonstrate those hypotheses.

Approach using Linear Structural Equation Modeling (SEM) through Partial Least Squares SEM (PLS-SEM) to determine the relationships between input variables and dependent variables in a structural model. The software SmartPLS is utilized for its lightweight and user-friendly nature compared to similar software when analyzing SEM models while ensuring the effectiveness in estimating the model.

The questionnaire used in this study aimed to investigate seven factors and 31 observed variables that influence the continued use of ShopeePay among students at Vietnam National University in Ho Chi Minh City. To gather the data, an online survey was conducted using Google Forms. Additionally, data from various age groups were collected to ensure comprehensive analysis. The age groups considered in the survey were 18-19 years, 20-22 years, and over 22 years. The researchers then conducted a survey among participants to standardize the measurement scale and refine the variables, resulting in a formal survey questionnaire. This approach allowed the researchers to collect comprehensive data on the factors influencing students’ continued use of ShopeePay, facilitating a more accurate analysis of the research objectives. After conducting a small group survey and conducting research on the combination of the Technology Continuance Theory (TCT) and Technology Task Fit (TTF) models, the factors selected for investigation were “Technology Characteristics,” “Perceived Ease of Use,” “Perceived Usefulness,” “Satisfaction,” “Security,” “Trust,” and “IS Continuance Intention.”

4. RESULTS

4.1. What are the factors affecting the decision to continue using ShopeePay for the Shopee shopping platform and other transactions?

Through means of experiments and interpretations of analytical techniques. The research team standardized the research model for the topic “Factors affecting the decision to continue using ShopeePay

of National University students” by eliminating the non-standard components. Because the Cronbach’s alpha index is lower than the suggested level, “Perceived Usefulness” is specifically eliminated through the Cronbach’s Alpha reliability test. By using EFA exploratory factor analysis, “Trust” was changed to “Perceived Security” because of how similar the Pattern matrices are to one another. Finally, TTF1 should be eliminated from the SEM structure model because the Composite Reliability index is subpar.

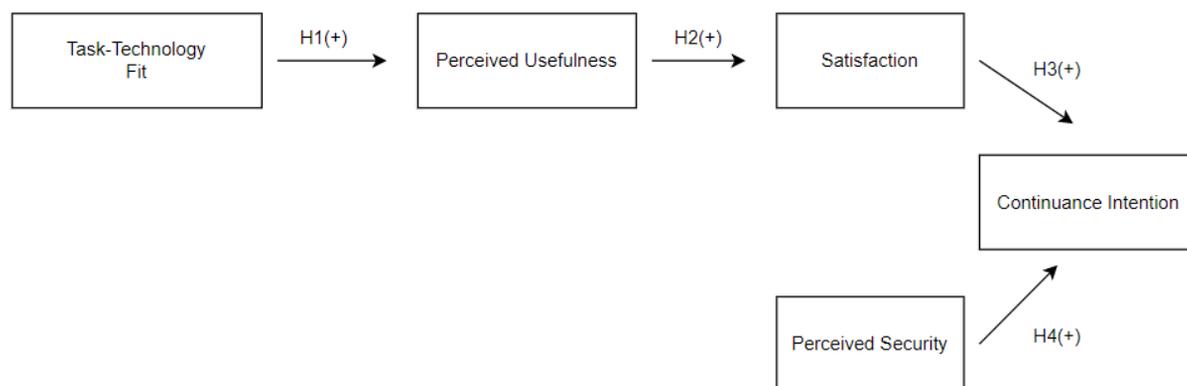


Figure 4. Model of influencing factors

The model’s final study findings have demonstrated that if a payment method fits the following requirements, users will continue to use it: (1) Satisfaction; (2) Providing safety. In which customers’ perceptions of ease of use have a direct impact on satisfaction, and acceptable technology features have an indirect impact.

4.2. What is the level of influence of each factor and which is the decisive factor that has the highest impact on the change of consumer behavior?

After using the pls-SEM analysis, the research team obtained the following linear equation results:

$$IC = 0.284*PE + 0.454*SA + 0.206*PS + 0.183*TTF + e$$

Through analyzing the current situation and quantifying the research sample of 211 students in the National University area, the above results have shown that all factors have an impact on “Intention to continue”, which meets the hypotheses. proposed research. “Intent to continue” is positively impacted from “Satisfaction” and “Perceived Security”, in which “Satisfaction” has the highest coefficient, up to 0.454. Thereby, it shows that satisfaction and satisfaction have the most important influence on consumers’ decision to use. Besides, according to ANOVA analysis of variance, “Satisfaction” is said to have a difference in age groups, in which age group 20 - 22 has a high level of satisfaction near 4 and no variation between occupational groups and genders. This shows that, whether in the technical - technological or social - economic sectors, whether men or women, “Satisfaction” is still the main factor that determines the perception of continued use of ShopeePay.

In addition, “Task - Technology Fit” has a direct and positive impact on “Perceived ease of use”, indirectly on “Satisfaction”. Besides, “Perceived ease of use” is also the factor that has the most important influence on “Satisfaction” with a standardized regression coefficient up to 0.626. From there, it shows that, if you want to increase customer satisfaction and satisfaction when using ShopeePay, Shopee also needs to pay attention to the factor of the ease of use of this e-wallet.

In order to have a better overview of the influence of these factors, the research team conducted a performance-importance matrix analysis.

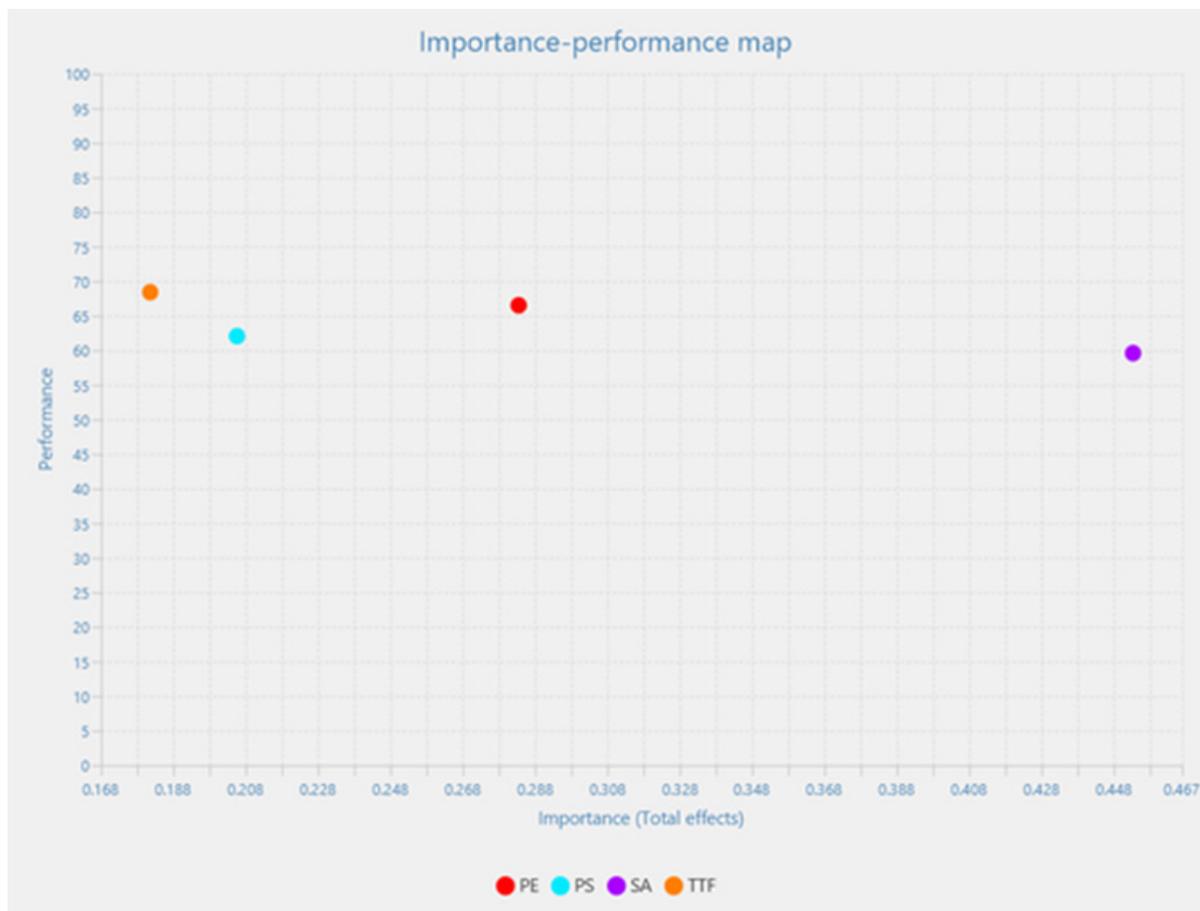


Figure 5. Importance - Performance Matrix

The IPMA matrix in image 4.2 has clearly shown that “Task - Technology Fit” and “Perceived ease of use” are both in the first corner, meaning that performance and the importance of both factors are high for intention to continue to use. “Perceived Security” is skewed towards the fourth corner of the matrix, indicating that the performance and importance of this variable are relatively low. In addition, “Satisfaction” is the only factor in the 3rd corner, which is also the part indicated for the variable that is of most interest - very high importance. In which, the total effect of the independent variable on the dependent variable (importance) is calculated from the total effect of the outcome variable in the SEM structural model, while the performance of the independent variable is obtained by varying the score ratios of latent variables range from 0 for the lowest to 100 for the highest (Rahi et al., 2018). Thereby, it shows that, although “Task - Technology Fit” and “Perceived ease of use” both bring the highest performance, for the priority consideration of solutions that increase the “Satisfaction” of customers. products are still more important to the business. Because the performance of this factor is still not high, it indicates that customers are really not satisfied with the current ShopeePay and this ewallet may continuously lose a large number of existing customers if there is no way to fix it.

4.3. What are the essential solutions that can contribute to promoting the continued use of ShopeePay e-wallet, minimizing the dropout rate of students in the National University area in particular and consumers aged 18-22 generally based on the highest impact factor found?

Through the research results, the authors propose some recommended solutions to increase the “Satisfaction” factor of customers for ShopeePay. For many different customer groups of different ages, genders and areas of activity, there will be different standards of satisfaction. Therefore, the following

proposed solutions are drawn by the research team from a number of causes, the main factor coming from customer dissatisfaction which leads to customers' discontinuation of ShopeePay.

- Firstly, Shopee can improve the user experience. This is also considered as one of the most important factors in increasing customer satisfaction in the process of using ShopeePay. This can be done by optimizing the interface using entertainment media such as video tutorials, images to advise and introduce users to new ShopeePay features or build a customer support system to help users solve problems quickly, and collect feedback from users so that the interface can be improved more optimally. Optimizing the ShopeePay interface not only improves the user experience, but also helps ShopeePay increase user attraction and narrow the competitive gap between e-wallets in the Vietnamese market. In addition, to increase the customer experience, Shopee also needs to pay attention to issues such as speeding up payments, increasing security, and simplifying the payment process. For the majority of users, the unpleasant experience with ShopeePay often arises during big promotions. At that time, they need a system with a fast enough transaction speed to proceed with the purchase of products with a limited number of offers. Although ShopeePay offers some useful features to simplify the payment process, there are still some missing features such as transferring money from other ShopeePay users, sending money via phone number instead of username, and the function of withdrawing money to the bank. In addition, the payment on ShopeePay team when experiencing network connection problems. This may cause the user to not be able to complete the payment and have to go through the checkout process again.

- Secondly, Shopee can provide many attractive offers and promotions because customers are often very interested in offers and promotions when using ShopeePay. Although Shopee already has a discount voucher for orders when using ShopeePay for the first time, it only makes them interested for the first time without necessarily maintaining the use process. The incentive programs that Shopee may consider such as: organizing reward points accumulation programs for users, these bonus points can be accumulated through regular transactions using ShopeePay and used to reward later. Or coordinate with its partners to create special promotions for ShopeePay users. For example, discounts for users who use ShopeePay to pay for car tickets, book flights, or book hotels on some ShopeePay partners, providing discounts and refunds for payments made. available through this e-wallet. These discounts or refunds can be applied to purchases, money transfers or topping up your ShopeePay account. Because, some customers also complain about ShopeePay's high transaction costs and fees compared to other payment services. High fees or charges may cause them to rethink using ShopeePay for payment transactions.

- Thirdly, providing good customer service is an important factor in keeping customers happy. ShopeePay users also complained about the slow processing speed for their transactions. This can lead to user transactions being slow or not being processed in a timely manner. Therefore, the customer support team should be fully equipped with ShopeePay knowledge to be able to answer customer inquiries quickly and accurately. Besides, ShopeePay should regularly listen to customer feedback to improve and develop its services.

- Fourthly, protecting customer information is very important in building trust with ShopeePay. Although ShopeePay has advanced security features such as information encryption and HTTPS protocol to ensure the security of users, there is still a risk that hackers can steal information related to users' cards. Therefore, Shopee needs to take some measures to enhance the security and ensure the safety of customers' information that will help increase their satisfaction, such as strengthening the encryption system for their user data. with stronger encryption methods such as AES-256 or RSA, making specific commitments and policies to increase reliability for users. In addition, ShopeePay should provide recommendations to secure users' mobile devices such as using password protection, not using public wifi to make payment transactions, and downloading apps from trusted sources. Educating users about security risks and how to

protect their personal information is also essential as it not only helps them feel safe when using ShopeePay, but it also helps reduce security risks for the ShopeePay system.

- Finally, customer dissatisfaction may come from the fact that the wallet is not popular in some countries. ShopeePay is only available in certain markets and countries. This makes paying with ShopeePay difficult to use in other countries. To overcome this, Shopee can work with international partners to provide payment services to users in different countries. Cooperation with well-known partners can also help ShopeePay quickly grow and quickly become more popular in many different countries. Moreover, the development of some features such as online money transfer between ShopeePay accounts will allow users to transfer money quickly and easily.

5. DISCUSSION

The research paper on the topic “Research on the factors affecting the decision to continue using ShopeePay among students of the National University of Ho Chi Minh City” gives important results on the study of the factors affecting the decision. intend to continue using ShopeePay by students of Vietnam National University, Ho Chi Minh City.

The study put forward three hypotheses to test in their study. They are: The suitability of technology positively affects ease of use (1), ease of use factor positively affects customer satisfaction (2), Satisfaction directly affects to consumers’ intention to continue using e-wallets (3), the security of ShopeePay has an influence on the decision to continue using (4). In total, this study collected 174 responses from college students, and the results show that customer satisfaction and security of confidentiality both influence students’ decisions to continue. use this service.

Compared with previous studies, the results of this study differed significantly. Research has found a new factor that directly affects users’ decisions, which is the “Perceived Security”. It focuses on discovering if users really trust ShopeePay to be safe for them. Moreover, a new finding was found when combining 2 research models including TTF and TCT, the results show that the appropriateness in technology application has an influence on customer satisfaction about ease of use of the payment platform. It means that consumers using the ShopeePay platform increase when technology functions meet user requirements, such as transaction speed during sales. The results of this study can help ShopeePay and other e-payment services to adjust their strategies to improve their convenience, security and reliability to attract more users. , especially university students.

However, the limitation of this study is that it only focused on a particular audience of university students, so the results may not apply to other user groups. Besides, the factor “Satisfaction” just stops at the basic level and has not been exploited deeply. Therefore, the following studies can be expanded to focus on ShopeePay usage behaviors, such as usage frequency, transaction amount, online purchase behavior of ShopeePay users and predict customer behavior, thereby evaluating service quality, thereby proposing solutions to improve the service quality of ShopeePay.

6. CONCLUSION

Regarding the research objectives, the study focuses on finding out the factors affecting the decision to continue using ShopeePay by consumers, which is the later stage of the conversion process - acceptance. The study of factors affecting the intention to continue using ShopeePay is very important in understanding and adjusting the usage behavior of ShopeePay users. In addition, the factors are evaluated and analyzed more deeply in terms of performance as well as the importance of the impact level. From there, providing essential solutions for businesses in the process of retaining consumers, accurately assessing and predicting customer needs and requirements in order to improve service quality,

and developing promotional policies. new promotions to attract customers, especially the 18-22 age group in the area of Vietnam National University, Ho Chi Minh City. Thereby, the research helps to compare the efficiency of Shopee's investment in ShopeePay, orienting strategies to make ShopeePay more popular and actively contributing to the growth of Shopee in particular as well as in the market. Vietnamese e-commerce in general.

To achieve the set objectives, the research team chose to use a combination of two research models including TCT model - Continuity of technology and TTF model - Appropriate technology. The combined application of the two models will help the research team more deeply assess the factors affecting the suitability of technology with the task and the continued use of technology by the user. It helps measure satisfaction and adoption of technology, identifying factors that influence technology use and continued use of ShopeePay. Combining these two models will provide a complete method for evaluating and predicting technology use behavior. In addition, according to Oliveira et al. (2014) effective technology will make electronic payment more attractive and useful, on the other hand, poor technology characteristics reduce users' intention to continue using. The analysis of the study also demonstrated the significant influence of the TTF model on the factors underpinning the TCT model. Specifically, "Task - Technology Fit" had an important influence on "Satisfaction" with a standardized regression coefficient of up to 0.401, thereby contributing to an indirect impact on real behavior of consumers.

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STUDY ON THE INFLUENCE OF BRAND VALUE ON LOCAL BRAND CLOTHING SHOPPING BEHAVIOR OF HANOI STUDENTS

Authors: Tran Thi Hong Van (K56C2)¹, Nguyen Thi Minh Thu (K56T1)¹,
Nguyen Thi Trang (K56C2)¹, Vu Thi Huyen Trang (K56C3)¹, Van Thi Hoa (K56T2)¹
Facilitator: Dr. Nguyen Thi Thanh Nhan

ABSTRACT: *The current generation of young people is excited about new brand experiences along with innovative and unique products. Therefore, the appearance of Local Brand received a warm welcome because of its good product quality, beautiful designs, reasonable prices and gradually became one of the top choices of young people. The research has found 5 factors of brand equity that have strong impact on Local Brand clothing purchase behavior, which are: Brand association, Brand loyalty, Brand trust, Perceived Quality and Brand Awareness. In which, the brand association factor has the strongest impact on the buying behavior of Local Brand clothing products of Hanoi students.*

Keywords: *Brand value, buying behavior, Local Brand, clothing, students*

1. INTRODUCTION

1.1. Rationale

Human life is increasingly improved and enhanced, therefore, consumer demand is also developing more and more. One of the increasingly demanding areas of human beings is the fashion market. In just a short time, a series of world-famous fashion brands such as Stradivarius, Massimo Dutti, Hennes & Mauritz (H&M) ... has landed in the Vietnamese market. The emergence of foreign fashion industry “giants” not only meets the increasing shopping demand of consumers, but also creates fierce competition in the domestic fashion market.

Local Brands - domestic clothing brands are also having a significant influence on young people. Local Brand has been around for a long time, but the concept of “Local Brand” is still not widely popular with consumers. However, with the explosion of streetwear style among young people, Local Brand gets more attention. Especially today, Local Brand clothes are being favored by young people because of their unique designs with their own style in line with the trends of today’s youth. Therefore, a series of domestic branded chain stores were born. Local Brands Vietnam has launched eye-catching fashion lines, especially clothes with new and eye-catching designs. The appearance of these products has quickly attracted the trust and interest of customers. This product line has increased the demand for use, responding to the movement of “Vietnamese people use Vietnamese goods” of the young generation, thereby improving the competitiveness of Vietnamese products. In addition, the role of brand value factors also plays an important part and is becoming more and more clear. However, not all Local Brands build successful brands for themselves.

Therefore, in order to determine the influence of brand value factors on the shopping behavior of consumers, specifically Hanoi students, the authors decided to choose the topic: “Study on the influence of brand value on the shopping behavior of Local Brand clothing products of Hanoi students”. Through research, the team saw the influence of brand value factors on the shopping behavior of Local Brand clothing products of Ha Hoi students, thereby offering measures and development directions for Local Brands in the future.

¹ Thuongmai University

1.2. Research questions

- What is brand value?
- What are the elements of brand value?
- What are the factors of value that influence local brand buying behavior?
- The influence of brand value factors on the shopping behavior of Local Brand clothing products of Hanoi students.
- What are the solutions to help local brand businesses better meet the needs of customers and improve business efficiency?

1.3. Object of study

Customers within the scope of the research topic are identified as Hanoi students. The product in question is Local Brand clothing.

1.4. Scop of study

- Spatial scope: The topic is researched with students in Hanoi.
- Time range: From October 14, 2022 to January 18, 2023.

2. LITERATURE REVIEW

Brand value is a collection of all the unique values that the brand brings to stakeholders (customers, employees, shareholders, community ...). These values will be added to the product or service to add value to the people involved. The elements that constitute brand value are connected to the logo, logo of the company or product. What makes up brand value can vary from case to case. The most common brand value will have 4 main factors: brand loyalty; brand awareness; perceived quality; brand associations; and other ownership factors such as brand protection, relations with distribution channels... (Aaker, 1991).

The study of buying behavior, according to Philip Kotler (2001), who studies the buying behavior of customers with the aim of identifying their needs, preferences, and habits. Specifically, see what customers want to buy, why they buy that product or service, why they buy that brand, how they buy, where to buy, when to buy and how much to buy to build a marketing strategy to motivate customers to choose products, its services. Customers' buying behavior is influenced by external stimuli and internal psychological processes that take place through the process of deciding on the choice of goods and services. This process consists of stages: recognizing needs, seeking information, evaluating options, buying decisions, and post-purchase behavior. In which the buying decision is considered the result of the customer's product buying behavior, this study refers to the customer's buying behavior as the customer's decision to buy the product.

All in all, measuring the influence of brand value on customer buying behavior is extremely important in evaluating the value of a brand. For research purposes, the authors have based on 5 constituent factors to measure brand value: Brand Association, Brand Loyalty, Brand Trust, Perceived Quality and Brand Awareness.

3. RESEARCH MODELS AND RESEARCH HYPOTHESES

Based on theoretical and practical knowledge of research related to the influence of brand value on the buying behavior of consumers in different fields and categories, by domestic and foreign authors, the authors propose the following research model: (Figure 1)

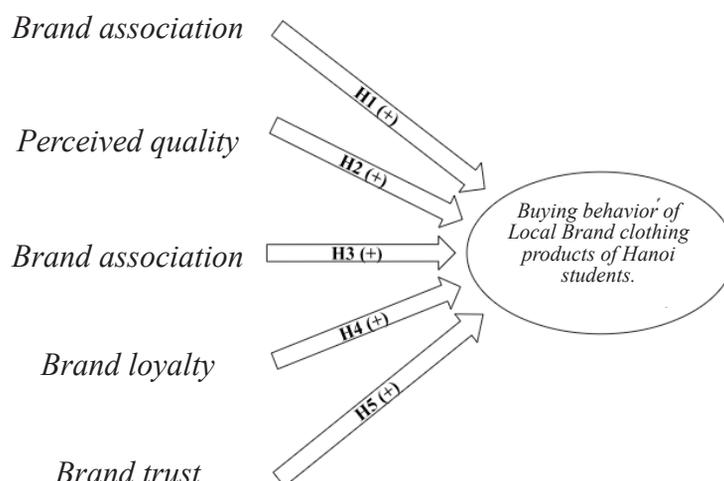


Figure 1: Proposed research model

[Source: Authors]

From the research model, the authors have the following research hypotheses:

Hypothesis H1: Brand awareness positively affects the buying behavior of Local Brand clothing products of Hanoi students.

Hypothesis H2: Perceived quality positively affects the buying behavior of Local Brand clothing products of Hanoi students.

Hypothesis H3: Brand association positively affects the behavior of Hanoi students buying Local Brand clothing products.

Hypothesis H4: Brand loyalty positively affects the behavior of Hanoi students to buy Local Brand clothing products.

Hypothesis H5: Brand trust positively influences Local Brand clothing buying behavior of Hanoi students.

4. METHODS

4.1. Research methods

4.1.1. Secondary data collection and processing methods

Secondary data collection methods

The authors apply the desk search method to collect secondary data from research topics related to the group's topic between 2013 and 2022 as well as documents and textbooks of famous authors such as Philip Kotler, Solomon... Secondary data is collected in two forms: paper documents and Internet-based digital documents. For paper documents, the research team mainly reads from the national library, while the digitized documents, the research team collects mainly from portals, websites of research institutions, government-affiliated organizations and trade book magazines such as BeanSurvey, iPanel Vietnam...

❖ Secondary data processing methods

The authors apply methods of comparison, contrast, and synthesis of secondary data from which the group draws experience and references to build their linear structure model on “Influence of brand value on Local Brand clothing shopping behavior of Hanoi students”.

4.1.2. Primary data collection and processing methods

❖ Primary data collection methods

In order to collect the amount of information that can represent students in Hanoi, the authors collected information in large quantities and spread evenly across many universities in Hanoi. To accomplish this, the team used primary data collection methods such as the following:

- In-depth interview method to detect, adjust and add the influence of brand value on Local Brand clothing shopping behavior of Hanoi students. The authors conducted interviews with 05 students of Thuongmai University.

- After an in-depth interview, the authors conducted an official survey using a questionnaire on the Likert scale of 5 levels with a scale of 404 questionnaires through the form of online surveys. This survey was conducted from October 14, 2022, to January 18, 2023, with the respondents being students in Hanoi, the tool used was Google Forms and posted it on student support pages of universities in Hanoi.

❖ Primary data processing methods

To process the collected primary data, the authors use Excel application for statistics and SPSS 26.0 software for analysis.

The data processing methods used by the authors are: Descriptive Statistical Analysis, Scale Reliability Validation Analysis, Factor Discovery Analysis, Linear Regression Analysis. In addition, other research methods are also used such as: Analysis, comparison, contrast, synthesis ...

4.2. Sampling Technique, Instrument and Data Collection

The authors selected the study sample according to the quantitative “snowball sampling” sampling method. The authors group sent survey links to suitable and random subjects, specifically students in Hanoi, then asked people to share the link on forums, groups, or friends, until they reach the number of votes that the research team wants, then stop. As of June 2022, Hanoi also has 120 universities and colleges under ministries and branches with nearly 1 million students. According to the research of Hair et al. (1998), according to the judgment of Hoang Trong and Chu Nguyen Mong Ngoc (2008) from the study of Bollen (1989), the sample size must be at least 5 times the number of variables in factor analysis. For this paper, the team used 28 observational variables, so the minimum estimated sample size is $N = 28 \times 5 = 140$. In this topic, the research team has approached 404 subjects who are students in Hanoi. Thus, the sample size is suitable and gives feasible results.

5. RESULTS

Of the 404 respondents, the number of female students was 316 (78.2%) higher than the number of male students (21.8%). The highest percentage of third-year students answered at 222 (55%) and fourth-year students responded at least 41 (10.1%). The freshmen and sophomores who responded to the survey were 141 (39.9%).

To test the hypothesis of the proposed research model. First, the team analyzed the reliability of the collected data. Since there is an NT5 variable with a total variable correlation coefficient less than 0.3, we must test it for the 2nd time. The results obtained after the inspection are as shown in Table 1 below:

Table 1: Variables reliability test results and descriptive statistics

No.	Variables	Cronbach's Alpha coefficient	Variable constituents	Correlations
1	Brand awareness	0.859	NT1	0.724
			NT2	0.726
			NT3	0.671
			NT4	0.694
2	Perceived quality	0.921	CL1	0.769
			CL2	0.744
			CL3	0.777
			CL4	0.757
			CL5	0.749
			CL6	0.719
			CL7	0.734
3	Brand association	0.930	LT1	0.824
			LT2	0.779
			LT3	0.789
			LT4	0.725
			LT5	0.819
			LT6	0.837
4	Brand loyalty	0.870	TT1	0.749
			TT2	0.692
			TT3	0.723
			TT4	0.745
5	Brand Trust	0.917	NIT1	0.842
			NIT2	0.815
			NIT3	0.843
6	Buying behavior	0.879	HV1	0.743
			HV2	0.714
			HV3	0.747
			HV4	0.750

Second, the team conducted a discovery factor analysis (EFA). To determine the appropriateness of factor analysis one should perform a KMO and Bartlett's test. The KMO coefficient = 0.934 > 0.5 is significant factor analysis integrated with the study data, with a significance level of Sig = 0.000, so factor analysis is consistent with the data collected. These factors are interrelated and conditionally satisfy the EFA exploratory analysis. We obtain the table of rotation matrix results as follows:

Table 2: Results of the rotation matrix

Rotated Component Matrix ^a					
	Component				
	1	2	3	4	5
CL1	.811				
CL3	.787				

CL2	.784				
CL4	.779				
CL5	.750				
CL7	.734				
CL6	.720				
LT6		.842			
LT5		.823			
LT1		.822			
LT2		.803			
LT3		.790			
LT4		.777			
TT3			.795		
TT4			.756		
TT2			.749		
TT1			.735		
NT2				.811	
NT1				.755	
NT4				.729	
NT3				.709	
NIT1					.853
NIT2					.847
NIT3					.841
Extraction Method: Principal Component Analysis.					
Rotation Method: Varimax with Kaiser Normalization. ^a					
a. Rotation converged in 6 iterations.					

[Source: Data analysis results on SPSS software]

The results of EFA exploratory analysis show that 24 observed variables are grouped into five factors, all of which have a Factor Loading factor greater than 0.5.

Third, the correlation coefficient analysis has shown that all 5 independent variables are correlated with the dependent variable “Buy behavior” due to having a coefficient of p-value = 0.00.

Table 3. Results of the Pearson correlation coefficient analysis

Correlations							
		HV	H1	H2	H3	H4	H5
HV	Pearson Correlation	1	.501**	.502**	.629**	.546**	.485**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	335	335	335	335	335	335
H1	Pearson Correlation	.501**	1	.527**	.454**	.542**	.453**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	335	335	335	335	335	335
H2	Pearson Correlation	.502**	.527**	1	.467**	.499**	.442**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	335	335	335	335	335	335

H3	Pearson Correlation	.629**	.454**	.467**	1	.473**	.423**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	335	335	335	335	335	335
H4	Pearson Correlation	.546**	.542**	.499**	.473**	1	.498**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	335	335	335	335	335	335
H5	Pearson Correlation	.485**	.453**	.442**	.423**	.498**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	335	335	335	335	335	335

[Source: Data analysis results on SPSS software]

Fourth, on the analysis to determine the degree of impact of 5 independent variables on the dependent variable. The first is the model suitability analysis, Table 4 has summarized the model analysis indicating a correction R2 factor of 0.51. That is, 51% of the variation of the dependent variable “Behavior” is explained by 5 independent variables.

Table 4. Results of regression analysis (model summary)

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.719 ^a	.518	.510	.65844	1.939
a. Predictors: (Constant), H5, H3, H1, H2, H4					
b. Dependent Variable: HV					
[Source: Data analysis results on SPSS software]					

Table 5 shows the results of the analysis of the overall suitability of the model. The result in the table shows the value $F = 70.616$ with $sig = 0.000$. This demonstrates that the constructed linear regression model is consistent with the collected dataset, all of the included variables are statistically significant. Thus, the independent variables in the model are related to the dependent variable “Buy behavior”.

Table 5: ANOVA table of linear regression analysis

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153.075	5	30.615	70.616	.000 ^b
	Residual	142.635	329	.434		
	Total	295.710	334			
a. Dependent Variable: HV						
b. Predictors: (Constant), H5, H3, H1, H2, H4						

[Source: Data analysis results on SPSS software]

Fifth, the results of regression analysis of the impact of independent variables on the buying behavior of Hanoi students in table 6 showed that all regression coefficients were significant measuring sig. significance less than 0.05 and there was no linear multi-additive phenomenon between variables because the VIF values of the variables were less than 2.

Table 6: Results of regression analysis

Coefficients ^a								
Model	B	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Std. Error	Beta				Tolerance	VIF
1	(Constant)	-.080	.216		-.373	.710		
	H1	.132	.062	.107	2.129	.034	.585	1.708
	H2	.134	.056	.117	2.386	.018	.609	1.643
	H3	.409	.050	.385	8.203	.000	.667	1.500
	H4	.204	.057	.182	3.597	.000	.572	1.747
	H5	.117	.042	.132	2.807	.005	.663	1.507

a. Dependent Variable: HV

[Source: Data analysis results on SPSS software]

The regression coefficients of H1, H2, H3, H4, H5 all bear positive marks, proving that all variables have a positive influence on the buying behavior of Hanoi students.

From the table of results we have the regression equation as follows:

$$HV = 0.385 * H3 + 0.182 * H4 + 0.132 * H5 + 0.117 * H2 + 0.107 * H1$$

Based on the table we see that the dependent variable is a normal, non-infringing distribution (standard deviation = 0.992 is close to 1). Therefore, the normal distribution hypothesis is not violated at all, suitable for running the regression model.

Such is through Cronbach Alpha reliability determination, EFA analysis for independent variables and regression variables. The model is separated into 5 factor variables that affect a dependent variable. From here, the team came up with the following new hypothesis:

Hypothesis 1: Brand awareness positively impacts Local Brand clothing buying behavior of Hanoi students

Hypothesis 2: perceived quality positively impacts Local Brand clothing buying behavior of Hanoi students.

Hypothesis 3: Brand association positively impacts the behavior of Hanoi students buying local brand clothing products.

Hypothesis 4: Brand loyalty positively impacts Local Brand clothing buying behavior of Hanoi students.

Hypothesis 5: Brand trust positively impacts Local Brand clothing buying behavior of Hanoi students.

Thus, in this study, the factors and dimensions affecting the buying behavior of Local Brand clothing products of Hanoi students gradually decreased in the following order: (1) Brand association, (2) Brand loyalty, (3) Brand trust, (4) perceived quality, (5) Brand awareness (these factors all affect in the same direction). The results of the study are exactly as five assumptions (from H1 to H5) have set out about the dimension of impact of factors. Regarding the magnitude of impact and comparison of research results shown in Table 6.

6. SOLUTIONS AND RECOMMENDATIONS THROUGH "RESEARCH ON THE INFLUENCE OF BRAND VALUE ON LOCAL BRAND CLOTHING SHOPPING BEHAVIOR OF HANOI STUDENTS"

- Brand awareness: Increase brand exposure by investing in marketing and advertising to reach out to potential customers. Make use of relevant communication platforms such as social media, websites, and online and offline advertising. And plan events that increase brand exposure and interaction.

- Perceived quality: Improving product quality ensures that they meet expectations and give the best user experience. Furthermore, it is vital to provide care, support, and respond swiftly, efficiently, and effectively before, during, and after the transaction.

- Brand association: Increase marketing actions to create the most favorable and profound brand image in the minds of customers, such as strongly promoting the values and benefits of Local Brand products. Furthermore, in order to gain the support of the consumer community, Local Brand must prioritize environmental conservation.

- Brand Loyalty: provide unique policies and promotions for loyal customers, provide exceptional customer care services, provide a pleasant shopping experience, and swiftly and efficiently address client needs.

- Brand trust: Increase on-time delivery and customer satisfaction by providing accurate and transparent information about the product's origin, manufacturing process, and quality.

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INFLUENCER MARKETING IN BEAUTY INDUSTRY: A RESEARCH OF ARGUMENT QUALITY

**Authors: Nguyen Quynh Mai¹, Dang Thuy Linh², Dinh Thi Trang Nhung²,
Dong Ngoc Khanh², Vu Duy Phong²**

ABSTRACT: Digital transformation has innovated marketing strategies. One of the sectors that use influencer marketing most frequently is the beauty industry. Based on the S-O-R model, this study clarifies the impact of argument quality on the purchase intention of Generation Z consumers in the beauty industry. The survey obtained 393 responses; based on Cronbach's Alpha test, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural model analysis (SEM), the results show that argument quality has a direct impact on purchase intention, and message process involvement play a role as a mediator between argument quality and purchase intention. From the research results, the authors propose solutions to improve the effectiveness of influencer marketing.

Keywords: argument quality, influencer marketing, message process involvement, beauty industry, purchase intention.

1. INTRODUCTION

Digital transformation has led to changes in traditional marketing from traditional media tools (such as radio, movies, television, etc) to digital platforms. With the rise of social media and other digital platforms, influencers are now able to approach audiences that were previously out of reach for many brands. One of the key benefits of influencer marketing in the digital transformation era is its ability to help brands engage with customers in a more personal and authentic way. Digital technologies, in contrast to traditional media platforms, enable a more interactive and real-time communication by offering a greater amount of information, which has improved interaction between brands and consumers (KALAN, Özlem, 2020). Social networks and the Internet have been a part of Generation Z's life since infancy. 44% of Gen Z buyers, according to Kantar (2020), base their purchases on recommendations from influencers. Since Gen Z consumers are becoming more conscious of their appearance (Francis và Hoefel, 2018), brands in the beauty industry frequently employ influencer marketing to connect with this audience.

Previously, businesses had to spend “extreme” costs for companies providing advertising services, or using traditional and expensive marketing methods that might not achieve the desired effect. Thanks to social networks, they were able to choose a new marketing method: influencer marketing. According to research by Zrinka, Ekaterina and Dominik (2019), influencer marketing is most effective and best applied for businesses providing products and services in the following industries: cosmetics and skin care, fashion, nutrition and health, travel, lifestyle, etc.

Regarding the research gap, in terms of industry, a number of research papers on influencer marketing in the world have focused on the beauty industry (Torres et al., 2019; Schouten et al., 2020; Ladhari et al., 2020). In Vietnam, research papers on influencer marketing in general and influencer marketing in the beauty industry in particular are still limited. At the same time, studies have not yet provided a research framework that focuses on the content that the influencer created and uploaded on social media. Regarding the research object of previous studies on influencer marketing in the beauty

¹ Foreign Trade University; Email: k59.2014150224@ftu.edu.vn

² Foreign Trade University

industry in Vietnam, there is no research paper focusing on Generation Z. In reality, generation Z was born in the explosion of social networks, where they could post their personal images before “public scrutiny”, so they valued their own appearance and from there sought out beauty products (Francis et al. Hoefel, 2018).

Therefore, the authors decided to conduct a research on the argument quality of influencers in Vietnam, focusing on the beauty industry with the research object being Generation Z. We utilized the S-O-R (stimulus-organism-response) model to examine the effect of argument quality on consumers’ purchase intentions. In our model, argument quality was examined from two more in-depth perspectives: “perceived informativeness” and “perceived persuasiveness”. The relationship between the two facets of argument quality will then be looked at, and investigated if it may be used to predict customers’ purchase intention. Additionally, whether message process involvement plays the role of a moderator or a mediator in the connection between the argument quality and customer’s purchase intention will also be covered. This study is going to answer two research questions:

- How does argument quality impact purchase intention?
- What is the role of message process involvement in the relationship between argument quality and purchase intention?

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Beauty industry

A wide range of goods and services linked to enhancing and maintaining one’s outer look and health (such as: cosmetics, skin care, hair care, nail care, body care, oral care, and other products) are included in the beauty industry. Cosmetics like lipstick, eyeshadow, lotions, body washes, etc. are among the products in the market that are frequently produced from either chemical or natural ingredients, or a combination of the two. Other products include those designed to assist cleansing, moisturizing, protecting, and enhancing the appearance of skin, hair, and nails. Currently, the beauty industry is also experiencing great development due to the growth of the manufacturing industry and the increasing interest of consumers in health, appearance and skin care.

According to data from Statista (2023), Vietnam has the largest retail size in Southeast Asia, reaching nearly 17 billion USD, nearly 2 times higher than the second ranked Philippines, and about 12 times higher than Laos. Insight Handbook (2019) by Kantar Worldpanel, the most popular products in the Vietnamese beauty market are skin care products with average spending on this product increasing.

According to Wen et al. (2009), beauty products are experiential goods. Experiential goods are goods that need to be consumed directly in order to fully appreciate their use. Because beauty products themselves contain many substances that have a direct effect on health, buyers tend to be concerned about the ingredients and uses of each ingredient in the product. In addition, because the characteristics of each person’s skin type and skin problem are different, their needs are also different. A buyer must be convinced beyond a reasonable judgment that the product will be helpful to them in overcoming their problems before they will purchase it (Sung, I., 2021). Therefore, influencer marketing is an effective way to reach consumers in beauty industry as influencers are considered to be an endorser as well as a consumer, who promotes a product based on their real experience (Paço & Oliveira, 2017)

2.2. Influencer marketing in beauty industry

“A social media influencer is a content creator: a person with expertise in a particular field, who has a following and has marketing value for a brand through content production on social media channels” (Lou & Yuan, 2019).

Influencer marketing is a marketing strategy that uses the influence of famous individuals or public opinion leaders to change consumer attitudes towards brands and products (Brown & Hayes, 2008; Scott, 2015). This marketing strategy has become a method for brands to reach and persuade customers (Barta et al., 2023). Influencer marketing delivers 11 times more net return on investment (ROI) than traditional advertising (Ahmad 2018). According to ExpertVoice (2015), 82% of consumers rated that they would trust and buy cosmetic products recommended by an influencer rather than directly advertised by a manufacturer. Therefore, influencer marketing is a commonly used marketing strategy in the beauty industry. According to research by Dogra, K. (2019), younger generations (Generation Z and Generation Y) tend to be more impacted by the usage of influencer marketing in the beauty industry than those who only encountered traditional marketing.

2.3. Stimulus-Organism-Response model

The Stimulus-Organism-Response (S-O-R) model is a rigorous theoretical framework that has been studied and applied to study customer behavior. Mehrabian & Russell (1974) built the S-O-R model describing how stimuli (input) - such as extrinsic variables - that will have an impact on the organism (process) like human intellect and emotions - are related to responses (output) - like behavior - from those organisms. A stimulus (S) is an outside element connected to the environment. Eroglu et al. (2003) defined organisms (O) as those that react to stimuli, such as sensations, feelings, and emotions. According to Buxbaum (2016), a person's action and reaction to the organism is referred to as their “response” (R). Humans have been added to the stimulus-organism-response (SOR) model as organisms that produce emotional and psychological components in addition to moods, feelings, or attitudes. to a stimulus (Zhai et al., 2020).

In the process of studying influencer marketing researches, in terms of theoretical models, we found that there have been many studies using stimulus-subject-response (S-O-R) model to examine the way consumers' purchase intention can be influenced by different factors, including information and source characteristics (Breves et al., 2019; Casalo et al., 2021; Liu, C., Bao, Z., & Zheng, C., 2019; Zhou et al., 2021). This proves the suitability of S-O-R to the research in the field of influencer marketing. In the context of this research, argument quality is viewed as a stimulus, message process involvement is the main organism and purchase intention is the response.

2.4. Argument quality

Argument quality is an element of content and a major factor in media and advertising persuasive research. According to H. Zhang et al. (2014) and Zhou et al. (2017), argument quality includes both perceived persuasiveness, which means “the rigor and rationality of the argument” (Eagly & Chaiken, 1993) and perceived informativeness, which means the viewer's perception of the content's capacity to deliver information about goods and services (Zhang et al., 2014). Liu et al. (2019), who used the S-O-R model to examine user-generated content in social commerce, demonstrated that argument quality can stimulate information processing, which plays the role of stimuli in the S-O-R model.

Advertising communications with strong arguments are more able to persuade consumers to make a purchase. According to research by Petty et al. (1983); Petty and Cacioppo (1984), messages with coherent, understandable and objective arguments help change consumer attitudes more effectively than messages without rationality, emotion and style in a subjective way. Research by Lee, S.-H. (2009) also showed that influencer argument quality has a positive impact on online purchase intention. Consequently, the hypothesis formulated:

H1: Argument quality has a direct and positive impact on purchase intention.

2.5. Message process involvement

The degree of information processing is an important factor in improving the effectiveness of advertising (Muehling et al., 1991). According to Baker & Lutz (2000), the message process involvement is the user's willingness or motivation to process information when exposed to a stimulus, including two cognitive and emotional aspects. Cognitive information processing represents a willingness to exert effort over an extended period of time to understand a complex topic or skill (Vivek et al., 2012; Algharabat, 2018; Patterson et al., 2006); Brodie et al., 2011, 2013), is the degree of attachment to information (Hollebeek, 2011) and the acquisition of information (Patterson et al., 2006). Emotion is a customer's positive attitude toward experiencing a brand, platform, or contact with an influencer (Fredricks et al., 2004; Mollen & Wilson, 2010; Algharabat & Rana, 2020). A high level of willingness to process information contributes to the formation of consumer attitudes (Fernando et al., 2016; Greenwald & Leavitt, 1984).

Many studies also recognize the moderating effect of message process involvement on the relationship between argument quality and consumer attitudes. Specifically, with a higher message involvement, the influence of argument quality on consumers' attitudes is greater (Petty et al., (1981); Coulter et al. 2004). An argument-based content requires cognitive effort, so it is presumably the most effective when the personal involvement is high. When an issue is not as important to the recipient personally, they may be more driven by a desire to avoid processing the information cognitively and consequently, the effect of argument quality in this case is lower (McGuire, 1969). A person is more likely to have thought deeply about a topic and have a vast structure of prior knowledge that can be helpful in evaluating new information if it has significant personal implications. As a result, someone may find it simpler to assess the cogency of an argument on a topic with high engagement than one with low involvement (Petty et al., 1981).

H2: The impact of argument quality on purchase intention is stronger when message process involvement is higher.

Magno, F. (2017) when studying the influence of bloggers in the field of cultural products, found that argument quality has a positive impact on buyer's engagement with blogger and information they provide. Engagement emphasizes the interactive character of the relationship between a person and an item, such as the blog, and goes beyond simple involvement (Brodie et al., 2013; Shankar & Batra, 2009). Recipients' perception that bloggers provide them with reliable information creates blog attachment (Tsai & Men, 2013). Based on information provided by bloggers, consumers can choose more efficient behaviors (Babin, Darden, & Griffin, 1994). This is because cultural products require consumers to gather reliable, high-quality information to reduce risk and uncertainty before making a purchase (Kaldis, Boccorh, & Buhalis, 2003; Zehrer, Crotts, & Magnini, 2011; Zafiroopoulos, 2012). Similarly, in our research, since beauty products' efficiency often varies among people due to their differences in skin type and condition, the buyer wants to reduce risk and uncertainty before making a purchase by looking into the argument quality.

H3: Message process involvement mediates the impact of argument quality on purchase intention.

2.6. Purchase intention

Purchase intention, as opposed to the desire to buy, is regarded by Bagozzi & Burnkrant (1979) as the consumer's subjective tendency to pay for particular goods or services. In our study, purchase intention is an individual's conscious plan to purchase a certain product (Spears and Singh, 2004) and is a dependent

variable describing consumer evaluation on whether they will consider purchasing a product that is available and advertised by the influencer in the near future (MacKenzie and Lutz 1989). Purchasing intention is frequently seen as a key factor in the ability to anticipate buying behavior (Ghosh, 1990; Reynolds and Wells, 1977).

Trivedi, J. P. (2018) when studying the impacts of influencers in the fashion industry on Gen Y suggested that purchase intention was significantly influenced by message process involvement. According to Greenwald and Leavitt (1984), message process involvement has a positive impact on brand attitudes, which had a significant impact on purchase intention as suggested by Ajzen, and Fishbein (1980). Consequently, the hypothesis formulated:

H4: Message process involvement has a positive impact on purchase intention

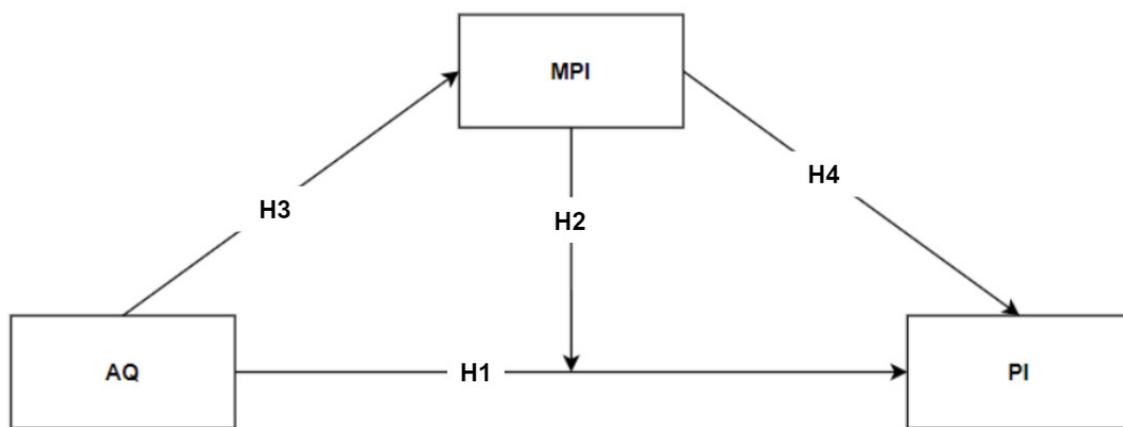


Figure 1. Proposed Research Model

3. RESEARCH METHOD AND DATA COLLECTION

3.1. Measurement development

To validate the proposed research model, the group conducted a survey using a questionnaire. The observed variables were all measured by applying a 5-point Likert scale, ranging from level 1 - completely disagree to level 5 - strongly agree. The research group constructed the scale by selecting, referencing, and relying on scales from previous studies related to the survey content.

Denotation	Scale	References
AQ	Argument Quality	
AQ1	The influencer’s content provides information related to the product.	Chao Liu, Zheshi Bao, Chuiyong Zheng (2019)
AQ2	The influencer’s content provides complete information about the product.	
AQ3	Influencer content provides timely information about the product.	
AQ4	The influencer’s content is convincing.	Chao Liu, Zheshi Bao, Chuiyong Zheng (2019)
AQ5	The influencer’s content is persuasive enough for me to make a purchase.	
AQ6	Influencer content provides solid and coherent information.	
MPI	Message process involvement	

MPI1	I'm involved in topics covered in influencer content.	Cindy, Sia, Kuan 2012
MPI2	I think it's important to get informed from influencer content.	
MPI3	I'm interested in the topics covered in influencer content.	
PI	Purchase intention	
PI1	I intend to make a purchase advertised by the influencer.	Dodds, Monreo & Grewal (1991)
PI2	It is likely that I will purchase the product advertised by the influencer.	
PI3	I am willing to buy the product advertised by the influencer.	

3.2. Data collection

The research group utilized both primary and secondary information sources simultaneously to analyze and make predictions about the factors influencing consumer purchasing intention. Secondary data was compiled from available studies for overview and preliminary research. Then, the authors compared and cross-checked the research results.

The data was collected through direct and online survey forms. Online survey forms were sent to the study participants through online tools such as email, social media (Facebook, Zalo, forums, etc.). The research group then completed the data survey to conduct formal research.

3.3. Data analysis

After conducting the survey to collect answers, STATA software version 17 was used by the authors to analyze the data. Actions include: sample descriptive statistics, reliability scale testing by cronbach's alpha and exploratory factor analysis EFA. In addition, the authors also used STATA to conduct linear regression models SEM and confirmatory factor analysis CFA.

4. RESULT

4.1. Descriptive Statistics

This study was conducted on social media to survey consumers' opinions on influencers. The total number of responses was 429, of which 393 were valid. Female participants contributed more to the survey with 319 out of 393 responses. Among respondents, undergraduate students, newly employed individuals (1997-2004), and high school students (2005-2011) had the highest participation rates with proportions of 49% and 48%, respectively. Therefore, the selected samples could represent our research object of generation Z, who were born from the mid-1990s to mid-2010s. The social media platform most commonly used to approach influencers' content was found to be Facebook and TikTok (41% and 32%), followed by YouTube, Instagram, and other platforms, accounting for 16%, 10%, and 1%, respectively.

Variable	Categories	Sample (n=393)	Percentage (%)
Gender	Female	319	81.17%
	Male	72	18.33%
	Others	2	0.5%
Age	Below 18 years old	192	48.86%
	From 18-26 years old	191	48.6%
	Above 26 years old	10	2.54%
Expenditure	Below 500 thousand VND	253	64.38%
	From 500 thousand VND - 1 million VND	104	26.46%
	Above 1 million VND	36	9.16%

Social media platforms commonly used to follow influencer content	Facebook	163	41.48%
	Tiktok	124	31.55%
	Youtube	61	15.52%
	Instagram	41	10.43%
	Others	4	1.02%
Purchase history for influencer-recommended beauty products	Already made a purchase	291	74.05%
	Never made a purchase	102	25.95%

4.2. Scale reliability testing

The first step in validating a scale is to analyze the reliability using Cronbach’s alpha. Looking at Table 1, the Cronbach’s alpha coefficient for the variables ranges from 0.8384 to 0.8779. The Cronbach’s alpha coefficient decreases when any variable is removed. The total variable correlation coefficient is greater than 0.5 and ranges from 0.7444 to 0.9146. Therefore, the authors conclude that the scale is reliable enough to be used in the next analysis.

After that, authors used exploratory factor analysis (EFA) to assess the convergent validity of the observed variables. The authors performed the analysis with two groups of independent and dependent variables. The results of the analysis show that all requirements are met: $0.5 < KMO < 1$, the factor loading coefficient is greater than 0.5, and the percentage of total variance extracted is greater than 50%.

Table 1. Scale reliability testing

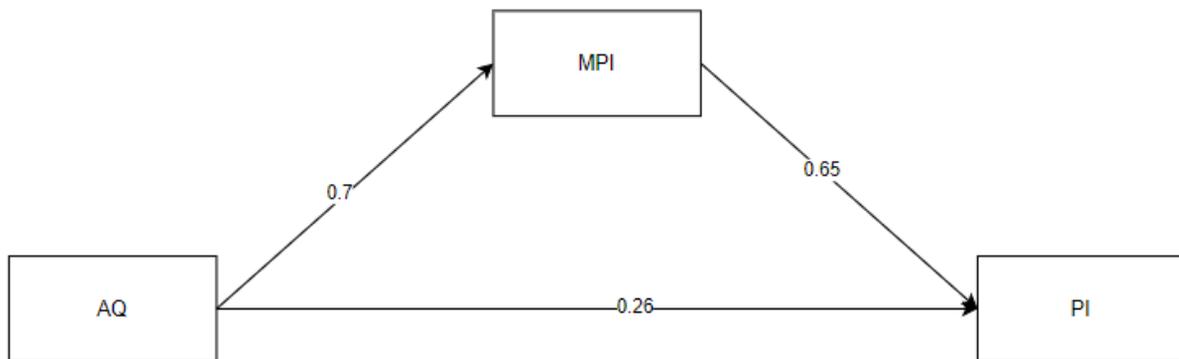
Variables	Items	Cronbach’s alpha	Mean value
Argument Quality	AQ1	0.8654	3.667
	AQ2		3.417
	AQ3		3.544
	AQ4		3.527
	AQ5		3.366
	AQ6		3.366
Message process involvement	MPI1	0.8779	3.443
	MPI2		3.443
	MP3		3.478
Purchase intention	PI1	0.8384	3.145
	PI2		3.532
	PI3		2.865

Based on the results summarized from Stata to evaluate the model’s fit, $CMIN/df=2.996 (<5)$, comparative fit index (CFI)=0.966 (>0.9), root mean square error of approximation (RMSEA)=0.078 (<0.08), standardized root mean square residual (SRMR)=0.039 (<0.08), and Tucker-Lewis index (TLI)=0.953 (>0.9). Therefore, it can be concluded that the model is suitable for the data and is of good quality.

Finally, the authors evaluated the quality of the observed variables. The estimated coefficients were all different from 1 and greater than 0.5, with a p-value less than 0.05, indicating that the observed variables are all distinguishable.

4.3. Structural Equation Modeling

The authors analyzed the SEM structure model for a model without a moderator variable. The results showed that the standardized regression coefficients of the research hypotheses were positive and the p-values were 0.00, indicating that AQ positively impacted both MPI and PI, and that MPI also had a positive impact on PI. The R-squared analysis indicated that PI was explained by 74% and MPI was explained by 52.5%.



The authors then used medsem to evaluate the indirect and direct effects of MPI, as well as to test the mediating effect of MPI. Both Baron and Kenny’s method and Zhao, Lynch and Chen’s method indicated that AQ had both direct and indirect effects on PI via MPI. The results showed that RIT was 0.634, RID was 1.734, indicating that the indirect effect of AQ via MPI accounted for 63.4% of the total effect on PI and was 1.734 times the direct effect.

To verify the hypothesis regarding the moderating role of MPI, the authors added the variable INT (AQ X MPI) and performed SEM analysis. The results showed that the impact of INT on PI was positive with a p-value of 0.665. This meant that INT did not have statistical significance when analyzing the impact on PI. Therefore, MPI did not moderate the relationship between AQ and PI.

The indices for SEM analysis for both models met the criteria: CMIN/df < 5, RMSEA < 0.08, CFI > 0.9, SRMR < 0.08, TLI > 0.9. Therefore, it can be concluded that the models fit the data well.

5. DISCUSSION AND IMPLICATIONS

5.1. Discussion

In the current context of the explosion of information on social media, the quality of arguments has become more important than ever. With billions of pieces of information shared every day, consumers are looking for persuasive arguments that contain a lot of information to make accurate and effective decisions.

The results of the R squared analysis show that purchase intention is explained by 74% and message process involvement is explained by 52.5%. This indicates that for consumers, the influence of advertising messages and arguments is very high. Therefore, the quality of arguments and advertising messages will greatly affect the consumer’s purchase decision. High-quality arguments not only contain a lot of information but also have a high degree of persuasiveness. This means that arguments must be presented in a clear, logical, and persuasive manner so that consumers can understand and make accurate decisions. In addition, arguments also need to be supported by evidence, data, and factual information to increase their persuasiveness and credibility. Therefore, evaluating the quality of arguments has become more important than ever.

The result of research also shows that message process involvement has a role to play as a mediator, but not as a moderator. This syncs to Greenwald and Leavitt (1984) and Trivedi, J. P. (2018) and contradicts research of Petty et al., (1981); Coulter & c.s., (2004). It means that when arguments are informative

and persuasive, recipients are more willing to process information and thus purchase intention is higher. However, even when the willingness to process information is high, the effect of argument quality on purchase intention is not stronger. This can be explained as in the context of the beauty industry. Because each recipient has a different skin type and condition, their skin problem can vary. Recipients are already interested in the content due to some other source characteristics such as influencer's trustworthiness, attractiveness or expertise, etc., but the products recommended by the influencer may be not suitable to their needs. Nonetheless, when messages are coherent, persuasive, relevant and timely, recipients would be more convinced to lead to purchase intention due to some potential benefits to their skin promised by influencers.

Study shows that the argument quality affects purchase intention indirectly through increased message processing involvement. Besides, argument quality directly affects purchase intention. This syncs to Lee, S.-H. (2009); Petty et al. (1983). Before buying a product, consumers also evaluate the entire product, especially with beauty products, which often have side effects that can have very negative impacts on the consumer. To persuade customers of the excellence of the product, one conveying message must be able to bring this knowledge to them (SUNG, I., (2021). Because argument quality includes "perceived informativeness", this suggests that when quality of argument is fully informed, buyers are more likely to buy beauty products.

However, the indirect effect of argument quality is 1.7 times greater than the direct effect on purchase intention. This has significant implications for influencer marketing campaigns. Influencers' content should be designed to capture the attention of readers and create interest in the content, rather than focusing too much on commercial content. Therefore, when approaching influencer marketing, brands should focus on creating engaging and informative content rather than simply advertising their products. Influencers should be encouraged to create original and educational content about their products or services, rather than simply promoting them. By creating engaging content, influencers can capture the attention of buyers and have a significant indirect impact on their purchase decision.

5.2. Implications

5.2.1. For buyers

There are several proposed solutions that can help buyers make informed purchase decisions:

Evaluate the quality of the argument presented: When social media users encounter an advertisement or message promoting a product or service, they should evaluate the quality of the argument presented and look for evidence-based claims, logical reasoning, and convincing examples that support the product's benefits.

Consider the level of message process involvement: Message recipients should think about the level of message process involvement when evaluating a product or service. Are they paying close attention to the message and actively processing the information presented? Or are they distracted and not fully engaged with the message? The level of message process involvement can impact buyers' perception of the argument presented and ultimately their purchase intention.

Seek out multiple sources of information: The buyer should not rely solely on the message presented by the seller. Seek out additional sources of information, such as reviews from other buyers, expert opinions, and independent studies, to get a more comprehensive understanding of the product or service.

Be aware of cognitive biases: The message recipient should be aware of their own cognitive biases that may influence their purchase intention. For example, confirmation bias can cause them to seek out information that confirms their pre-existing beliefs, while availability bias can cause recipients to overestimate the likelihood of an event based on how easily it comes to mind.

Overall, being a critical and informed buyer, taking into account the effect of argument quality and message process involvement on purchase intention can lead to more effective purchase decisions.

5.2.2. For influencers

To create effective marketing strategies, influencers should:

Focus on providing high-quality content: As an endorser, influencers should focus on providing high-quality information that is relevant and useful to their followers and create content with evidence-based, logical, and persuasive arguments, and that the message is clear and concise.

Understand audience: Understanding audience is crucial in creating effective marketing strategies. Conduct market research to identify the needs, preferences, and behaviors of the target audience. This can help influencers tailor the message to their specific interests and concerns.

Create engaging content: Create content that is engaging and captures the attention of the followers. Influencers should make visuals, videos, and interactive elements to create more compelling and memorable content.

Build trust with the audience: Building trust with the audience is essential in influencing their purchase intention. Influencers should be transparent and honest in their communication, and avoid promoting products or services that they do not believe in or have not experienced themselves.

Evaluate the effectiveness of marketing strategies: Continuously evaluate the effectiveness of the marketing strategies by monitoring the engagement rates, conversion rates, and sales data. This can help influencers identify areas for improvement and optimize their future marketing efforts.

5.3. Contributions

Although there were a number of researches on the topics of influencer marketing, the research into the impact of argument quality on message process involvement of generation Z towards the beauty products. Therefore, the current study supplements and evaluates the impact of argument quality, which is a core element in the influencer's content. Another contribution is that this study reinforces the significance of message process involvement by comparing the direct and indirect influence of argument quality on purchase intention. Specifically, a content could be informative and persuasive, but if it cannot draw people's attention then its effectiveness will not be optimized. Furthermore, our practical contributions are recommendations for consumers and influencers in the beauty industry, in which consumers could base on our research to take advantage of influencers' content in their consumption and influencers are aware of aspects of content that they should prioritize to reach consumers effectively.

5.4. Limitation and future research

However, our study has some limitations and we suggest some directions for future research. Firstly, the research paper does not specify types of content (audio information, text information, etc.). The group of authors suggested that future researchers could study more specifically the types of content as the impact of argument quality could vary under different types of content. Second, because of limited conditions and time, the collected data is not large enough and almost exclusively focuses on online objects in certain areas. The future research could widen and collect the sample randomly to generalize the result better. Third, the study is limited to the age group of generation Z who are easily accessible to social media content. The following studies can be studied at different ages to improve generality.

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FACTORS AFFECTING THE SPENDING HABITS OF ORDERING FOOD THROUGH ONLINE APPLICATIONS OF GEN Z IN HANOI CITY AND SUGGESTIONS FOR ONLINE FOOD BUSINESSES

Authors: Le Van Hau¹, Pham Thi Cam Ly², Nguyen Thu Ha², Dao Thi Ngoc², Ha Thai Thanh²

Mentor: Assoc.Prof.Dr Tran Si Lam²

ABSTRACT: In 2022, according to the Food Delivery Trend in Vietnam report, 83% of Vietnamese people used food delivery services, and 77% of users used online food ordering apps. This study will focus on evaluating factors affecting the spending habits of Gen Z on online food applications (OFAs) in Hanoi city by using quantitative method. After analyzing 270 samples, the results obtained shows that there are 3 direct factors that have a significant positive impact on spending habits, namely: (1) Price-saving orientation, (2) Time-saving orientation, (3) Intention to order food online through apps; and 3 indirect factors has positive impacts through other factors, including: (1) Experience of buying food online through apps; (2) The level of satisfaction with the apps; (3) The level of satisfaction with the restaurant. This information can be used to help online food businesses to accelerate their products and services to elevate customer satisfaction and brand loyalty.

Keyword: Spending habits, gen Z, online food delivery apps, distribution channels, customer service.

1. INTRODUCTION

The behavior of buying food and spending habits of consumers has undergone significant changes since the outbreak of the Covid-19 pandemic (Chenarides et al., 2020). Although the market has witnessed 2 years with unprecedented growth, the food delivery market revenue is still expected to continue to grow annually at an impressive rate of 12.33% from 2023 to 2027, with a corresponding market volume of \$1.45 trillion (Daniel, 2023). And not outside that trend, Vietnam is also a country with competitive and impressive growth rates.

In 2022, according to the report of Food Delivery Trend in Vietnam, 83% of Vietnamese people use food delivery services, witnessed a rise by 62% compared to the previous year, 77% of users use online food ordering applications. The top three food delivery apps are Grab, Now and Baemin. Among them, Grab is the most popular, Baemin quickly gained market share with high satisfaction scores. And users are satisfied with characteristics such as: “easy ordering”, “attitude of delivery staff” and “delivery speed”. In addition to the above factors, online food ordering applications are probably also the most important tools for busy lifestyle users (Chotigo & Kadono, 2021).

In addition, attractive business opportunities in the fast food industry are partly supported by the characteristics and behavior of target users and the development of contemporary lifestyle applications. Study of Thamizhvanan & Xavier (2013) also emphasized factors that companies must consider to maximize online market profits are tastes, preferences and thoughts of target customers. Many previous studies have pointed out factors that directly affect online purchasing decisions include consumer behavior, business orientation and technical aspects (Bringula, 2016; Clemes et al., 2014; Ingham et al., 2015; Lian & Yen, 2013). This shows that revenue growth in this service sector depends on consumer behavior and spending habits. In addition, consumers are also attracted by the time-saving nature of online food ordering (Bashir et al., 2015) and cost-saving orientation (Akroush & Al-Debei, 2015; Assaker et al., 2020). And these

¹ Foreign Trade University; Email: haulek59ftu@gmail.com

² Foreign Trade University

characteristics do not apply equally to all generational groups because the characteristics of each group are completely different. Therefore, further research on Generation Z born after 1995 (Bassiouni & Hackley, 2014) is necessary due to the explosion of this generation and the characteristics when born in a digital era.

However, currently there has been no previous study that comprehensively examines the direct and indirect impacts of variables on the spending habits of Gen Z for online food delivery services. In the world, most previous studies mainly focus more on research models related to direct impacts. In Vietnam, there are quite a few other studies conducted on the intention and online shopping behavior of customers on online platforms such as Nguyen et al. (2021), Luu et al. (2021), Tieu & Tran (2021). In general, studies mainly focus on factors affecting intention and online shopping behavior, the survey space is in Ho Chi Minh City, there are very few studies comprehensively focusing on factors affecting customer spending habits, especially Gen Z customers for ordering food online through applications in Hanoi city. Realizing that analyzing factors affecting Gen Z's spending habits is necessary to review spending habits and make recommendations to satisfy both businesses and young people, the authors decided to choose the research topic, which is "*Factors affecting the spending habits of ordering food through online applications of Gen Z in Hanoi city and suggestions for online food businesses*", with the desire to comprehensively analyze the factors affecting the spending habits of young Generation Z, in order to make some useful recommendations for online food businesses. The research subjects are identified as: (1) Spending habits of Generation Z for food ordering applications in Hanoi; (2) Factors affecting spending habits for food ordering applications in Hanoi; (3) Solutions for online food businesses in Hanoi city. The research is aimed at assessing and quantifying the factors affecting spending habits on online food ordering applications in Hanoi and making some suggestions for online businesses.

2. THEORETICAL FRAMEWORK

2.1. Previous ordering food experience and intention to order food online

Online shopping behavior begins with a desire or plan to buy (Chen et al., 2010) with the perception that this process will take time and money (Wu, 2013). Experience ordering food through applications from previous times will be the basis for evaluating or considering for the next purchase, possibly in the form of a recommendation to continue buying or not buying, or just giving lessons on what to do and not to do when buying online. The findings of Yeo et al. (2017) show that past shopping experiences can be useful in reducing uncertainty in order to make a purchase decision. The risk aversion and uncertainty of humans will limit the intention to buy online to some extent, especially when that individual has little prior knowledge of this behavior and must rely primarily on expected value (Lee & Tan, 2003). The study of Helson (1964) focusing on an individual's reaction to a judgmental action showed that the individual's decision would depend on the past experiences. The authors proposes the hypothesis:

H1: Better previous experience ordering food online through applications will lead to higher intention to order food online through applications of Gen Z in Hanoi.

2.2. Intention to order food online and spending habits

According to the UTAUT developed by Venkatesh et al. (2012), habit is the final factor added to study how consumers interact with new technology applications. According to Ajzen & Fishbein (2018), lessons from previous usage experiences and the formation of habitual behavior from those experiences can affect customer attitudes and beliefs, thereby predicting customer intentions to continue behavior in a similar way to previous experiences. Amoroso & Lim (2017) concluded that customers who were satisfied with their previous mobile app experiences were more likely to form habitual behavior towards those apps and would therefore be willing to repeat using those apps in the near future. In this study, the authors considers

the possibility that the intention to use food ordering applications affects the spending habits of Generation Z rather than vice versa as previous studies have shown. Therefore, the authors proposes the hypothesis:

H2: The intention to order food online through applications will adjust the spending habits of Gen Z in Hanoi city.

2.3. Previous ordering food experience and time-saving orientation

Indriyarti et al. (2022) explains that previous online shopping experiences will have a significant impact on time-saving orientation in buying food through online applications for Generation Z in Jakarta. Consumers, including Generation Z customers, especially those in urban and high-income groups, tend to be more sensitive in saving time based on their previous online food shopping experiences. Both Bashir et al. (2015) and Chiu et al. (2012) concluded that customers are willing to pay a higher price if the quality of service advertised on the food ordering applications is equivalent to the product they receive. Based on these foundations, the authors proposes the hypothesis:

H3: Previous experience ordering food online through applications significantly affects the time-saving orientation of Generation Z in Hanoi city when ordering food online through applications.

2.4. Previous ordering food experience and price-saving orientation

Price is the monetary value of a product. This view is derived from previous studies (Assaker et al., 2020; Gupta et al., 2018) that price-saving orientation is saving a monetary value for consumers. In the context of shopping, customers want to get the best possible price (DelVecchio & Puligadda, 2014). Indriyarti et al.'s study concludes that previous online shopping experiences have a significant impact on the price-saving orientation of Generation Z consumers in Jakarta when buying food through food ordering applications (Indriyarti et al., 2022). This finding is entirely consistent with the theoretical concept that customers will seek and get a lower price if possible (DelVecchio & Puligadda, 2014) and can be specifically applied to Generation Z customers when buying food online through applications. The results of Chiu et al. (2012) and Akroush & Al-Debei (2015) also have similar views that customers will compare prices to get the most economical purchase decision. Based on these foundations, the authors proposes the hypothesis:

H4: Previous experience ordering food online through applications significantly affects the price-saving orientation of Generation Z in Hanoi city when ordering food online through applications.

2.5. Price-saving orientation and spending habits

The research of Hoang & Le (2020) and Tan & Ooi (2018) explain that habit is the degree to which individuals perform actions or automatically perform their behavior. This is a consequence of accumulated previous experiences. As mentioned above, customers will seek and get a lower price (DelVecchio & Puligadda, 2014) will be specifically applied to Generation Z customers when ordering food through applications. The price-saving motivation plays a leading role in guiding subsequent purchase intentions repeated on food ordering applications for consumers to achieve the lowest price. Based on these foundations, the authors proposes the hypothesis:

H5: Price-saving orientation significantly affects the spending habits of Generation Z in Hanoi city when ordering food online through applications.

2.6. Time-saving orientation and spending habits

One of the most key and useful factors in deciding to choose food ordering applications is time-saving (Chiu et al., 2014; Jadhav & Khanna, 2016). The time-saving benefit for consumers means that they can use the time that would otherwise have to be spent on traditional food shopping or meal preparation for other

activities (Punj, 2012). According to Gentry & Calantone (2002), the time saved is not only a important to consumers in general and to high-income groups in general, the value also includes opportunity costs when saving that time. Pitchay et al. (2022) pointed out the importance of time-saving orientation in consumers using smartphones to access food ordering applications has a significant impact on the formation of user psychology in repeating the selection of these applications to get the desired food. Based on these foundations, the authors proposes the hypothesis:

H6: Time-saving orientation significantly affects the spending habits of Generation Z in Hanoi city when ordering food online through applications.

2.7. Satisfaction with applications and intention to order food online

One of the most key and useful factors in deciding to choose food ordering applications is customer satisfaction (Ajzen & Fishbein, 2018; Amoroso & Lim, 2017). As argued above, among previous experiences ordering food through applications, only positive experiences will lead to future buying behavior while negative experiences will tend to limit consumer intentions to repeat buying behavior (Weber & colleagues, 1999; Shim et al., 2001). Satisfaction with food ordering applications can only be achieved through previous satisfying experiences. Based on these foundations, the authors proposes the hypothesis:

H7: The higher the satisfaction with food ordering applications, the higher the intention to order food online through applications of Generation Z in Hanoi city.

2.8. Social influence and satisfaction with applications

The UTAUT model (Venkatesh et al., 2003) defined social influences as the factors affecting a willingness of person to receive encouragement from those around them (including family, peers and co-workers) that they should experience a certain technology. The study of Le & Nguyen (2021) assessing factors affecting the intention to continue using food ordering applications of Generation Y consumers in Ho Chi Minh City, Vietnam produced statistical results proving that social influence has a significant impact on user satisfaction with food ordering applications. This result of the impact of society on satisfaction has also been verified by previous studies: Lai & Shi (2015), Palau-Saumell et al. (2019). Consequently, the authors proposes the hypothesis:

H8: Social influence has a positive and significant impact on the satisfaction of Gen Z in Hanoi city with online food ordering applications.

2.9. Trust in applications and satisfaction with applications

Consumer trust in food ordering applications and application quality are factors that determine the level of satisfaction of Generation Z in Hanoi city with food ordering applications. Consumer trust is their feeling that the above applications can provide what consumers want and users can trust transactions on those applications (Cha & Seo, 2020). Trust has been proven to be a basis for positively impacting satisfaction when using e-commerce platforms (Gefen et al., 2000; Jarvenpaa et al., 2003). From there, the authors' group proposes the hypothesis:

H9: The higher the trust in online food ordering applications of Generation Z in Hanoi city, the higher the satisfaction with the application.

2.10. Quality of applications and satisfaction with applications

Satisfaction is the accumulation of perception when an individual's previous emotions are combined with unconfirmed expectations around (Oliver, 1980). The study of Cha & Seo (2020) evaluated the role

of application quality on user satisfaction through factors such as reliability, informativeness, ease of use and flexibility. The reliability of the application along with delivery speed has been pointed out by some previous studies as important factors affecting user satisfaction with the application, even the reliability of the application has a significant impact on both customer perception of the overall service quality of the application and customer satisfaction (Jun et al., 2004; Cha & Seo, 2019a). Meanwhile, reliability is an internal factor that gives customers trust and accuracy (Han, 2016). In other words, trust of user is formed on the basis of application reliability. The results show that all four factors above have a significant positive impact on user satisfaction with food ordering applications. Based on these foundations, the authors proposes the hypothesis:

H10: The better the quality of online food ordering applications, the higher the satisfaction of Gen Z in Hanoi city with online food ordering applications.

2.11. Satisfaction with restaurant and intention to order food online

The higher customer satisfaction will promote future product purchase or service use behavior of customers for that restaurant. When consumers decide to buy, the uniqueness of the brand will be the criterion for making a purchase decision (Choi & Jun, 2007). The Lim's study (2006) showed that the integration of factors that make up a brand has a positive impact on customer satisfaction. In Choi & Jun's (2007) study, brand factors such as reliability, scale and customer friendliness have a positive impact on consumer repurchase intentions (Cha & Seo, 2019b). Through research of Kang & Kim (2004) concluded that among brand factors, environmental friendliness affects customer loyalty, which can only be created by customer satisfaction, thereby motivating customers to buy in subsequent times. From there, the authors proposes the hypothesis:

H11: The higher the satisfaction with the restaurant, the higher the intention to order food online through applications of Generation Z in Hanoi city.

2.12. Quality of food and customer service quality and satisfaction with the restaurant

Post-sale service quality was analyzed by Jun & Jaafar (2011); Koo et al. (2008) and Gatautis et al. (2014) found the impact of post-sale service quality on online shopping intentions. In addition, issues such as payment and delivery, auctioning, online feedback and service value are stimulants for online shopping intentions (Alam & Yasin, 2010; Hackman et al., 2006). The study of Ghosh (2020) concluded that quality factors are the top agents to make up consumer satisfaction. Where food quality is evaluated by the author through factors such as availability, convenience and safety. Bringula (2016) explains that if price is not accompanied by product quality, online shopping habits will not be formed and customers will return to choose traditional stores. Customer service quality is measured through attributes such as complaint resolution, refunds, and prompt response. From there, the authors proposes two hypotheses H12 and H13:

H12: The better the quality of food served through online applications, the higher the satisfaction with the restaurant.

H13: The better the quality of customer service of food providers, the higher the satisfaction with the restaurant.

2.13. Financial knowledge and spending habits

Financial knowledge is how an individual understands, manages and plans their own finances. Poor understanding of financial knowledge can be associated with increased uncontrolled spending, poor financial management and debt. Mahadi et al.'s (2022) study concluded that there is a significant impact between financial knowledge factors on the spending habits of university students at FSKM, UiTM Shah Alam. Based on these foundations, the authors proposes the hypothesis:

H14: Financial knowledge significantly affects the spending habits of ordering food online through applications of Generation Z in Hanoi city.

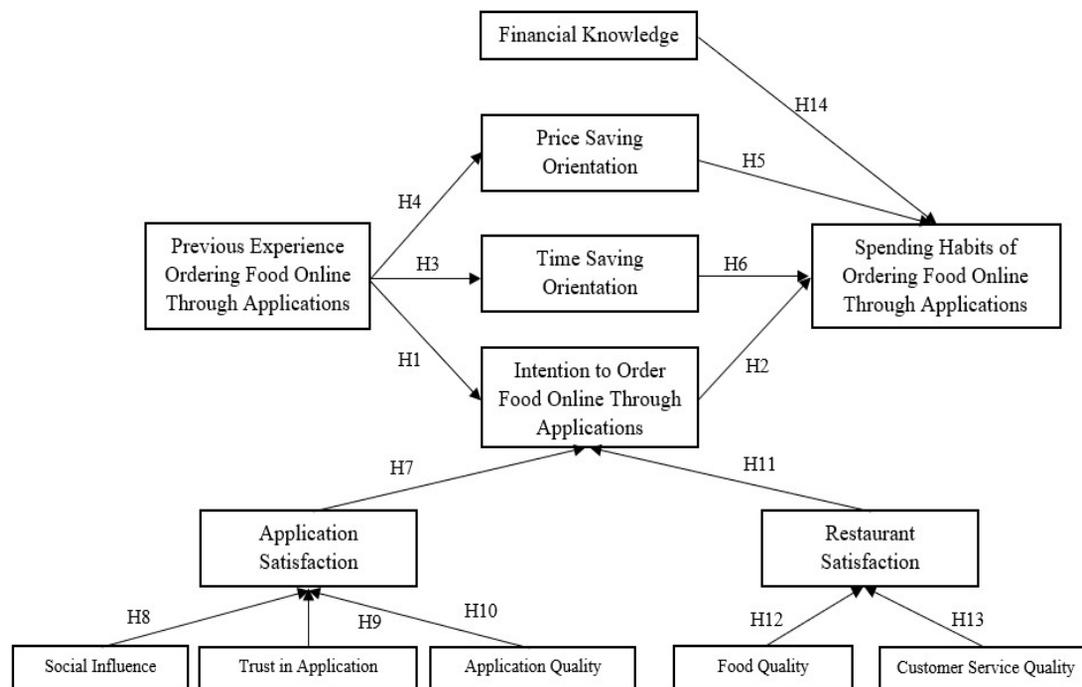


Figure 2.1. Research model

Source: Proposed by the authors

3. RESEARCH METHOD

3.1. Data and sample

The survey applied to the research subjects is individuals of Generation Z using online food ordering services. The authors decided to use 300 questionnaires to survey to ensure the representativeness of the sample during the research process. The group’s investigation process includes 2 stages, the first stage is preliminary quantitative investigation and received 42 valid responses to be able to analyze and evaluate the scale preliminarily. Next, the authors adjusted the scales, removed inappropriate observed variables to prepare for the second stage which is the official quantitative investigation with the goal of obtaining over 270 valid ballots.

Of the total number of subjects participating in the study, there were 178 females (64.7%) and 97 males (35.3%). The response rate is that females are the majority, showing that females are more interested in food ordering issues through applications than males. In 4 age groups divided in the survey form, the main age group participating is from 18 - 22 years old (87.3%) and the remaining age group accounts for a total of 12.7%. This result can be partly explained by students being easier to access and exploit information as well as having knowledge and quickness in answering. From the above results, the main occupation of individuals answering the questionnaire is students with 241 people (87.6%), education level is university accounting for up to 88%. In terms of income, the income level of participating subjects at less than VND 3 million per month accounts for up to 48% - this is the current average income level of students receiving family allowances or working part-time. The income level from VND 3 - 7 million per month is the second most popular with 36%. The income level from VND 7 - 15 million per month accounts for 6.5%, from VND 15 - 25 million accounts for 4.4% and from VND 25 million or more is 5.1%. Of more than 270 samples obtained, more than two-thirds of samples responded with experience ordering food

through applications for one year or more (70.2%) and there were no cases where samples had never used food ordering services through applications, from which it can be confirmed that ordering food through applications is very popular with Generation Z in Hanoi city. In Hanoi city, there are many applications providing food delivery services. According to the survey results, ShopeeFood is the most popularly used application with a user rate of 33.8%, followed by Grab Food with 21.8% and GoFood 20.4%.

3.2. Measures

To measure variables, the authors used a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree) and a single correct answer selection questionnaire. In addition, the questionnaire also includes 2 parts of classification questions, which are: (1) general information questions (gender, age, education, occupation and income) and (2) questions about habits of using OFAs.

3.3. Data analysis

The authors used SPSS version 26 and AMOS version 20 software to support analysis and evaluation after collecting and cleaning data. According to Tabachnick & Fidell (1996), for multivariate regression analysis, the minimum sample size required is $n=50+8*m$ (m is the number of independent factors). The authors's model includes 13 independent factors, so the sample size should be chosen from 154 or more. Therefore, the authors decided to issue 300 questionnaires to ensure the representativeness of the sample during the research process. Preliminary scale evaluation is performed by considering Cronbach's alpha reliability and convergence value of factors in the model (multidimensionality). The authors uses the Principal component analysis method with orthogonal rotation (varimax). Confirmatory factor analysis using estimation method is maximum likelihood estimation. Linear structure analysis of the model uses path analysis technique with a significance level of 5%. In order to evaluate the discriminant value between research concepts with each other, the group uses bootstrap analysis with a confidence interval of 95% to test the correlation coefficient between variables in the model. The proposed concepts are considered different if the coefficient.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Measurement model testing

From the table below, it can be concluded that the Cronbach's Alpha value of the factors in the research model is all greater than 0.7. All 43 observed variables have a total correlation coefficient value greater than 0.4. Therefore, the observed variables all achieve data reliability to be included in the analysis in the next steps.

Table 4.1. Results of reliability testing of scales in the research model

No	Scale	Total Correlation	Cronbach's Alpha when the variable is removed	Cronbach's Alpha
1	Social influence (SI), including 5 scales: SI1; SI2; SI3; SI4; SI5	0.745; 0.613; 0.646; 0.691; 0.649	0.610; 0.768; 0.654; 0.639; 0.805	0.749
2	Trust in the app (TRUST), including 3 scales: TRUST1; TRUST2; TRUST3	0.746; 0.857; 0.677	0.894; 0.947; 0.747	0.921
3	Quality of the app (AQ), including 3 scales: AQ1; AQ2; AQ3	0.655; 0.518; 0.621	0.736; 0.763; 0.760	0.868
4	Quality of food (FQ), including 3 scales: FQ1; FQ2; FQ3	0.745; 0.778; 0.728	0.869; 0.847; 0.856	0.893

5	Quality of customer service (CSQ), including 3 scales: CSQ1; CSQ2; CSQ3	0.936; 0.623; 0.875	0.736, 0.763, 0.760	0.945
6	Satisfaction with the app (ASAT), including 5 scales: ASAT1; ASAT2; ASAT3; ASAT4; ASAT5	0.715; 0.777; 0.652; 0.775; 0.689	0.855; 0.875; 0.749; 0.861; 0.759	0.865
7	Satisfaction with the restaurant (RSAT), including 3 scales: RSAT1; RSAT2; RSAT3	0.845; 0.791; 0.654	0.908; 0.859; 0.888	0.933
8	Previous experience with OFAs (EXP), including 3 scales: EXP1; EXP2; EXP3	0.725; 0.785; 0.734	0.858; 0.839; 0.864	0.875
9	Intention to use OFAs (CI), including 3 scales: CI1; CI2; CI3	0.859; 0.731; 0.686	0.917; 0.869; 0.844	0.938
10	Time-saving orientation (TSO), including 4 scales: TSO1; TSO2; TSO3	0.718; 0.705; 0.819; 0.715	0.879; 0.894; 0.879; 0.880	0.907
11	Price-saving orientation (PSO), including 3 scales: PSO1; PSO2; PSO3	0.741; 0.784; 0.781	0.864; 0.906; 0.898	0.912
12	Spending habits on OFAs (SH), including 5 scales: SH1; SH2; SH3; SH4; SH5	0.751; 0.613; 0.575; 0.616; 0.756	0.887; 0.849; 0.859; 0.848; 0.813	0.862

Source: Compiled from SPSS by the authors

After performing EFA analysis, the results show that the KMO coefficient of the scales is all in the range from 0.5 to 1 and the total variance extracted is all greater than 50% satisfying the hypothesis. The statistically significant Barlett test shows that the observed variables are correlated with each other. Thus, the scales of the research model are unidirectional scales and suitable for research.

4.1.2. Confirmatory Factor Analysis (CFA)

The authors proceeded to perform confirmatory factor analysis with 4 scales: the scale of factors affecting satisfaction with applications, the scale of factors affecting satisfaction with restaurants, the scale of factors affecting intention to order food through applications and the scale of factors affecting spending habits when ordering food through applications. After performing CFA analysis, all scales have Chi-square/df less than 3; GFI, CFI, TLI indices are all greater than 0.9; RMSEA is less than 0.08, from the analysis results it can be confirmed that the model is consistent with actual data. The weight of the observed variables is all greater than or equal to 0.5 and statistically significant so it can be concluded that all observed variables achieve convergence value. The estimated coefficients are all different from 1 and statistically significant showing that discriminant validity is ensured.

4.1.3. Results of linear structural model analysis

The linear structural model has 889 degrees of freedom and model fit indices include: (Chi-square/df = 2.233; GFI = 0.907; CFI = 0.966, TLI = 0.958 and RMSEA = 0.067). The standardized estimated parameters for the relationships between 13 variables are all statistically significant (p-value < 0.05) except for the relationship between Financial Knowledge variable and Spending Habits on Ordering Food Online through Applications variable (p-value = 0.809).

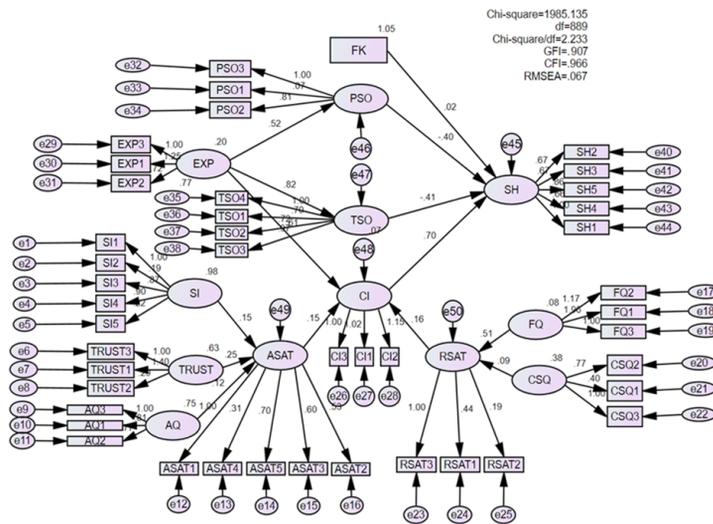


Figure 4.1. Results of SEM structural model analysis

Source: Compiled from AMOS by the authors

To evaluate the stability of the model, the study was bootstrapped with a sample size of N=2000. The results showed that the bias of the Beta coefficients from the original sample and the average Beta coefficients from the bootstrap analysis were all less than 0.006. Therefore, it can be concluded that the estimated model ensures reliability and stability for inference for the population.

After using the Levene test and T-test or F-test, the results of comparing the differences in online food ordering habits through apps by group showed that there were differences by gender, frequency of food ordering, and income, and there was no difference in spending habits between users with different lengths of time using online food ordering apps.

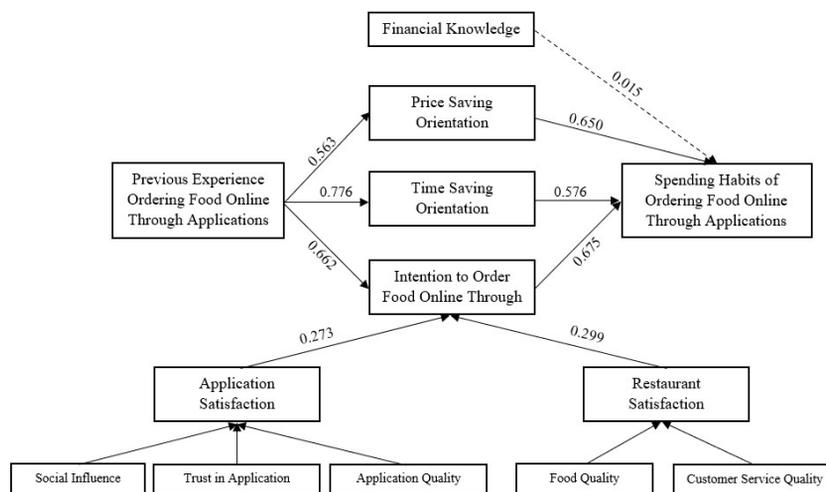


Figure 4.2. Results on factors affecting spending habits when ordering food online through applications

Source: Compiled by the authors

Annotation:

- The hypothesis is accepted
- - - - -→ The hypothesis is rejected

4.2. Discussion

Satisfaction with the application has a positive impact on the intention to order food through the application with an estimated coefficient of 0.276. This can be understood as when satisfaction with the application increases by 1 unit, the intention to order food through the application increases by 0.273 units. Similarly, satisfaction with the restaurant also has a positive impact on the intention to order food through the application with an estimated coefficient of 0.299. This result is also consistent with previous studies, for example, Katerina Annaraud & Katerina Berezina (2020) pointed out that user satisfaction (Affected by food quality, convenience, customer care, service quality and service control) has a positive impact on the intention to order food through applications. Chotigo et al. (2021) also agreed with the above conclusion when stating that customer satisfaction has a positive impact on the intention to use food ordering services through applications under the condition that satisfaction is affected by variables such as food price, social impact, trust, convenience, and application quality. The research result is also consistent with reality, consumers will continue to use services in the future when they are satisfied with the application and restaurant.

The hypothesis proposed for the variable “Previous experience ordering food online through applications” is that it has a positive impact on all 3 variables Price Saving Orientation, Time Saving Orientation and Intention to Order Food Online through Applications. Specifically, past service usage experience affects price saving orientation with an estimated coefficient of 0.563, affects time saving orientation with an estimated coefficient of 0.776 and affects intention to order food through applications with an estimated coefficient of 0.662. This shows that young consumers also care about and use past service experience as an important aspect to consider before making a purchase. Indriyarti et al. (2022) concluded that during the Covid-19 pandemic period, past shopping experience had a significant impact on time-saving orientation and price-saving orientation for Generation Z in Jakarta. In reality, customers will tend to continue using a certain service if they have a good impression in their first shopping experience; otherwise, if their first experience is not good, they may not return to use the service for a second time.

According to results, time-saving orientation has a positive impact on spending habits with an estimated coefficient of 0.650, meaning that when time-saving orientation increases by 1 unit, spending habits on ordering food through applications increase by 0.65 units. Price-saving orientation also has a positive impact on spending habits with an estimated coefficient of 0.576, meaning that when time-saving orientation increases by 1 unit, spending habits increase by 0.576 units. This result is consistent with previous research, Tieu and Tran (2021) pointed out that time-saving orientation and price-saving orientation have a positive and significant impact on the behavior of using food ordering applications indirectly through the channel of impact is the motivation for convenience and usefulness after use. Dewi Sri Woelandari Pantjolo Giningroem et al. (2022) also agreed that time-saving orientation and price-saving orientation have a significant impact on customer service usage behavior in reality. Compared to reality, price and delivery time are two important criteria for customers to consider before making a purchase, especially for Generation Z who do not have as much income as Generation Y or Millennials and need time for study, work and daily entertainment.

The intention to order food through the application has the greatest impact on spending habits with an estimated coefficient of 0.675. That is, when the intention increases by 1 unit, the habit of spending on ordering food through the application increases by 0.675 units.

The intention to order food through the application has the greatest impact on spending habits with an estimated coefficient of 0.675. That is, when the intention increases by 1 unit, the habit of spending on ordering food through the application increases by 0.675 units. The UTAUT2 model and the Technology Acceptance Model (TAM) also argue that consumers’ intention to use services has a positive impact on

actual usage behavior. Intention sometimes does not lead to consumer spending decisions but in order for consumers to have actual spending, they must have the intention to buy/use services.

The hypothesis that financial knowledge has a positive impact on spending habits when ordering food online through applications was rejected with a significance level greater than 5%. To explain this phenomenon, the authors argue that financial knowledge is a very small part of knowledge for an individual to effectively manage their spending. With the questions in the survey form, the authors believes that individuals with average financial knowledge can still make reasonable financial decisions like individuals with high financial knowledge so the hypothesis is not accepted theoretically. Previous studies by Henry et al. (2001), Bona (2018) agreed with the view that financial knowledge includes aspects such as attitudes towards finance, personal financial management,... have a positive impact on spending habits.

5. CONCLUSION

Conclusion

Firstly, the study has systematized theories related to online food ordering apps (OFAs), theories on spending habits as well as issues related to current spending on apps. In addition, the study also systematized models and theories related to user behavior including the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB) and the Unified Theory of Acceptance and Use of Technology (UTAUT).

Secondly, using statistical and quantitative methods, the authors analyzed the direct and indirect impacts of factors affecting the spending habits of Generation Z in Hanoi for food ordering apps. In which, the study shows that there are 3 direct factors of the model that have a significant positive impact on spending habits, which are (1) Price-saving orientation; (2) Time-saving orientation; (3) Intention to order food online through apps and 3 indirect influencing factors, including: (1) Experience of buying food online through apps; (2) The level of satisfaction with the apps; (3) The level of satisfaction with the restaurant.

Thirdly, the study also evaluated the impact level of each variable proposed on the spending habits of Generation Z. The intention to use OFAs has the greatest overall impact on spending habits for food ordering apps. Factors such as price-saving orientation and time-saving orientation have positive impacts on the spending habits for ordering food through OFAs whereas the reverse is true for financial knowledge which has an insignificant impact.

Fourthly, based on the results obtained, the study also made suggestions for online food businesses to attract more Gen Z customers and improve their satisfaction.

Suggestions for online food businesses

Ensure the quality of food provided

As the results have shown, the better the quality of online food, the higher the level of satisfaction with the restaurant. Therefore, ensuring that the food delivered to consumers intact and attractive is a prerequisite for gaining their satisfaction and trust. In addition, packaging is another distinguishing feature between traditional food service and online food business, because transporting food requires suitable, sturdy packaging that ensures hygiene, safety and to meet some specific requirements of long-distance transportation. In addition, Gen Z is increasingly concerned about environmental issues and green consumption, so using environmentally friendly packaging (e.g. sugarcane pulp boxes, rice straws, grass straws, ...) will be a big plus.

Brand promotion

Buying food through “reviews” has become a leading trend, especially for Generation Z. Reviews and suggestions from celebrities, KOLs (Key Opinion Leaders) in the form of “Food Reviewers” are still an

effective channel to reach new consumers and create long-term effects. KOLs in the direction of experience and storytelling will bring more positive effects in inspiring trust from consumers due to their clever use of digital platforms. However, online food businesses should be careful in choosing KOLs that match the image of the store, avoiding over-the-top “reviews” that cause reverse effects.

Solving customer problems

Concerns about online food ordering services causing customers to wait too long are common. Based on this issue, online food business owners can consider applying some sales management software integrated with delivery units (e.g. iPOS integrated with AhaMove) to help food businesses ensure delivery time with customers ordering food online. To best care for customers, business owners should also pay attention to ensuring customer experience after receiving the product. Any complaints or feedback from customers must be resolved quickly, promptly and satisfactorily.

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THE INFLUENCE OF CORPORATE SOCIAL RESPONSIBILITY ON LOYALTY AND PURCHASE INTENTION: EXAMINING THE MEDIATING ROLE OF CUSTOMER TRUST AND CUSTOMER VALUE

**Author: Luu Thuc Khue¹, Nguyen Duc Trung Hieu², Nguyen Thi Ngoc Phung²,
Tran Phu Thanh², Huynh Nguyen Nhat Minh²
Mentor: Ha Hien Minh²**

ABSTRACT: Corporate Social Responsibility (CSR) is one of the most prominent concepts in the modern economy, highlighting the impacts of businesses on customers. However, current research in Vietnam still faces limitations in explaining the relationship between customer loyalty and purchase intentions with CSR. This study aims to further elucidate the impact of CSR on business operations, specifically manifested through stimulating purchasing behavior and customer loyalty toward businesses. The sample collection includes Vietnamese citizens selected through random sampling methods. The analysis of the data provides evidence that CSR significantly influences loyalty and purchase intention.

Keywords: CSR, Customer trust, Customer value, Loyalty, Purchase Intention.

1. INTRODUCTION

1.1. Rationale

In 2022, the global economy is expected to recover from the Covid-19 pandemic. Having achieved noteworthy milestones and successfully fulfilled 14/15 economic and social targets set by the National Assembly, Vietnam still has difficulties in addressing environmental and social issues.

2023 is forecasted to be the third worst year for global economic growth in the 21st century, following 2009 and 2020. Vietnam needs to implement strategies to overcome existing problems, maximize strengths, and require all stakeholders to have a proper understanding of this issue. As a crucial component of the economy, businesses also have a responsibility toward society to ensure the development of the economy.

CSR is considered an optimal strategy for building customer loyalty (Mandhachitara & Poolthong, 2011) which helps businesses differentiate themselves from others and significantly influences PI (Kline & Dai, 2005). The indirect effects of CSR on PI and loyalty in the short-term highlight the impact of CSR on loyalty and PI.

It can be seen that implementing CSR not only helps address economic, social, and environmental issues but also has positive impacts on business activities, such as stimulating purchasing behavior and loyalty. However, the significance and extent of these impacts still require detailed research. Therefore, our team has chosen the research topic “The Influence of CSR on Loyalty and Purchase Intention: Examining the mediating role of customer trust and customer value”.

1.2. Overview

1.2.1. Overview of international research

Currently, there is an increasing number of studies focusing on the impact of CSR activities on related factors.

¹ Foreign Trade University; Email: thuckhue1910@gmail.com

² Foreign Trade University

From the perspective of PI, Balqiah et al. (2011) and Tung-Ju Wu et al. (2016) examined the relationship between PI and CSR activities of businesses. They demonstrated that an increase in CSR activities positively influenced customer demand through reputation enhancement to show that CSR factors indirectly affected PI.

Regarding the impact of CSR on loyalty, Tung Ju Wu (2016) and Rujirutana (2011) both concluded that positive CSR practices significantly influenced customer trust and loyalty. Han et al. (2019) affirmed that all CSR activities related to economic, environmental, legal, human, and philanthropic responsibilities generated positive customer perceptions and inspired continued engagement and loyalty to the business. Furthermore, Arli and Lasmono (2010) found that when consumers had similar product/service price options, CSR directly influenced PI. However, these studies have limitations, such as the scope of the study subjects and insufficient consideration of external factors impacting loyalty and PI. However, most studies separately evaluated the effects of CSR on PI and loyalty, making less comprehensive impact assessments.

1.2.2. Overview of research situation in Vietnam

Recently, CSR-related topics have gained popularity in Vietnam, which makes a growing number of research studies examining the relationship between CSR and other relevant factors.

Bui Thi Lan Huong's research (2010) concludes that CSR in Vietnam is closely linked to corporate commitments toward two key stakeholders: customers and society. Furthermore, studies by Nguyen Hoang Khoi and Duong Ngoc Thanh (2020) and Thao (2020) show that CSR components directly influence consumer behavior, including loyalty, trust, and PI. Other domestic studies worth mentioning include Nguyen Thi Hoang Yen's research (2016) on CSR theories and their financial implications for businesses through customer behavior and consumption decisions. However, domestic research still has limitations, such as the clear determination of the positive or negative impact of CSR on loyalty and PI, the extent of its influence, and the future direction for businesses on whether to enhance CSR activities or not.

1.3. Research objectives

This research will include the following main objectives:

- Provide a general introduction to the research topic, examine relevant studies conducted both domestically and internationally, and determine the novelty of the research topic.
- Summarize the theoretical foundations and propose a research model to examine the relationships under investigation.
- Propose research methods to survey and evaluate the impact of CSR on other factors within the conceptual framework.
- Conduct surveys and analyze the collected data.
- Conclude and propose directions for businesses in developing CSR initiatives.

1.4. Conceptual framework

1.4.1. Corporate Social Responsibility (CSR)

CSR refers to businesses' responsibility to make decisions that align with societal goals and values and has been studied and defined by various scholars over the past 70 years. Howard Bowen (1953) emphasized that CSR involves businesses incorporating social goals into their strategies while respecting the right to evaluate and criticize societal values. Carroll (1979) identified four dimensions of social responsibility: economic, legal, ethical, and philanthropic. These dimensions have provided a foundation for understanding businesses' responsibilities within society.

However, we adopt the definition proposed by Rupp et al. (2006), which describes CSR as voluntary activities undertaken by businesses to improve social and environmental conditions. They divide CSR into three main responsibilities: social, environmental, and economic. Their concept provides a comprehensive understanding of CSR, highlighting its impact on businesses' benefits and aligning with the current economic landscape.

This study focuses on investigating the impact of CSR on consumers through social and environmental responsibilities. Previous studies suggest that consumers prioritize social and environmental responsibility over economic responsibility. Economic responsibility is considered less important, and businesses are encouraged to go beyond pursuing pure profit. Consumers tend to associate CSR with ethical responsibility rather than economic responsibility.

CSR is understood as social activities related to ethical issues, fair treatment of all stakeholders, and compliance with socially appropriate standards. Businesses that actively engage in CSR activities are perceived more positively by customers within the same industry. CSR initiatives contribute to enhancing a business's brand image. CSR is an integral part of business operations, and its impact on consumers is examined through social and environmental responsibilities in this study.

1.4.2. Purchase intention

Dodd and Supa (2011) view it as customers' willingness to pay and satisfy their own needs with a company's products. Schiffman and Wisenblit (2015) consider PI as an attitude related to purchasing capability. However, Ajzen and Fishbein's (1975) concept provides a more comprehensive and detailed understanding of PI, aligning better with the modern economic landscape. In this research, PI is defined based on Ajzen and Fishbein's (1975) framework. It is said to be the subjective probability of a user engaging in a specific behavior and if consumers express interest in owning a particular product/service, it indicates their intention to purchase, either in the short/long term. Positive attitudes towards branded products and the reputation associated with them can influence PI.

1.4.3. Loyalty

According to Oliver (1997), it is characterized by a strong commitment to consistently repurchase a preferred product/service, resulting in repeat purchases. This long-term attachment is unaffected by external factors influencing the business (Oliver, 1999). It is demonstrated through customers' commitment to repurchase from a particular company, which is crucial for fostering and developing customer loyalty (Yoo & Bai, 2013).

The cost of acquiring new customers is considerably higher compared to retaining existing ones, and loyal customers tend to generate higher profitability due to their increased spending and lower service costs (Thomas & Tobe, 2012). Therefore, loyalty plays a vital role in achieving profit growth and reducing costs for businesses, as emphasized by marketing analysts (Wilson, 2012). Moreover, loyalty serves as an effective measure of a company's progress and is closely tied to its ongoing existence and future growth (Kim et al., 2004). Managing and enhancing loyalty is recognized as a strategic imperative for businesses (Yap, 2012; Moretta, 2019). Thus, companies need to proactively analyze various aspects of loyalty to strengthen its impact (Sayani, 2015).

1.4.4. Customer value

Holbrook (1999) defines customer value as the relative preference for the interactive experience customers have with various objects such as goods, entities, places, events, or ideas. Zeithaml (1988) emphasizes that customer value is based on customers' evaluations of a product and the overall benefit derived from it. Sweeney (2001) further adds that customer value encompasses functional, emotional, and social dimensions.

Enhancing customer value is a crucial strategy in marketing, as businesses aim to meet diverse customer needs and design effective marketing initiatives. In a competitive economy, businesses can gain an advantage by delivering superior value and choices that maximize customer satisfaction (Kotler & Keller, 2009). Customers choose to align with companies that offer perceived benefits above competitors (Anderson, 2004), leading to long-term customer relationships and sustainable competitive advantage (Chang, 2008). Furthermore, providing significant value to customers improves the objective of profit growth (Chang, 2008).

1.4.5. Customer trust

According to Patrick (2002), trust is essential for the success and normalcy of social relationships. Customer trust encompasses the emotions, thoughts, and actions demonstrated when customers believe in the reliability and trustworthiness of the supplier, acting in the customers’ best interests. Morgan and Hunt (1994) define trust as the confidence one party has in the honesty and dependability of another party. Trust is built when customers have faith in the credibility and integrity of the service provider (Kim, 2009).

Prioritizing the maintenance of long-term customer relationships helps reduce customer attrition and enhances customer repurchase behavior (Marakanon & Panjakajornsak, 2017). Customer trust has proven to be a critical factor in fostering positive buyer-seller relationships in marketing (Morgan & Hunt, 1994). As businesses sustain long-term relationships with customers, customer trust in the company also grows (Sun & Lin, 2010), resulting in various benefits for the business, including increased profitability.

Proposed framework and Hypothesis development

Based on the theoretical foundation of combined consumer value and existing theoretical and empirical research on factors influencing loyalty and purchasing behavior, we decide to propose the following model:

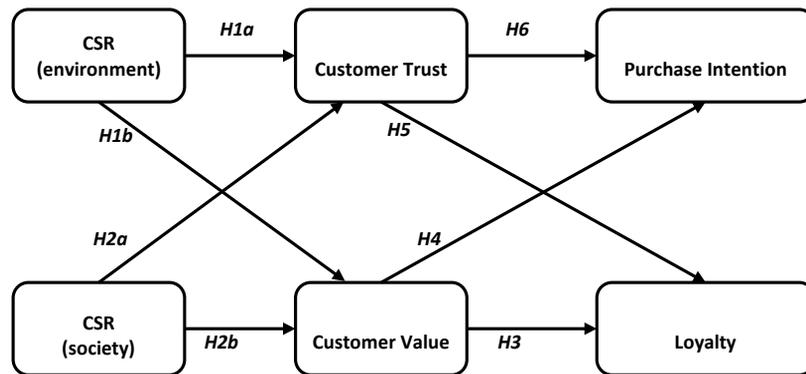


Figure 2: Conceptual model

(Source: Conducted by authors, 2023)

2.1. CSR and Customer Trust

CSR activities influence trust, as highlighted by Pivato et al. (2008) and Hansen et al. (2011). Trust is formed through consumer perceptions and company reputation (Perez, 2011), making CSR a significant driver in enhancing the company’s image. Park and Kim (2019) found CSR effective in fostering trust and ethical capital (Iglesias et al., 2020). Engagement in CSR leads to benefits like customer satisfaction, loyalty, and positive brand perception (Pivato et al., 2008). Ethical practices positively impact product image and customer trust (Leventhal et al., 2006). Iglesias et al. (2018) support a positive CSR-customer trust relationship. Companies must prioritize transparent communication and trust cultivation (Markovic et al., 2018). Therefore, the following hypothesis is proposed:

H1a: Environmental social responsibility positively influences customer trust.

H1b: Social responsibility positively influences customer trust.

2.2. CSR and customer value

Limited research on CSR's influence on customer value exists, but integrating CSR into strategic decision-making is significant (Peloza & Shang, 2011). CSR initiatives can enhance customer value (Staudt et al., 2014). Sheth et al. (1991) identified emotional, social, and functional value drivers related to CSR and consumer perceptions. Emotional value comes from supporting environmental or social causes, social value from purchasing from CSR-engaged companies, and functional value from practical benefits (Green & Peloza, 2011). Alrubaiee et al. (2016) found CSR positively impacting customer value, corporate image, and marketing effectiveness in Amman's hospital context. Thus, customer value positioning is crucial for CSR's positive impact on company performance. Therefore, the following hypothesis is proposed:

H2a: Environmental social responsibility has a positive impact on customer value.

H2b: Social responsibility has a positive impact on customer value.

2.3. Customer value and Loyalty

Customer value, linked to loyalty, reflects customers' business predictions and loyalty to a supplier (Sirdeshmukh et al., 2002). Supplier-customer value behavior, akin to relationship concepts like collaboration and adaptation (Cannon & Homburg, 2001), plays a vital role in evaluations (Flint et al., 2011). Studies support a positive relationship between customer value and loyalty. Lin Tsai & Chang (2010) found customer value significantly and positively influences satisfaction and loyalty to hypermarkets in Taiwan. Kmar et al. (2016) conducted a meta-analysis showing the positive relationship between customer value and loyalty, especially when compared to competitive alternatives. Therefore, the following hypothesis is proposed:

H3: Customer value positively influences customer loyalty.

2.4. Customer value and Purchase intention

PI reflects customers' efforts to purchase a product or consume available products (Retnawati et al., 2018). Diallo (2012) argues that PI is typically manifested in the act of buying a product. Vuong et al. (2012) affirm that customers go through several steps when they intend to make a purchase, including information search, evaluation, and product assessment. Price reductions implemented by retailers can affect customer value, store image, and positively influence PI (Grewal et al., 1998). Vazifehdooost & Jamali (2017) further add that PI is positively influenced by customer value and store image as perceived through discounts and perceived brand quality. Monetary promotions, such as price discounts, increase customer value and encourage PI (Pai et al., 2017). Nina Maharani et al. (2020) have also shown a significant positive impact of customer value on PI in various contexts, including in-store advertising. Therefore, the following hypothesis can be proposed:

H4: Customer value positively influences customer PI.

2.5. Customer trust and Loyalty

Trustworthy parties are willing to accept risks and maintain the customer-company relationship (Choi & La, 2013). Kaur et al. (2012) have demonstrated that trust plays a significant role in fostering customer loyalty. Although it seems that CSR scarcely attempts to build ethical capital (Godfrey, 2005), consumer trust research argues that CSR performance alone is insufficient. Service quality influences perceived trust and behavior, which subsequently impacts consumer loyalty (Vlachos et al., 2009). Satisfied customers will become loyal if a high level of trust exists (Dimitriadis et al., 2011). Kassim & Abdullah (2010) explored the relationship between trust and customer loyalty in Malaysia and Qatar (Amin et al., 2013).

Furthermore, Leninkumar's (2017) study in Sri Lankan banks revealed a significant positive relationship between customer trust and loyalty. Therefore, the following hypothesis can be proposed:

H5: Customer trust positively influences customer loyalty.

2.6. Customer trust and Purchase Intention

Trust has been found to positively influence PI, as it reduces uncertainty and influences purchase behavior (Kenning, 2008). Roman (2003) discovered a positive relationship between trust and ethical behavior of bank employees, where trust positively affected customer satisfaction and loyalty. Sirdeshmikh et al. (2002) also found that trust can positively influence loyalty. Moreover, Pornpratang et al. (2013) supported the findings of Kenning (2008) that both general and specific trust positively impact purchasing behavior. Therefore, higher levels of trust reflect higher PI from consumers (Gefen & Straub, 2004). The following hypothesis can be proposed:

H6: Customer trust positively influences PI.

3. RESEARCH METHOD

3.1. Research design, sample selection and information collection

Our team began by conducting preliminary research and constructing a scale based on theoretical foundations and experimental models. We refined the scale by incorporating relevant factors and aligning it with the context and CSR activities of current businesses. The content of the scale was adjusted to align with the context and CSR activities of current businesses.

The questionnaire includes 31 quantitative questions, focusing on aspects such as (1) Company's environmental responsibility; (2) Company's social responsibility; (3) Customer trust; (4) Customer value; (5) Loyalty; (6) Purchase intention. Respondents used a 5-point Likert scale to assess the influence of CSR on loyalty and PI.

Our team determined the sample size based on the 10 times rule proposed by Hair et al. (2014) and collected 264 valid samples. The target population consisted mostly of economics students in Ho Chi Minh, and we employed online surveys and sharing through social media, student forums, and email to respondents. Despite facing challenges in obtaining a large number of respondents, we collected data over nearly a month and continuously updated it in Excel. Once the required sample size was achieved, we used PLS-SEM 4.0 software for data analysis and presented the official results in the subsequent section.

3.2. Measurement of the variables

The income data was cleaned by removing inappropriate samples with unreliable responses. The evaluation process involves two steps: Evaluating the measurement models and structural models.

Outer loading representing the relationship between latent variables and observed indicators was assessed in the measurement model. Different viewpoints exist on the quality of observed variables based on outer loading thresholds (Hair et al., 2010). However, variables with outer loadings above 0.6 are accepted, while those below 0.6 may be considered for removal and reanalysis.

Reliability measurement scale in SmartPLS is evaluated using Cronbach's Alpha and Composite Reliability (CR). A Cronbach's Alpha value greater than 0.7 indicates good reliability (Nunnally, 1994) and a CR value of 0.6 or higher is recommended for exploratory studies (Chin, 1998). Other studies have also supported a threshold of 0.7 for CR (Henseler & Sarstedt, 2013).

Convergence in SmartPLS is assessed through the Average Variance Extracted (AVE) index. A measurement scale achieves convergence if the AVE is 0.5 or higher (Hair et al., 2011). Before evaluating the

AVE, it is necessary to assess the quality of observed variables and ensure the reliability of the measurement scale. If convergence is not achieved after removing variables, the scale should not be used for further quantitative analysis.

Discriminant validity measuring differences between constructs in the same model is evaluated using two approaches in SmartPLS: the traditional approach by Fornell and Larcker (1981) and the modern approach by Henseler et al. (2015). The Heterotrait-Monotrait Ratio (HTMT) is used to assess discriminant validity, and bootstrapping is performed to determine if the value is significantly different from 1. A threshold of 0.85 is used to evaluate HTMT, following the stricter standards proposed by Clark & Watson (1995) and Kline (2015).

3.3. Structural model evaluation

To assess multicollinearity, we will use the PLS algorithm and its results. Two widely accepted general rules regarding the VIF (Variance Inflation Factor) exist in the research community. A VIF greater than or equal to 5 suggests the possibility of multicollinearity (Hair, Ringle & Sarstedt, 2011). Diamantopoulos & Siguaw (2006) propose a threshold of VIF greater than or equal to 3.3 to indicate multicollinearity. These align with Hair’s research methodology, where VIF has three thresholds for assessing multicollinearity. A VIF of 5 or higher indicates a high likelihood of multicollinearity, VIF between 3 and 5 suggests possible multicollinearity, and VIF below 3 may indicate no multicollinearity.

To evaluate the impact relationships, we use the bootstrapping analysis as discussed earlier in assessing the measurement model. If the p-values of the impact relationships are equal to or less than 0.05, they are statistically significant. This allows us to assess the strength of these relationships. If $p > 0.05$, it is necessary to reevaluate or exclude the relationship as it lacks statistical significance.

For analyzing the R^2 results, we continue to utilize the PLS algorithm. In SmartPLS, we have two indicators: R^2 and R^2 adjusted. If both indicators are available, we prioritize using the R^2 adjusted. The R^2/R^2 adjusted values range from 0 to 1, with higher values indicating a greater proportion of variance explained by the independent variables. Establishing a general rule for accepting R^2 values is challenging, as it depends on the model’s complexity and research field.

To evaluate effect size coefficients (F^2), we rely on the results obtained from the PLS algorithm analysis. Cohen (1988) proposed four thresholds for interpreting F^2 values: F^2 less than 0.02 suggests extremely small or no impact, F^2 between 0.02 and 0.15 indicates small impact, F^2 0.15 and 0.35 suggests moderate impact, and F^2 greater than 0.35 indicates a large impact.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

4.1.1. Descriptive Statistics of Independent Variables

Table 4.1. Descriptive statistics of Independent variables

Variable	Size	Minimum Value	Maximum Value	Mean Value	Standard Deviation
CTE1	194	1	5	3,979	0,849
CTE2	194	1	5	4,046	0,863
CTE3	194	1	5	4,119	0,937
CTE4	194	1	5	3,562	1,074
CTE5	194	1	5	3,67	1,028
CTE6	194	1	5	3,392	1,07

CTS1	194	1	5	3,933	0,99
CTS2	194	1	5	4,072	0,876
CTS3	194	1	5	4,289	0,799
CTS4	194	2	5	4,389	0,734

(Source: Research team's data analysis results)

The statistical analysis reveals that the scales used have ratings ranging from 1 to 5 on the Likert scale, except for variable CTS4, which ranges from 2 to 5. This suggests a diverse range of opinions among the surveyed students regarding the social responsibility of businesses. Upon examining the mean values of the independent variables, it is observed that the average scores range from 3.392 to 4.389. All variables indicate mean values above 3, indicating general agreement with the scale's statements. Notably, the variable CTS4 has the highest mean value of 4.389, while the variable CTE6 has the lowest mean value of 3.392.

4.1.2. Descriptive Statistics of Mediating Variables

Table 4.2. Descriptive Statistics of Mediating Variables

Variable	Size	Minimum Value	Maximum Value	Mean Value	Standard Deviation
TRU1	194	1	5	4,165	0,893
TRU2	194	1	5	4,247	0,806
TRU3	194	1	5	4,33	0,763
TRU4	194	2	5	4,17	0,751
TRU5	194	2	5	3,923	0,812
TRU6	194	1	5	4,247	0,774
TRU7	194	1	5	4,34	0,792
VAL1	194	1	5	3,505	0,97
VAL2	194	1	5	3,577	0,912
VAL3	194	1	5	3,268	1,041
VAL4	194	1	5	3,897	0,855

(Source: Research team's data analysis results)

The statistical analysis shows diverse responses from the participants, with most scales ranging from 1 to 5, except for two scales (TRU4 and TRU5) with scores from 2 to 5. The mean values indicate that the participants perceive and trust businesses through social responsibility, as the mean values are below 4, ranging from 3.268 to 4.34. The standard deviations of the observed variables are generally small (<1), except for variable VAL3, which has a larger standard deviation, indicating differing perspectives on the provision of free products/services by companies.

4.1.3. Descriptive Statistics of Dependent Variables

Table 4.2. Descriptive Statistics of Dependent Variables

Variable	Size	Minimum Value	Maximum Value	Mean Value	Standard Deviation
LOY1	194	1	5	3,99	0,897
LOY2	194	1	5	3,938	0,829
LOY3	194	1	5	3,954	0,857
LOY4	194	2	5	3,186	1,082

LOY5	194	2	5	4,067	0,838
PI1	194	1	5	3,907	0,909
PI2	194	1	5	3,784	0,976
PI3	194	1	5	4,165	0,699
PI4	194	1	5	3,536	0,948
PI5	194	1	5	4,072	0,743

(Source: Research team's data analysis results)

The dependent variables in the statistical analysis show similar patterns to the other variables. They all follow a Likert scale ranging from 1 to 5, except for variable PI5 (ranging from 2 to 5) and variable PI3 (ranging from 3 to 5). These findings indicate diverse evaluations and positive attitudes towards PI and loyalty when perceiving social responsibility from businesses. The average values of the dependent variables range from 3.186 to 4.165, with standard deviations ranging from 0.699 to 1.082. Notably, variable LOY4 has a standard deviation larger than 1, at 1.082.

4.2. Measurement model analysis

The data was analyzed using the PLS-SEM method.

Mean values: Respondents rated all measurement scales within the range of (3.56-4.17), indicating a positive and favorable attitude towards the research topic.

Outer loadings: All variables had loadings between 0.638-0.869, exceeding the acceptable threshold of 0.6 as mentioned. Therefore, most measurement scales met the required outer loadings. However, CTE3 had a lower loading below 0.6 and was removed from the analysis.

Reliability and convergent validity: All factors exhibited satisfactory reliability with Cronbach's Alpha coefficients ranging from 0.775 to 0.904.

Composite reliability: All factors achieved CR values greater than 0.7, ranging from 0.854 to 0.924.

Average Variance Extracted: Most factors met the AVE requirement, with values greater than 0.5. The factor CTE approached the threshold with an AVE of 0.496 but was still considered acceptable. Overall, the results indicate satisfactory reliability, convergent validity, and discriminant validity of the measurement scales.

Heterotrait-Monotrait Ratio: HTMT values were below 0.85, indicating discriminant validity. However, LOY and PI variables slightly exceeded the threshold at 0.937, indicating a violation of discriminant validity. Nevertheless, they satisfied the discriminant validity condition according to Fornell and Larcker (1981), along with other variables in the table. Therefore, we considered and accepted all variables to meet the discriminant validity condition.

4.3. Structural model analysis results

The research team conducted 5000 iterations of the bootstrap procedure to test the significance of the linear structural model.

Variance Inflation Factor: The VIF values ranged from 1.394 to 2.976, indicating no violation of multicollinearity as they were below the threshold of 5.

Adjusted R²: The independent variables and measurement scales explained 47.1% of loyalty, 36.7% of PI, 45.5% of trust, and 29.1% of customer value. These adjusted R² values indicate a satisfactory model fit.

F² effect size: The influence of the variables on the dependent variable in the structural model was evaluated based on Cohen's threshold (1998).

Table 4.3. F2 Values and Impact Levels

Relationship between variables	Coefficient	Impact Level
CTE→TRU	0,109	Small
CTE→VAL	0,220	Moderate
CTS→TRU	0,291	Moderate
CTS→VAL	0,014	No effect
TRU→LOY	0,264	Moderate
TRU→PI	0,207	Moderate
VAL→LOY	0,181	Moderate
VAL→PI	0,091	Small

(Source: Research team’s data analysis results)

4.3.1. Path coefficients results

Table 4.3.1. Path coefficients results

Relationship between variables	Impact Coefficient	Std	T value	P value
CTE→TRU	0,290	0,065	4,472	0,000
CTS→TRU	0,474	0,056	8,410	0,000
CTE→VAL	0,470	0,073	6,429	0,000
CTS→VAL	0,120	0,077	1,566	0,117
TRU→LOY	0,433	0,083	5,198	0,000
TRU→PI	0,420	0,095	4,414	0,000
VAL→LOY	0,358	0,079	4,539	0,000
VAL→PI	0,278	0,084	3,324	0,001

(Source: Research team’s data analysis results)

The table presents the path coefficients in the model, indicating the relationships between variables. Most of the paths show significant and positive impact coefficients: CTE→TRU ($\beta = 0.29$) and VAL ($\beta = 0.47$), CTS→TRU ($\beta = 0.474$) and VAL ($\beta = 0.42$), TRU→LOY ($\beta = 0.433$) and PI ($\beta = 0.42$), and VAL→LOY ($\beta = 0.358$) and PI ($\beta = 0.278$). However, the impact of CTS on VAL lacks statistical significance, as the P-value exceeds 0.5. This particular relationship will be further examined and discussed in subsequent validation analyses.

4.3.2. Evaluation of the Mediating Effects of Variables

Table 4.3.2. Results of the impact of intermediate variables

	Indirect effects	P value	Total effects	P value	
CTE	CTE→TRU→PI	0,122	CTE→PI	0,252	0,000
	CTE→VAL→PI	0,131			
	CTE→TRU→LOY	0,126	CTE→LOY	0,294	0,000
	CTE→VAL→LOY	0,169			

CTS	CTS→TRU→PI	0,199	0,000	CTS→PI	0,232	0,000
	CTS→VAL→PI	0,033	0,186			
	CTS→TRU→LOY	0,206	0,000	CTS→LOY	0,249	0,000
	CTS→VAL→LOY	0,043	0,157			

(Source: Research team's data analysis results)

Based on the table of indirect effects, we can evaluate the roles of the mediating variables as follows. CTE has a significant indirect effect on PI through the mediating variables TRU and VAL, with coefficients of 0.252, 0.122, and 0.131, respectively. CTE also has a significant indirect effect on LOY through TRU and VAL, with coefficients of 0.294, 0.126, and 0.169, respectively. Similarly, CTS has significant indirect effects on PI and LOY through the mediating variable TRU, with coefficients of 0.232 and 0.249, respectively. However, CTS does not have a significant indirect effect on VAL. Therefore, the mediating variable VAL does not play a specific role in this relationship.

The results indicate that corporate social and environmental responsibility have positive indirect effects on LOY and PI through trust and customer value leading to increased loyalty and PI.

It is important to note that these analyses focus on the indirect effects of CSR on PI and LOY. The direct impact of CSR on customer loyalty and PI was not explicitly addressed in this study.

4.3.3. Discussion of research findings and model validation

4.3.3.1. Validation of Research Result

Table 4.3.3. Results of variable relationships testing

Hypothesis	Research Model			Evaluation
	Relationship between variables	Path Coefficient	P value	
H1a	CTE→TRU	0,290	0,000	Accepted
H1b	CTS→TRU	0,474	0,000	Accepted
H2a	CTE→VAL	0,470	0,000	Accepted
H2b	CTS→VAL	0,120	0,117	Rejected
H3	TRU→LOY	0,433	0,000	Accepted
H4	TRU→PI	0,420	0,000	Accepted
H5	VAL→LOY	0,358	0,000	Accepted
H6	VAL→PI	0,278	0,001	Accepted

(Source: Research team's data analysis results)

The research findings support all seven hypotheses proposed in the study, including H1a, H1b, H2b, H3, H4, H5, and H6. The strongest impact is observed in the social responsibility of businesses towards the environment on customer value (H2a) and the social responsibility of businesses towards customer trust (H1b). These results indicate that when customers perceive positive environmental impacts and socially responsible actions by a business, they place higher value and trust in that business.

However, the results did not provide sufficient statistical evidence regarding the impact of social responsibility on customer value (H2b). It suggests that the social CSR activities considered in the study may not directly contribute to enhancing customer value. This discrepancy could be due to a mismatch between the social activities analyzed and the factors that significantly influence customer value. Some businesses' CSR initiatives may not effectively influence customer perceptions of value.

Overall, the research findings highlight the importance of social responsibility, trust, and customer value in shaping customer behavior and loyalty. The results support the notion that businesses engaging in socially responsible actions can gain customer value and trust, leading to increased loyalty and PI.

4.3.3.2. Discussion of Research Result

These findings are consistent with Tung-Ju Wu research (2016), which further expands by specifying two indirect influencing factors, namely trust and customer value, on customers' PI. In reality, when customers have trust or previously received customer value from a particular company, they exhibit strong loyalty towards that company and are more likely to support additional CSR activities that benefit society and the environment. Moreover, customers are willing to repurchase and maintain long-term relationships with companies that have implemented numerous socially responsible activities. CSR facilitates the development of relationships based on trust, promises, and actions of others. Hence, this study provides additional empirical evidence and strongly affirms the research conducted by Han et al. (2019), which suggests that all CSR activities related to economic, environmental, legal, human, and philanthropic responsibilities evoke a positive perception among customers, while also inspiring continued commitment and loyalty towards the company. These noteworthy and novel findings contribute to the current body of research.

Additionally, it is noteworthy that statistical evidence regarding the impact of CSR on customer value has not been found. Consequently, the hypothesis suggesting that CSR activities in the social domain enhance customer value remains unsubstantiated. From a measurement perspective, it is apparent that the mentioned social activities do not sufficiently focus on the main causes that influence customer value, resulting in inconsistencies across various dimensions of measuring customer value. As a result, there is no connection between the two measurement scales. In practical terms, some businesses have implemented social CSR activities, but customers do not perceive these actions as having a positive impact or increasing customer value, thus indicating a lack of influence from the company's social responsibilities on customers.

5. CONCLUSION

5.1. Implication

This research has important theoretical and managerial implications. The findings support previous studies, highlighting that positive perceptions of a company's CSR activities enhance customer trust, value, and loyalty. Trust and customer value mediate the relationship between CSR and loyalty. Environmental CSR activities significantly impact on customer perception and PI, while social CSR initiatives increase customers' likelihood of purchasing. Managers should actively engage in responsible practices, align CSR strategies with business objectives, measure their impact, and collaborate with relevant organizations. Transparency, honesty, and a commitment to addressing environmental and social issues are crucial for building customer trust and loyalty. Prioritizing the environmental and social aspects of CSR can strengthen the connection between CSR and positive business outcomes.

5.1.1. Theoretical Implication

These findings support the relationship between CSR and loyalty, showing that being perceived positively as socially responsible enhances customer trust, value, and loyalty. This research provides further clarity by highlighting the mediating role of trust and customer value in the CSR-customer loyalty relationship. CSR activities, particularly those related to the environment, stakeholders, and society, can foster stronger relationships between businesses and customers (Rivera et al., 2016). Studies acknowledge the influence of CSR's environmental aspect on customer perception and purchase intention (Laroche, 2001). Customers familiar with the company's CSR activities respond positively when purchasing its products (Mohammed & Al-Swidi, 2019). Fulfilling social responsibilities also contributes to higher loyalty and positive evaluations from customers (Chomvilaiuk & Butcher, 2010). Engaging in social contribution activities and impacting the community enhances customer loyalty (Moisescu et al., 2020).

Regarding PI, the research shows that CSR activities, especially those related to the environment and society, indirectly influence PI through customer value and trust. Environmental protection initiatives lead to higher consumer satisfaction and PI (Berezan et al., 2013). People purchase environmentally friendly products due to signaling theory and competitive altruism (Griskevicius et al., 2010). Environmental protection demonstrates a willingness to pay for products benefiting the environment and society (Gao & Mattila, 2014). Social CSR activities, such as philanthropy and support for community welfare, increase customers' PI and likelihood of purchase (Lee, 2015; Mulaessa & Wang, 2017).

5.1.2. Managerial implication

Applying environmental and social responsibility enhances loyalty. Customers value products/services that contribute to society and the environment, leading to loyalty. Companies should engage in responsible practices for long-term profitability. CSR activities indirectly influence loyalty through customer trust, fostered by promoting CSR initiatives and investing in causes. Meaningful CSR programs contribute to sustainability and differentiate companies, increasing trust and loyalty. Managers should align CSR strategies with objectives, measure impact, engage stakeholders, and collaborate to address challenges. Transparency and commitment to improvement build customer trust and loyalty.

Social and environmental CSR initiatives positively impact on customer trust, which influences their PI. Emphasizing transparency, honesty, and the company's commitment to addressing environmental and social issues builds customer trust. Collaborating with suppliers and customers to promote shared responsibility further enhances customer trust and purchasing potential. Increasing customer concern for sustainability leads to a positive impact of environmental CSR activities on customer value and PI. Providing high-quality environmentally friendly products/services enhances customer awareness of the company's commitment to environmental issues. However, CSR initiatives related to social aspects may not significantly impact customer value, possibly due to various factors such as industry type, customer demographics, and specific CSR initiatives. Social CSR may not directly affect perceived quality, performance, or price, which are key drivers of customer value.

In conclusion, managers should prioritize customer trust and value as intermediaries in enhancing customer loyalty and PI through CSR activities. Specifically, focusing on environmental and social aspects within CSR can play a vital role in strengthening the connection between CSR and business outcomes.

5.2. Limitations and Future Research

Although most of our hypotheses were supported, this study has a few limitations. First, this study lacked publicly available information on CSR practices of businesses in Vietnam, as CSR data disclosure is not mandatory. This limitation hinders the availability of reliable information, making it challenging to build a comprehensive model and analyze the full impact of all factors. Future research should emphasize the importance of encouraging businesses to disclose CSR information and establish a standardized framework for reporting CSR activities.

Another limitation is the incomplete analysis and evaluation of additional factors that influence the relationship between CSR, PI and loyalty. This reduces the objectivity and accuracy of the conclusions and assessments of the relationships. Hence, future research should consider incorporating a wider range of variables, such as demographic factors and specific CSR initiatives, to provide a more comprehensive understanding of the relationship.

CSR factors were evaluated primarily through trust and customer value, but these factors do not cover all aspects comprehensively and have limitations in considering the influence of other economic environmental factors. Further research should explore the impact of additional variables, such as corporate

reputation and customer satisfaction, to provide a more holistic assessment of CSR’s influence on PI and customer loyalty.

Lastly, the study’s generalizability may be limited as the majority of survey participants were Vietnamese students. Students represent a specific group with some awareness of CSR but may not fully represent the entire Vietnamese population. Therefore, it is recommended to include a more diverse sample, encompassing individuals from different age groups, professions, and backgrounds.

6. APPENDIX

Table: System of Scales of Measurement

Variable	Description	Source
CTE1	The company encourages customers to participate in activities related to environmental protection and green consumption.	Matthew et al., 2014
CTE2	The company’s products are designed to be environmentally friendly.	
CTE3	The company implements measures to ensure food safety.	
CTE4	The company engages in activities to reduce single-use items.	
CTE5	The company engages in activities to reduce plastic waste and plastic bags.	
CTE6	The company engages in activities to reduce noise pollution.	
CTS1	The company has programs to support addressing social issues (social vices, poverty, etc.).	Matthew et al., 2014
CTS2	The company’s activities contribute to promoting social welfare.	
CTS3	The company contributes to creating a better life for future generations.	
CTS4	The company’s activities aim for sustainable growth.	
TRU1	I fully enjoy using the company’s products/services.	Morteza et al., 2020
TRU2	The company’s products/services make me feel safe.	
TRU3	I trust the quality of the company.	
TRU4	The company cares about its customers.	
TRU5	The company is honest with its customers.	
TRU6	Overall, I trust the company.	
TRU7	The company’s products/services are safe to purchase repeatedly.	
VAL1	The company offers products/services at a more attractive price than other companies.	Morteza et al., 2020
VAL2	The company charges comparable fees for similar products/services compared to other companies.	
VAL3	The company provides more free products/services than other companies.	
VAL4	Considering the cost I have to spend and what I can receive, I believe that the company provides better value than other companies.	
LOY1	I will introduce the company to colleagues/friends.	Morteza et al., 2020
LOY2	I will speak positively about the company to others.	
LOY3	I will encourage friends and family to use the company’s products/services.	
LOY4	I will post positive information about the company on social media.	
LOY5	I intend to use the company’s products/services at present.	

PI1	The company is my first choice when I need products/services.	Amoroso, 2015
PI2	I am certain that I will recommend others to use the company's products/services.	Suh & Han, 2003
PI3	I plan to purchase the company's products/services in the future.	Amoroso, 2015
PI4	I am willing to spend more money on the company's products/services.	
PI5	I enjoy purchasing the company's products/services.	

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FACTORS AFFECTING ONLINE PURCHASE INTENTION FOR COSMETIC PRODUCTS ON SHOPEE OF GEN Z IN HO CHI MINH CITY

**Author: Nguyen Thi Anh Ngoc¹, Pham Uyen Yen Nhi², Luu Thu Hang²,
Nguyen Hoang Anh², Hoang Le Trung Nguyen²
Mentor: Tran Thi Phuong Thuy³**

ABSTRACT: *This research aims to gain deep understanding of factors influencing cosmetics purchase intention on Shopee of Gen Z in Ho Chi Minh City. The data was collected and developed from a questionnaire with a sample of around 300 Gen Z consumers living in Ho Chi Minh City. The findings were analyzed with descriptive statistics, Cronbach's Alpha reliability analysis, Exploratory Factor Analysis, Pearson's correlation analysis and Multiple regression analysis. Results showed that all factors investigated had significant effect on online purchase intention and consumers of different backgrounds have similar opinions on the research subject matter. Practical recommendations and insights to vendors on Shopee to improve its service and increase customers' purchase intentions.*

Keywords: *Online Purchase Intention; Trust, Social Influence; Performance Expectancy; Effort Expectancy; Behavior Control Awareness, Gen Z, Ho Chi Minh City*

1. INTRODUCTION

Nowadays, the Internet has penetrated deeply into Vietnamese life, with over 68 million Internet users. Therefore, the E-commerce market in Vietnam is becoming more active than ever, especially owing to the effect of the COVID-19 pandemic. In this considerable growth, cosmetics accounted for a large proportion of the E-commerce sales. The largest E-commerce platforms in terms of market share in Vietnam are Shopee, Lazada, Tiki, and Sendo respectively. Shopee, owned by the Singapore-based company Sea Group, is currently the most popular E-commerce platform in Vietnam with over 70% of the total sales.

The most commonly purchased items online are clothing, footwear, and cosmetics, which make up 69% of total purchases. The cosmetics industry has experienced significant growth, with the annual sales in the Vietnam domestic cosmetics of approximately 2.3 billion USD. In the next five years, the annual growth rate in the sales is expected to range from 3% to 6%. It is also noteworthy that cosmetics, along with clothing and footwear are the most popularly purchased products on online platforms. Furthermore, with 80% growth value of cosmetics coming from online shopping and the purchase potential from the Gen Z group, it is more important for cosmetics companies as well as E-commerce platforms to pay more attention to this group purchase intention of cosmetics.

So far, there have been many international and domestic research on the purchase behavior as well as intention on E-commerce platforms with various factors investigated. The factors studied are mostly related to customer perception, expectation, as well as platform-related and service-related factors. Many researchers even analyzed whether these factors affect differently among groups, e.g gender. However, it is noteworthy that not much research focuses particularly on the Gen Z group; they either focus on the customers as a whole, or the university students. Furthermore, most research didn't study particular products on E-commerce platforms, not to mention the fast-growing cosmetics products among Gen Z.

¹ Foreign Trade University - Ho Chi Minh City Campus; Email: nguyenthianhngoc2011115391@ftu.edu.vn

² Foreign Trade University - Ho Chi Minh City Campus

³ Foreign Trade University - Ho Chi Minh City Campus; Email: tranthiphuongthuy.cs2@ftu.edu.vn

Therefore, this research aims at gaining a deeper understanding of the factors that significantly affect purchasing intentions of cosmetics among Gen Z whether opinions were different among different groups (gender, age, educational background, etc) and using the result to provide recommendations to enhance the viability of corporate products and ensure effective operations. The research investigates the correlation between online purchase intention and five customers-related factors: Trust, Social Influence; Performance Expectancy; Effort Expectancy; Behavior Control Awareness and Perceived Risk. The data used in this study was collected primarily by survey questionnaire from early February to early March 2023, in which surveyees were Gen Z living in the area of Ho Chi Minh City Then, the data processing was carried out using the quantitative research method and Stata 16 software was also utilized Once evaluated for Cronbach alpha reliability, EFA factor analysis, the scale will be used linear regression method to measure the influence of each factor on customers' intention to buy cosmetics online.

The results showed that there is a positive correlation between Trust, Social Influence, Performance Expectancy, Effort Expectancy, and Behavior Control Awareness and a negative correlation between perceived risk and the dependent variable - Online Purchase Intention. The studied factors accounted for nearly 75% of the variations in Gen's online purchase intention in the Ho Chi Minh City area. Furthermore, it was found that consumers with different demographic characteristics, such as age, gender, income level tend to have no different opinions on purchase intention. Last but not least, the research has provided practical recommendations for Shopee Corporation to enhance its service quality and provoke customers' willingness to purchase online in the future.

2. THEORETICAL FRAMEWORK

2.1. Theories

2.1.1. Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) developed by Fishbein & Ajzen (1975) is a theoretical model that explains how attitudes, subjective norms, and behavioral intentions influence individuals' behavior. The theory assumes that individuals are rational and that their behavior is guided by a systematic thought process. It also suggests that attitudes, subjective norms, and behavioral intentions are interdependent and that changes in one factor can influence the others. TRA is widely used in social psychology to predict and explain various behaviors, including health behavior, consumer behavior, and environmental behavior.

2.1.2. Technology acceptance model (TAM)

The Technology Acceptance Model (TAM) developed by Davis, et al. (1989) is an extension of Ajzen and Fishbein's theory of reasoned action (TRA) has been widely used in research relating to adoption of information technology applications. It removes a lot of measures relating to attitude present in TAM but instead considers the perceived usefulness and ease of use as contributing factors to the consumer's intentions and behaviors.

2.1.3. Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) postulates that the likelihood of an individual engaging in healthy behavior (for example, regular exercise) is correlated with the strength of his or her intention to engage in the behavior. A behavioral intention represents an individual's commitment to act and is itself the outcome of a combination of several variables. According to the TPB, the factors that directly influence intentions to engage in a health behavior include the person's attitudes toward the behavior, the person's perception of subjective group norms concerning the behavior, and the extent to which the person perceives him- or herself to have control concerning the behavior (Fishbein & Ajzen, 1991).

2.1.4. The Unified theory of acceptance and use of technology

UTAUT is one of the most comprehensive theories that can help in explaining and predicting the acceptance or rejection of the adoption of new technology (Venkatesh et al., 2003). The UTAUT model comprises four core integrated variables, namely, performance expectancy, effort expectancy, social influence and facilitating condition and their significant influence in behavioral intention and use behavior of new technology under the moderating effect of age, gender, experience and voluntariness of us (Venkatesh et al., 2003).

2.1.5. Theory of Perceived Risk (TPR)

Bauer (1960) originally conceptualized perceived risk as a two-dimensional construct consisting of uncertainty and adverse consequences, albeit with limited specificity regarding the latter dimension. Peter & Ryan (1976) subsequently refined this model by proposing a formula that calculates risk as the product of the probability of a negative consequence occurring and the severity of that consequence in the context of poor brand choice. This simple yet widely used model has been complemented by Mitchell's (1992) classification of perceived risk into six categories: social, financial, physical, performance, time, and psychological. Additionally, Mitchell noted that perceived risk plays a role in all types of consumer behavior. Thus, perceived risk is frequently invoked as an explanation for why consumers fail to transition from the desire stage to the action stage, i.e., making the actual purchase intention.

2.2. Proposed research model

2.2.1. Trust

Trust is one of the factors that have a significant influence on consumers' intention to buy online. The lack of trust has been recognized as one of the main reasons preventing consumers from shopping online (Yadav et al., 2017). If trust is not built, online transactions will not happen (Winch and Joyce, 2006). In the context of online shopping, trust plays a particularly important role because, in the online environment, consumer perceptions of risks in transactions are higher because buyers do not have direct contact with people selling as well as the product they intend to buy (Aetal, 2000).

The study "Factors Affecting Online Purchase Intention: The Case of E-commerce on Lazada" (Phuong Viet Le-Hoang, 2020) revealed that trust is a significant factor that affects online purchase intention. Customers are more likely to make online purchases if they trust the website or app. The study "The impact of security, individuality, reputation, and consumer attitudes on purchase intention of online shopping: The evidence in Vietnam" (Tran & Nguyen, 2022) also found that cognitive trust has a positive impact on purchase intention of online shopping. In the context of online shopping, this means that customers believe that the website or store they are buying from is secure, reputable, and will protect their personal information. Therefore, the proposed research hypothesis is:

H1: Trust has a positive effect on online purchase intention for cosmetic products on Shopee of Gen Z in Ho Chi Minh City.

2.2.2. Social Influence

The UTAUT emphasizes the role of social influence as one of the critical factors influencing the adoption of new systems. Social influence is characterized by an individual's perception of the degree to which others should adopt the new system, such as buying cosmetics online (Venkatesh et al., 2003).

In the research "Factors affecting online purchase intention: A study of Vietnam online customers" (Thu-Trang Thi Doan, 2020), Social influence is a major determinant of online purchasing intention. From responses collected from 204 participants from Vietnam via online and paper questionnaires, the research

suggested that Vietnamese consumers are likely to be influenced by the opinions of their peers and relatives and the judgment of members from this group can significantly impact the consumer's purchasing intention in spite of its subjectivity. Social influence factors also act as an outlet from which positive feedback of other determinants can be propagated through word of mouth. Dewi et al. (2020) also found that Social influence factor has influence on the consumers' purchasing intentions by elevating consumers' perception of those factors through positive reviews from their personal social networks. For Gen Z consumers, social influence from the people around them plays a significant role in their intention to purchase cosmetic products online. These consumers often rely on feedback and comments from society when deciding whether to buy a product, and negative comments from previous users can have a significant impact on their purchasing decision. Therefore, the proposed research hypothesis is:

H2: Social Influence has a positive effect on online purchase intention for cosmetic products on Shopee of Gen Z in Ho Chi Minh City.

2.2.3. Performance Expectancy

The degree of satisfaction experienced by Gen Z consumers in their intention to purchase online is influenced by several factors, including convenience, time-saving, and improved efficiency in their customer experience. The expected effect of these factors may vary depending on the specific focus of each study, and for this particular research, the definition of expected effectiveness from Venkatesh et al. (2003) was selected to align with the study's objectives. The expected effectiveness of using the system refers to the degree to which an individual believes that doing so will lead to benefits in their job performance. This definition provides a clear framework for assessing the effectiveness of the system, as perceived by Gen Z consumers, and allows for a more targeted approach to understanding the drivers of their satisfaction and intention to purchase online.

Dewi et al. (2020) found that performance expectancy has a significant positive impact on consumers' intention to make purchases online and this effect is consistent regardless of the consumer's gender. While in the research "Factors affecting online purchase intention: A study of Vietnam online customers" (Thu-Trang Thi Doan, 2020), the results showed that Performance expectancy was the largest determinant when it comes to consumers purchasing intention. The research suggested that how swiftly and effortlessly an online transaction can be made greatly affects the user's intention of buying from the website. Therefore, the proposed research hypothesis is:

H3: Performance Expectancy has a positive effect on online purchase intention for cosmetic products on Shopee of Gen Z in Ho Chi Minh City.

2.2.4. Effort Expectancy

In the research "User Acceptance of Information Technology: Toward a Unified View", Venkatesh et al. (2003) defined effort expectancy as the degree of ease associated with the use of a system. They found that effort expectancy is a positive factor in determining behavioral intention, regardless of whether the use is voluntary or mandatory. Venkatesh et. al (2003) also proposed via the UTAUT model that the impact of effort expectancy will be moderated by gender, age and experience; especially, the result will be stronger for women.

Dewi et al. (2020) found that effort expectancy is a significant determinant of online purchase intention for both genders. However, their results did not find any significant differences between genders in the relationship between effort expectancy and online purchase intention, which is inconsistent with the findings of Venkatesh et al. (2003).

Meanwhile, Thu-Trang Thi Doan (2020) in the research "Factors affecting online purchase intention:

A study of Vietnam online customers” revealed that online purchase intention is positively correlated with effort expectancy, in this case is also defined as the ease of use of a system. The author also concluded that the customers’ belief that they don’t need to make lots of effort can positively affect their online purchase intention. However, unlike the two studies above, this study didn’t not investigate nor mention the difference in the impact of effort expectancy between males and females. Based on the conducted review of relevant literature, the proposed research hypothesis is:

H4: Effort Expectancy has a positive effect on online purchase intention for cosmetic products on Shopee of Gen Z in Ho Chi Minh City.

2.2.5. Behavior Control Awareness

Perceived behavioral control reflects the ease or difficulty of behavior, depending on the availability of resources and opportunities for behavior (Ajzen, 1991). In the context of online shopping, behavioral control awareness describes consumers’ perceptions of the availability of necessary resources, knowledge, and opportunities to implement online shopping (Lin, 2007; Ha, 2016). Le-Hoang (2020) concluded that behavioral control awareness has a positive impact on intention to buy online products on Lazada of Vietnamese consumers in Ho Chi Minh city from data of 300 customers obtained through an online survey. Therefore, the proposed research hypothesis is:

H5: Behavior Control Awareness has a positive effect on online purchase intention for cosmetic products on Shopee of Gen Z in Ho Chi Minh City.

2.2.6. Perceived Risk

The risks the consumers may encounter when the consumers buy the products online and the risk that includes financial risks and product risks (Bauer, 1960). The perceived risk refers to consumer perceptions of the uncertainty and consequences of engaging in a particular activity (Ha, 2016; Nguyen, 2016). Uncertainty regarding online transactions creates a lot of different risks. Pavlou (2003) classifies risks into financial risk, seller risk, privacy risk (personal information may be disclosed illegally) and security risks (Stolen credit card information).

Some studies have found an inverse relationship between perceived risk and intention to buy online. In the research “Factors affecting online purchase intention: the case of e-commerce on Lazada” (Le-Hoang, 2020) conducting on 300 customers, the results showed that the perceived risk of the customers should be captured and any complaints should be immediately responded and handled so that customers can be assured of the money they have spent, and have more online purchase intention. Ta and Dang (2021) also concluded that potential negative consequences or uncertainties associated with online shopping, including concerns about financial risks, security issues, and privacy have a negative impact on the intention to shop online among Generation Z consumers in study “Factors influencing the intention to shop online among Generation Z consumers in Vietnam”. Based on the conducted review of relevant literature, the proposed research hypothesis is:

H6: Perceived Risk has a negative effect on online purchase intention for cosmetic products on Shopee of Gen Z in Ho Chi Minh City.

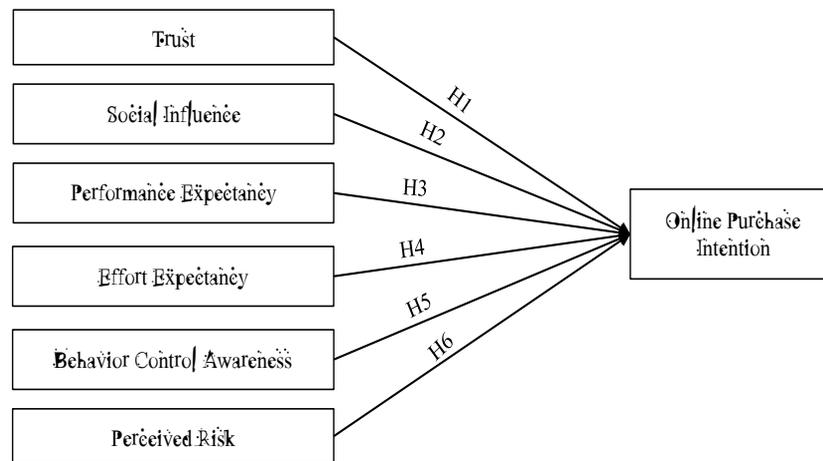


Figure 1. The Proposed Model

3. RESEARCH METHOD

3.1. Procedure

The research process includes two main stages: preliminary research and official research. Preliminary research is carried out qualitatively by examining earlier trustworthy studies, investigations, and reports. Then, in the middle of December 2022, initial qualitative research was carried out using in-depth questionnaires and one-on-one interviews. After assessing the validity and usefulness of the survey in order to confirm and correct the correctness of the measurement variables, valid variables are established and the official questionnaire is finished. The official research phase is quantitatively carried out. An official online poll of approximately 260 responses was done from February 12 to March 10, 2023. Microsoft Excel and SPSS 20 will be used to code and analyze the data that has been collected. The data will then be examined using the SPSS 20 program to calculate the scale's Cronbach's Alpha coefficient, as well as to perform multiple regression analysis, a Pearson correlation analysis, and ANOVA analysis.

3.2. Questionnaire development

The research aims to investigate the relationship between various factors, including trust, social influence, performance expectancy, effort expectancy, behavior control awareness, perceived risk, and the intention to purchase cosmetics online on Shopee of gen Z consumers in Ho Chi Minh City. Therefore, the questionnaire contains an introduction that outlines the purpose of the study, general questions focusing on the frequency of online cosmetics shopping, the purpose of such purchases, and whether the respondent has previously purchased cosmetics online in order to obtain a better understanding of the respondent's online cosmetics shopping experience and to classify participants into different groups and a set of questions related to online cosmetics shopping that can be answered using a 5-point Likert scale. The study requires a minimum of 145 completed surveys, based on a sample size of at least $29 \times 5 = 145$ (Bollen, 1989) but the survey was conducted on a sample of 260 respondents, all of them were deemed valid for the purposes of statistical analysis.

3.3. Demographic statistics

In Table 1 (appendix), the survey highlights that female consumers are the primary focus of cosmetic product platforms due to their high demand for purchasing beauty products online. Out of the 260 valid respondents, 193 were female. However, the number of male buyers is still considerable and they are encouraged to participate more in buying cosmetics online in the future. This outcome indicates the growing

awareness of consumers, regardless of gender, in following the current trend of purchasing cosmetic products through online channels. With respect to the Age, it indicates that the largest proportion of individuals falls within the age range of 18 to 22 years old. After that group is the group spanning from 13 to 18 years old while those between 22 and 26 account for a very small percentage. In terms of the education background, 62.3% of the population is presently attending Universities or Colleges, while 35.4% studying in high schools. Only a few are master's and second-level learners, with rates of 1.2% and 0.8% respectively. Regarding shopping frequency, the most popular choice among young people is 1-5 times per quarter. The frequency of shopping below 1 time per quarter and above 5-10 times per quarter are not significantly different while the rate of shopping 5-10 times per quarter is still quite modest at 6.5%. This shows that the online cosmetics shopping market, although still very potential, must continue to develop to attract a large number of consumers and encourage them to shop more frequently.

4. RESULTS AND DISCUSSION

4.1. Results

Cronbach's alpha value of 0.6 or higher is considered acceptable for research purposes (DeVon et al., 2007). From Table 2 (appendix), the Cronbach's Alpha coefficient of the PI is 0.797, TR is 0.920, SI is 0.929, PE is 0.952, EE is 0.925, BCA is 0.892, PR is 0.878. The results exceed the minimum threshold of 0.6. Therefore, the scale of subjective variables was reliable.

In Table 3 and Table 4 (appendix), the Exploratory Factor Analysis showed a KMO coefficient of 0.892 and a significant Bartlett test (Sig. = 0.000 < 0.05) with all six independent factors analyzed having an Eigenvalue of larger than 1, from which we can conclude that all independent variables conform with the criteria of The KMO - Bartlett test and therefore suitable for this research. Besides, the KMO index of the dependent variable shown in Table 5 (appendix) is 0.711 and a significant Bartlett test (Sig. = 0.000 < 0.05), indicating that the data is suitable for factor analysis.

As shown in Table 7 (appendix), the Pearson correlation coefficient (r) between purchasing intention and other variables such as trust, social influence, performance expectancy, effort expectancy, behavior control awareness and perceived risk also has a high absolute value (between 0.5 and 1), with values of 0.522, 0.613, 0.601, 0.615, 0.610 and 0.512, respectively. These values indicate a significant relationship between effort expectancy, social influence with purchase intention, as it has the highest correlation coefficient compared to other variables. The correlation coefficients of the other variables follow in descending order: behavior control awareness, performance expectancy, trust and perceived risk.

Hypothesis testing

Test hypothesis H1: The beta coefficient of the trust factor is 0.175 which is greater than 0 and the t-test sig is equal to 0.000 < 0.05. Thus, with the 95% confidence level, the trust factor has a positive impact on the purchase intention. Therefore, accepting hypothesis H1: "Trust has a positive effect on online buying intention for cosmetic products on the Shopee e-commerce platform of generation Z in Ho Chi Minh City".

Test hypothesis H2: Table 8 (appendix) shows that the social influence factor has a positive regression coefficient $\beta_2 = 0.260$, and sig = 0.000 < 0.05. With a confidence coefficient of 95%, the social influence factor has a positive impact with the purchase intention. Therefore, accepting the hypothesis H2: "Social Influence has a positive effect on online buying intention for cosmetic products on the Shopee e-commerce platform of generation Z in Ho Chi Minh City".

Test hypothesis H3: Regression coefficient of performance expectancy variable is 0.242 > 0 and sig value = 0.000 < 0.05. Thus, with a confidence coefficient of 95%, performance expectancy has a

positive influence on the intention to buy cosmetics through Shopee. Therefore, accept the hypothesis H3: “Performance expectancy positively affects the intention to buy products on the Shopee e-commerce platform of generation Z in Ho Chi Minh City”.

Test hypothesis H4: The results of Table 8 (appendix) show that the beta coefficient of the effort expectancy variable has a positive value of 0.207 and sig value < 0.05 , statistically significant. Therefore, accepting the hypothesis H4: “The effort expectancy has a positive impact on the intention to buy cosmetics on the Shopee e-commerce platform of generation Z in Ho Chi Minh City”.

Test hypothesis H5: Table 8 (appendix) shows that the behavioral control awareness variable BCA has a t-test sig of $0.000 < 0.05$, so this factor is statistically significant at the 5% significance level. Beta coefficient measured at 0.292 is greater than 0, so this factor has a positive effect on the dependent variable intention to buy. Therefore, accepting the hypothesis H5: “Behavioral control awareness has a positive effect on the intention to buy products on the Shopee e-commerce platform of generation Z in Ho Chi Minh City”.

Test hypothesis H6: Perceived risk variable PR has a standardized Beta coefficient of -0.091 less than 0, and the t-test has a sig value $= 0.014 < 0.05$. Thus, this variable has a negative effect on the dependent variable of purchase intention. Therefore, accepting the hypothesis H4: “Perceived risk has a negative effect on the intention to buy products on the Shopee e-commerce platform of generation Z in Ho Chi Minh City”.

4.2. Discussion

In the context of online shopping, trust plays a crucial role in connecting buyers and sellers and establishing transactions, especially since buyers cannot interact directly with the seller or physically touch the product they wish to buy. As a result, the lack of trust is identified as one of the primary obstacles that prevent Gen Z consumers from purchasing cosmetics through the Shopee e-commerce platform. This finding is consistent with previous research by Le-Hoang (2020), Tran and Nguyen (2022).

The significant role of social influence means that when relatives, friends, and other people in their social circle encourage and endorse the idea of buying cosmetics on Shopee, Gen Z’s intention to make a purchase is strengthened. This finding is consistent with previous studies by Celik (2016) and Dewi et al. (2020). In fact, Gen Z still relies on input from important people in their lives, such as friends, family, past customer reviews, and media sources when considering buying cosmetics online.

The expected performance of online purchase intention for cosmetic products on Shopee is also a significant driver of Gen Z’s intention to make a purchase. When Gen Z perceives more benefits from buying cosmetics online through Shopee, their intention to make an online purchase is heightened. It is consistent with the studies by Venkatesh et al. (2003) and Dewi et al. (2020).

The positive impact of expected effort to online purchase intention for cosmetic products through Shopee Gen Z consumers shows that when Gen Z expects to make a quick and easy purchase on the Shopee platform, their intention to buy cosmetics is strengthened. This finding is consistent with previous studies by Venkatesh et al. (2003) and Dewi et al. (2020). In fact, finding cosmetics through the Shopee e-commerce platform is quick and convenient, with a wide range of options available, allowing consumers to save time and costs while still selecting the right product for their needs.

The intention of Generation Z to purchase cosmetic products on Shopee is also increased by their perception of behavioral control awareness. This conclusion is completely consistent with TPB theory and previous studies of Le Hoang (2020). It means that when consumers are confident in their ability to make online purchases, they are more likely to buy. Although Generation Z has a strong desire to shop, many of them are not financially independent and do not have access to credit cards, which limits their ability to purchase cosmetics on Shopee due to the lack of financial and informational resources.

The final result has revealed that perceived risk negatively affects the intention of Gen Z customers in Ho Chi Minh City to purchase cosmetics on Shopee which is consistent with previous studies conducted by Le-Hoang (2020) and Mosunmola et al. (2019). When intending to purchase cosmetic products on Shopee comes, the inability to physically examine products before purchasing online increases the perceived risk for Gen Z consumers because they are unable to touch, feel, or try on the product. Despite the advantages that e-commerce offers to Gen Z consumers in Ho Chi Minh City, they still have concerns about the potential risks associated with buying cosmetics through the Shopee platform, such as financial risks (losing money), privacy risks (illegal disclosure of personal information), and product risks (products not matching the description).

5. CONCLUSION

The results have concluded that Trust (TR), Social Influence (SI), Performance Expectancy (PE), Effort Expectancy (EE), Behavior Control Awareness (BCA), and Perceived Risk (PR) were all determinants for the purchasing intention of Gen Z consumers living Ho Chi Minh City of cosmetics on Shopee at a significance level of 5%. The model compiled from the analysis of the collected data is as follows:

$$PI = 0.175*TR + 0.260*SI + 0.242*PE + 0.207*EE + 0.292*BCA - 0.091*PR + \varepsilon$$

Based on these findings, some recommendations have been given:

+ Vendors on Shopee should allow GenZ consumers to check cosmetics before receiving goods and address all their concerns regarding purchasing cosmetics to build a foundation of trust between the consumer and the brand. They can also provide better after-sales support by employing more consumers support staff to improve responsiveness and equipping them with better training to give a better grasp of the brand's different product lines and problems that frequently occur so that when a Gen Z consumer contacts the store bearing a problem, their issue is swiftly and accurately resolved.

+ Regarding Social Influence, brands should create diverse branding activities and contents that target Generation Z on different channels, such as Facebook, Instagram and Tiktok. These marketing campaigns preferably should feature trending and/or popular celebrities, KOLs and influencers among the Generation Z demographic endorsing the use of the Shopee platform as a way of purchasing the brand's products. In addition, negative feedback from consumers must be handled professionally to avoid damaging the company's reputation. Vendors on Shopee should provide careful and thorough solutions to complaints, followed by a satisfaction survey to regain consumers' trust.

+ Brands should work on increasing the variety of cosmetics brands and products available on their Shopee store that cater to the needs of Gen Z consumers to increase the perceived usefulness of the vendor's online store in the eyes of Generation Z customers as they are likely to find more products that suit their needs on the site. They can also focus on providing more deals and discounts for cosmetics products. This will increase the chances of Gen Z consumers getting better deals on their purchases, which will further enhance the usefulness of the platform. Vendors on Shopee can improve their search engine optimization (SEO) process on the platform. An effective implementation of SEO can help the brand's products appear more prominently in searches for cosmetics products. This will give the company's products an edge over the competition by guaranteeing its store page will turn up in relevant searches relating to cosmetics.

+ Large enterprises or a consortium of brands can collaborate with Shopee to work on a number of different ways in which it can consensually collect personalized data from its users to create highly customized cosmetics purchasing experiences based on data collected on the consumer so that Shopee's algorithm can easily and precisely recommend products that users are interested in and truly want to buy which lead to the perception of an effortless shopping experience from the perspective of the consumer.

+ Vendors should give Gen Z consumers more liberty and flexibility over how consumers make their payments and the medium which they can choose to facilitate purchases. One improvement is the

implementation of the paying in installments giving consumers the freedom to manage their finance, thus giving them more control over their online purchasing experience. Brands with existing loyalty programs should extend these programs to their Shopee store so that their existing consumers base can find the transition more palatable as they can still benefit from loyalty programs that they have already been a part of.

+ Brands must work with Shopee to ensure that its data privacy agreement should be concise and transparent so that their users can easily understand what their data is being used for and how it is being stored to avoid confusion and uncertainty on the consumers' end which may drive them away from making transactions on the platform. Vendors need to petition the platform to always keep an eye on the latest developments in cybersecurity by hosting frequent training sessions for its IT department and working with cybersecurity firms to ensure proper and prompt acknowledgment of newly discovered vulnerabilities, exploits and attacks.

However, this research is limited to only one city, Ho Chi Minh City in Vietnam. Additionally, it only examines the intention to purchase, not actual behavior. Therefore, future research could focus on analyzing the actual behavior of Gen Z consumers in other cities or regions of Vietnam when purchasing cosmetics online or could explore the role of external factors such as shipping costs, delivery times, and availability of funds in the intention of Gen Z consumers when purchasing cosmetics online.

6. APPENDIX

Table 1. Descriptive analysis

Factors	Indicators	Frequency	Percent
Gender	Male	67	25.8
	Female	193	74.2
	Total	260	100.0
Factors	Indicators	Frequency	Percent
Gender	Male	67	25.8
	Female	193	74.2
	Total	260	100.0

Education background	Secondary School	2	.8
	High school	92	35.4
	University/ College	162	62.3
	Master/PhD	3	1.2
	Others	2	.4
	Total	260	100.0
Frequency of purchasing cosmetics on Shopee	Under 1 time/ quarter	51	19.6
	1-5 times/ quarter	152	58.5
	5-10 times/ quarter	40	15.4
	Above 10 times/ quarter	17	6.5
	Total	260	100.0

Table 2. Cronbach's Alpha Scale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if item Deleted
TRUST (Cronbach's Alpha = .920)				
TR1	15.10	13.326	.816	.897
TR2	15.13	13.728	.804	.900
TR3	14.94	13.108	.791	.902
TR4	15.00	12.884	.749	.912
TR5	14.91	13.301	.816	.897
SOCIAL INFLUENCE (Cronbach's Alpha = .939)				
SI1	11.34	9.715	.836	.927
SI2	11.35	9.532	.895	.908
SI3	11.43	9.512	.865	.918
SI4	11.40	10.047	.828	.929
PERFORMANCE EXPECTANCY (Cronbach's Alpha = .952)				

Education background	Secondary School	2	.8
	High school	92	35.4
	University/ College	162	62.3
	Master/PhD	3	1.2
	Others	2	.4
	Total	260	100.0
Frequency of purchasing cosmetics on Shopee	Under 1 time/ quarter	51	19.6
	1-5 times/ quarter	152	58.5
	5-10 times/ quarter	40	15.4
	Above 10 times/ quarter	17	6.5
	Total	260	100.0

SOCIAL INFLUENCE (Cronbach's Alpha = .939)				
SI1	11.34	9.715	.836	.927
SI2	11.35	9.532	.895	.908
SI3	11.43	9.512	.865	.918
SI4	11.40	10.047	.828	.929
PERFORMANCE EXPECTANCY (Cronbach's Alpha = .952)				

PE1	8.99	11.290	.862	.944
PE2	9.02	10.694	.907	.930
PE3	9.03	10.922	.887	.936
PE4	9.02	11.035	.880	.939
EFFORT EXPECTANCY (Cronbach's Alpha = .925)				
EE1	11.42	7.835	.810	.908
EE2	11.38	7.628	.838	.899
EE3	11.25	7.609	.828	.902
EE4	11.24	7.456	.828	.902
BEHAVIOR CONTROL AWARENESS (Cronbach's Alpha = .892)				
BCA3	5.66	6.209	.753	.875
BCA4	5.77	5.761	.856	.785
BCA5	5.58	6.128	.756	.873
PERCEIVED RISK (Cronbach's Alpha = .878)				
PERCEIVED RISK (Cronbach's Alpha = .878)				
PR1	4.89	4.969	.797	.800
PR2	4.83	4.924	.768	.824
PR3	4.83	4.834	.731	.860
PURCHASE INTENTIONS OF GEN Z FOR COSMETICS IN SHOPEE PLATFORM (Cronbach's Alpha = .797)				
PI1	6.69	4.138	.635	.734
PI2	7.00	3.757	.647	.716
PI3	6.85	3.451	.649	.719

Table 3. KMO and Bartlett results - independent variable

Scope	Result	Comparison to condition
KMO coefficient	.892	.5 < .892 < 1
Sig. of Bartlett's Test	.000	.000 < .05
Eigenvalue	1.428	1.428 > 1
Total variance explained (%)	82.470%	82.470% > 50%

Table 4. EFA analysis for independent variable

VARIABLE	COMPONENTS					
	1	2	3	4	5	6
TR1	.863					
TR2	.849					
TR3	.823					
TR4	.813					
TR5	.856					
PE1		.879				
PE2		.904				
PE3		.891				
PE4		.873				
SI1			.849			
SI2			.906			
SI3			.875			
SI4			.854			
EE1				.812		
EE2				.878		
EE3				.829		
EE4				.821		

BCA3					.832	
BCA4					.897	
BCA5					.843	
PR1						.846
PR2						.852
PR3						.828

Table 5. KMO and Barlett results - dependent variable

Scope	Result	Comparison to condition
KMO coefficient	.711	.5 < .711 < 1
Sig. of Barlett's Test	.000	.000 < .05
Eigenvalue	2.140	2.140 > 1
Total variance explained (%)	71.345 %	71.345% > 50%

Table 6. EFA analysis for dependent variable

Variables		Component
		1
Online Purchase Intention	PI1	.839
	PI2	.847
	PI3	.848

Table 7. Pearson correlation between independent and dependent variables

Correlations		PI	TR	SI	PE	EE	BCA	PR
PI	Pearson correlations	1	.522**	.613**	.601**	.615**	.610**	-.512**
	Sig (2-tailed)		.000	.000	.000	.000	.000	.000
TR	Pearson correlations	.522**	1	.324**	.310**	.405**	.271**	-.274**
	Sig (2-tailed)	.000		.000	.000	.000	.000	.000

SI	Pearson correlations	.613**	.321**	1	.300**	.424**	.344**	-.388**
	Sig (2-tailed)	.000	.000		.000	.000	.000	.000
PE	Pearson correlations	.601**	.310**	.300**	1	.463**	.345**	-.326**
	Sig (2-tailed)	.000	.000	.000		.000	.000	.000

EE	Pearson correlations	.615**	.405**	.424**	.463**	1	.286**	.345**
	Sig (2-tailed)	.000	.000	.000	.000		.000	.000
BCA	Pearson correlations	.610**	.271**	.344**	.345**	.286**	1	-.414**
	Sig (2-tailed)	.000	.000	.000	.000	.000		.000
PR	Pearson correlations	-.512**	-.274**	-.388**	-.326**	-.345**	-.414**	1
	Sig (2-tailed)	.000	.000	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed)

Table 8. Coefficient Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	-.003	.222		-.013	.990		
F_TR	.180	.037	.175	4.898	.000	.781	1.280
F_SI	.235	.034	.260	6.998	.000	.718	1.393
F_PE	.205	.031	.242	6.500	.000	.717	1.395
F_EE	.211	.040	.207	5.269	.000	.646	1.549
F_BCA	.226	.028	.292	8.017	.000	.748	1.337
F_PR	-.079	.032	-.091	-2.467	.014	.725	1.379

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RESEARCH ON THE INFLUENCE OF SHORT VIDEO MARKETING ON TIKTOK ON THE CONSUMER PURCHASE INTENTIONS OF YOUNG PEOPLE IN HO CHI MINH CITY TOWARD THE F&B INDUSTRY

Author: Nguyen Hai Vi¹, Hoang Thanh Huong², Tran Quynh Mai²,
Le Ngoc Thien Minh², Le Ly Hoang Vy²
Mentor: Truong Bich Phuong²

ABSTRACT: *TikTok is an emerging platform officially launched in April 2019 and quickly attracts numerous users through short videos that offer useful information and recommend videos with content tailored to the preferences of each user. Not an exception, the F&B sector also adopts TikTok to establish completely new marketing tactics and strategies. Currently, in Vietnam, there is an increasing demand for food. Consumers can evaluate F&B brands by watching food videos on TikTok as virtual experiences of restaurants. However, there have not been many in-depth studies on the influence of short video marketing on TikTok on purchase intentions in the F&B sector. This article builds a model of the impact of aspects related to short videos on TikTok on the purchase intention of young people in the F&B industry. It is also a scientific background for F&B businesses to market and increase purchase intention through TikTok's short videos and for successive research.*

Keywords: *Short video; TikTok; purchase intention; F&B*

1. INTRODUCTION

TikTok has become a trendy mainstream of social media with more than 1 billion users (2023). Marketing products on this platform is the foremost choice for brands aiming to increase business performance.

Besides, F&B service is a strongly developed industry, and food and drink topics also attract great attention on TikTok. According to MGH Inc (2021), 36% of TikTok users ordered from a restaurant after seeing that restaurant on this platform. The survey “Vietnam social media popularity” by Q&Me Vietnam Market Research (2022) shows that 28% of users think TikTok is a platform to update social trends, ranking first compared to other platforms such as Youtube (13%), and Instagram (6%). The team found that trendiness is a potential factor that can significantly impact the effectiveness of short video marketing.

Short videos are 10 minutes long and are primarily recorded and edited by mobile devices (Liu et al., 2019). They can be viewed, posted, and shared on the platform. Although TikTok is currently one of the most fundamental parts of short video marketing strategies in the global F&B industry, the truth is Vietnam’s F&B businesses are not capable of designing systematic and optimized promotion activities on TikTok. Chief among the reasons is the lack of comprehensive research in this area.

Liu et al. (2019) discovered the positive impact of interesting content, scenario-based experiences, and user engagement interactions on brand attitudes. By solely implementing questionnaires, this research should have employed interviews and other methods to form more representative data and authentic research results. Le Hong Long (2022), whose study collected 173 questionnaires, concluded that an increase in the quality of video advertising content on TikTok leads to higher perceived value and positively influences purchase intention. However, the biggest limitation of the study is the small number of independent variables and the small number of survey samples, so the results are not collective and not appropriate to the size and

¹ Foreign Trade University; Email: k60.2111113308@ftu.edu.vn

² Foreign Trade University

conclusions of the study. Meanwhile, trendiness is a rarely mentioned factor in studies on the influence of short videos on purchase intention, especially in the F&B industry.

Given the importance of the marketing on TikTok platform and the gaps in the research mentioned above, the authors believe that “Research on the Influence of Short Video Marketing on TikTok on the Consumer Purchase Intentions of Young People in Ho Chi Minh City towards the F&B Industry” is an obvious practical topic.

2. THEORETICAL FRAMEWORK

2.1. The Model of Consumer Purchase Intention

2.1.1. Stimulus - Organism - Response Model (SOR Model)

The SOR model proposed by Mehrabian and Russell in 1974 is one of the most prevalent models in environmental psychology:

- Stimulus: the external environmental factor of the organism.
- Organism: a psychological transformation mechanism by which the user internalizes the stimulation into information.
- Response: represents the user to the external stimulus information content of the relevant response behavior.

For the TikTok platform, the research of Ouyang or Dwinanda, Syaribuddin, and Hendriana (2022) also applies the SOR model to investigate the factors affecting purchase behavior.

2.1.2. Elaboration Likelihood Model (ELM)

Developed by Petty and Cacioppo in 1986, the Elaboration Likelihood Model (ELM) is a psychological theory that explains the process of forming and changing the attitudes of individuals.

According to the ELM model, one’s perspectives and attitudes can be affected in two channels. They are the central and peripheral routes. Which path each individual is affected by depends on their motivation and level of expertise in analyzing and processing information. In particular, many authors have been applying this model, such as Chu, Deng, and Mundel (2022) and Ahmadi and Hudrasyah (2022).

2.1.3. Construction of the conceptual framework

From two theoretical bases, the authors found that the two models (SOR and ELM) are similar as both are analytical frameworks used to study the factors that can affect consumers’ attitudes, intentions and behaviors. Therefore, these two theories are not contradictory and can combine and complement each other.

The Stimulus factors (S) in the SOR model separate into two directions: the central route and the peripheral route, according to the ELM model; the Subject (O) and Response (R) factors stay the same.

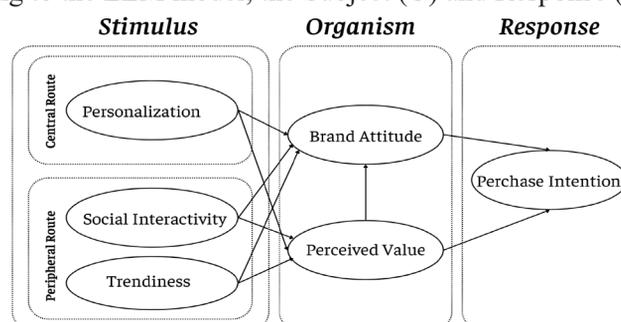


Figure 2.3 Model Construction

2.2. Research hypothesis

Trends emerge with a burst of discussion by society (Naaman et al., 2011) or the most recent, timely information and pictures (Liu et al., 2019). With its intelligent algorithm, TikTok automatically updates and recommends the most relevant and trending content to users.

Hypothesis H1. *Trendiness positively affects customers' brand attitude.*

Sharabati et al. (2022) claimed that “social networking trends aid in more interpersonal connections because it allows individuals to interact with like-minded people, and it often satisfies people’s desires for better esteem and self-actualization”.

Hypothesis H2. *Trendiness positively affects customers' perceived value.*

“Personalization refers to the degree of conformity between information content and personal preferences” (Chen et al., 2014; Gao and Zang, 2016). Personalized video content makes customers feel differently and encourages them to place more trust in the brand.

Hypothesis H3. *Personalization positively affects customers' brand attitude.*

Compared with other groups, young people show more personalized consumption. They proactively pay more attention to those offerings. By purchasing and using such products, they express their personality and create a circle of like-minded people to satisfy their psychological needs.

Hypothesis H4. *Personalization positively affects customers' perceived value.*

Interactivity is closely related to the user’s attitude toward the brand. Research by Liu et al. (2019) has shown that user interactivity on short video platforms significantly impacts their attitudes toward brands.

Hypothesis H5. *Interactivity positively affects customers' brand attitude.*

Interactivity is also one of the factors affecting customers’ perceived value. Studies like those by Abdullah et al. (2016), Huang and Liao (2017), and Dwinanda et al. (2022) also show that interactivity is positively related to the perceived value of consumers.

Hypothesis H6. *Interactivity positively affects customers' perceived value.*

According to the research by Liu et al. (2019), there is a significant positive impact on attitudes toward marketing videos. Dwinanda et al. (2022) had similar results that the perceived advertising value notably positively affects customers’ viewpoints.

Hypothesis H7. *Perceived value positively affects customers' brand attitude.*

According to Gan and Wang (2017), perceived value significantly and positively affects purchase intention. The same for the F&B industry users will tend to want to have or try the product after watching the review video (Rezi and Roro, 2022).

Hypothesis H8. *Perceived value positively affects customers' purchase intention.*

Dwinanda et al. (2022) noted that consumers’ attitudes positively affect purchase intention in Indonesia. Zhao and Wang (2020), when researching health advertising on short-video social media in China, also found that consumers who have a positive attitude towards short video advertising are more likely to make a purchase.

Hypothesis H9. *Brand attitude positively affects customers' purchase intention.*

In the study of Huang and Lu (2020) and Sallam and Algammash (2016), attitudes play a mediating role between external factors and consumers’ purchase intention.

Hypothesis H10a. *Brand attitude mediates between trendiness and purchase intention.*

Hypothesis H10b. *Brand attitude mediates between personalization and purchase intention.*

Hypothesis H10c. *Brand attitude mediates between interactivity and purchase intention.*

The perceived value comprises price and other psychological variables that affect consumers’ decisions, such as functional, emotional, and experiential factors (Jamal et al., 2011), quality, emotional response, and reputation (Petrick, 2002). On short video platforms, perceived value acts as a bridge between consumers and sellers, and consumers can choose to purchase or not based on products’ perceived value (Hewei, 2022).

Hypothesis H11a. *Perceived value mediates between trendiness and purchase intention.*

Hypothesis H11b. *Perceived value mediates between personalization and purchase intention.*

Hypothesis H11c. *Perceived value mediates between interactivity and purchase intention.*

3. RESEARCH METHOD

3.1. Questionnaire Design

To ensure the reliability and validity of the variables, we refer to the question items measuring potential variables commonly used in relevant domestic and foreign studies. When selecting variables and designing the questionnaire, we use them as a theoretical basis. At the same time, we conducted focus group interviews to refine and complete the preliminary scale. The specific measure and question items in the final questionnaire are in Table 3.1. The measure is a five-point Likert scale, with 1, 2, 3, 4, and 5 correspondingly indicating “Strongly disagree”, “Disagree”, “Neutral/Uncertain”, “Agree”, and “Strongly agree”.

Table 3.1. Relevant variables and descriptions.

Potential Variables		Title Source
Trendiness		
XH1	I am often attracted to short videos about food and drink on TikTok that deliver me the latest information.	Godey, B., et al., (2016); Aji et al., (2022); Kim and Ko (2012)
XH2	I am often attracted to short videos about food and drink that are trending on TikTok.	
XH3	Short videos about food and drink on TikTok give me new information about the brand.	
Personalization		
CNH1	Short videos about food and drink on TikTok remember my food preferences and provide relevant videos based on that interest.	Zhang et al (2014); Liu et al (2019)
CNH2	Short videos about food and drink on TikTok create realistic scenes, consistent with reality.	
CNH3	The different scenarios of the short marketing video about food and drink produced a series of associations that corresponded to that scenario (appetite, meal planning, etc.).	
Interactivity		
TTT1	I often like, comment, and share short videos about food and drink on TikTok.	Wang et al (2022); Xiao et al (2019)
TTT2	Short videos about food and drink on TikTok motivate me to interact (like, comment, share...) with other users.	
TTT3	When interacting with others, I often trust the opinion of the majority (for example, there are many positive comments, many likes...).	
TTT4	I relish learning about the F&B brand through interacting with other users on TikTok.	
Brand Attitude		

TD1	Watching short videos about food and drink on TikTok reminds me of some familiar F&B brands.	Liu et al (2019); Zhao et al (2020); Wang et al (2022)
TD2	Watching short videos about food and drink on TikTok gives me a fresh perspective on the F&B brands I already know.	
TD3	Watching short videos about food and drink on TikTok gives me a positive view of some of the F&B brands.	
TD4	Watching short videos about food and drink on TikTok inspired me to consume products from several F&B brands.	
TD5	I often share and recommend products from F&B brands marketed on TikTok with people around.	
TD6	I often like F&B brands that use marketing videos (with attractive images, interesting content,...) on TikTok.	
Perceived Value		
GTCN1	I think the food in the short videos on TikTok will meet my expectations.	Hewei (2022); Lin et al (2022)
GTCN2	After watching short videos about food and drink on TikTok, I tried them and felt that the quality of the food met my expectations of the food this video brings.	
GTCN3	I trust the quality of the food in the short videos on TikTok.	
Purchase Intention		
YDMH1	I will recommend the food in the video on TikTok to others.	Lin and Kim (2016); Wang et al(2022); Chang and Dong (2016) Ha and Lam 2017)
YDMH2	After watching short videos about food and drink on TikTok, I wanted to experience these foods.	
YDMH3	After watching short videos about food and drink on TikTok, I plan to try these dishes in the future.	
YDMH5	Short videos about food and drink on TikTok help me choose the right F&B brand when I plan to eat out in the future.	
YDMH6	I plan to find information about the F&B brand that I want to try through a short video about food and drink on TikTok.	

Stimulus Variables

Trendiness is the new level of information that the brand provides the customers or the promotional strategies that keep up with the latest trends (Godey et al., 2016).

Personalization refers to the degree of concordance between the content of the short video and consumers' personal preferences (Chen et al., 2014; Gao and Zang, 2016).

According to Liu et al. (2019), interactivity is the level of consumer involvement in producing content for short videos, establishing relationships with others, communicating, exchanging information regarding the brand, and eventually achieving emotional satisfaction.

Mediating variables

The brand attitude in this study is the evaluation, emotion, and behavioral tendency in the positive direction, favorable or unfavorable consumer sentiment toward a brand, which is similar to the definition of Kotler, Bowen, and Makens (1999).

According to Zeithaml (1998), the above concept is a "consumer's comprehensive assessment of the benefits of a product based on customers' perceptions of gain and loss", or in other words, the trade-off between perceived benefits and perceived costs.

Response variables

According to Wang and Nguyen (2018), purchase intention is a consumer's willingness to buy a product or service. On the other hand, in some situations, purchase intention also means whether the customer will repurchase the product or service.

3.2. Method

The research methods used were a combination of the qualitative and quantitative methods, conducted respectively. The former was used in advance with focus group interviews for the purpose of refining and completing the preliminary scale. Then, the research was continuously conducted using the latter for 3 objectives: preliminary scale assessment, official scale assessment, and official research results analysis, by using Cronbach’s Alpha coefficient, Cronbach’s Alpha coefficient, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) in order.

3.3. Focus group interview

In the qualitative research, we conducted 2 focus group interviews to collect the opinions of the study’s target respondents. In the first interview, we invited 7 people, including both males and females from different professions. We introduced our research topic, research purpose, and the objective of the interview, then asked the respondents’ views about all variables in our questionnaire respectively. The participants are free to express their opinions and also discuss their opinions about the variables. Afterward, we received many comments on all the variables, then selected the appropriate opinions and modified some variables: CNH1, CNH2, TTT1,... The edited questionnaire after interview 1 was used in interview 2.

In the second interview, the number of interviewees was the same as in the first one. Most respondents said that they quite agreed with the current edited questionnaire, but some members still made a few comments about the words, clarity, relevance, and order of questions. Some variables modified were XH1, CNH3, TTT2, TD2,... and this second edited questionnaire was used for quantitative research.

3.4. Descriptive statistics of the sample

In quantitative research, the data was collected by carrying out an online survey via Google Forms, with the target respondents being young people aged 18-25 in Ho Chi Minh City. After 2 weeks of implementation, the survey was filled by 477 participants and there were only 394 valid respondents. The details can be seen in Table 3.2.

Table 3.2. Descriptive statistical analysis of the sample.

Statistical Indicators	Classification Indicators	Number of Samples (N=394)	Proportion (%)
Gender	Male	121	30.71%
	Female	273	69.29%
Education level	High school	18	4.56%
	Undergraduate	208	52.80%
	Postgraduate	168	42.64%
Monthly income (million VND)	< 5 million VND	151	38.32%
	5 - 10 million VND	130	33%
	10 - 15 million VND	73	18.53%
	> 15 million VND	40	10.15%
Average time using TikTok per day	< 30 minutes	80	20.30%
	30 minutes to 1 hour	69	17.51%
	1 hour to 2 hours	123	31.22%
	> 2 hours	122	30.96%

Time frame of using TikTok	0h00 - 6h00	53	9.91%
	6h00 - 12h00	61	11.40%
	12h00 - 18h00	103	19.25%
	18h00 - 0h00	318	59.44%

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Test of reliability and exploratory factor analysis (EFA)

At first, we evaluated the reliability of the scale by using Cronbach's Alpha coefficient. In Table 4.1, all 6 scales have Cronbach's Alpha coefficients that were greater than 0.6. The detailed findings in Appendix 1 also showed that Corrected Item - Total Correlation coefficients in all 6 scales were also higher than 0.3. Moreover, Cronbach's Alpha if Item Deleted values in all 6 scales were less than or equal to the general Cronbach's Alpha value of the scale. Thus, all 6 scales were reliable and preserved for further analyses.

Table 4.1. Reliability assessment

Scale	Cronbach's Alpha	N of Items
Trendiness	0.803	3
Personalization	0.753	3
Social interactivity	0.830	4
Brand attitude	0.873	6
Perceived value	0.792	3
Purchase intention	0.880	5

After using Cronbach's Alpha, we continued to conduct exploratory factor analysis (EFA). The results showed a KMO value of $0.923 > 0.5$ and Sig. Bartlett's Test value of $0.000 < 0.05$, indicating the data was suitable for analysis. Eigenvalues of all 6 extracted variables were greater than 1; the Total Variance Explained was $68.137\% > 50\%$, showing that 6 extracted factors can explain 68.137% of the variance. Factor loading coefficients were all higher than 0.5, demonstrating that all 24 indicators were good and preserved for further analyses (Table 4.2)

Table 4.2. Rotated Component Matrix

	Component					
	1	2	3	4	5	6
TD1	0.761					
TD2	0.758					
TD3	0.715					
TD4	0.682					
TD6	0.647					
TD5	0.574					
YDMH3		0.765				
YDMH6		0.751				
YDMH5		0.744				
YDMH2		0.727				

YDMH1	0.570		
TTT2		0.846	
TTT1		0.789	
TTT3		0.713	
TTT4		0.644	
GTCN3		0.837	
GTCN2		0.779	
GTCN1		0.574	
XH1			0.857
XH2			0.813
XH3			0.727
CNH2			0.786
CNH3			0.777
CNH1			0.649

Confirmatory Factor Analysis (CFA)

The confirmatory factor analysis (CFA) was used to test the reliability and validity (convergent validity and discriminant validity) of the variables (Table 4.3). Although Cronbach’s Alpha coefficient had shown that the scale was reliable, the CR values below can still be used to demonstrate that the reliability of the scale was good with the value of each factor in the scale being higher than 0.700. Another index was AVE with the value of each variable being greater than 0.500, indicating that the scale’s convergent validity was well attained.

Table 4.3. Composite Reliability (CR) and Average Extracted Variance (AVE)

	CR	AVE
TD	0.875	0.545
YDMH	0.881	0.598
TTT	0.835	0.560
XH	0.810	0.589
GTCN	0.794	0.562
CNH	0.756	0.508

After testing the convergent validity, we evaluated the discriminant validity of the model. The Fornell–Larcker criterion was used to compare the square root of the AV values and the correlation coefficients. In Table 4.4, all square roots of the AVE of each variable were greater than the corresponding correlation coefficient, thus, the scale’s discriminant validity was met.

Table 4.4. Fornell - Larcker Criterion

	TD	YDMH	TTT	XH	GTCN	CNH
TD	0.735					
YDMH	0.719***	0.773				
TTT	0.589***	0.545***	0.749			

XH	0.469***	0.506***	0.358***	0.768		
GTCN	0.636***	0.689***	0.522***	0.351***	0.75	
CNH	0.609***	0.553***	0.475***	0.482***	0.566***	0.713

Structural Evaluation Modeling

The results of SEM analysis indicated that the model had 240 degrees of freedom with a Chi-square value of 555.4 (P = 0.000 < 0.05). The values of other indicators: CFI = 0.932 > 0.9, TLI = 0.922 > 0.9, and RMSEA = 0.058 < 0.06 indicated that the research model can be statistically accepted.

The hypotheses were also verified using SEM (Table 4.5).

Table 4.5. Hypotheses testing results.

Hypothesis				Estimate	S.E.	C.R.	P-value	Conclusion
H1	TD	←	XH	0.163	0.051	2.957	0.003	Supported
H2	GTCN	←	XH	0.07	0.058	1.071	0.284	Not supported
H3	TD	←	CNH	0.235	0.08	3.296	***	Supported
H4	GTCN	←	CNH	0.389	0.085	4.881	***	Supported
H5	TD	←	TTT	0.267	0.046	4.52	***	Supported
H6	GTCN	←	TTT	0.324	0.049	4.921	***	Supported
H7	TD	←	GTCN	0.297	0.072	4.329	***	Supported
H8	YDMH	←	GTCN	0.392	0.073	5.856	***	Supported
H9	YDMH	←	TD	0.482	0.07	7.227	***	Supported

As the results in Table 4.6, the R-square value of GTCN variable was 0.432, meaning that the independent variables in the models (trendiness, personalization, social interactivity) explained the variation of GTCN factor by 43.2%. Similarly, the R-square value of TD variable was 0.572, so the independent variables explained 57.2% of the variation of TD; and the R-square value of YDMH variable was 0.626, thus, 62.6% of YDMH variation was explained by the independent variables.

Table 4.6. R-square values

	GTCN	TD	YDMH
Estimate	0.423	0.572	0.626

Estimating the theoretical model using bootstrap

With bootstrapping into 1000 samples, the results presented in Table 4.7 demonstrated that the C.R values were all less than 1.96, deducing the p-value > 5%, so the biases were not statistically significant at the confidence level of 95%. Thus, we can conclude that the estimates in the research model can be trusted.

Table 4.7. Results of bootstrap analysis

	Parameter		SE	SE-SE	Mean	Bias	SE-Bias	C.R
TD	←	XH	0.06	0.001	0.161	-0.002	0.002	-1
GTCN	←	XH	0.075	0.002	0.068	-0.002	0.002	-1
TD	←	CNH	0.103	0.002	0.233	-0.002	0.003	-0.66667
GTCN	←	CNH	0.093	0.002	0.39	0.001	0.003	0.333333
TD	←	TTT	0.072	0.002	0.265	-0.002	0.002	-1
GTCN	←	TTT	0.072	0.002	0.324	0	0.002	0

TD	←	GTCN	0.096	0.002	0.3	0.003	0.003	1
YDMH	←	GTCN	0.092	0.002	0.392	0.001	0.003	0.333333
YDMH	←	TD	0.092	0.002	0.482	0	0.003	0

Analyses of Mediating Effects

According to the results in Table 4.8, the Sig. values were all less than 0.05. Thus, there was an indirect relationship between the variables of XH, CNH, and TTT to YDMH. Or in other words, the two variables of GTCN and TD played an intermediary role in the influence of XH, CNH, and TTT on YDMH.

Table 4.8. Significance values

	XH	TTT	CNH
YDM	0.017	0.002	0.002

The results of mediating effects analysis shown in Table 4.9 verified that most intermediary relationships in the model were statistically significant and supported (p-value < 5%), except for the influence of trendiness (XH) on purchase intention (YDMH).

Table 4.9. Analyses of Mediating Effects

Hypothesis	Indirect Path				Standardized Estimate	P-Value	Conclusion	
H10a	XH	→	TD	→	YDMH	0.079	0.004	Supported
H10b	CNH	→	TD	→	YDMH	0.114	10	Supported
H10c	TTT	→	TD	→	YDMH	0.129	0.001	Supported
H11a	XH	→	GTCN	→	YDMH	0.027	0.275	Not supported
H11b	CNH	→	GTCN	→	YDMH	0.152	0	Supported
H11c	TTT	→	GTCN	→	YDMH	0.127	0	Supported

4.2. Discussion

Hypothesis H1

The result of structural model analysis (SEM) shows that the trendiness of short videos on TikTok has a positive effect on consumers’ brand attitudes (p-value = 0.003 < 0.05, λ = 0.163). Hypothesis H1 is accepted. The research results are consistent with Muntinga (2011). Accordingly, F&B brands need to regularly update and catch up with trending content on TikTok, or create new trends in order by encouraging consumers to participate in video recording towards a particular trend concerning their brands.

Hypothesis H2

The study found that the relationship between trendiness and perceived value was not statistically significant (p-value = 0.284 > 0.05). As a result, we reject hypothesis H2. That is, the extent to which the video is trending does not affect perceived value. This phenomenon can be explained by the fact that the sample size does not cover young people (from 18-25 years old) in Ho Chi Minh City.

Hypothesis H3

Hypothesis H3 is accepted at p-value = 0.000, λ = 0.23. This shows that the higher the personalization of short videos on TikTok, the greater the impact on consumers’ brand attitudes, which is consistent with the study of Aji et al (2020). Therefore, F&B brands are required to ensure that the video content is relevant to the needs of consumers to attract more of their interest in short marketing videos, ultimately contributing to a positive brand attitude.

Hypothesis H4

Hypothesis H4 about the positive relationship between personalization and perceived value is also accepted at $p\text{-value} = 0.000$ and $\lambda = 0.389$. These results are in line with the findings of Tian et al (2022). By watching videos that provide the latest information and are relevant to customers' psychology, there is a positive influence of videos on their perception of image and brand quality.

Hypothesis H5

The interaction of short videos on Tiktok and consumers' brand attitudes have a significant relationship ($p\text{-value} = 0.000$, $\lambda = 0.267$), thus Hypothesis H5 is accepted. This is consistent with previous studies by Liu et al (2019), and He et al (2021). Accordingly, F&B brands need to encourage customers to create content and imitate new trends regarding brands on Tiktok or like, comment and share videos with others.

Hypothesis H6

The result shows that increasing the interactivity of short videos on Tiktok helps increase the perceived value of consumers ($p\text{-value} = 0.000$, $\lambda = 0.324$). Hypothesis H6 is accepted. This conclusion is similar to previous studies by Hewei (2022), Dwinanda et al (2022), Abdullah et al (2016), and Huang and Liao (2017). Interactivity allows users to like, comment, and share interesting information and also offers an opportunity to receive others' feedback and exchange information to achieve emotional satisfaction. Additionally, consumers tend to be attracted by videos with high engagement and trust the majority opinion, which helps enhance the perceived value.

Hypothesis H7

The result shows that increasing perceived value could improve consumers' brand attitudes, which is similar to those of Huang and Lu (2020), Wang et al (2022), and Zhao and Wang (2020). Hypothesis H7 is accepted. In fact, when the perceived value is high, they will pay more attention to the video and generate positive thoughts about the services.

Hypothesis H8

The perceived value has a positive relationship with the purchase intention ($p\text{-value} = 0.000$, $\lambda = 0.392$), which is consistent with Hewei (2022) and Le (2022). Hypothesis H8 is accepted. When young consumers watch short marketing videos about F&B services, they make a judgment about them and expect to experience them in the future.

Hypothesis H9

Brand attitude plays an important role in increasing purchase intention. Hypothesis H9 is accepted. This result is consistent with the studies of Dwinanda et al (2022), Zhao and Wang (2020), Jain et al (2018), Wang and Lan (2018), and Lin and Kim (2016). When consumers have a positive attitude, a feeling of satisfaction, and a good evaluation of the brand, they tend to consume its offerings more.

Hypothesis H10a, H10b, H10c

Three hypotheses H10a, H10b, and H10c are accepted, with the respective regression coefficients are 0,079, 0,114, and 0.129. This result is consistent with studies of Huang and Lu (2020), and Sallam and Algamash (2016). This can be understood as the formation of a positive or negative attitude by consumers towards a brand is a process of searching and evaluating many different sources of information, which is strongly influenced by many factors from both central route factors (personalization) and peripheral route factors (trendiness and interactivity) with the degree of impact of each factor is also different.

Hypothesis H11a, H11b, H11c

The research team rejected H11a, and accepted H11b and H11c. Similarly, in the study of Jiang et al (2022), perceived value has a mediating effect between purchase intention and the characteristics of short

videos. After self-assessing the advantages and disadvantages of the service based on short videos, young consumers will consider making a purchase decision.

5. CONCLUSION

5.1. Research Findings

In this study, the following conclusions are drawn:

Two peripheral route factors (trendiness and interactivity) and a central route factor (personalization) all regulate brand attitude; the positive influence of interactivity is the most important determinant ($\lambda = 0.267$, $p\text{-value} = 0.000$), followed by personalization and trendiness.

Both personalization and interactivity have significant positive effects on perceived value. Among these two elements, personalization plays a more dominant role ($\lambda = 0.389$; $p\text{-value} = 0.000$). This is also found in the study of Dwinanda et al (2022).

In addition, brand attitude positively affects purchase intention ($\lambda = 0.482$; $p\text{-value} = 0.000$), successfully followed by the perceived value ($\lambda = 0.392$; $p\text{-value} = 0.000$).

The results of the mediating effect test indicate that perceived value and brand attitude have a mediating effect between external stimulus variables and consumers' purchase intention.

5.2. Theoretical Implications

The current study makes significant academic contributions:

First, in addition to validating the relationship between the variables, this study also explores a new area by concentrating on the case of F&B service's short video marketing on TikTok, which has rarely been studied by other researchers in Viet Nam.

Second, this study introduces a new independent variable (trendiness) under the F&B service's short video marketing context, which helps extend and enrich the structural model.

5.3. Managerial Implications

Based on the results, some managerial implications can be suggested for F&B enterprises:

Firstly, trendiness is an important determinant that managers necessitate concentrating on when creating short video marketing campaigns on TikTok. Additionally, enterprises can also turn their unique selling points into a trend so as to attract the response of a huge number of TikTokers, gain more potential customers and eventually enhance customer loyalty and purchase intention.

Second, F&B enterprises should focus on analyzing the needs of consumers and then come up with informed customer-centric marketing strategies. They should also create familiar consumption scenarios in short marketing videos to appeal to more customers. Consequently, this helps encourage consumers to experience these scenarios in real life.

Third, marketers need to pay attention to the interactivity of short video marketing on TikTok. Enterprises can also be proactive in creating positive opinions about the brand by promoting positive interaction between TikTokers so as to improve brand awareness and brand attitudes. The main reason is that the lively and active conversations in the Comments section, and the large number of likes and shares of the video can increase brand credibility and make a strong impression on consumers.

Fourth, enterprises need to improve customers' perceived value. The most important thing to do is to create attractive short marketing video content. Besides, an indispensable step to increase perceived value is to constantly improve the quality of services so as to fulfill customers' expectations.

5.4. Research Limitations

There are certain limitations in this research.

First, the study has a survey scope in Ho Chi Minh City, so the generalizability and representativeness of the data are not high.

Second, this study only focuses on short video marketing on only one platform, TikTok. Meanwhile, other media platforms Youtube, Facebook on Instagram all exploit this short video feature although they are less popular.

The last one is that there are other antecedent variables of purchase intention, such as trialability, credibility, and entertainment,... Further research can enrich the research model by adding other factors.

6. APPENDIX

Appendix 1. Detailed results of Cronbach's Alpha coefficient

Item - Total Statistics				
Ký hiệu	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
<i>Trendiness</i>				
XH1	7.57	2.658	0.714	0.663
XH2	7.65	2.649	0.660	0.719
XH3	7.71	2.923	0.578	0.803
<i>Personalization</i>				
CNH1	7.16	2.825	0.537	0.720
CNH2	7.46	2.646	0.596	0.654
CNH3	7.26	2.615	0.613	0.633
<i>Social interactivity</i>				
TTT1	9.51	8.413	0.652	0.788
TTT2	9.45	7.765	0.758	0.737
TTT3	9.07	8.862	0.613	0.805
TTT4	9.13	8.981	0.610	0.806
<i>Brand attitude</i>				
TD1	17.82	13.904	0.681	0.850
TD2	17.80	13.913	0.742	0.840
TD3	17.87	14.182	0.685	0.849
TD4	17.85	14.014	0.685	0.849
TD5	18.09	14.176	0.605	0.864
TD6	17.86	13.937	0.656	0.854
<i>Perceived value</i>				
GTCN1	6.15	2.827	0.580	0.773
GTCN2	6.36	2.668	0.666	0.685
GTCN3	6.53	2.484	0.659	0.690

<i>Purchase intention</i>				
YDMH1	14.55	9.678	0.675	0.864
YDMH2	14.18	9.544	0.756	0.845
YDMH3	14.25	9.658	0.727	0.851
YDMH5	14.24	9.809	0.713	0.855
YDMH6	14.31	9.605	0.699	0.858

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IMPACTS OF ATTITUDE TOWARD GREEN BEHAVIOR AND SOCIAL INFLUENCE ON GREEN PURCHASING INTENTION AND GREEN PURCHASING BEHAVIOR

**Author: Nguyen Thi Cam Nhung¹, To Thi Hoai Dung², Nguyen Thi Bich Giao²,
Nguyen Thi Nu², Ho Gia Phong²
Mentor: Ha Hien Minh², Pham Thi Chau Quyen²**

ABSTRACT: *This research paper analyzes the impacts of Attitude toward Green Behavior and Social Influence on Green Purchasing Intention and Green Purchasing Behavior of customers in Ho Chi Minh City. Research data is collected from an official survey of about 250 customers living in Ho Chi Minh City through online platforms and encrypted and analyzed using Microsoft Excel 2016 and SmartPLS 4. The estimated model results show that Environmental knowledge, Environmental concern, Attitude toward green behavior, Social influence, and Green purchasing intention have a positive influence on attitude toward green behavior, while Environmental awareness does not have an impact on attitude toward green behavior. These findings can provide the government and policy-making agencies with some suggested solutions to promote sustainable consumption practices and contribute to the broader goal of environmental sustainability.*

Keywords: *Green Purchasing Behavior, Green Purchasing Intention, Social Influence, SmartPLS*

1. INTRODUCTION

Over the last decade, the increase of manufacture and population in the world has made a continuous increase in industrial waste and domestic garbage, leading to the destruction of natural resources and severe damage to the environment. Particularly, according to a report by (Suzanne C. Grunert, Hans Jorn Juhl, 1995), household consumer purchases are responsible for 40% of environmental damage. Some consequences can be mentioned such as Earth's temperature has increased by 1 degree Celsius (IPCC, 2018), worldwide forest area decreased from 31.6% of global land area to 30.6% in 25 years, from 1990 to 2015 (Food and Agriculture Organization of the United Nations, 2018). There have been many parts of the world that have noticed the problem and taken concrete actions.

Having the same situation, there is the rapid development of Vietnamese people's social life. That strong development not only improves people's lives but also causes serious impacts on the environment. According to statistics conducted at the end of 2022, on average, the country generates about 25.000 tons of domestic waste each year, the total amount of domestic waste generated from urban areas tends to increase by 10% - 16% on average. In particular, the average rate of waste collection in urban areas across the country is only about 70% - 85%. Currently, nationwide, the amount of domestic waste in urban areas is 38.000 tons per day, and the collection and treatment rate is more than 85%. With the encouragement of policies from the State, most people in Ho Chi Minh City have gradually switched to consuming green products and prioritizing a green lifestyle. Specifically, according to the results of a survey conducted by two Ho Chi Minh City University of Technology, 82.3% of survey respondents tend to consume green products and 88% of respondents. The trend of green product consumption will increase in the near future.

With the above points, the research team carried out research with the topic "Impacts of Attitude toward Green Behavior and Social Influence on Green Purchasing Intention and Green Purchasing Behavior" to better identify the motivations, the main factors affecting consumer attitudes and behavior in Ho Chi Minh City. From there, propose solutions to increase the green consumption behavior of customers, contributing to environmental protection.

¹ Foreign Trade University; Email: nguyenthicamnhung2011115444@ftu.edu.vn

² Foreign Trade University

2. THEORETICAL FRAMEWORK

The model is built based on TRA theory as a theoretical framework. Ajzen and Fishbein developed the Theory of Reasoned Action (TRA) in 1967 and adjusted and expanded it over time. The TRA model shows that purchasing trends are the best predictors of purchasing behavior. Two main factors to consider in this theory are customers’ attitudes and social norms. Consumers will notice attributes that provide necessary benefits and have varying degrees of importance. In the TRA model, attitude is measured by the perception of product attributes. Social norm factors can be measured through people related to customers (such as family, friends, colleagues,...); these people like or dislike what they buy. The degree of impact of social norm factors on customer purchasing intention depends on: (1) the degree of support/opposition to the purchase of the customer and (2) the motivation of the customer to follow the wishes of influencers.

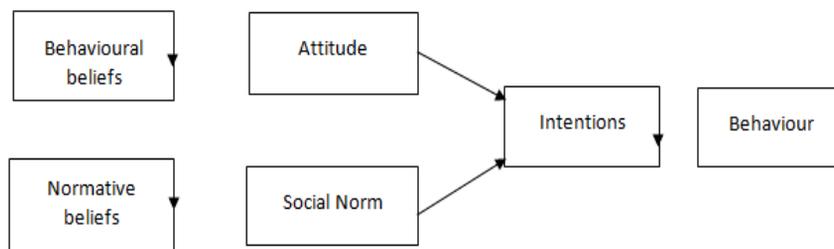


Figure 2.1: TRA Model

Source: Ajzen and Fishbein, (1975)

The research model is formed according to the research of Troudi et al. (2020), Tinh (2021), and Yang and Chai (2022). According to the study of Troudi et al. (2020), environmental knowledge and environmental concern have a positive impact on the attitude toward green food. In 2021, a study on the topic of green purchasing intention was conducted by (Tinh, 2021) with two methods: qualitative research and quantitative research. The results of the study show that green product beliefs, attitudes towards the environment, product positioning, perceived behavioral control, and social norms have an impact on the green purchasing intentions of consumers’ people in Cam Ranh City. Besides, Shuli Yang and Junwu Chai (2022) seek to explore the influence of Chinese enterprises’ green marketing behavior on consumers’ green consumption willingness.

This theory and researches show that the degree of influence of related people on customer behavior trends and the motivation of consumers to follow related people are two basic factors for assessing social norms. Thus the terms “Social Norms” and “Social Influence” are similar and interchangeable.

With the above arguments, the figure below shows the conceptual framework established to study the relationship between dependent and independent variables.

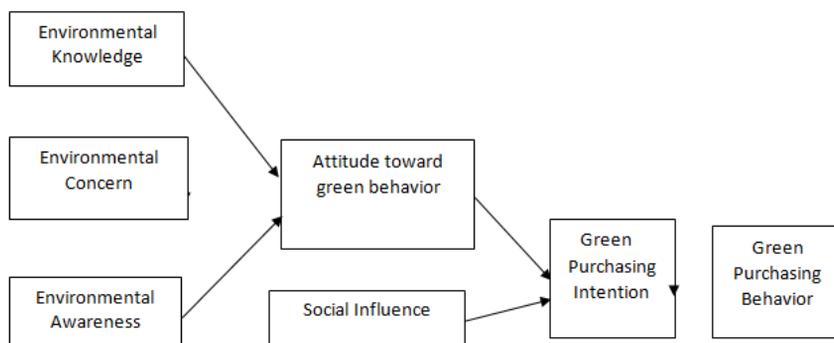


Figure 2.2: Research Model

3. RESEARCH METHOD

3.1. Research philosophy and the research process

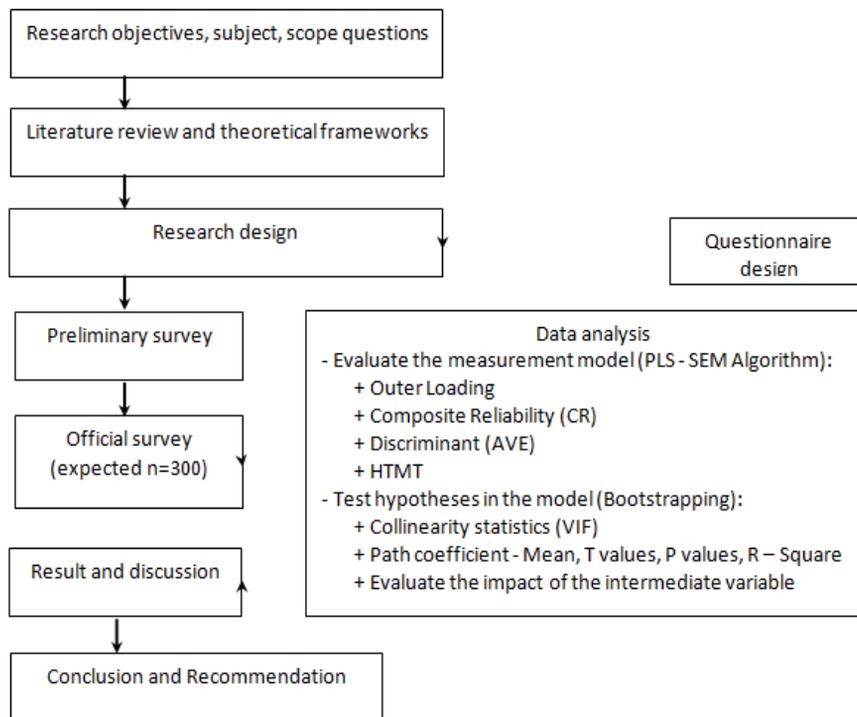


Figure 3.1: The research process

The preceding Figure 3.1 depicts the research process for this thesis, which consists of two major stages: preliminary research and official survey conducting.

In the first stage: preliminary research, basic research is undertaken qualitatively by analyzing previous credible studies, investigations, and reports. Following that, a research model and hypotheses for further study are offered based on the theoretical basis. During the first 2 weeks of December 2022, preliminary research was conducted through a questionnaire using a google form. The objective of this first research stage is to evaluate the survey's validity and usefulness, which enables the author to verify and adjust the accuracy of the measured variables. As a result, the author is able to establish official trustworthy variables for the research and finalize the questionnaire.

Secondly, the quantitative method is selected for this study because of its fundamental function in measuring amount and quantity. This research method is applied to measure and analyze a large amount of respondents' options which were collected through structured questions. The questionnaire is proposed regarding the context of the thesis and implemented in different ways, via mail, messages, as well as interviews. Therefore, the larger the number of respondents, the more reliably the result of the study reflects the actual market. In the second stage: This stage was carried out quantitatively throughout the research's formal period, and it involved four steps:

The first step is data collection. We From December 2022 to the end of January 2023, an official survey of about 250 customers was conducted online. After collecting the data, it will be encrypted and analyzed using Microsoft Excel 2016 and SmartPLS 4. Following that, the data will be analyzed using SmartPLS 4 software to evaluate the measurement model (Outer Loading, Composite Reliability, Discriminant, HTMT) and test hypotheses in the model (Collinearity statistics, Path coefficient – Mean, T values, P values, R – Square, Evaluate the impact of the intermediate variable).

3.2. preliminary research methodology

3.2.1. Measurement Scale

Variable	Sign	Index	Source
Green purchasing behavior	GPB1	When I want to buy a product, I look at the ingredients label to see if it contains things that are environmentally damaging.	Tang Sook Mun (2014)
	GPB2	I prefer green products over non-green products when the product's qualities are similar.	
	GPB3	I choose to buy products that are environmentally friendly.	
	GPB4	I buy green products even if they are more expensive than the non-green ones.	
Attitude toward green behavior	ATG1	I like the idea of purchasing green.	Ricky Y. K. Chan (2001)
	ATG2	Purchasing green is a good idea.	
	ATG3	I have a attitude towards purchasing a green version of a product.	
	ATG4	Purchasing green meets my expectations.	
Environmental knowledge	EK1	It is necessary to have knowledge about environment.	(Saichao, 2016)
	EK2	Ecological knowledge has influence on green.	
	EK3	This knowledge of product is an Important way about green products.	
	EK4	Consumers with higher eco knowledge have higher green purchase intention.	
Environmental concern	EC1	I am very interested in issues related to the quality of the living environment.	Grace K. Dagher, Omar Itani, Abdul Nasser Kassar (2015)
	EC2	I would be willing to reduce my consumption of environmentally unfriendly products to protect the environment.	
	EC3	Current development is destroying the environment.	
	EC4	I am worried about the declining quality of living environment.	
	EC5	I am excited to participate in environmental protection activities.	
	EC6	The anti-pollution law should be enforced more strongly.	
Green purchasing intention	GPI1	I often buy green products because I care about the environment.	Saeed Siyal, Munawar Javed Ahmed, Riaz Ahmad, Bushra Shahzad Khan, Chunlin Xin (2021)
	GPI2	In general, I am happy to buy green products because it is environmentally friendly.	
	GPI3	I think I will use green products in the future because it is less polluting.	
Social influence	SI1	I learn a lot about environmentally friendly products from my friends.	(Saichao, 2016)
	SI2	I learn about environmental issues from my friends.	
	SI3	I discuss with my friends about environmentally friendly products.	
	SI4	I always share information regarding environmentally friendly products with my friends.	
Environmental awareness	EA1	When making decisions, I consider the potential environmental impact of my actions.	(Shuli Yang and Junwu Chai, 2022)
	EA2	I consider myself a responsible person for the environment.	
	EA3	I worry about waste and destruction of natural resources.	
	EA4	I will do environmentally friendly actions even if it is inconvenient for me.	

3.2.2. Pilot study

After creating the questionnaire, the author conducts a short pilot study with a sample of 50 people currently living or working in Ho Chi Minh City. The vast majority of opinions think that the question is straightforward and easy to understand. However, after testing the model, the authors found that there were some questions that did not properly reflect the relationship between variables. So the team decided to filter out some of the questions. After that, the author team started to conduct a formal survey. Details of the questionnaire can be found in the appendix of the study.

3.3. Official research methodology

3.3.1. Sample size determination

In this research about consumers' green purchasing behavior, if a sample size is too small, it won't be possible to represent the behavior of everyone in Ho Chi Minh City as a whole.

After conducting the survey, the authors collected a total of 220 observations to proceed to analyzing the data and testing hypotheses. With a sample size of 220, compared to the recommended size of 170 above, the model is considered valid to continue with the analysis and regression.

3.3.2. Data collection

The method of data collection used by the authors is mainly through online surveys. This method can reach a wide range of subjects since nowadays most people, specifically in Ho Chi Minh City, are familiar with online survey platforms, especially people from the Generation Z and the Millennials.

The next phase began with sending out the survey and collecting answers from respondents. The network of the research team was used to distribute this online survey across universities, friends and family, and most respondents are authors' family members and friends from school or work.

After finishing with data collecting, the authors download the worksheet in csv format and then upload the file onto the latest version of the statistical tool SmartPLS to proceed with evaluating the information gathered and testing.

3.3.3 Methods of data analysis

3.3.3.1. Descriptive statistics analysis

After gathering the data from the online survey, all the information entered into the survey will be automatically gathered into a Google worksheet. Data will then be reorganized into columns with encoded abbreviations. Gender information is converted to respective binary numbers while age is sorted into encoded categories which run from 1 to 5, with 1 means the age range corresponds to the Generation Z, 2 is generation Y, 3 is generation X, 4 is BoomersI and 5 is BoomersII. Income information is handled the same way with age, of which categories include 1 corresponding to income lower than 2,300,000 VND, 2 means the income is from 2,300,000 to 8,400,000, 3 means the income falls into 8,400,000 and 19,600,000, above 19,600,000 is encoded as 4.

3.3.3.2. Analyzing the measurement model

In evaluating the measurement model, there are several conditions that researchers need to focus on in order to ensure the reliability and validity of their study. One key condition is construct reliability and validity. This is important because if the observed variables are not reliable and valid measures of the construct, then the study results may be biased or inaccurate.

Another important condition to evaluate is convergence validity. This refers to the extent to which the observed variables are measuring the same construct. In other words, if two or more observed variables are intended to measure the same underlying construct, then they should be strongly correlated with each other.

A third key condition to evaluate is discriminant validity. This refers to the extent to which the observed variables are measuring different constructs.

3.3.3.2.1. PLS-Algorithm function initiation

The PLS (Partial Least Squares) algorithm function in SmartPLS4 is a key feature that enables the authors to conduct structural equation modeling (SEM) and path modeling.

After running the PLS-Algorithm function, the authors will use results shown by SmartPLS4 to proceed with the evaluation of the measurement model, which means to examine the criteria of construct reliability and validity, convergence validity and discriminant validity.

3.3.3.2.2. Construct Reliability and Validity

Outer loading should be higher than 0.7 to be considered reliable. If outer loading falls between 0.4 and 0.7, variables can be considered to be removed if it leads to the increase of composite reliability and AVE but overall, 0.5 can be acceptable according to Chin (1998).

DeVellis (2012) suggested that 0.7 is the appropriate threshold for the Cronbach's Alpha. According to the author, Cronbach's Alpha value greater than 0.7 is preferred in this study.

Composite Reliability (CR) is preferred by many researchers over Cronbach's Alpha because Cronbach's Alpha underestimates reliability compared to CR. Chin (1998) suggested that in exploratory research, CR must be 0.6 or higher. With confirmatory studies, the threshold of 0.7 is the appropriate level of the CR index (Henseler & Sarstedt, 2013).

3.3.3.2.3. Convergence validity analysis

To evaluate the convergence on SMARTPLS, the author relies on the average variance extracted AVE (Average Variance Extracted). Hock & Ringle (2010) suggest that a scale achieves convergent value if the AVE is 0.5 or higher. This level of 0.5 (50%) means that the average parent latent variable will explain at least 50% of the variation of each observed child variable.

3.3.3.2.3. Discriminant validity analysis

Discriminant validity shows how different a structure is when compared to other constructs in the model. The traditional approach to evaluate discriminant is to use the square root index AVE proposed by Fornell and Larcker (1981). Henseler et al (2015) used simulation studies to demonstrate that discriminant validity is better assessed by the HTMT index they developed.

For the HTMT index, Clark & Watson (1995) and Kline (2015) use a stringent threshold of 0.85. However, Henseler et al. (2015) suggest that if this value is below 0.9, discriminant validity will be guaranteed.

3.3.3.3. Analyzing the structural model

3.3.3.3.1. Bootstrapping function initiation

Bootstrapping is used in the analysis of structural equation models (SEM) and path models. It works by randomly sampling the data with replacement to create a large number of "bootstrap samples" from the original dataset. For each bootstrap sample, the model parameters are estimated and recorded. This process is repeated many times, generating a distribution of parameter estimates that can be used to calculate the standard errors and confidence intervals of the model parameters.

3.3.3.3.2. Multicollinearity validity analysis

To quantify the extent of multicollinearity, researchers often use the variance inflation factor (VIF). According to Hair et al. (2019), a VIF of 1 indicates that the variables are not correlated, meaning that there's no multicollinearity. A VIF between 1 and 5 indicates a moderate correlation, where the variables are related, but not highly so. In contrast, a VIF between 5 and 10 is a sign of high correlation between the variables, which can cause significant issues for statistical analysis. In some cases, VIF values above 10 may suggest extreme levels of multicollinearity, which should be addressed by removing one of the highly correlated independent variables or by transforming the data.

3.3.3.3. Path coefficient analysis

The path coefficients in SEM represent the strength and direction of the relationships between variables. In path coefficient analysis, the goal is to estimate these coefficients and evaluate their statistical significance using various criteria such as p-values, t-values, and confidence intervals. SmartPLS4 uses a partial least squares (PLS) algorithm to estimate the path coefficients in SEM.

3.3.6.4. Total indirect effect and specific indirect effect analysis

The total indirect effect indices represent the total effect of the exogenous variable on the endogenous variable through all possible mediators. The total indirect effect index can be calculated by multiplying the path coefficient from the exogenous variable to the mediator(s) by the path coefficient from the mediator(s) to the endogenous variable.

4. RESULT AND DISCUSSION

4.1. Descriptive statistics

Table 1: Author Self-Synthesized descriptive statistics

		Frequency (respondent)	Percentage (%)
Gender	Male	70	68.2
	Female	150	31.8
	Total	220	100
Age	18 - 21	181	82.3
	More than 21	39	17.7
	Total	220	100
Income	Under 2.3 million vnd	76	34.6
	2.3 - 8.4 million vnd	107	48.6
	8.4 - 19.6 million vnd	29	13.2
	More than 19.6 million vnd	8	3.6
	Total	220	100

The majority of survey respondents in this study were female, indicating that women are more interested in consuming green products, accounting for 68.2% of the respondents. The highest proportion of respondents belonged to the age group of 18 to 21, comprising 82.3% of the sample. This indicates that the study's author group is limited in terms of age range. In terms of income, the majority of respondents had a monthly income ranging from 2.3 million to 8.4 million dong, accounting for 48.6%. Additionally, 34.5% of the respondents had a monthly income of less than 2.3 million dong. It is important to note that since most respondents are under the age of 21, many of them are still in school and have limited opportunities to generate extra income each month.

4.2. Research result

The model for this study is suggested as followed:

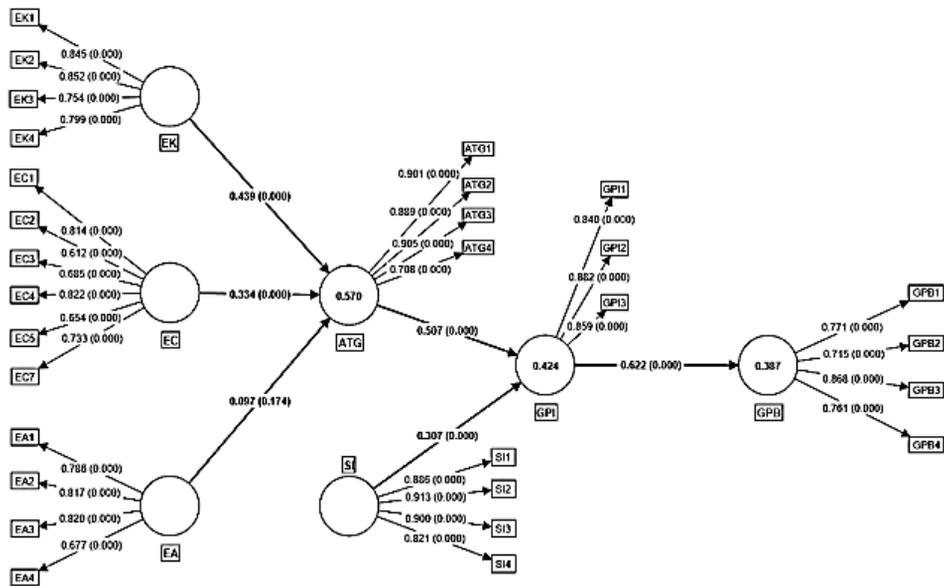


Figure 4.1: The research model

4.2.1. Measurement model analysis

The study evaluated the reliability and validity of the research model using various statistical measures. The outer loading values were mostly above 0.7, indicating satisfactory reliability. Some values fell between 0.6 and 0.7, but they were still considered acceptable for inclusion in the research model based on Cronbach’s alpha and satisfactory reliability (Chin, 1998). The composite reliability (CR) values were above 0.7 (Hair et al., 2012), and the average variance extracted (AVE) values were above 0.50 (Fornell and Larcker, 1981), indicating compliance validity according to established thresholds. To assess discriminant validity, the square root of AVE values and the Heterotrait-Monotrait (HTMT) were calculated. According to the Fornell-Larcker criterion, the square root of the AVE for each variable should be greater than its correlation with all other variables in the structure (Hair et al., 2019). The diagonal values were larger than the other values in the rows and columns, confirming discriminant validity. Discriminant validity was also assessed using the HTMT ratio. A value below 0.9 indicates discriminant validity. The calculated HTMT ratios were all below 0.9 (Henseler et al., 2015), indicating that the constructs in the research model represent distinct concepts rather than being highly correlated and measuring the same thing. Overall, the measures used in the study demonstrated satisfactory reliability, compliance validity, and discriminant validity, indicating that the constructs examined in the research model are reliable, distinct, and aligned with the intended concepts.

4.2.2. Multicollinearity validity analysis

Upon examining the variance inflation factor (VIF) coefficients in the proposed model, it has been found that all of the coefficients fall within the range of 1 to 5 . This indicates that there is only a moderate level of correlation among the independent variables in the model, suggesting that the occurrence of multicollinearity is not a significant issue (Hair et al. 2019).

4.2.3. Adjusted coefficient of determination and effect size analysis

Table 2: R_square

	R-square	R-square adjusted
ATG	0.570	0.564

GPB	0.387	0.384
GPI	0.424	0.419

The R-square adjusted value of the green purchasing behavior is 0.384, which states that the percentage of variance in the green purchasing behavior variable explained by other dependent variables is 38.4%. The other 61.6% is the effect of other factors that haven't been considered in the model suggested.

Table 3: f_square

	ATG	EA	EC	EK	GPB	GPI	SI
ATG						0.423	
EA	0.011						
EC	0.106						
EK	0.287						
GPB							
GPI					0.630		
SI						0.155	

The f-square value, also known as effect size, shows the proportion of the change in the dependent variable that is explained by the independent variables in the model, controlling for other variables in the model. Most values in the model of this study fall between 0.1 and 0.7, which indicates strong effects happening between the variables. The only exception to this is the case of the environment awareness variable, with f-square between EA and ATG being 0.011, which can be considered a weak effect.

4.2.3. Path coefficient analysis and the mediating effect of attitude towards green behavior and green purchasing intention

According to Figure 4.1, apart from the effect of the EA variable on the ATG variable, all P-values associated with other path coefficients are less than 0.05, which shows that the estimated path coefficient is said to be statistically significant. This means that there is a significant effect of the two variables. In simple terms, a P-value less than 0.05 suggests that the observed relationship is not likely to be due to chance. As for the effect of the EA variable on the ATG variable, the P-value associated with its path coefficient is greater than 0.05. A P-value greater than 0.05 indicates that the estimated path coefficient is not statistically significant. In other words, it suggests that the observed relationship between the two variables is likely due to chance and there is not enough evidence to support the conclusion that the EA variable has a significant effect on the ATG variable. The overall result of hypotheses testing is shown as followed:

Hypothesis	Result	Path coefficients
H1: Environmental knowledge has a positive influence on attitude toward green behavior	Supported	0.439
H2: Environmental concern had a positive relation with attitude toward green behavior	Supported	0.334
H3: Environmental awareness had a positive relation with attitude toward green behavior	Rejected	0.097
H4: Attitude toward green behavior had a positive relation with green purchase intention	Supported	0.507
H5: Social influence had a positive relation with green purchase intention	Supported	0.307
H6: Green purchasing intention had a positive relation with green purchasing behavior	Supported	0.622

Table 4: Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
EK -> ATG -> GPI	0.223	0.220	0.043	5.158	0.000

EK -> ATG -> GPI -> GPB	0.138	0.137	0.032	4.380	0.000
EC -> ATG -> GPI	0.169	0.168	0.041	4.172	0.000
EC -> ATG -> GPI -> GPB	0.105	0.105	0.028	3.762	0.000
EA -> ATG -> GPI	0.049	0.052	0.038	1.297	0.195
EA -> ATG -> GPI -> GPB	0.031	0.033	0.024	1.275	0.202

In this study, the ATG and GPI variable plays a role of a set of mediators in the model. The ATG is the mediator between EK, EC, and EA and GPI, while GPI is the mediator between ATG and GPB. So to evaluate the impact of the independent variables on the dependent variables through this mediator set, the specific indirect effects are analyzed. The result from Table 4 shows that apart from the indirect effect of the EA variable on the GPI and GPB variables, others have the associated P-values less than 0.05. Which means it suggests that the indirect effect is statistically significant. This proves that the mediating effect of attitude toward green behavior and green purchasing intention is greatly supported. As for the EA variable, following the path coefficient result shown earlier from Figure A, it shows that the observed relationship between the EA variable on the ATG variable is not statistically significant. And since the ATG and GPI are the mediators set between the EA and GPB, it is suggested that the indirect effect of the EA variable on the GPI and as well as GPB variable is statistically insignificant, which can be concluded from the P-values being greater than 0.05.

4.3. Discussion

This study found no strong evidence supporting the influence of environmental awareness on attitudes towards green behavior. Awareness alone may not sufficiently motivate people to adopt green purchasing behavior, particularly in Ho Chi Minh City where environmental problems persist despite annual campaigns. In contrast to other countries with a high sense of environmental preservation, Vietnamese people generally lack a strong sense of environmental protection, making awareness an ineffective driver for green purchasing.

However, all factors, except for environmental awareness, significantly impact green purchasing behavior. Green purchasing intention has the greatest influence, and attitudes towards green behavior and purchasing mediate the effects of environmental knowledge, concern, and social influence. Individuals with environmental knowledge, concern, positive attitudes, social influence, and a strong intention to purchase green products are more likely to engage in green purchasing behavior.

Attitude and social influence are the key factors in the model. Attitude strongly influences green purchasing intention, indirectly impacting behavior. Social influence directly affects purchasing intention, indirectly influencing behavior. Vietnam, particularly cities like Ho Chi Minh City, presents opportunities for environmentally friendly production and purchasing. However, challenges remain, including low environmental consciousness, the higher cost of green products, limited demand, and limited availability of green products in the market.

To promote green purchasing, solutions include raising public awareness, utilizing media platforms, implementing incentive programs and policies, and supporting environmental organizations and initiatives. These efforts can drive the growth of environmentally friendly practices and contribute to sustainable development.

5. CONCLUSION

5.1. Research Conclusion

The research group embarked on a scientific inquiry aimed at identifying and analyzing the factors that influence green purchasing behavior among consumers in Ho Chi Minh City. The study sought to uncover the key drivers that motivate people to adopt eco- friendly buying practices and to examine the barriers that hinder such behavior.

It is worth noting that while environmental awareness has been proven to be a critical driver of green behavior in many other countries, the situation may be different in Vietnam. Given that Vietnamese people, as a whole, do not have a strong sense of environmental protection, raising awareness alone may not suffice to encourage them to purchase green products. Although several initiatives have been implemented in the country to promote environmental sustainability, the issue remains a quandary, and awareness campaigns may not be the most effective means of promoting green behavior among the populace. Thus, this study's results underscore the importance of exploring other potential drivers of green behavior beyond environmental awareness in Vietnam, such as economic incentives or regulatory policies. In addition, the findings suggest the need for tailored approaches to promoting green behavior that are more attuned to the local cultural and social context, considering the differences in attitudes and beliefs regarding environmental sustainability across different regions and countries. Ultimately, addressing the challenges of promoting green behavior in Vietnam will require a multi-pronged approach that leverages a range of strategies and initiatives, from education and awareness-raising to policy interventions and stakeholder collaboration.

Our research team has developed a comprehensive model that identifies the various factors that influence consumers' green purchasing behavior. The model includes six primary factors that play a critical role in shaping attitudes towards eco-friendly products and consumption practices. These factors include environmental knowledge, environmental concern, environmental awareness, attitude towards green behavior, social influence, and green purchasing intention.

Furthermore, our model includes two mediators that help to explain the complex relationships between these six factors. The first mediator, attitude towards green behavior, serves as a critical link between green purchasing intention and three other factors: environmental knowledge, environmental concern, and environmental awareness. This implies that a positive attitude towards eco-friendly behavior can influence consumers' environmental knowledge, concern, and awareness, thereby increasing their likelihood of adopting green purchasing practices. The second mediator in our model is green purchasing intention, which plays a crucial role in shaping the relationship between green purchasing behavior and two other factors: attitude towards green behavior and social influence. Specifically, a strong intention to purchase green products can lead to a more positive attitude towards eco-friendly behavior and increase the influence of social norms and expectations in shaping consumption practices.

Overall, our model offers a valuable framework for understanding the complex interplay of factors that drive green purchasing behavior among consumers. By highlighting the critical role of attitude towards green behavior and green purchasing intention, our model provides insights that can inform the development of effective strategies and interventions for promoting sustainable consumption practices.

The results demonstrate that all factors, except environmental awareness, have a significant impact on the adoption of eco-friendly consumption practices. Specifically, green purchasing intention emerges as the most influential factor in driving green purchasing behavior.

Moreover, our analysis reveals that two mediators, namely attitude towards green behavior and green purchasing intention, play a crucial role in explaining the relationships between the different factors and green purchasing behavior. The mediating effect of these factors highlights the importance of environmental knowledge, environmental concern, and social influence in shaping consumer attitudes towards eco-friendly behavior and their likelihood to engage in green purchasing practices.

In conclusion, the results of our research emphasize the importance of promoting environmental knowledge, concern, and social influence, as well as developing positive attitudes towards eco-friendly behavior and strong intentions to purchase green products, in encouraging green purchasing behavior among consumers.

5.2. Recommendation

We can see the fact that there are a lot of opportunities to develop environmentally producing and purchasing in Ho Chi Minh City in particular and Vietnam in general. Firstly, the increase in the number of people who want and are willing to pay for green purchasing behaviors to protect the environment and their health among the total population of Vietnam, especially in big cities: Ho Chi Minh City, Ha Noi, Da Nang, and so on. Secondly, green purchasing behaviors and the greening of production have been included in the national development policies. Specifically, greening production and sustainable lifestyles and consumption are two of the four main themes in Vietnam's green growth action plan for the period 2014-2020. For Vietnam, the shift to a green economy and green growth is not only an inevitable choice but also an opportunity to become a pioneer in the region, catching up with the development trend of the world.

On the other hand, some threats need to be considered and found solutions too. One of the clearest problems is that A part of the population still does not have much knowledge about green purchasing and still keeps traditional consumption habits, such as using unprocessed raw materials and using a lot of goods of poor quality, not conducive to resource-saving and sustainable development. They focus on product prices and personal savings rather than product quality or resource-saving and environmental protection. Another issue is that The cost of green products in general is still much higher than that of conventional products. Besides, the demand for green products is still limited for many customers, so the range of green products is still diverse and not popular. For green purchasing to be increasingly popular in Ho Chi Minh City, we need to improve the understanding and concerns of the environment and green products to increase the purchasing intention to promote the green buying behavior of the people. For these reasons, our team suggests some feasible and proper solutions. Firstly, Improve people's knowledge about the environment, environmental protection, and green purchasing. Secondly, Effectively exploiting the media in bringing green products and consumption closer to consumers. Thirdly, Develop programs and policies to encourage people to use environmentally friendly products: Encourage new buying and consumption methods to save resources, and increase the use of products with reusable stickers. packaging. Fourthly, by Supporting and creating conditions for clubs, organizations, and associations on the environment and green purchasing to operate, relevant departments and sectors can cooperate with organizations and associations to operate, end events Connecting communities together, thereby providing a lot of useful and positive information and providing rich green buying approaches for people. Fifthly, Launching and organizing activities such as Green Purchasing and Consumption Day, Green Purchasing and Consumption Month. Sixthly, Businesses should have a strategy of using green customer ambassadors who are influential figures in society to lead customers to have a more positive attitude toward their green purchasing and consumption behavior. Finally, Enterprises and corporations should focus on appropriate investment strategies for the production and distribution of green, environmentally friendly products with more diversity and reasonable scale in the common world market which requires more attention to sustainable values so as not to be "left behind.

5.3. Limitation and further research orientation

This study only surveyed 220 consumers in Ho Chi Minh City from 18 to 30 years old by convenient sampling method, so the representativeness is not high. In order for the research results to be more representative of science, the survey sample needs to be larger to have higher reliability. Further studies need to survey the habits and lifestyle characteristics of customers in Ho Chi Minh City to further identify factors affecting the green purchasing behavior of customers in HCMC. In addition, further studies can use random sampling or use in-depth interviews to increase the reliability of research results.

The scope of the study is only in Ho Chi Minh City, so the research results are not highly generalizable to all customers in Vietnam. The following studies need to expand the research scope more widely.

The research only focuses on quantitative research, not qualitative, so there are limitations in explaining all the concepts of factors. Because this is a quantitative study, the purpose is to carry out the research results, so we have not gone into the explanation of the causes of the results. Therefore, the following studies need to combine qualitative and quantitative research analysis to analyze and fully explain the concepts of factors as well as the causes of the results.

6. APPENDIX

Table 5: Outer loadings

	Outer loadings		Outer loadings
ATG1 <- ATG	0.901	EK2 <- EK	0.852
ATG2 <- ATG	0.889	EK3 <- EK	0.754
ATG3 <- ATG	0.905	EK4 <- EK	0.799
ATG4 <- ATG	0.708	GPB1 <- GPB	0.771
EA1 <- EA	0.786	GPB2 <- GPB	0.715
EA2 <- EA	0.817	GPB3 <- GPB	0.868
EA3 <- EA	0.820	GPB4 <- GPB	0.761
EA4 <- EA	0.677	GPI1 <- GPI	0.840
EC1 <- EC	0.814	GPI2 <- GPI	0.882
EC2 <- EC	0.612	GPI3 <- GPI	0.859
EC3 <- EC	0.685	SI1 <- SI	0.886
EC4 <- EC	0.822	SI2 <- SI	0.913
EC5 <- EC	0.654	SI3 <- SI	0.900
EC7 <- EC	0.733	SI4 <- SI	0.821
EK1 <- EK	0.845		

Table 6: Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ATG	0.873	0.887	0.915	0.730
EA	0.784	0.814	0.858	0.604
EC	0.817	0.837	0.867	0.525
EK	0.829	0.840	0.886	0.662
GPB	0.787	0.794	0.861	0.609
GPI	0.825	0.825	0.895	0.741
SI	0.903	0.905	0.933	0.776

Table 7: Fornell-Larcker criterion

	ATG	EA	EC	EK	GPB	GPI	SI
ATG	0.854						
EA	0.520	0.777					
EC	0.664	0.695	0.724				
EK	0.681	0.435	0.598	0.813			

GPB	0.477	0.632	0.623	0.347	0.781		
GPI	0.578	0.724	0.653	0.464	0.622	0.861	
SI	0.231	0.563	0.371	0.155	0.553	0.425	0.881

Table 8: Heterotrait-monotrait ratio (HTMT) – Matrix

	ATG	EA	EC	EK	GPB	GPI	SI
ATG							
EA	0.612						
EC	0.768	0.867					
EK	0.787	0.511	0.705				
GPB	0.555	0.819	0.774	0.402			
GPI	0.682	0.889	0.805	0.557	0.755		
SI	0.273	0.696	0.465	0.180	0.679	0.488	

Table 9: Collinearity statistics (VIF)

Variable	VIF	Variable	VIF
ATG1	3.165	EK1	1.901
ATG2	3.048	EK2	2.133
ATG3	2.947	EK3	1.580
ATG4	1.436	EK4	1.711
EA1	1.678	GPB1	1.741
EA2	1.749	GPB2	1.325
EA3	1.548	GPB3	2.092
EA4	1.399	GPB4	1.840
EC1	1.968	GPI1	1.712
EC2	1.453	GPI2	2.183
EC3	1.593	GPI3	1.892
EC4	2.102	SI1	3.368
EC5	1.459	SI2	3.836
EC7	1.491	SI3	2.988
		SI4	1.855

Table 10: Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
ATG -> GPI	0.507	0.505	0.052	9.791	0.000
EA -> ATG	0.097	0.102	0.071	1.358	0.174
EC -> ATG	0.334	0.331	0.073	4.596	0.000
EK -> ATG	0.439	0.434	0.068	6.407	0.000

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/ STDEV)	P values
GPI -> GPB	0.622	0.623	0.044	13.978	0.000
SI -> GPI	0.307	0.309	0.052	5.934	0.000

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AN ONLINE CELEBRITY BRAND EQUITY: A CASE STUDY OF THE TIKTOK PLATFORM IN VIETNAM

Author: Do Thi Thu Uyen¹

Mentor: Tran Thi Kim Phuong²

ABSTRACT: *This paper aims to propose and investigate the relationships among the components of brand equity and examine the effects of these components on overall online celebrity brand equity on the TikTok platform in Vietnam from the perspective of followers. Questionnaire data were collected from 443 respondents who have been using TikTok and have followed at least one online celebrity on that platform. The results of empirical tests using a structural equation model support the research hypotheses. The results indicate positive relationships between the research concepts, except for the impact of online celebrity brand image on online celebrity brand loyalty and overall brand equity, which was not statistically significant ($p > 0.05$). Some implications and policies have been recommended to online celebrities and celebrity management organizations to boost specific activities regarding the TikTok platform in Vietnam.*

Keywords: *Online celebrity brand awareness; online celebrity brand image; online celebrity brand trust; online celebrity brand loyalty; overall online celebrity brand equity; TikTok platform.*

1. INTRODUCTION

Celebrity has become a vital characteristic and dynamic of our modern cultures and societies. The concept of celebrity has aroused human interest for several decades. It is increasingly accessible and facile for ordinary people from all walks of life to become famous through social media. In our media-flooded societies of the twenty-first century, we have witnessed a drastic change in the concept of celebrity from one maintained the “parasocial relationship” with the audience through mass and broadcast media to one that reflects a more diverse media landscape (Marwick, 2015). Unlike traditional celebrities famous for films, music, and TV shows, online celebrities became famous via their social media presence. New forms of social media can simultaneously transform ordinary people into celebrities. Hence, the competition among online celebrities has become intense.

Online celebrities seek to differentiate themselves from other competitors and give followers the impression of being unique on social media. The success of empathetically influencing followers heavily relies on brand-building strategies, a powerful tool to help online celebrities create sustainable competitive advantage. Through forming online celebrity brand equity, online celebrities can alter a set of followers’ perceptions, attitudes, knowledge, and behaviors that results in increased utility and allows an online celebrity to earn greater volume or more significant margins than they could without that brand equity (adapt the definition of brand equity from Christodoulides & de Chernatony (2010) little in terms of a literature review has been published on this since Feldwick’s (1996). Based on online celebrity brand equity, followers can evaluate the characteristics of online celebrities and create long-term relationships with their favorite celebrities.

¹ University of Economics - The University of Danang; Email: 191121723253@due.udn.vn

² University of Economics - The University of Danang; Email: phuong.ttk@due.udn.vn

In various research contexts (e.g., products, services, tourism, destinations, fashion, etc.), identifying contextualized brand equity dimensions will better explain brand equity evaluations than traditional approaches. Over the years, several approaches to measuring brand equity have been developed, and various dimensions have been implemented by different authors (Aaker, 1991; Keller, 2003; Oliver, 1997). Among several brand equity models in the literature, the model constructed by Aaker (1991) is the most commonly cited to measure the contribution of each component on overall brand equity in a particular context. Moreover, several authors have confirmed and investigated the hierarchy of effects among brand equity components (Matthews, 2014; Xu et al., 2020). As such, they have also proposed an integrated model to test the causal relationships among brand equity components, investigating its effects on overall brand equity (Buil et al., 2013).

Brand equity has been studied for products, services, and tourism, such as destinations, lodging, food, and beverage. However, research about human brands, especially online celebrity brand equity, is much younger and scarce. The research of Liu et al. (2020) is one of the first studies reviewing online celebrity brand equity. Through conducting a literature review, this study found research gaps from previous studies as follows:

(1) Concerning identifying components of online celebrity brand equity and a hierarchical cognitive-affective-conative relationship among brand equity components, previous studies mainly measured (online) celebrity brand equity through factors belonging to a follower's cognitive perspective (e.g., online celebrity brand awareness, online celebrity brand image) and conative perspective (e.g., online celebrity brand loyalty). The involvement of affective factors (e.g., online celebrity brand trust) in measuring online celebrity brand equity has not flourished. Brand trust is a dimension that has received wider attention from researchers to assess the situation as a component of customer-based brand equity (Dedeoğlu et al., 2019; Xu et al., 2020). The essence of brand equity lies in establishing and sustaining trust, as it is a fundamental aspect of forming and maintaining a prosperous long-term relationship (Dedeoğlu et al., 2019). Thus, this study identifies the research gap, wherein very few studies consider online celebrity brand trust as an affective component of online celebrity brand equity or evaluate the hierarchical relationships between online celebrity brand equity components.

(2) Very few studies investigate the impact of online celebrity brand equity components on overall celebrity brand equity.

(3) Very few studies have used an integrated model to simultaneously investigate the causal relationships among online celebrity brand equity components and their effect on overall celebrity brand equity.

Since the industry of creating online celebrities has found tough competition, online celebrities and celebrity management companies need to concentrate on all dimensions of online celebrity brand equity to boost overall celebrity brand equity. Variances in online celebrity characteristics and social platform features make how each component affects overall online celebrity brand equity ambiguous. Hence, it is crucial to examine the influence of each dimension on overall online celebrity brand equity on a specific online platform. To fill this research gap, this study proposes an integrated model to analyze the links between the cognitive-affective-conative components of online celebrity brand equity and their impacts on overall celebrity brand equity.

This study examines online celebrity brand equity components and their effect on overall celebrity brand equity within a specific platform. Online celebrity brand equity has been validated on social media platforms such as Facebook, Instagram, and others (Jun & Yi, 2020; Xiong et al., 2021). Each platform has its attributes and offers distinctive features to its users, requiring celebrities to specify the appropriate social network environment for them. The reason for choosing the TikTok platform as TikTok currently represents one of the most successful social media applications in the world. In TikTok, users can easily reach personalized and endless content available. TikTok has minimal production costs, fast propagation speed, and blurred boundaries between online celebrities and followers. As of June 2022, TikTok has earned an estimated \$5.5 billion in total lifetime revenue. And TikTok online celebrity refers to users who often post short videos on TikTok and have a certain number of followers and strong influence (Abidin, 2020). The core value of online celebrities - is their ability to retain high visibility online; they are often the leaders of trends within subcultures. On the other hand, this platform controls the power of viral rankings and brings a tough competitive environment for participants since an ordinary individual can become an online celebrity on TikTok thanks to a trending video. Specifically, TikTok is the 2nd most popular platform amongst young users in Vietnam, behind Facebook. Therefore, there is a need for a study on the online celebrity brand equity on the TikTok platform in Vietnam. The results of this study will be a reference resource for online celebrities and celebrity management enterprises to get a knowledgebase of the relationship among components of online celebrity brand equity and its effect on overall online celebrity brand equity.

2. LITERATURE REVIEW

2.1. Online celebrity brand

Human brand represents an emerging facet of consumer phenomena, implying well-known individuals who may serve marketing communication efforts (Thomson, 2006). Celebrity brand is considered unique human brands (Centeno & Wang, 2017), which agree with existing studies across multiple spheres, including sports, entertainment, and arts. The terms "human brands" and "celebrity brands" are used interchangeably (Osorio et al., 2020).

As opposed to traditional celebrities who must rely on traditional media outlets, online celebrities directly interact with their followers via social media platforms, such as Facebook, Instagram, TikTok, or YouTube (Brooks et al., 2021). Online celebrities can be once members of groups of ordinary people with similar interests, pastimes, or lifestyles, so they can offer more pertinent and custom content targeting these audiences (Belanche et al., 2021). However, nowadays, online celebrities can share daily content (e.g., photos and videos) and mention a brand that may relate to the shared topic (Brooks et al., 2021). This blurs the presence of paid advertising as online audiences cannot tell whether this sharing act is of the celebrities' own volition or for compensation. Thus, in recent years, firms have increasingly embraced the use of online celebrities as brand ambassadors (Belanche et al., 2021).

2.2. Brand equity and its application to online celebrity

Brand equity is determined by consumers' perceptions and influenced by various factors. Aaker (1991) and Keller (1993) are the most prominent and well-recognized studies on brand equity. A definition of brand equity from Aaker (1991) says: 'Brand equity is a set of brand assets and liabilities linked to a brand, its

name and/or symbol that adds or subtracts from the value provided by a product or service to a firm and/or to its customers.' Keller (1993) defines brand equity as 'the differential effect of brand knowledge on consumer response to the brand's marketing.' Brand equity has different manifestations and impacts on various industries and organizations. Christodoulides & de Chernatony (2010) defined brand equity as a set of consumer perceptions, attitudes, knowledge, and behaviors that increase utility and allow a brand to earn greater volume or more significant margins than it could without that brand name. Human brand equity is co-created with other stakeholders, such as followers and fans (Osorio et al., 2020). Therefore, evaluating online celebrity brand equity based on their followers' perceptions is beneficial.

Online celebrities have been mentioned more regularly and continuously than ever in academia and practice. Despite these interests, the existing literature on customer-based brand equity definition applied to online celebrities is still sparse (Liu et al., 2020). This study's online celebrity brand equity definition is grounded in Christodoulides & de Chernatony (2010). The value of online celebrity stems from followers' ability to identify and differentiate themselves from others (Eng & Jarvis, 2020). Thus, online celebrity brand equity is defined as followers' perceptions, attitudes, knowledge, and behaviors that increase utility. It allows an online celebrity to earn greater volume or more significant margins than they could without that brand equity.

Aaker (1991) operationalizes four important consumer-related sources of brand equity: brand awareness, brand associations, perceived quality, and brand loyalty. Similarly, in the research context of human brand equity, Liu et al. (2020) categorized brand equity into three broad categories: brand awareness, brand image, and brand loyalty. Although other researchers have proposed numerous definitions of brand equity and its components, they all share common dimensions, including brand association, brand image, brand awareness, brand loyalty, and perceived quality (Chang & Liu, 2009). However, in human brands (e.g., online celebrity) research, human brands (e.g., online celebrity) focus mainly on delivering emotional and experiential benefits. Hence, this study has found that the concept of "perceived quality" primarily relates to the functional aspect of a product and is not applicable to evaluating human brands (e.g., online celebrities). Moreover, "brand image" and "brand associations" are often used interchangeably in the literature (Tasci, 2018). Therefore, this research proposed that using brand image as a substitute for brand association is reasonable. On the other hand, this study has also suggested and examined the hierarchical cognitive-affective-conative relationship among brand equity components. The contribution of affective factors (e.g., brand trust) has been mentioned in the literatures (Bernarto & Margaretha, 2020; Jun & Yi, 2020; Xu et al., 2020). Alan (2012) showed that brand loyalty is part of the continual process of valuable and notable relationships which is produced by brand trust. Reichheld & Scheffer (2000) asserted that trust is the key to gaining customer loyalty. These statements emphasize that trust can serve as a predictor of loyalty. Thus, including brand trust as an affective component of online celebrity brand equity makes better sense.

Given this study, dimensions of online celebrity brand equity consist of brand awareness, brand image, brand trust, and brand loyalty. This study evaluates the causal relationships among these four components.

Online celebrity brand awareness (OCBA). Keller (2003) pointed out that the term "brand awareness" pertains to whether customers can remember or recognize a particular brand or are at least aware of its existence. When customers encounter a wide range of commodity brands, a brand

with greater awareness has a greater chance of drawing in consumers. The significance of brand awareness cannot be overstated, as it serves as a means of communication and transaction with potential customers. The same idea has been applied to online celebrities, and thus online celebrity brand awareness implies the existence of online celebrity images in the mind of potential followers. When an individual has more excellent recall and recognition of an online celebrity, they draw more attention to the celebrity brand than regular celebrities. High brand awareness makes online celebrities likely to be more trustworthy in the eyes of potential followers. Therefore, for an online celebrity to be successful, it must be known to potential followers in some context before it can even be considered an online celebrity.

Online celebrity brand image (OCBI). Marketing researchers have suggested that brand image is a pivotal component of brand equity. Brand image is usually considered as the 'perceptions about a brand as reflected by the brand associations held in consumer memory' (Keller, 2003) or 'the consumer's perceptions of the brand's tangible and intangible associations' (Faircloth et al., 2001). Like product brands, online celebrities can establish an image in followers' minds. By applying it to online celebrity brands, online celebrity brand image is defined as 'the degree to which followers have a first impression when an online celebrity is placed in social media platforms and real-life' (adapt the definition of the brand image of Liu et al. (2020)). Online celebrity brand image can help potential followers meet their needs by identifying online celebrities from those competitor celebrities. Online celebrity brand image includes conceptions of quality, value, attitude, brand associations, and feeling (Aaker, 2013).

Online celebrity brand trust (OCBT). In recent studies, brand trust has been recognized as a crucial factor for building lasting relationships with customers, ultimately leading to increased brand loyalty (Jun & Yi, 2020). In the research context of online celebrity brand equity, online celebrity brand trust can be defined as a follower's willingness to be vulnerable to the actions of an online celebrity based on the beliefs, confidence, and expectation that the online celebrity is reliable, honest, committed, and competent (adapt the definition of the brand trust of Bauer (2019)). The followers believe that online celebrities will not only genuinely consider followers' welfare but also demonstrate empathy and attentiveness toward them (Hussain et al., 2020). As expected, online celebrity brand trust is based on the follower's conviction that the online celebrity possesses particular attributes that distinguish them as unique, trustworthy, responsible, and so on (Hussain et al., 2020). When followers are hesitant to make a purchase decision due to fear, utilizing a well-known personality (e.g., online celebrity) can be helpful to evoke empathy and alleviate uncertainty.

Online celebrity brand loyalty (OCBL). Brand loyalty, considered a core dimension of brand equity, is significant in determining the long-term relationships between consumers and brands (Kumar et al., 2013). In this study, online celebrity brand loyalty was examined using an attitudinal perspective, which refers to 'the tendency to be loyal to an online celebrity, which is demonstrated by the willingness to recommend the online celebrity to others and the intention to repeated viewing the online celebrity.' (adapt the definition of brand loyalty of Nam et al. (2011)). When referring to loyalty, behavioral measures cannot explain the reasons or factors that may influence a consumer's purchase decision-making process. When examining follower loyalty, the attitude method is preferable to the behavioral approach since followers might be devoted to an online celebrity even if they never see it in person (Bartfeld, 2020).

2.3. Conceptual model and hypothesis development

2.3.1. The causal relationships between online celebrity brand equity components

Following Keller (2003), brand equity categorization, brand awareness, and brand image are the core dimensions of brand equity. Previous studies show that brand awareness positively affects brand image (Bernarto & Margaretha, 2020). According to Biedenbach & Marell (2010), brand awareness as a necessary condition for establishing a brand node in memory positively affects the formation of solid and unique brand associations in customers' memory. In online celebrity brand equity, brand awareness is important for differentiating between different alternatives and developing a strong and positive brand image.

Brand awareness is the crucial first step in a customer's readiness to develop a brand preference. Similarly, prior research found that brand awareness positively affects trust (Bernarto & Margaretha, 2020; Bilgin, 2018). Brand awareness can significantly impact beliefs concerning a brand's quality and thus enhance their confidence in brand performance. More awareness of an online celebrity means more familiarity with the celebrity, which may reduce risk perceptions and thus enhance trust toward the celebrity.

From the discussion above, this study proposes the following hypotheses:

H1. Online celebrity brand awareness positively impacts online celebrity brand image.

H2. Online celebrity brand awareness positively impacts online celebrity brand trust.

A positive brand image helps consumers improve consumer trust in the product brand (Mudzakkir & Nurfarida, 2015). Similarly, in the current study, a favorable brand image is expected to increase customer confidence in a brand end, consequently leading to brand trust (Belén del Río et al., 2001). Esch et al. (2006) confirmed the direct impact of brand image on a consumer's brand trust. Like product brands, the positive image of an online celebrity can help followers improve their confidence. Without a positive image and strong brands, it will not be easy to draw new followers while keeping current ones.

The brand image was found to influence brand loyalty positively (Tan et al., 2011). In other words, follower opinions and thoughts about an online celebrity can lead to trust in the celebrity while fostering follower loyalty.

From the discussion above, this study proposes the following hypotheses:

H3. Online celebrity brand image positively impacts online celebrity brand trust.

H4. Online celebrity brand image positively impacts online celebrity brand loyalty.

Many scholars have examined the relationship between brand trust and brand loyalty, revealing that trust is an essential antecedent of brand loyalty (Kumar et al., 2013). Brand trust leads to brand loyalty because trust creates exchange relationships that are highly valued. Rauyrueen & Miller (2007) argued that one must win trust to obtain customer loyalty. In the online celebrity brand equity concept, if followers perception thinking that online celebrities are trustworthy and capable of responding followers' needs and the belief that online celebrities will not benefit from follower vulnerability, followers will be willing to recommend to other customers their favorite and reliable online celebrities and word-of-mouth will bring the positive effect on online celebrities (Liao et al., 2010). Therefore, the following hypothesis was posited:

H5. Online celebrity brand trust positively impacts online celebrity brand loyalty.

2.3.2. The influence of online celebrity brand equity components on overall celebrity brand equity

Despite the importance of the celebrity brand concept, the majority of marketing research focuses on celebrities' roles as endorsers rather than the influence of the components of online celebrity brand equity on overall online celebrity brand equity. According to Chattopadhyay et al. (2010), strengthening the dimensions of brand equity will increase the effectiveness of overall brand equity.

Brand awareness provides learning advantages for the brand and influences consumer decision-making. According to Tran et al. (2019), destination brand awareness has a beneficial influence on overall destination brand equity. Similarly, Faircloth et al. (2001) proposed that brand image can create brand equity directly or indirectly. Numerous studies examine the role of positive image plays in enhancing overall brand equity (Kashif et al., 2015).

Many authors stated that building and maintaining trust is at the core of brand equity because it is vital to any successful long-term relationship (Dedeoğlu et al., 2019; Kumar et al., 2013). Finally, one feature of brands with high equity levels is that consumers are incredibly loyal. In reality, brand loyalty is the primary driver of brand equity since it is seen as the road that leads to certain marketing benefits and outcomes (Aaker, 1991). Brand loyalty was found to have a dominant effect on brand equity. It leads to a high level of brand equity (Tran et al., 2019).

From the discussion above, this study proposes that the components of online celebrity brand equity boost overall celebrity brand equity since each is positively associated with overall online celebrity brand equity. Accordingly, research hypotheses have been determined as follows:

H6. Online celebrity brand awareness has a positive and significant influence on overall online celebrity brand equity.

H7. Online celebrity brand image has a positive and significant influence on overall online celebrity brand equity.

H8. Online celebrity brand trust has a positive and significant influence on overall online celebrity brand equity.

H9. Online celebrity brand loyalty has a positive and significant influence on overall online celebrity brand equity.

The conceptual model is presented in Figure 1.

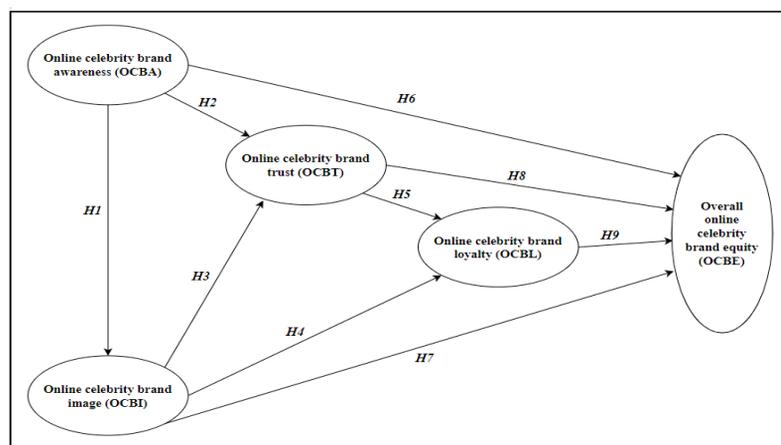


Figure 1. Conceptual model

3. RESEARCH METHODOLOGY

3.1. Measurement

This study develops the first draft scales regarding 24 observable variables of five constructs. Respondents are asked to rate their degree of agreement with each section item on a five-point Likert scale anchored by “strongly disagree (=1)” to “strongly agree (=5)”. The questionnaire was created in English and then translated into Vietnamese to make the survey procedure easier for Vietnamese respondents. The survey results were eventually translated into English to ensure the items matched the original version.

Before distributing a formal survey, this study conducted pilot research on the observed variables’ reliability, internal consistency, and content validity. A group discussion with five experts was held for multiple purposes, including producing expert ideas, exploring perspectives, receiving input on the research model and scales, and modifying the scale’s terms when translated into Vietnamese to fit the study setting in Vietnam. Consequently, the experts agreed on the scales’ rationality and coherence. As a result, the second draft scales can be generated by this investigation. With a sample size of 98, preliminary quantitative research was conducted to assess the scale’s quality early. Data were collected through an online survey of respondents who have been using TikTok and have followed at least one online celebrity on TikTok. As a result, through the scale by EFA and Cronbach’s alpha reliability coefficient, 21 observed variables of five scales were included in the formal study. At the same time, OCBA2 - “I am aware of [online celebrity X] as an online celebrity”, OCBL3 - “I would recommend [online celebrity X] to those planning to follow an online celebrity” and OCBE5 - “If another online celebrity’s performance is more excellent than [Online celebrity X], I would prefer to view [Online celebrity X]” were deleted (factor loadings < 0.5).

3.2. Sample and procedure

This work concentrated on target respondents who have been using TikTok and have followed at least one online celebrity on that platform. Data was collected using online and paper-based surveys. The intercept personal and convenient sampling methods were applied for the paper-based study, concentrating on a target sample of respondents in Vietnam. Respondents to the online survey were approached via Facebook. First, the questionnaire’s opening was designed to introduce the study’s aim, providing directions for completing it and noting that the questionnaire is unrelated to respondents’ personal privacy concerns. Second, the surveyor asked respondents screening questions such as “Do you follow any famous TikTokers?” and “Please enter the name of a famous TikToker you are interested in and answer the questions below” to filter for eligible research respondents. Third, respondents were required to complete each item individually and could not submit comments if numerous items remained unanswered.

The survey was conducted across two months, from February 2023 to March 2023. As a result, 443 valid questionnaires were collected. Sample information is described in Table 1 and Table 2.

Table 1. Information of respondents

Items	Statistics (n = 443)	Percentage (%)
Gender		
Male	220	49.66
Female	223	50.34
Age		
15 - 24	159	35.89
25 - 34	108	24.38
35 - 44	77	17.38
45 - 54	68	15.35
55 - 64	27	6.09
64 or above	4	0.90
Marital status		
Single	234	52.82
Married	209	47.18
Occupation		
Student/pupil	123	27.77
Laborer	153	34.54
Self-employed	85	19.19
Public servant	51	11.51
Retired	24	5.42
Other	7	1.58
Annual income		
Under 60 million VND	127	28.67
From 60 - 120 million VND	241	54.40
Above 120 million VND	75	16.93
Region of residence		
North Vietnam	129	29.12
Central Vietnam	187	42.21
South Vietnam	127	28.67

Table 2. Behaviors of respondents on Tiktok

	Statistic	Percentage (%)
Frequency of activity on TikTok		
Seldom	21	4.74
Sometimes	132	29.80
Frequent	234	52.82
Very often	56	12.64
Purpose of using TikTok (multiple responses allowed)		
Searching information	257	58.01
Study/work	253	57.11
Entertainment	421	95.03
Other	112	25.28
The number of hot TikTokers you follow		
1	2	0.45
2	17	3.84
3	37	8.35
4 and above	387	87.36
The frequency of following online celebrity X on TikTok		
Seldom	29	6.55
Sometimes	129	29.12
Frequent	247	55.76
Very often	38	8.58

3.3. Data analysis

Covariance-based (CB)-SEM was applied to examine how well-established theories fit reality. SPSS 23.0 and AMOS 21 software were used to analyze the data. A consistent series of steps for data analysis included sample analysis, an evaluation of the measurement models, and an evaluation of the structural model.

4. RESULTS

4.1. Evaluation of the measurement models

The Cronbach alpha values of OCBA, OCBI, OCBT, OCBL, and OCBE are 0.912, 0.850, 0.931, 0.884 and 0.8176, respectively. All 21 observed variables satisfied the requirements of corrected item-total correlation (> 0.3).

This study performed confirmatory factor analysis (CFA) to evaluate the quality of its measurement models. The proposed-model CFA results are $\chi^2/df = 1.554 (< 3)$, CFI = 0.906 (> 0.9), AGFI = 0.820 (> 0.8), and RMSEA = 0.054 (< 0.08). All criteria met the recommended values in the measurement model (Hair et al., 1998). Therefore, the indicators were acceptable, so the model was suitable for the collected data. The convergent validity results were supported by standardized loadings, construct reliability (CR), and the average variance extracted (AVE) (Hair et al., 1998). In this study, item reliability (standardized loadings) satisfied the requirement of convergent validity (> 0.7). In addition, the CR and AVE of ten constructs exceeded the recommended level (> 0.7 and > 0.5 , respectively). These results indicated the measurement items' reliability and validity (Table 3).

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This study examined the differences between constructs using the Fornell-Larker criterion (Fornell & Larcker, 1981). The results showed that discriminant validity was achieved when each factor's square of root AVE value was greater than the correlations among factors (Table 4).

Table 3. Results of convergent validity

Constructs	Standardized loading	CR	AVE
Online celebrity brand awareness (OCBA) (adapted from Dedeoğlu et al. (2019))			
OCBA1- I can imagine what [online celebrity X] looks like.	0.855	0.912	0.721
OCBA3- I can recognize [online celebrity X] among other similar online celebrities.	0.864		
OCBA4- Some characteristics of [online celebrity X] come to my mind quickly.	0.836		
OCBA5- I can quickly recall the activities of [online celebrity X].	0.840		
Online celebrity brand image (OCBI) (adapted from Frias et al. (2020))			
OCBI1- The image that I have of [online celebrity X] is as good as, or even better than, that of other similar online celebrities.	0.915	0.854	0.746
OCBI2- The overall image of [online celebrity X] is very positive.	0.809		
Online celebrity brand trust (OCBT) (adapted from Hussain et al. (2020))			
OCBT1- I have confidence in the information provided by [online celebrity X].	0.841	0.931	0.692
OCBT2- I think [online celebrity X] is among the best in their endorsed area.	0.852		
OCBT3- [Online celebrity X] shows a high commitment to the followers.	0.875		
OCBT4- [Online celebrity X] can endorse the brand.	0.754		
OCBT5- [Online celebrity X] has high integrity.	0.846		
OCBT6- [Online celebrity X] is highly reliable.	0.818		
Online celebrity brand loyalty (OCBL) (adapted from Dedeoğlu et al. (2019) (Dedeoğlu et al., 2019))			

Constructs	Standardized loading	CR	AVE
OCBL1- I would positively relate my opinion of other people about [online celebrity X].	0.849	0.885	0.606
OCBL2- I would encourage my friends and relatives to follow [online celebrity X].	0.798		
OCBL4- I would like to continue to support [online celebrity X].	0.767		
OCBL5- I will view [online celebrity X] more frequently.	0.707		
OCBL6- I will consider viewing [online celebrity X] as my first choice.	0.765		
Overall online celebrity brand equity (adapted from Lili et al. (2022))			
OCBE1- It makes sense to follow [Online celebrity X] instead of other online celebrities, even if they are the same.	0.749	0.819	0.531
OCBE2- Even if another online celebrity has the same characteristics as [Online celebrity X], I would prefer viewing [Online celebrity X].	0.746		
OCBE3- If the performance concern of another online celebrity is not different from that of [Online celebrity X] in any way, it seems smarter to view [Online celebrity X].	0.711		
OCBE4- Viewing [Online celebrity X] is more attractive than other online celebrities.	0.707		

Table 4. Results of discriminant validity

The square root of AVE/ R^2	OCBA	OCBI	OCBT	OCBL	OCBE
OCBA	0.849				
OCBI	0.228	0.864			
OCBT	0.188	0.201	0.832		
OCBL	0.007	0.016	0.071	0.778	
OCBE	0.086	0.043	0.613	0.199	0.729

Note(s): OCBA- online celebrity brand awareness, OCBI- online celebrity brand image, OCBT- online celebrity brand trust, OCBL- online celebrity brand loyalty, OCBE- overall online celebrity brand equity; R^2 - square of the correlation

4.2. An assessment of the structural model

The test of model fit results from CB-SEM analysis showed $\chi^2/df = 1.926 (< 3)$, CFI = 0.905 (> 0.9), AGFI = 0.827 (> 0.8), and RMSEA = 0.054 (< 0.08). Thus, the results indicated a good fit for the proposed structural model. The SEM analysis showed that there were positive relationships between the research concepts because they were significant ($p < 0.05$), except for the impact of online celebrity brand image on online celebrity brand loyalty and overall brand equity, which were not found to be statistically significant ($p > 0.05$). Model testing was performed using the bootstrapping technique with a repeated sample size 1000. The results of the bootstrap analysis indicated that all absolute values of the critical values were

less than 2. Therefore, the estimates in the research model were reliable. Thus, all seven hypotheses are supported except for rejecting hypotheses H4 and H7 (Table 5).

Table 5. Results of testing the causal relationships

Causal Path	Hypothesis	Standardized Estimates	Standard Error	CR	p-value	Test Results
OCBA → OCBI	H1	0.478	0.052	9.400	***	Accept
OCBA → OCBT	H2	0.284	0.054	5.193	***	Accept
OCBI → OCBT	H3	0.312	0.055	5.400	***	Accept
OCBI → OCBL	H4	0.024	0.064	0.371	0.511	Reject
OCBT → OCBL	H5	0.276	0.064	4.488	***	Accept
OCBA → OCBE	H6	0.113	0.037	2.199	0.028	Accept
OCBI → OCBE	H7	0.006	0.031	0.128	0.598	Reject
OCBT → OCBE	H8	0.762	0.054	10.308	***	Accept
OCBL → OCBE	H9	0.159	0.038	2.940	0.003	Accept

Note(s): OCBA- online celebrity brand awareness, OCBI- online celebrity brand image, OCBT- online celebrity brand trust, OCBL- online celebrity brand loyalty, OCBE- overall online celebrity brand equity; CR- Critical ratios; P- p-value

*Note: *** p < 0.001*

5. CONCLUSION

This study aims to explore the links among the components of brand equity and how they affect overall brand equity in the context of online celebrities. This study devised and tested a model based on a literature review that explores the causal relationships among the online celebrity brand equity components and the impact of these on overall online celebrity brand equity.

5.1. Theoretical implications

Bridge the above-stated gap in the existing literature is perhaps the most significant contribution of this study. The first theoretical contribution of this paper is to consider online celebrity brand trust as an affective component of online celebrity brand equity. By evaluating online celebrity brand equity from cognitive, affective, and conative components in the follower mindset, it is possible to understand online celebrity assessments better. This study can establish the contributions of each part in the hierarchical chain relationship by studying all components of online celebrity brand equity. Identifying the components and linkage mechanism among online celebrity brand equity components along the hierarchy of effects helps this study explore many relationships that are scarcely examined in the online celebrity brand equity model. Most previous studies in different research contexts (e.g., product, destination, tourism and hospitality industry, human brands) simultaneously identified brand awareness and image affecting other factors. As a result, studies of brand awareness's impact on brand image have been relatively inadequate.

The second theoretical contribution of this paper is to propose and test an integrated model to study the relationships among the various online celebrity brand equity components and their influence on overall

online celebrity brand equity. Prior research suggests the hierarchy of effect and potential causal relationship among brand equity dimensions. However, the existing literature investigates the interrelations among online celebrity brand equity components and how these dimensions affect overall online celebrity brand equity. The results show that all causal relationships except the association between OCBI and OCBL, OCBI and OCBE are supported. The plausible reason may be that the image of online celebrities may not be special and unique enough to differentiate them from other competitors. A positive image of online celebrities could not appeal to potential followers to create a long-term engagement with online celebrities and eventually increase overall celebrity brand equity since brand loyalty is a cardinal driver of brand equity. Nevertheless, online celebrity brand image can indirectly influence overall online celebrity brand equity through other components.

5.2. Managerial implications

First, when researching online celebrity brands, most studies focus mainly on empirical research in social media channels other than TikTok. Hence, this research advocates empirical research to explore the managerial practices in Vietnam regarding if and how online celebrity brand equity is managed within TikTok's social platforms. The current interest trend is identifying how celebrity brand equity is formed. As a result, this research assists celebrities and fame-seekers who lack a strong public identification and do not know how to self-promote themselves to build forceful online celebrity brand equity. This will serve as the foundation for long-term success and competitive advantage.

Second, many online celebrities or celebrity management businesses invest many resources in attracting followers and building brand awareness in potential followers' minds, forming a preferred brand image, leading to trust, and thereby creating loyalty between followers and online celebrities. It is a cardinal driver of brand equity, which eventually facilitates the conversion of followers into customers. Therefore, it is paramount for online celebrities and celebrity management companies to form a brand orientation strategy. They need to have a knowledge base of online celebrity brand equity. As such, the effect of components and overall online celebrity brand equity would be evaluated more carefully. The results also reveal that online celebrity brand trust has a significant, positive influence on overall online celebrity brand equity (0.762). Consequently, trust is the essence of a strong brand's value for followers; paying attention to how much followers trust in an online celebrity might be considered a tool to manage online celebrity brand equity.

5.3. Limitations and future research

The limitations and future research directions are as follows. First, the empirical research was conducted within Vietnam, limiting the study's generalizability. As a result, further studies are needed to validate the results in other cultural contexts, generalize its findings, and broaden its target respondents to include both national and international followers. Second, this study should consider moderators such as demographic variables (e.g., gender, age) or attractiveness that can further enhance online celebrity brand equity theory and practice.

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HOTEL QUALITY ASSESSMENT BASED ON OPINION MINING AND SENTIMENT CUSTOMER ANALYSIS FROM ONLINE REVIEWS

Author: Tran Thi Quynh Chi¹, Vo Thi Nhu Ngoc, Dang Hoang Yen

Mentor: Nguyen Van Chuc²

ABSTRACT: *The application of information technology in the tourism industry in Vietnam is increasingly thriving with the emergence of numerous online applications and websites aimed at supporting customers' travel needs. Here, users can plan itineraries, book flights, hotels, and share their experiences and reviews after utilizing services at various locations. These comments significantly influence the behavior of future customers, as they tend to research and refer to previous feedback before making decisions. Therefore, evaluating quality based on the collection, extraction, and synthesis of these reviews is crucial. This research focuses on hotel services within the city of Da Nang. The proposed solution is to develop a machine-learning model to analyze customer sentiment through comments collected from specific online platforms, particularly Tripadvisor. Subsequently, a topic extraction model is utilized to identify the most prominent issues users are concerned about, serving as representative criteria for hotels. These criteria are then scored based on the sentiment analysis results of the corresponding reviews. Finally, the hotels are ranked using the obtained scores. The results of this study provide specific insights hidden within the reviews, enabling a better understanding of the strengths and weaknesses of hotels. This assists managers in devising more effective strategies, while customers can make better choices for themselves.*

Keywords: *opinion mining, machine-learning, quality of service*

1. INTRODUCTION

Travel is a means of self-awareness, exploration, and experiencing different lifestyles. Leisure travel is not seen as a luxury product but as a necessary element to rejuvenate an individual's energy (Tripzuki, 2013). Over the past decade, Da Nang in Vietnam has witnessed significant growth in domestic and international tourist arrivals (Holladay et al.; K., 2018). Da Nang has been voted as one of the top 10 destinations in Asia by the online magazine Smart Travel Asia (VNtourism, 2016).

Simultaneously, searching for information related to their plans, from flights to hotel bookings, has become an integral step in the decision-making process for travelers. Online review websites dedicated to rating hotels have become widely popular (Buhalis, D., & Law, R. 2008) due to the increasing influence of tourism. Online customer ratings play a crucial role in the hotel industry (Xie et al., Z., 2014). Many opinions about hotels, travel destinations, and tourism services are presented in the form of online consumer reviews (Sigala, M., 2009). Online hotel reviews also provide insights into customer satisfaction (Geetha, M., Singha, P., & Sinha, S., 2017). The percentage of customers referring to online travel reviews before making bookings is increasing. Consumers tend to trust peer reviews more than businesses' information (Wilson, E. J., & Sherrell, D. L., 1993). Therefore, online reviews of travel services have become an essential source of information for travelers (Mauri, A. G., & Minazzi, R., 2013).

Based on the information above, our group has chosen to research **“Hotel Quality Assessment based on Opinion Mining and Sentiment customer Analysis from online reviews”**. We aim to provide a platform that helps travel service businesses and managers compare and evaluate various tourism services. Additionally, it can provide recommendations for customers to choose convenient travel services. In this study, we propose several preprocessing techniques and data augmentation methods after collecting data

¹ University of Economics - The University of Danang; Email: 201124029204@due.edu.vn

² University of Economics - The University of Danang; Email: chuc.nv@due.edu.vn

from booking websites. Error analysis methods are also used to evaluate and label noisy raw data. We then employ Latent Dirichlet Allocation (LDA), a topic modeling technique, to identify confidential information and aspects of customer reviews. After testing four popular text classification models, SGD Classifier, Logistic Regression, Naïve Bayes, and Decision Tree, we use evaluation metrics such as Accuracy, Precision, and Recall to classify these models and select the best candidate model. Finally, based on the collected results, we will score the hotels, and the extracted topics from the LDA model will be chosen as evaluation criteria. The result will be a ranking table of hotels based on the scores obtained.

2. THEORETICAL FRAMEWORK

2.1. Online reviews

Online customer reviews can be considered as “product reviews created by businesses posted on the company’s or third-party website” (Mudambi et al., D., 2010). Typically, customers are prompted to provide a specific rating scale to measure overall evaluation and write an optional text of any length to justify their rating (Trenz et al.; B., 2013). Customer reviews have become an essential tool for both sellers and online markets. Online customer reviews are more relevant than other marketing communication forms and can increase trust in an online store (Chen et al.; J., 2008).

Our research provides an aspect to understand the sentiment polarity of a review in a positive or negative context so that managers can better respond to those reviews. Our current study focused on the significance of hotel ratings and reviews on categories so managers could have a specific strategy for each hotel category (Geetha et al.; S., 2017).

2.2. Sentiment analysis

Opinions and customer comments are a form of natural language written out (Eisenstein, J. 2019; Popescu et al.; O., 2007). However, to achieve effectiveness in sentiment analysis through online comments, appropriate natural language processing methods and techniques are needed:

1. A dataset containing customer comments on product and service experience in hotels on the website must be prepared for analysis.
2. The pre-processing stage includes data cleaning, removing special characters, redundant data, and normalizing syntax and semantics.
3. Select the input factors for analysis and reduce the dimensionality of the data to achieve the most accurate results.
4. Evaluation of results and project implementation are necessary.

Sentiment analysis is a crucial method to extract user opinions and emotions in online comments, providing helpful information for businesses on the quality of their products and services (Buche et al., A., 2013; Sun et al.; J., 2017).

2.3. Natural Language Processing (NLP)

Natural Language Processing (NLP) is a field of computer science and artificial intelligence that deals with processing, analyzing, and producing natural language humans use. NLP covers various aspects of language, including syntax, semantics, and language interactions (VBD., 2022).

NLP methods include machine learning techniques, deep learning, rule-based natural language processing, and combining these techniques to create effective NLP solutions.

2.4. Analytic Hierarchy Process method (AHP)

Analytic Hierarchy Process (AHP): This is a method of “measurement through pairwise comparison and based on expert evaluations to derive priority scales”. It is one of the most widely used multi-criteria decision-making tools. This method allows for the determination of the weights (significance) of specific or non-structural hierarchical level criteria in relation to higher-level criteria (Podvezko, V., 2009).

From the matrix, the components of the eigenvector matrix $W = [w_{i,j}]_{n \times n}$ are calculated using the formula:

$$w_{i,j} = \frac{a_{i,j}}{\sum_{i=1}^n a_{i,j}} \quad (i = \overline{1, n}, j = \overline{1, n})$$

From the matrix W, the value of the component of the weight vector w_j is calculated using the formula:

$$W_j = \frac{\sum_{i=1}^n a_{i,j}}{n} \quad (j = \overline{1, n})$$

The consistency ratio (CR) was determined:

$$CR = \frac{CI}{RI}$$

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

Where λ_{max} is the maximum eigenvalue of the pairwise comparison matrix and n is the number of criteria.

2.5. Latent Dirichlet Allocation model (LDA)

Latent Dirichlet Allocation (LDA) is a probabilistic generative model for a corpus of documents. The basic idea is that documents are represented as random mixtures of latent topics, where each topic is characterized by a distribution over words (Blei, D. M., Ng, A. Y., & Jordan, M. I., 2003).

LDA assumes that each document can be represented as a probability distribution over latent topics, and the topic distribution for all documents share a common prior Dirichlet distribution. Each latent topic in the LDA model is also represented as a probability distribution over words, and the word distribution for all topics shares a common prior Dirichlet distribution.

$$p(D|\alpha, \beta) = \prod_{d=1}^M \int p(\theta_d|\alpha) \left(\prod_{n=1}^{N_d} \sum_{z_{dn}} p(z_{dn}|\theta_d) p(w_{dn}|z_{dn}, \beta) \right) d\theta_d$$

2.6. Machine learning classification models

2.6.1. Logistic regression

Logistic regression is a classification model, not a regression model. It is a simple and effective method for binary and linear classification problems. It is a recognizable classification model and achieves very good performance with linearly separable classes. This is a widely used algorithm for classification in the industry. The logistic regression model, like adaline and perceptron, is a statistical method for binary classification that can be generalized into multiclass classification. Scikit-Learn has a highly optimized implementation of logistic regression, supporting classification tasks (Raschka, S., 2015).

The general logistic model for k independent variables can be written as P(X) equals 1 over 1 plus e to the power of negative alpha plus the sum of $\beta_i X_i$,

$$P(X) = \frac{1}{1 + e^{-(\alpha + \sum \beta_i X_i)}}$$

Another way to write the logistic model is called the logit form of the model.

$$\text{logit } P(X) = \alpha + \sum \beta_i X_i$$

2.6.2. Decision tree

Decision tree is a classification algorithm represented as a recursive partitioning of the feature space. A decision tree consists of nodes that form a tree with a root, meaning it is a directed tree with no incoming edges to the root. All other nodes have exactly one incoming edge. A node with outgoing edges is called an internal or decision node. All other nodes are called leaves (also known as terminal or decision nodes) (Rokach, L., & Maimon, O., 2005).

To evaluate whether a conditional node split is good or not, information gain and Gini gain are often used (Rokach, L., & Maimon, O., 2005):

$$\text{InformationGain}(a_i, S) = \text{Entropy}(y, S) - \sum_{v_{i,j} \in \text{dom}(a_i)} \frac{| \sigma_{\alpha_i=v_{i,j}} S |}{|S|} \cdot \text{Entropy}(y, \sigma_{\alpha_i=v_{i,j}} S)$$

$$\text{Entropy}(y, S) = \sum_{c_j \in \text{dom}(y)} \frac{| \sigma_{y=c_j} S |}{|S|} \cdot \log_2 \frac{| \sigma_{y=c_j} S |}{|S|}$$

$$\text{Gini}(y, S) = 1 - \sum_{c_j \in \text{dom}(y)} \left(\frac{| \sigma_{y=c_j} S |}{|S|} \right)^2$$

Therefore, the evaluation criterion for selecting the attribute α_i is defined as:

$$\text{GiniGain}(\alpha_i, S) = \text{Gini}(y, S) - \sum_{v_{i,j} \in \text{dom}(\alpha_i)} \frac{| \sigma_{\alpha_i=v_{i,j}} S |}{|S|} \cdot \text{Gini}(y, \sigma_{\alpha_i=v_{i,j}} S)$$

2.6.3. Naïve Bayes

Naive Bayes is a simple machine learning algorithm that uses Bayes' rule along with a strong assumption that the conditional attributes are independent of the class.. Naive Bayes assigns probabilities to every possible value within the target range. The resulting distribution is then condensed into a single prediction (Frank, E., Trigg, L., Holmes, G., & Witten, I. H., 2000). Bayes' theorem states that:

$$p(Y|E) = \frac{p(E, Y)}{\int p(E, Y) dY} = \frac{p(E|Y)p(Y)}{\int p(E|Y)p(Y) dY}$$

2.6.4. SGD Classifier

The SGD Classifier is one of the most widely used algorithms that can offer new perspectives to solving problems. The SGD Classifier is an algorithm for minimizing functions (Nedrich, M., 2014). The SGD Classifier is best used when parameters cannot be computed analytically (e.g., using linear algebra) and must be sought using an optimization algorithm (Jason Brownlee, 2019).

The algorithm process of stochastic gradient descent is to choose θ to minimize $J(\theta)$. A search algorithm is used to provide some initial predictions to θ and iteratively changes the value of θ to produce the result where J is minimized (Prasetijo, A. B., Isnanto, R. R., Eridani, D., Soetrisno, Y. A. A., Arfan, M., & Sofwan, A., 2017). The iterative update process in SGD is constructed as follows:

$$\theta_j = \theta_j - \alpha \frac{\partial}{\partial \theta_j} J(\theta)$$

3. RESEARCH METHOD

The study utilizes experimental research with classification models such as Logistic Regression, SGD Classifier, Decision Tree, and other complex quantitative research methods like AHP and LDA to rank the quality of a hotel.

The research adopts the CRISP-DM (Cross et al. for Data Mining) methodology, an industry standard in data mining, to conduct the study. The research process includes the following steps:

- (1) Data collection and preprocessing: Data is collected and preprocessed to prepare for the model training process.
- (2) Model training and evaluation to select the appropriate model for classification prediction.
- (3) Utilizing the LDA topic extraction model and weight calculation methods in AHP.
- (4) Evaluating the service quality based on the prediction results and the defined criteria: The prediction results from the model are used to calculate scores.

The research is implemented using the Python programming language with the support of available libraries.

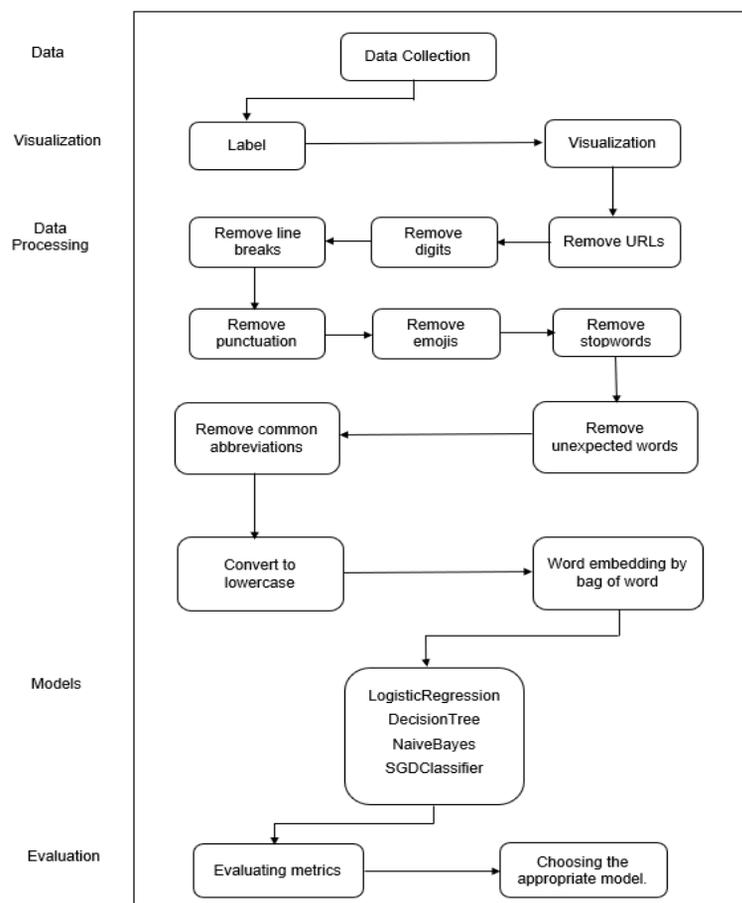


Figure 1. Workflow

3.1. Collecting data

The Python libraries Scrapy and Selenium are used to collect data from the website. Data collection is based on the Hypertext Markup Language (HTML) structure of the Tripadvisor page. To collect specific information, data extraction is performed by accessing the corresponding HTML tags that contain the desired information. The collected dataset consists of 9274 rows and 9 columns.

To gain a better understanding of the obtained data, we conducted visualization. It can be observed that the dataset consists of 82 hotels and six different types of tourism ‘Đã đi du lịch với gia đình’, ‘Đã đi du lịch với bạn bè’, ‘Đã đi du lịch theo đôi’, ‘Đã đi du lịch theo dạng công tác’, ‘NA’, ‘Đã đi du lịch một mình’. ‘Đã đi du lịch với gia đình’ type constitutes the most considerable quantity, with 3522 instances, accounting for 37.977% of the total types. Next are ‘Đã đi du lịch với bạn bè’, ‘Đã đi du lịch theo đôi’, ‘Đã đi du lịch theo dạng công tác’, ‘NA’ and finally, ‘Đã đi du lịch một mình’ type.

As shown in Figure 3.2.1, most of the reviews exhibit highly positive sentiments with the presence of many positive words in customer reviews such as : “Tuyệt vời”, “Tốt”, ...

Within the dataset, most hotels achieve the highest ‘Rating’ score of 50, while the remaining ‘Rating’ scores are significantly lower.

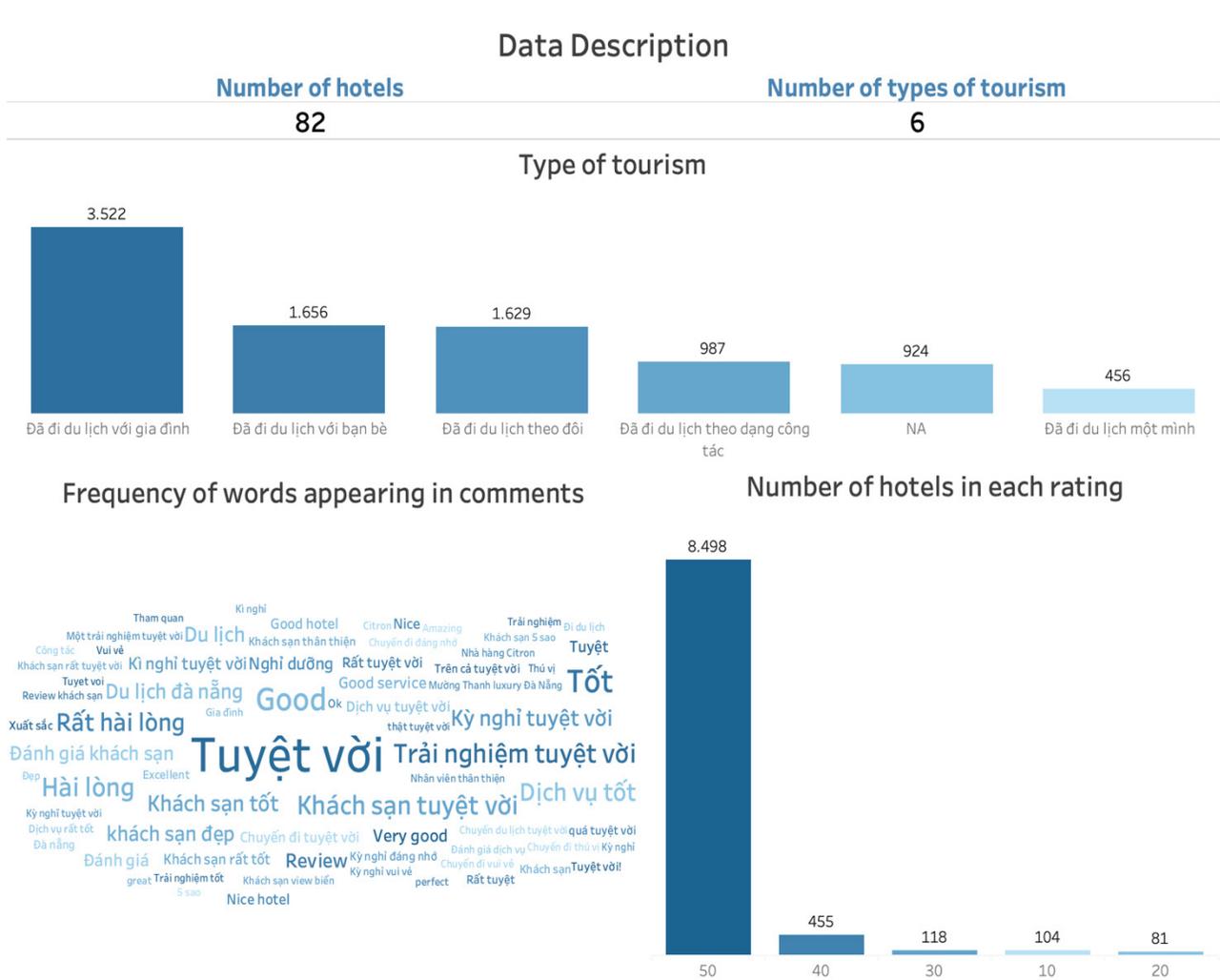


Figure 2. Data description

3.2. Data preprocessing

Import the necessary libraries for processing: pandas, numpy, regex, emoji, ... Keep the required columns ‘Content comment’ and ‘Rating’. Proceed to label the ‘Rating’ column. If the ‘Rating’ score is greater than 30, assign a label of 1; otherwise, assign a label of -1 (1: good rating, -1: poor rating). After classification, assign the data to a new column called ‘label’

Perform Natural Language Processing (NLP):

Remove URLs: Any URLs present in the text are removed.

Remove digits: Numeric digits are removed from the text.

Remove line breaks: Line breaks and newlines are eliminated from the text.

Remove punctuation: Punctuation marks such as periods, commas, exclamation marks, etc., are removed from the text.

Remove emojis: Emojis or emoticons are removed from the text.

Remove stop words: Commonly used stop words, such as “and,” “the,” “is,” etc., are removed from the text as they do not contribute significantly to the meaning.

Remove unexpected words: Words that do not provide meaningful information in the context of the analysis are removed.

Remove standard abbreviations: Abbreviations that are commonly used and do not add value to the text are removed.

Convert to lowercase: All text is converted to lowercase to ensure consistency and avoid duplicate word forms.

These preprocessing steps help clean and standardize the text data, making subsequent analysis and modeling tasks easier.

3.3. Text vectorization:

Before feeding text data into a machine learning model for training, it is necessary to convert the textual data into vectors. The Bag of Words (BoW) method uses natural language processing to represent text documents as feature vectors. The main idea of BoW is to treat each document as a bag containing words and disregard the order or structure of the words in the text.

The process of using BoW typically involves the following steps:

(1) Building a vocabulary: Create a set of words (often called a dictionary) from the entire corpus or a training dataset.

(2) Document representation: For each document, count the occurrences of each word in the vocabulary and construct a feature vector. The values in the vector are often normalized to reflect the frequency of each word in the document.

(3) Training and using a model: The feature vectors of the documents can be used to train machine learning models, such as classifiers, for tasks like text classification or sentiment analysis. The trained models can then be used to classify new documents.

3.4. Training model and predicting opinion classification

Determine the variables X and y for model implementation, where X represents customer reviews, and y represents positive and negative ratings. Import the sklearn library and build the necessary functions to construct models: Linear Regression, Naive Bayes, Decision Tree, and SGD Classifier. Use model evaluation metrics to select the appropriate model and proceed with predicting opinion classification.

3.5. Selecting evaluation criteria based on LDA Model

We can extract hidden topics behind customer reviews or comments for the LDA model. These hidden topics are built based on prominent words contributing to each topic. In this step, the team will select hidden topics as evaluation criteria for assessing the quality of a hotel and assign names to these topics based on the contributing vocabulary. Subsequently, each comment will be predicted to belong to a specific topic, and we can observe how many positive and negative comments exist within each topic. Finally, we will use perplexity and coherence scores to evaluate the quality of the model.

3.6. Using AHP to Calculate Weights for Evaluation Criteria

Based on the AHP theory, the team will construct an equation to calculate the hotel’s score using the established evaluation criteria, and the weight of each criterion will be derived from the AHP analysis method. As this is an expert opinion-based approach, the team has consulted two experts in the hotel industry to obtain pairwise comparison matrices in AHP. We will calculate the weights for each criterion from these matrices and utilize CR (Consistency Ratio) and CI (Consistency Index) metrics to evaluate the model’s suitability.

After performing sentiment classification, categorizing opinions as positive or negative based on the best-performing machine learning model during the training and evaluation phase, we will proceed to aggregate the prediction results and rank the hotels according to customer feedback using the following formula (Journal of Science and Technology, 2020):

$$\frac{\text{positive} - \text{negative}}{N}$$

Where:

positive: the total number of comments predicted as positive.

negative: the total number of comments predicted as negative.

N: The total number of comments.

In this formula, a higher ranking value indicates a more positive overall sentiment for the hotel, while a lower value indicates a more negative sentiment.

4. RESULTS AND DISCUSSION

4.1. Evaluating models

Accuracy: Accuracy is a performance metric that measures the overall correctness of the predictions made by a model. It is calculated as the ratio of correctly predicted instances to the total number.

Recall: Recall, also known as sensitivity or valid positive rate, measures the proportion of actual positive instances the model correctly identifies. It is calculated as the ratio of true optimistic predictions to the sum of accurate positive and false pessimistic predictions.

Precision: Precision measures the proportion of correct positive predictions. It focuses on the accuracy of optimistic predictions rather than the overall correctness. It is calculated as the ratio of true positive predictions to the sum of accurate positive and false positive predictions.

F-score: The F-score is a measure that combines precision and recalls into a single metric. It provides a balanced assessment of a model’s performance by considering both precision and recall.

Table 1. Model comparison result.

Model	Accuracy	Precision	Recall	F_score	Time
Naive Bayes	67.13	97.74	67.56	79.89	0.006050
Logistic Regression	96.65	96.66	100.00	98.30	0.010306
Decision Tree	94.39	97.63	96.54	97.08	0.012869
SGD Classifier	96.65	96.86	99.77	98.29	0.014042

Based on the training results, all four models demonstrate high accuracy, with 96.65% and 94.39%, respectively. This indicates that these models are effective. However, when considering the Recall metric of Logistic Regression and SGD Classifier models, we observe that these scores are 100% and 99.77%, respectively.

This implies a high percentage of correctly classified samples in their respective classes, nearing the maximum value. However, selecting these two models may lead to overfitting the training data and inaccurate predictions. Therefore, from these results, the Decision Tree model may perform better than the other three models.

In conclusion, we can utilize the Decision Tree model to predict comments in the subsequent steps. The findings of this study have helped identify a suitable opinion classification model and utilize it for predictions. This is considered a crucial part of the quality evaluation process.

4.2. Results of topic extraction from LDA model

In the model, we requested the extraction of two hidden topics within customer feedback, and the results are as follows:

For topic 0, the extracted features include:

(0, ‘0.045*”khách_sạn” + 0.040*”phòng” + 0.033*”nhân_viên” + 0.029*”không” + 0.018*”positive” + 0.015*”đi” + 0.014*”tốt” + 0.010*”tuyệt_vời” + 0.010*”nhiệt_tình” + 0.008*”dịch_vụ”’)

For topic 1, the extracted features include:

(1, ‘0.045*”khách_sạn” + 0.033*”đẹp” + 0.025*”nhân_viên” + 0.023*”biển” + 0.021*”phòng” + 0.020*”nhiệt_tình” + 0.017*”thân_thiện” + 0.016*”sạch_sẽ” + 0.016*”tốt” + 0.015*”đà_năng”’)

From the results, it can be observed that two identified topics (numbered 0 and 1) display the top ten most crucial vocabulary contributing to that topic. The first topic is related to keywords such as “phòng”, “positive”, “tốt”, “tuyệt vời” và “dịch vụ” while the second topic is associated with keywords such “nhân viên”, “nhiệt tình”, “thân thiện” và “tốt”. Based on this contributing vocabulary, the first topic relates to hotel rooms, and the second is about hotel staff.

By obtaining the results from the LDA model, we successfully extracted two hidden topics from customer comments and used these topics as criteria to evaluate hotel quality.

4.3. Results of weighting the criteria using the Analytic Hierarchy Process (AHP) method

From the analyses mentioned earlier, it can be observed that the team has identified three criteria to evaluate a hotel’s quality: comment score, rooms, and staff. The customer ratings are calculated based on sentiment classification results, while the remaining two criteria are selected from the LDA model results.

Using the AHP method, the team has constructed the pairwise comparison matrix as follows:

Table 2. Pairwise comparison matrix.

	Comment score	Room	Staff
Comment score	1	3	5
Room	0.33333	1	2
Staff	0.2	0.5	1
Sum	1.53333	4.5	8

Based on the pairwise comparison matrix, we can calculate the weights for each criterion as follows:

Table 3. Weight of each criteria.

	Comment score	Room	Staff	Criteria Weights
Comment score	0.652173913	0.66666667	0.625	0.64794686
Room	0.217391304	0.22222222	0.25	0.229871176
Staff	0.130434783	0.11111111	0.125	0.122181965

Using the weights of the criteria and the pairwise comparison matrix, we can calculate the Consistency Ratio (CR) as follows:

Table 4. Consistency Ratio table.

Criteria weights	0.64794686	0.2298118	0.1218197		
	Comment score	Room	Staff	Sum weight	Consistency vector
Comment score	0.64794686	1.94384058	3.2397343	5.831521739	9
Room	0.076623725	0.22987118	0.45974235	0.766237252	3.33333333
Staff	0.024436393	0.06109098	0.12218196	0.20770934	1.7

Calculate the Consistency Index (CI)

$$CI = 0.838888889$$

Calculate the Consistency Ratio (CR)

$$CR = 0.014463602$$

From the CR result, we can see that the CR value is less than 10%, indicating that the proposed model is suitable.

4.4. The scoring results for each hotel

According to the results obtained from the AHP analysis, the equation for calculating the score of each hotel based on the criteria of Comment Score, Room, and Staff is as follows:

$$\text{Score} = 0.229871176 * \text{Room} + 0.122181965 * \text{Staff} + 0.6479486 * \text{Comment score}$$

Each criterion is calculated using the formula mentioned earlier:

$$\frac{\text{positive} - \text{negative}}{N}$$

Where:

positive: the total number of comments predicted as positive.

negative: the total number of comments predicted as positive.

N: The total number of comments.

For sample N, we substitute the total number of comments to calculate the Comment Score, substitute the total comments about the room to calculate the Room score, and do the same for the Staff.

Based on these results, we obtain the scores for the ten sample hotels as follows:

Table 5. Consistency Ratio table.

Hotel	Room	Staff	Comment score	Score
Monsieur Diesel Hotel	1.00	1.00	1.00	1.000
Pavilion Hotel	1.00	1.00	1.00	1.000
TIA Wellness Resort Spa	1.00	1.00	1.00	1.000
Sanouva Danang Hotel	1.00	1.00	1.00	1.000
Jolia Hotel Apartment	0.93	1.00	0.95	0.952
Lucky Bee Homestay	1.00	0.89	0.94	0.948
Yarra Ocean Suites	0.94	0.89	0.92	0.921
Danaciti Hotel	1.00	0.74	0.89	0.897
Four Points by Sheraton	1.00	0.67	0.83	0.850
Lahome Apartment and Villa	0.91	0.71	0.83	0.834

5. DISCUSSION

Hotel evaluations are still conducted traditionally, which require more clarity in monitoring and supervising service quality and customer satisfaction. In this study, we approach a completely new scoring method that provides independent scores and reveals hidden aspects within each customer review. It helps managers gain insights into future strategies and strengthen the brand for hotels with top scores. Additionally, such evaluations enable customers to have more choices for their trips and streamline their decision-making process as comments are condensed into numerical scores.

However, to better evaluate a hotel, more than relying solely on the three criteria in this study is needed, as there are many other factors influencing the decisions of service users. It is a limitation of the research, as the chosen criteria in this paper are the topics frequently mentioned in customer reviews. If specific topics are not addressed or are discussed less, they will not appear. Therefore, if we want to evaluate more criteria, we need a sufficiently large and diverse training dataset.

Furthermore, to improve the research results, we need to utilize natural languages processing models such as Transformers, GPT ,... and expand the scope of the research. The obtained results will serve as a foundation for developing various extended studies to enhance service quality and provide decision support for customers in the tourism industry.

6. CONCLUSION

Analyzing customer sentiments on online platforms effectively evaluates service quality and the customer experience in the hotel industry. Reviews and feedback significantly impact customers' decisions when selecting a hotel. Building predictive models and scoring based on mining customer opinions about services and experiences can help hotel managers anticipate and improve quality before receiving customer feedback, thereby enhancing customer satisfaction and attracting more guests. It also provides valuable information for choosing a suitable hotel based on individual preferences. Additionally, the ranking results serve as a motivation for hotels to improve and increase competitiveness. This research also contributes to developing theories on service quality assessment, sentiment analysis, and customer experience management in the hotel industry.

7. APPENDIX

Appendix A. Model comparison result.

Appendix B. Pairwise comparison matrix.

Appendix C. Weight of each criteria.

Appendix D. Consistency Ratio table.

Appendix E. Consistency Ratio table.

Appendix F. Workflow

Appendix G. Data description

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THE MORAL MECHANISM TO PURCHASE COUNTERFEIT FOREIGN LUXURY FASHION GOODS: A STUDY IN VIETNAM

Academic advisor: MSc. Nguyen Le Khanh¹

Students: Tran Thi Them, Ha Thi Kieu Loan, Chau Ngoc An Tam, Nguyen Thanh Trung

ABSTRACT: Ethical issues have been included in many studies to evaluate consumers' unethical acts and discussed in many documents that are closely related to purchase behavior. This study aims to understand the attitudes of Vietnamese consumers for counterfeit foreign luxury goods based on the theory of planned behavior (TPB) proposed by Ajzen and Fishbein. We survey the role of personal morality and moral reasoning strategies that impacts the attitude towards counterfeit foreign luxury goods, thereby affecting the purchase intention. A survey was conducted with 300 individuals in Vietnam. Research's findings show that personal morality factors (such as Integrity, Moral Judgment, Religion, Ethical Concerns) negatively affect the attitude towards counterfeit foreign goods while moral reasoning strategies (such as Moral Rationalization, Moral Decoupling) positively affect the attitudes toward counterfeit foreign goods, with that, attitude has a positive effect on customer's purchase intention.

Keywords: Theory of planned behaviour, Consumer ethics, Consumer decision making, Theory of ethical values, Counterfeits.

1. INTRODUCTION

1.1. Research rationale

Counterfeit luxury products refer to items that are either identical or almost identical to genuine products and brands. From a financial perspective, counterfeit goods are a major source of competition with original brands on a global scale. Counterfeiting remains a major concern for global trade in many countries, and they also have an adverse effect on premium products (Ting et al. 2016). In order to integrate into the global economy, the Vietnamese government has promulgated the Law on Intellectual Property (effective from June 2006), but the implementation takes a long time. The strictness and the penalties are not enough to deter the problem of counterfeit goods and infringement of intellectual property rights in Vietnam is still high. This causes the reputation of the Vietnamese market to decline, and at the same time, many Vietnamese businesses have to face lawsuits for infringement of intellectual property of customers and international organizations. Counterfeits negatively affect the genuine industries by reducing the sales and damaging the image of authentic products. Vietnam is an emerging market with a large market size, counterfeiting is currently an urgent problem for the Vietnamese government and businesses. However, buying counterfeit luxury goods allows consumers to benefit from the attributes of these goods at a low cost such as high social status, noble image, prestige. This is easily explained by the fact that the majority of luxury brands popular in Vietnam originated from foreign countries with famous fashion images (Hermes, Louis Vuitton – France, Rolex, Burberry – the US, Gucci – Italy, ...). In Vietnam, counterfeit luxury goods appear more and more and have a dizzying growth rate.

Ethical considerations are one of the factors that influence consumer purchasing behavior. Many previous ethics studies have found that ethics has a negative impact on attitudes and intentions to purchase counterfeit goods (Chen, Teng et al. 2018, Jiang, Miao et al. 2019, Shan, Jiang et al. 2022). Purchasing counterfeit goods represents an ethical quandary that can elicit certain moral emotions, such as guilt, and thus may discourage the intention to engage in this unethical behavior. In other words, when consumers believe that the behavior is morally wrong, they are less likely to purchase counterfeit goods. (Tan 2002, Penz and Stottinger 2005).

¹ University of Economics – The University of Danang

Previous studies have demonstrated that the theory of rational action (TRA) and the theory of planned behavior (TPB) are deeply related to consumers' attitudes and intentions towards counterfeiting of luxury brands (Wang, Zhang et al. 2005, Zaman, Jalees et al. 2018). Previously, both of these theories have been used to understand the psychological dynamics that influence the behavior and intention of buyers to prefer counterfeit luxury goods (Celuch, Taylor et al. 2004, Arli and Pekerti 2017). There has been no investigation of the influence of moral considerations on Vietnamese customers' decisions to buy counterfeit luxury brands. Therefore, this study will also use them to support the development of a conceptual framework, including personal morality (such as Integrity, Moral Judgment, Religion, Ethical Concerns) and moral reasoning strategies (such as Moral Rationalization, Moral Decoupling) to study their effects on buying attitudes and behavior for counterfeit goods. The current study aims to predict the effects of ethical variables and moral reasoning techniques on consumers' views toward buying counterfeit goods. These findings may help lawmakers and specialists devise more effective methods for combating counterfeiting in Vietnam.

1.2. Research objectives

The main purpose of this study is to identify moral factors that affect the attitudes of customers, thereby affecting the intention of buying counterfeit foreign luxury fashion goods based on the Theory of planned behavior (TPB).

1.3. Research method

The collected data is analyzed with the partial least squares structural equation modeling (PLS-SEM).

2. LITERATURE REVIEW AND THEORETICAL BACKGROUND

2.1. Theory of planned behavior (TPB)

The theory of planned behavior (TPB) is a development of Ajzen and Fishbein's (1975) TRA, which is offered for the understanding and forecasting of particular behaviors in specified settings (Ajzen, 1991). In light of TRA's restrictions, perceived behavior control (PCB) was added in TPB. The attitude (A), behavioral intention (BI), and actual behavior are all directly related to this perceived behavioral control (PCB). According to the TPB, a person's actual behavior is influenced by their behavioral purpose and is also governed by their attitude, subjective standards, and perceived behavioral controls towards engaging in the behavior. An individual's negative or positive evaluation of the behavior is referred to as their attitude toward the behavior. The intensity of the behavior and convictions on the expected outcome have a distinct influence on a positive or negative attitude.

2.2. Overview of the research

2.2.1. Overview of abroad research

Counterfeiting is an old phenomenon (Veloutsou and Bian, 2008), however, the amount of counterfeiting has increased and is influencing marketplaces all over the world that occurs both in developed and developing countries (Saeed & Paracha, 2019). Counterfeits are in high demand due to their lower prices when compared to authentic products. For consumers who do not have enough financial means to purchase the higher priced genuine products, counterfeits can be used as substitutes. Current research proposes that people prefer to purchase famous and national brands to boost their social standing, regardless of whether they are genuine goods (Husic and Cicic, 2009). People appreciate image or status more than the item itself, which implies that an expensive item should be exclusive as well as be perceived and appreciated by others (Husic and Cicic, 2009). A number of studies have been conducted to understand purchase behaviour of

counterfeit products in various nations. In Singapore, Weisheng Chiu Ho Keat Leng, (2016) found that TPB can be used to explain the intention to purchase counterfeit goods. Iyus Wiadia et al. (2022) studied counterfeit purchase intentions of fashion brands in Indonesia in social aspects. In Bangladesh, Mohammad Osman Gani et al. (2019) examined the factors behind the purchase intention for counterfeit luxury goods in Bangladesh using TPB. In the USA, Wilcox et al. (2009) studied social motivations for buying counterfeits, Walthers and Buff (2008) compared counterfeit purchase behaviour across a decade and Kim and Karpova (2010) analysed consumer motivations based TPB.

2.2.2. Overview of national research

Nowadays, Vietnam is integrating into the global economy so violating intellectual property is not allowed by the prohibition in international law and affects the Vietnamese’s reputation. Additionally, Viet Nam is considered one of Southeast Asia’s quickest expanding consumer markets. Like many other emerging markets, there has been an increasing number of luxury brands appearing in Vietnam. Being a geographical close to China, which is considered a homeland of counterfeiting in many ways, it is not difficult for counterfeit products to be imported to Vietnam and distributed under perceived authentic brand names. Therefore, it is meaningful to analyze the purchase behavior of counterfeit luxury goods in the context of Vietnam, where the research topic still seems to receive very little attention. According to our knowledge, there are some studies that have been conducted to understand factors that affect consumers to purchase counterfeit goods which is shown in Table 1.

Table 1. National researches of moral factors on purchase behaviour of counterfeit products

Study	Personal morality				Moral reasoning strategies		Theory	Method
	INT	MRJ	RE	EC	MRR	MRD		
MN Ha et al. (2015)	X						TPB	Survey
NT Ngan et al. (2019)	X						TPB	Survey

In general, most of the past studies in Viet Nam as well as national have considered social and personal factors in relation to counterfeit product purchase intention. To date, none of the past studies abroad have attempted to investigate how all six factors work on attitudes toward purchasing counterfeit fashion goods. Considering this gap, the purpose of this paper is to investigate the direct as well as indirect effect of moral mechanisms on consumers’ attitudes toward counterfeit product purchases in the Vietnamese market.

2.3. Conceptual model and hypotheses development

2.3.1. Conceptual model

The TPB (Ajzen, 1991) is used as a hypothetical structure in this research paper to clarify the purchasing process of counterfeit luxury goods. Intention and attitude have a strong relationship that can be used to predict behavior (Ajzen and Fishbein, 1980). The impact of the moral mechanism of fundamental standards such as personal morality (integrity, moral judgment, religiosity, ethical concern) and moral reasoning strategies (moral rationalization, moral decoupling) will influence the feeling in the context of immoral actions (Jiang, Miao et al. 2019; Jiang, Xiao et al. 2018; Chen, Teng et al. 2018). By dividing moral mechanisms into two categories, namely personal morality and moral reasoning strategies, we have the following conceptual framework:

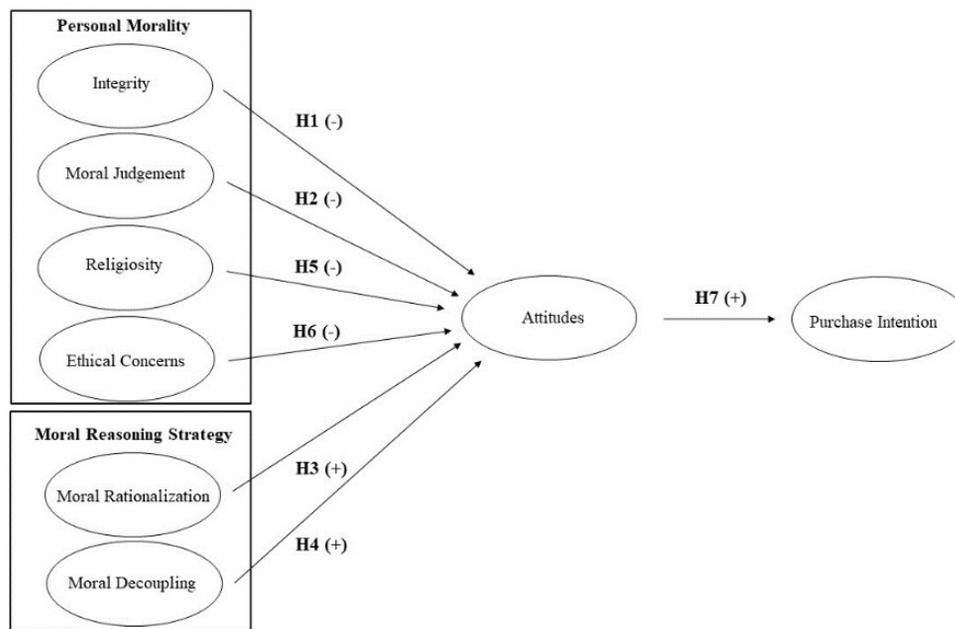


Figure 1. Theoretical model of moral mechanism to purchase counterfeit luxury brands

2.3.2. Hypotheses development

a) Integrity:

According to Abdullah and Yu (2019), integrity is defined as the capacity of an individual to uphold their moral independence and authenticity while still feeling a sense of belonging to their team or organization. Integrity appears the degree of customers' ethical criterions in accordance with the law. Integrity has other virtues, such as honesty, loyalty, responsibility, etiquette, and self-esteem. Consumers would be considerably less likely to perceive counterfeit luxury brands favorably if they viewed integrity as being vital (Wang et al., 2005). Purchasers who believed politeness, responsibility, and honesty were essential have a negative attitude toward counterfeit products (Jiang, Miao et al. 2019). Mayasari, Chris Haryanto et al. (2020) confirmed that integrity has a negative influence on consumer attitude toward counterfeit luxury brands. The following hypothesis can be put forth:

H1. Integrity has a negative influence on consumer attitudes toward counterfeit foreign luxury products for Vietnamese consumers.

b) Moral Judgement

Theories of ethical and moral judgement, for instance, a theory proposed by Hunt and Vitell (Hunt and Vitell 1986), is defined as an evaluation of an ethical issue based on an individual's ethical or moral beliefs or an individual's "prescriptive assessment of what is right or wrong". It involves evaluating which courses of action to a moral problem are morally justified (Lincoln and Holmes 2011). Moral judgment has been found to influence moral behavior (Schwartz-Mette and Shen-Miller 2018), which indicates that it influences attitude (Ellis and Griffith 2000). Customers want to thrill others, which is unethical, therefore they purchase counterfeit goods. The more individuals understand this, the more they would suffer embarrassment and adverse effects on their sense of themselves if this was discovered. Additionally, consumers who possess strong ethical predispositions themselves are less susceptible to criticism from others (Penz and Stottinger 2005). Moral judgment over the purchase of counterfeit luxury items was thought to have a detrimental influence on attitudes toward counterfeit luxury products (Jiang, Miao et al. 2019). Therefore, we predict that:

H2: Moral judgment has a negative influence on consumer attitudes toward counterfeit foreign luxury products for Vietnamese consumers.

c) Moral Rationalization

Moral rationalization is defined as the cognitive process that people employ to reassemble unethical acts into less immoral ones. (Aquino, Reed II et al. 2007, Bhattacharjee, Berman et al. 2013). Thus, utilizing a moral rationalization technique when faced with a moral choice to defend a possibly immoral action enables a person to disregard morality while yet appearing to be moral (Tsang 2002). By engaging in moral rationalization, customers frequently downplay the perpetrator's responsibility for harm, downplay or misrepresent the harms they themselves have created, or place blame on third parties. (Bhattacharjee, Berman et al. 2013). Moral rationalization allows people to convince themselves that their choice to acquire counterfeit goods is still in accordance with their moral standards and lowers their unfavorable attitude toward counterfeit goods (Chen, Teng et al. 2018). Therefore, we predict that:

H3: Moral rationalization has a positive influence on consumer attitudes toward counterfeit foreign luxury products for Vietnamese consumers.

d) Moral Decoupling

Bhattacharjee and colleagues (2013) developed and confirmed moral decoupling, a separate moral disengagement process distinct from moral rationalization. When people use this strategy, they focus on social benefits (e.g., image, use of status, etc.) as well as economic benefits (e.g., visual fashion content, physical appearance, performance, scarcity, etc). When facing a moral dilemma, an individual can employ the moral decoupling strategy so as to not be involved in improper behavior. Moral decoupling impacts consumer behavior through processing-evoked positive emotion, which, in turn, positively influences on attitude and intention to buy counterfeits, thereby highlighting ease and pleasantness as key advantages of decoupling over rationalizing (Orth et al. 2019). Therefore, we predict that:

H4: Moral decoupling has a positive influence on consumer attitudes toward counterfeit foreign

e) Religiosity:

The definition of religiosity is “the degree of a person's commitment to his religion” (Madni, Hamid, & Rashid, 2016). Religiosity level (high religiosity versus low religiosity) is a significant factor in explaining the attitude toward purchase intention (Ustaahmetolu, Finance et al. 2020). Religious people have positive attitudes that have a positive impact on their love, respect, appreciation, and fear of God, society, and the law, so they are prevented from engaging in unethical behavior. They are prevented from engaging in unethical behavior by these attitudes, including lying, cheating, and/or promoting, purchasing, and/or using illegal goods and/or services (Quoquab, Pahlevan et al. 2017). Sharma, Singh et al. (2022) confirmed that religiosity is associated with customer toward counterfeits in a negative way. Therefore, we propose the following hypothesis:

H5: Religiosity has a negative influence on consumer attitudes toward counterfeit luxury goods for Vietnamese consumers.

f) Ethical concern:

Ethics can be defined as principles, moral rules, or standards that guide a group or individual's behavior in the purchase, selection, selling, and use of services or products (Quoquab, Pahlevan et al., 2017). Ethical concern refers to an individual's perception of the morality and/or lawfulness associated with their own behavior (Jiang et al., 2019). By identifying the ethical basis of an action, moral concern

on a person's part helps to reduce immoral behavior. A guy has respect for himself, and it may be assumed that it is a permanent idea. (Schwartz, 2001). According to Quoquab, Pahlevan, et al. (2017), ethical people are more driven to act morally upright in all facets of their lives, including their commitment to their communities, their satisfaction, and their avoidance of unethical goods and services like counterfeit goods, illegal substances, alcohol, nightclubs, and so on. Previous study (Jiang, Miao et al. 2019) found that Ethical concerns have a negative connection with the attitude towards counterfeits of consumers. Therefore, we propose the following hypothesis:

H6: Ethical concern inversely influences consumers' attitudes towards foreign counterfeit luxury products for Vietnamese consumers.

g) Attitude and purchase intention:

The attitude, one of the predictors of purchase intention, refers to how one feels about a behavior, including whether they feel positively or negatively about it, as well as the results of that behavior, according to the theory of planned behavior by Ajzen (1991). This is relevant to the TPB theory because purchase intention is one of the key drivers of purchase behavior, and attitudes are a key driver of purchase intention (Harun, Mahmud et al., 2020; Phau et al., 2009). Consumer attitudes toward counterfeit luxury goods were determined to have a positive association with consumer purchase intentions for counterfeit luxury goods (Jiang, Miao et al. 2019). Therefore, we propose the following hypothesis:

H7. Positive attitudes towards counterfeit luxury products for Vietnamese consumers positively influence their attitudes towards the purchase intention of counterfeit luxury products.

3. METHODOLOGY

3.1. Sample and data collection

In the case of counterfeit luxury brands and consumers' attitude towards them, quantitative methods can be used to acquire certain findings. Information was collected by a convenience sample using online survey questionnaires. The distributed survey was accessible in Vietnamese and in English. Subsequently, participants volunteered by filling out questionnaires in person. No financial or other incentives were offered for completing it.

A total of 300 finished survey form participants reported that at least once in their lives they had bought a product that was a counterfeit. Therefore, we have taken this as the concluding sample size estimate for this research. The hypotheses are tested using partial least squares structural equation modeling (PLS-SEM).

3.2. Research framework

The framework utilized for the investigation of this research encompasses the following six independent variables: Integrity (INT), Moral judgment (MJ), Moral rationalization (MR), Moral decoupling (MD), Ethical concern (EC) and Religiosity (RE). The framework also includes one mediating variable, consumer attitudes towards counterfeit luxury goods (ATC); and it finally contains one variable that is dependent, purchase intention (PI). As mentioned earlier, the framework utilized is the TRA and its extension the TPB.

3.3. Survey instrument

The questionnaire was adopted from previous studies (Jiang, Miao et al. 2019); Chen, Teng et al. 2018; Jiang, Xiao et al. 2018) in which English is used. However, the questionnaire used in this study was translated into Vietnamese to ensure the understanding of the respondents towards the questions. All questions were graded on a seven-point Likert scale, with one representing "strongly disagree" and seven representing "strongly agree".

3.4. Profile of respondents

This study used consumers with a variety of ages from under 18 years old to over 50 years old, living in Vietnam. Those chosen were required to already know the counterfeit brands. The study collected the data through an online survey. Around 300 responses were included in this study. The data showed that the number of male respondents was 50.3% or 151 while the number of female respondents was 49.7% or 149. The respondents' ages were skewed toward consumers with 47% of the respondents being between the ages of 19 to 29. Related to their education levels, most of the respondents in this sample (64 percent or 192) had education up to college; 25.3 % have a high school's degree.

4. RESULTS

4.1. Description and reliability of initial constructs

Following the preliminary analysis, descriptive normality tests were performed to determine internal consistency and univariate normality. Fahrmeir and Tutz's 2013 research found that skewness and kurtosis levels were between ± 2.5 . As a result, the constructions are univariately normal. In additional, Cronbach's alpha values are at least 0.76 for all constructions, confirming the internal consistency of the adapted constructs. (John and Benet-Martínez, 2000).

4.2. Evaluation of measurement model

4.2.1. Internal consistency reliability

Firstly, composite reliability (CR) was examined for internal consistency reliability of the latent construct. The recommendation for the Internal consistency reliability, conducted by Bootstrap, is above 0.7 in confirmatory studies. It can be seen from Table 2, the CR value for each of eight constructs INT, MRR, MRJ, MRD, EC, RE, ATC and PI ranged from 0.863 to 0.964 that were higher than the recommended value 0.7 (Henseler et al., 2009). As a result, it could be believed that all eight constructs were well measured by their assigned items.

Table 2. Result of Descriptive Analysis

Measures	Mean	Standard deviation	Skewness	Kurtosis	Reliability (α)
INT	4.26	1.73	-0.08	-1.46	0.93
MRJ	4.07	1.90	-0.12	-1.85	0.95
MRR	4.38	1.49	-0.22	-1.62	0.94
MRD	4.12	1.33	0.16	-0.83	0.76
RE	4.14	1.67	-0.09	-1.57	0.94
EC	4.36	1.55	-0.25	-1.28	0.92
ATC	4.03	1.62	0.01	-1.56	0.93
PI	4.12	1.62	-0.08	-1.44	0.92

4.2.2. Convergent validity

Hair et al. (2016) confirm that the outer loading coefficient needs to be greater than or equal to 0.7 for the observed variable to be quality. The results show that there are no variables excluded from further analysis due to their high loadings (> 0.7). The recommended threshold value of AVE should be greater than 0.5 (Hair et al., 2017). The results show that all the AVE of each factor are above 0.5. Therefore, the adapted constructs meet the requirements of convergent validity (Shammout, 2007).

Table 3. Result of Reliability Analysis

Measures	Composite Reliability	Average Variance Extracted (AVE)
Integrity	0.948	0.822
Moral Judgement	0.964	0.871
Moral Rationalization	0.950	0.733
Moral Decoupling	0.863	0.677
Religiosity	0.954	0.839
Ethical Concern	0.943	0.805
Attitudes	0.944	0.771
Purchase Intention	0.941	0.798

4.2.3. Discriminant validity

Discriminant validity was examined using the Fornell-Larcker criterion (Hair et al., 2017). As shown in Table 3, AVE's square root on the diagonal for any construct is greater than the correlations of all the corresponding constructs, indicating that the condition of discriminant validity has been met. (Fornell and Larcker, 1981).

Table 4. Result of Discriminant Validity

	ATC	EC	INT	MRD	MRJ	MRR	PI	RE
ATC	0.878							
EC	-0.679	0.897						
INT	-0.838	0.630	0.906					
MRD	0.453	-0.317	-0.361	0.823				
MRJ	-0.875	0.627	0.840	-0.359	0.934			
MRR	0.647	-0.481	-0.553	0.434	-0.558	0.856		
PI	0.444	-0.343	-0.412	0.249	-0.420	0.395	0.894	
RE	-0.775	0.546	0.669	-0.413	0.745	-0.486	-0.334	0.916

4.3. Evaluation of structural model

4.3.1. Multicollinearity assessment

Firstly, the assessment of Multicollinearity for structural models is necessary (Hair et al., 2014). Table 4 shows that, all variance inflation factor (VIF) values in this research are below the cutoff value of 5 (from 1.000 to 4.443). Therefore, multicollinearity among the predictor constructs was not present in the structural model.

4.3.2. Evaluation of path relationships

Regression coefficients (β) were used to examine each path relationship. The evaluation of β values is based on t-value, with a recommended value is greater than 1.65 (Hair et al., 2014). Table 4 summarizes results of path coefficients, the corresponding t-values, significant levels and p-values

Table 5. Evaluation of impact relationships

	Path coefficient	STDEV	T statistic	P values	VIF
ATC PI	0.444	0.049	9.024	0.000	1.000
EC ATC	-0.111	0.032	3.490	0.000	1.829
INT ATC	-0.231	0.040	5.823	0.000	3.708
MRD ATC	0.062	0.024	2.575	0.010	1.324
MRJ ATC	-0.366	0.046	8.083	0.000	4.443
MRR ATC	0.140	0.028	5.003	0.000	1.676
RE ATC	-0.194	0.038	5.172	0.000	2.427

The f-square coefficient shows how strong or weak the influence of the independent variable on dependent variable. The result indicates that the impact of ATC on PI is strongest (f-square = 0.245) and MRD on ATC is weakest (f-square = 0.022). Additionally, the predictive relevance (Q2) and q2 effect size measures are also used to assess the model’s quality (Hair et al., 2017). Although all endogenous variables have small predictive relevance, they are still greater than zero (Hair et al., 2014). Overall, the proposed model achieved the predictive capability.

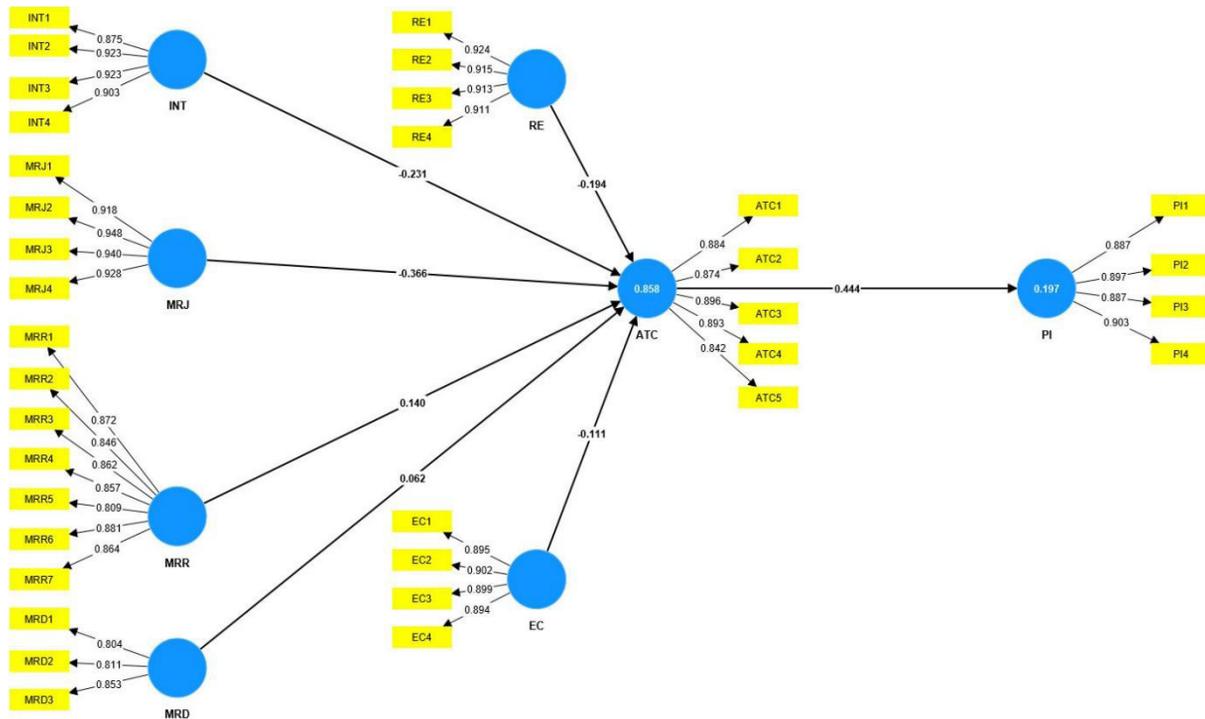


Figure 2. The structural mode

In addition, Figure 2 presents the analytical results of the structural model that shows all seven hypotheses were accepted. **H1** on the negative influence of integrity on attitude towards counterfeit luxury products is accepted (= -0.23, p < 0.05). **H2** on the negative influence of moral judgment on attitude towards counterfeit luxury products is accepted (= -0.37, p < 0.05). **H3** on the positive influence of moral rationalization on attitude towards counterfeit luxury products is accepted (= 0.14, p < 0.05). **H4** on the positive influence of moral decoupling on attitude towards counterfeit luxury products is accepted (= 0.06, p < 0.05). **H5** on the negative influence of religiosity on attitude towards counterfeit luxury is accepted

(= -0.19, $p < 0.05$). **H6** on the negative influence of ethical concern attitude towards counterfeit luxury products is accepted (= -0.11, $p < 0.05$). **H7** on the positive influence of attitude on purchase intention towards counterfeit luxury products is accepted (= 0.44, $p < 0.05$).

5. IMPLICATIONS AND CONCLUSION

5.1. Implications

Theoretically, this study has developed relatively new linkages, that is the effect of six factors, including integrity, moral judgement, moral rationalization, moral decoupling, religiosity, and ethical concern on consumer attitude to purchase counterfeit products. Moreover, the study is relatively new, that has been conducted to examine the impact of consumer attitude as a mediator between ethical aspects and the intention to purchase counterfeit products. The study is also particularly noteworthy because it adds to the Theory of Planned Behavior (TPB) by including ethical beliefs as a precursor to consumer attitudes. Previous studies have primarily focused on three types of beliefs - normative, behavioral, and control - with less attention paid to ethical beliefs. Therefore, this study's contribution to incorporating ethical beliefs as an essential component of the TPB is a significant step forward in comprehending how consumers make decisions regarding these types of goods.

Practically, this research has examined the direct and indirect connections within the Vietnamese counterfeit market. The findings of this investigation may benefit luxury goods manufacturers and governmental bodies by emphasizing the significance of moral factor in the Vietnamese culture as a means of altering consumer attitudes. By highlighting the potential violations of morality, luxury brand owners can combat counterfeiting in regions with underdeveloped administrative or enforcement systems. It is also strongly recommended that the government, legislators, and decision-makers in Vietnam incorporate ethical values, beliefs, and behavior into the education system at all levels to promote better conduct among current and future generations and enhance the quality of life in Vietnam. Furthermore, both private and public organizations can arrange conferences, seminars, and public talks to address this issue and devise strategies to control and minimize its impact.

5.2. Conclusion

The issue of counterfeit goods is increasingly stinging in society today, along with their negative effects on commerce and the economy, leading to increasing more research to consider the impact factors to attitudes and intentions to buy counterfeit goods in many different countries. Nowadays, Vietnam is more and more integrated with the world and begins to develop into a big economy, therefore, policies on controlling counterfeit goods and intellectual property rights need to be increasingly tightened. However, counterfeit goods are still a social problem that are stinging because of their profound influence on the lives of Vietnamese people. The habit of shopping, spending and overlooking the effects of counterfeit goods in the awareness of the people has made the reduction of the number of fake goods in the market still need a long way. This means that policymakers and corporate administrators need to solve the problem of consumers' denial attitude towards counterfeit luxury goods to be able to change their purchase behavior. The findings demonstrated that the research model was appropriate for the market data kit. The findings of the research show that: Integrity, Moral Judgment, Religion, and Ethical Concerns positively affect attitudes, whereas Moral Rationalization and Moral Decoupling negatively affect attitudes. PLS-SEM structure analysis also reveals a positive relationship between consumer attitudes and purchase intentions.

5.3. Limitations and future direction

The majority of participants in the study were young consumers, with 56% being under 29 years old, and had low incomes, with 52.3% earning less than 5 million VND per month. The study mainly focused

on four cities, including Quang Nam, Da Nang, Hue, and Ho Chi Minh City. Future studies can collect data from various age groups, incomes and cities. The present study did not consider the previous consumption of counterfeit products by participants, which may affect their attitudes and intentions towards counterfeit products. Future research should examine this factor and investigate whether it changes the relationships explored in this study. Additionally, to gain a more comprehensive understanding of consumer motivations for buying counterfeit luxury products in different countries, more cross-cultural studies are needed to provide new insights to the field (Tunçel 2022).

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BEYOND ENTERTAINMENT: THE POWER OF HISTORICAL MOVIES IN SHAPING BEHAVIORAL INTENTIONS OF VIETNAMESE CULTURAL AUDIENCES

Academic advisor: Dr. Truong Thi Van Anh¹

Students: Bui Thanh Thao, Dang Thi Quynh Truc, Le Nguyen Tuyet Nhi

ABSTRACT: *Historical movies can bring diverse benefits to a place represented in the movie, such as increasing place attachment and encouraging behavioral intention. However, there are very few studies that have explored the antecedents of cultural audiences' behavioral intention which plays a crucial role in promoting a place, and a historical movie was filmed at that place. To fill this gap, this study evaluates the relationships among movie identity coherency, movie engagement, place attachment, and behavioral intention in the context of Vietnamese historical movies to provide filmmakers useful information for developing the film industry in Vietnam. We gathered information from 300 cultural audiences who have watched historical movies or have previous knowledge about historical movies in general, Vietnamese historical movies in particular. The results show the positive impacts of movie identity coherency and place attachment on behavioral intentions. To develop Vietnam's film industry in the modern era, filmmakers are advised to pay close attention to research results on movie engagement, place attachment and behavioral intentions in the development of their plans.*

Keywords: *Movie identity coherency, Movie engagement, Place attachment, Behavioral intention.*

1. INTRODUCTION

1.1. Research Setting

Vietnamese indifference towards their history is a concern, as evident from students' misconceptions and poor performance in history exams. The younger generation shows more interest in the history of other nations, indicating a disinterest in learning Vietnamese history conventionally. To foster national identity and development, a new approach is needed. Cinema has been an effective channel in transmitting history globally. However, Vietnam's movie industry faces challenges and struggles to gain international recognition, especially in the genre of historical films. Limited quantity and quality, emphasis on propaganda, and lack of audience engagement hinder the success of Vietnamese historical films. A bolder approach is required to make historical films appealing and spiritually enriching for Vietnamese audiences, preventing them from solely consuming foreign historical films.

1.2. Research Motivation

Vietnamese historical movies promote patriotism and cultural appreciation by showcasing significant events and heroic figures, evoking national pride among audiences.

1.3. Research Scope

Our research examines the behavioral intentions of consumers after watching Vietnamese historical movies and identifies influencing factors. We focus on movies from the 60s to the present. The survey involves individuals with experience in Vietnamese historical films to ensure informed responses.

1.4. Research Objectives

We aim to explore the influence of historical movies on society, particularly in shaping perceptions of history and creating immersive visual experiences. Our study focuses on the identity of historical movies and their impact on the behavioral intentions of cultural consumers towards Vietnamese cultural products. The following research questions guide our investigation:

¹ University of Economics - The University of Danang

- 1) What are the audience’s behavioral intentions after watching historical films?
- 2) What are the key antecedents that influence the behavioral intentions of cultural consumers toward historical movies?
- 3) What is the extent to which important factors influence the behavioral orientation of cultural consumers?

1.5. Research Structure

Our research study consists of six chapters presented in order: Chapter 1: Introduction, Chapter 2: Literature Review, Chapter 3: Research Framework, Chapter 4: Methodology, Chapter 5: Results, Chapter 6: Discussion and Conclusion.

2. LITERATURE REVIEW

2.1. Cultural product

Cultural products are the distinctive collection of goods and values, ranging from manufactured goods that enable consumers to create distinctive forms of individuality, self-affirmation and social display (such as fashion clothing or jewelry) to entertainment and information (such as motion pictures, recorded music, print media, or museums) (Scott, 2004). The movie depicts cultural themes through the language, gestures, and actions of characters as well as by understated, or dazzling lyrical settings (Sankowski, 1999).

2.2. Historical movies

The movies to be expelled from the historical movie genre will be those that do not help audiences comprehend the past (Weinstein, 2014). Rosenstone and Parvulescu (2013) believe that historical movies can be used as retellings of events that happened before the year in which the movie was produced. These events will be emotionally enhanced and conveyed to the viewer through “plots”, which can be fictional (Burgoyne, 2008). The historical movie genre itself has a wide variety of subgenres. In this research, we opt for five among them based on their familiarity with Vietnamese audiences and their accessibility.

Table 1. Definition and examples of five historical movie’s subgenres

Historical movie’s subgenres	Definition	Vietnamese movies
Biographical movies	These movies focus on the life and achievements of a historical figure, such as a famous politician, artist, or inventor.	Em va Trinh (2022), Long Thanh Cam Gia Ca (2010)
Historical epic movies	These movies typically cover a broad span of history and follow the journeys of multiple characters. They often feature large-scale battle scenes and elaborate sets and costumes.	Dem hoi Long Tri (1989), Dat nuoc dung len (1995)
Costume drama movies	These movies are set in a particular historical period and focus on the daily lives and customs of the people who lived during that time. They often feature elaborate costumes and settings.	Xich lo (1995), Bao gio cho den thang Muoi (1984), Ao lua Ha Dong (2006), So Do (1990), Co Ba Sai Gon (2017)
War movies	These movies focus on military conflicts and the people involved in them. They often depict the brutality of war and its impact on soldiers and civilians.	Noi gio (1966), Canh dong hoang (1979), Em be Ha Noi (1974), Mui co chay (2012)
Historical fiction movies	These movies are based on historical events but take some creative liberties with the facts to tell a compelling story	Thien menh anh hung (2012), Khat vong Thang Long (2010)

2.3. Movie identity coherency

Movie identity coherency is the conjugation of elements that have enough influence to create the identity of a movie, making it simpler for a movie to stick in viewers’ minds. Elements of movie identity coherency are characters, production house, setting, plot, mise-en-scene, etc.

2.4. Movie engagement

“Consumer engagement” is described as a multidimensional concept that includes cognitive, emotional, and behavioral dimensions (Brodie et al., 2013). We can understand that “movie engagement” is the intensity consumers/ cultural audiences show their physical, mental and behavioral dedication to movies throughout the interaction and motivation-stimulated process.

2.5. Place attachment

Proshansky et al. (1983) give the meaning of place attachment as the attachment in which affects and emotions, knowledge and beliefs, behavior and actions are intertwined. Place dependence and place identity were utilized as two measuring constructs in the study of place attachment and feeling of place (Moore and Graefe, 1994). People develop “place dependence” when they clearly sense the value/performance of a specific place in comparison with comparable ones based on physical and functional facets (Chen et al., 2021). Rapoport (1977) indicates that a “place identity” is determined by the emotional and physical ties that are forged between someone and the place. Owing to the place-person interaction in place attachment, it not merely impacts effectively on place identity but also people identity or group identity (Relph, 1976).

2.6. Behavioral intentions

Theoretical and empirical studies have consistently shown the positive influence of movie in motivating viewers to travel to the locations featured in the movie (Beeton, 2005; Hudson and Ritchie, 2016; Riley and Van Doren, 1992). However, many other worthwhile behavioral intentions should also be taken into account for the high value that cultural goods offer. For example, after the movie Squid Game (directed by Hwang Dong Hyuk, 2021), many foreigners are rushing to learn Korean due to their specific interest in drama (Binghamton University, 2023), try out Korean food and beverage like dalgona sugar candy, ramyeon noodles, soju.

3. RESEARCH FRAMEWORK

3.1. Proposed research framework

Based on the literature review, we propose the research model as shown in Figure 1.

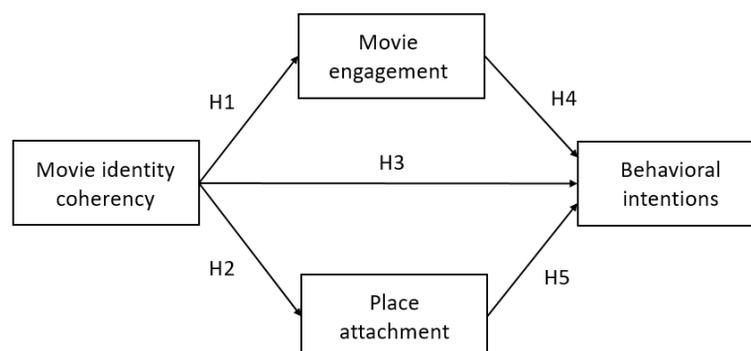


Figure 1. The proposed research model

Source: Proposed by the authors (adopted from Josiam et al. (2015))

3.2. Developing hypotheses

H1: Movie identity coherency will positively affect movie engagement.

Previous results show that due to easier comprehension, participants are able to more fully experience

a movie, give it a deeper meaning, perceive it to be more well-liked/successful, and form emotional bonds when they strongly identify themselves in movies. This supports earlier research showing that consumers are less likely to experience “category confusion” (Eric et al., 2013) when they perceive a movie’s identity to be coherent (Cooper-Martin, 1991).

H2: Movie identity coherency will positively affect place attachment.

It is clear that films with identity include types of places, specific elements to reinforce memories of places, identities, expectations. Those attitudes, values, thoughts, etc mentioned in place identity are triggered by movie identity coherency in the context of the movie.

H3: Movie identity coherency will positively affect behavioral intentions.

Due to their familiarity and fascination with the storyline and characters, which encourages them to thoroughly explore other related facets, consumers may think about movie-related behaviors related to purchases and follow the movie’s premise onto different platforms (e.g., TV serials, novels, and video games) after viewing a movie (Marshall, 2002).

H4: Movie engagement is positively related to behavioral intentions.

Individuals with a high degree of involvement in a movie are more likely to search for related information about the movie and the destinations where the movie is set. Audience involvement may be translated into positive feelings and attitudes towards the destination, thus engendering positive behavioral intentions, such as spreading favorable word-of-mouth and recommendations.

H5: There is a positive association between place attachment and behavioral intention.

According to Park et al. (2007), place attachment could help in attracting loyal consumers who are likely to recommend the establishment to others. According to earlier research (Buonincontri et al., 2017; Dai, 2017; Tsai, 2016), place attachment increases customers’ behavioral intentions positively. These intents include repurchasing, recommending, and spreading positive word of mouth.

4. METHODOLOGY

4.1. Research Design

We employed a mixed-method research approach in this study. The qualitative phase involved in-depth interviews to explore behavioral intention concepts and movie identity elements. The quantitative phase utilized a survey with questionnaires to collect data and test our research model and hypotheses.

4.2. Measures

The pool of items for the movie identity coherency concept included nine items derived from Kohli et al. (2020) and content analysis of in-depth interviews about the perception of cultural audiences in terms of movies (e.g., actor, plot, production house). Movie engagement was assessed using three items derived from Josiam et al. (2015). According to previous research by Ujang (2012) and Loureiro (2014), place attachment consists of six items, reflecting the attachment of viewers to the location in the movie. Behavioral intentions were measured with eleven items came from the research of Loureiro (2014), Teng (2020) and qualitative information. Finally, demographic questions regarding gender, age, education, marital status and personal monthly income were included in the questionnaire to better understand the respondents’ characteristics.

4.3. Sampling and Data collection

In the qualitative phase, we conducted face-to-face interviews with 15 respondents in March 2023 by snowball sampling, ensuring diverse perspectives on historical movies and cultures. Once the saturation

point was reached, we transitioned to the quantitative phase, collecting data through an online survey using non-probability convenience sampling methods. According to Hair et al (1998), in order to select an appropriate research sample size for Exploratory Factor Analysis (EFA), the minimum sample size is $N \geq 5 \cdot x$ (x: the total number of observed variables).

4.4. Data Analysis

We analyzed qualitative interview responses, coding and transforming them for meaningful insights. After filtering out invalid answers, we analyzed 300 questionnaires using descriptive and confirmatory factor analysis, as well as the bootstrapping method. IBM SPSS Statistics 20 and Smart PLS 4 Software were utilized for data analysis, assessing validity, reliability, and testing hypotheses.

5. RESULTS

5.1. Quantitative Results

We found new elements in film identity, including soundtracks, costumes, setting, and historical figures. Historical movies evoke stronger place attachment, leading to increased appreciation, memories, and emotional connections to featured locations. Viewers also engage in additional behaviors such as reading, purchasing cultural products, and discussing movies, strengthening their connection to the country.

5.2. Qualitative Results

5.2.1. Sample Profile

We collected 300 valid responses in April 2023 through a Google Form survey. The survey had a higher participation rate from female respondents, indicating their greater interest in watching movies compared to men. The majority of respondents (56%) were in the age group of 15-23 years old, while 13.3% were in the 1970s age group (44-53 years old). The largest proportion of participants were students (44.7%) with Bachelor's degrees and unmarried (67.3%). Among the respondents, 51.7% had a monthly individual income below 5 million VND, while 22.3% had a monthly income between 5 and 10 million VND.

Table 4. Demographic characteristics of survey respondents

Variable	Frequency	Percentage	
Gender	Male	109	36.3
	Female	189	63.0
	Others	2	0.7
Age	15-23 years old	168	56.0
	24-33 years old	37	12.3
	34-43 years old	26	8.7
	44-53 years old	40	13.3
	Over 53 years old	29	9.7
Marital status	Married	98	32.7
	Unmarried	202	67.3
Level of education	High school/Below	24	8.0
	Associate Degree	32	10.7
	Bachelor's degree	224	74.7
	Master's/PhD	20	6.7

Monthly individual income	Under 5 million VND	155	51.7
	5-10 million VND	67	22.3
	10-15 million VND	41	13.7
	15-20 million VND	13	4.3
	Over 20 million VND	24	8.0
Occupation	Civil servant	16	5.3
	Manager/Staff	65	21.7
	Businessman/ Businesswoman	37	12.3
	Unskilled labor	2	0.7
	Free labor	16	5.3
	Student	134	44.7
	Homemaker	7	2.3
	Pensioner	19	6.3
	Unemployed	4	1.3

Playing CDs from record stores accounted for a minimal percentage (1.2%), while social network applications were the preferred choice for movie viewing (28.7%). Notably, 17.5% of respondents reported visiting websites to watch pirated movies, indicating their popularity. When asked about their preferences for historical movies, 38.3% expressed a liking for this genre. These findings suggest that a significant portion of the participants in our survey have a genuine interest in historical movies. However, nearly half of the respondents (43.4%) stated that they rarely watch historical films (refer to Table 5).

Table 5. Film-related characteristics of survey respondents

Variable	Frequency	Percentage	
Ways to watch movies	Cinema	115	16.6
	Television	135	19.5
	Social network apps	199	28.7
	Illicit movie website online	121	17.5
	Movie streaming apps	115	16.6
	Play CDs from record stores	8	1.2
Historical movie genre's favorite level	Extremely dislike	5	1.7
	Dislike	39	13.0
	Neutral	77	25.7
	Like	115	38.3
	Extremely like	54	21.3
Historical movie watching frequency	Never	46	15.3
	Rarely (1-2 times a year)	130	43.3
	Sometimes (1 time every few months)	79	26.3
	Often (every month)	39	13.0
	Usually (every week)	6	2.0

Reliability measurement

By examining the constructs' discriminant validity and the reliability of the individual measures, the appropriateness of the measurements was determined (Hulland, 1999). The Table 6 shows that most of the items in our study are above 0.7. Although a reliability level of 0.7 is more advised and is

more frequently utilized in the great majority of circumstances, we find items within this threshold still acceptable. Furthermore, to decide whether to delete that item or not, we combine evaluating additional metrics like CR (composite construct) and AVE (average variance extracted). Table 6 demonstrates that all of our constructs are trustworthy due to the composite reliability values being higher than 0.7. The scale is regarded as convergent if the AVE achieves a minimum of 0.5 (Höck and Ringle, 2010). Therefore, our scale is convergent (see Table 6).

Table 6. Results of confirmatory factor analysis

Constructs/Variables	Item loading	Mean	SD	Cronbach's alpha	CR	AVE
Movie identity coherency				0.880	0.903	0.511
Script is attractive	0.743	0.741	0.036			
Plot twist is included	0.660	0.659	0.036			
The production house is reliable	0.652	0.650	0.038			
The settings reflect correct historical period	0.722	0.720	0.037			
Technical aspects have high quality	0.765	0.764	0.031			
Costumes are suitable with a historical period	0.753	0.751	0.033			
Actors/ actresses have good acting skills	0.643	0.643	0.037			
Movie-inspired artwork has popularity	0.723	0.722	0.035			
Cultural features represented are in accordance with the historical period	0.756	0.755	0.027			
Movie engagement				0.773	0.866	0.682
I actively seek information and gossip about new Vietnamese historical movies before they release	0.854	0.793	0.201			
My friends and family ask me to recommend Vietnamese historical movies	0.803	0.752	0.218			
I am considered an Vietnamese historical movies buff or superfan among my family and friends	0.820	0.728	0.248			
Place attachment				0.871	0.903	0.609
I remember memories I have had in places appeared in the movie	0.709	0.707	0.036			
I feel a special connection with the people and scenery here whether I have been there or not	0.752	0.751	0.032			
I think there is no place that can compare with places appeared in the movie	0.794	0.794	0.025			
Places appeared in the movie bring me special feelings	0.737	0.737	0.029			
Places appeared in the movie can speak partly of my personality	0.828	0.828	0.023			
Places appeared in the movie can speak partly of my own origin and life-values	0.853	0.852	0.017			
Behavioral intentions				0.904	0.919	0.510
Looking for other historical movies to watch	0.704	0.707	0.035			

Looking for information of historical events and figures	0.676	0.675	0.034
Reading publications about historical events and figures	0.713	0.711	0.033
Researching cultural products appeared in the movie	0.752	0.750	0.030
Purchasing cultural products related to/ included in the movie	0.765	0.761	0.029
Recommending the movie for others	0.711	0.714	0.031
Gossiping about the movie	0.728	0.729	0.030
Visiting places appeared in the movie	0.700	0.699	0.033
Visiting museums and historical relics	0.674	0.675	0.036
Responding historical events	0.740	0.742	0.029
Choosing history as research or studying field	0.682	0.678	0.041

Kline (2016) and Clark and Watson (1995) employ a criterion of 0.85 to guarantee the discriminant validity. In order to test HTMT, we used bootstrapping with 95% confidence, and we discovered that our model’s discriminant validity was guaranteed when the values were all less than 0.85 (see Table 7).

Table 7. Results of discriminant validity

	Movie identity coherency	Movie engagement	Place attachment	Behavioral intentions
Movie identity coherency		0.145	0.601	
Movie engagement			0.101	
Place attachment				
Behavioral intentions	0.499	0.076	0.593	

5.2.2. Structural model test

Through non-parametric bootstrapping analysis, the structural path and coefficient R2 were utilized to assess the explanatory power of the model. The analysis showed that the dependent variable (behavioral intentions) had an R2 value of 0.322, indicating a weak endogenous structure (see Table 8).

Table 8. Results of structural model analysis

Constructs	R ²
Movie identity coherency	
Movie engagement	0.007
Place attachment	0.286
Behavioral intentions	0.322

5.2.3. Hypothesis test

To retrieve the standard estimate and t-value, a nonparametric bootstrapping method was used (Chin, 1998; Fornell and Larcker, 1981). In most studies, if the t-value is over 1.96 or below -1.96, the test is statistically significant with 95% confidence. Table 9 clearly shows that hypothesis 2, hypothesis 3 and hypothesis 5 of this research are supported.

Table 9. Results of Standard Deviation and T values

Hypothesis	STDEV	T statistics
H1 = Movie identity coherency -> Movie engagement	0.069	1.509
H2 = Movie identity coherency -> Place attachment	0.046	11.706
H3 = Movie identity coherency -> Behavioral intentions	0.083	3.023
H4 = Movie engagement -> Behavioral intentions	0.067	0.054
H5 = Place attachment -> Behavioral intentions	0.077	5.189

Using Cohen (1988)'s f Square index table, we attempted to determine the significance of the independent variables. According to Table 10, 2 of the f Square index values in this study are larger than 0.02 and below 0.15, which reflects a minor effect, 1 of them reaches 0.406, which represents substantial influence. P values are a further tool we employ to evaluate the test's significance when compared to a threshold of 0.05. Results show that three of the five tests are supported, mirroring the outcomes of the f Square analysis (see Table 10).

Table 10. Hypothesis test

Hypothesis	f Square	Original sample (O)	P values	Results
H1 = Movie identity coherency -> Movie engagement	0.011	0.104	0.166	Not Supported
H2 = Movie identity coherency -> Place attachment	0.406	0.542	0.000	Supported
H3 = Movie identity coherency -> Behavioral intentions	0.066	0.250	0.003	Supported
H4 = Movie engagement -> Behavioral intentions	0.000	0.001	0.897	Not Supported
H5 = Place attachment -> Behavioral intentions	0.168	0.402	0.000	Supported

6. DISCUSSION AND CONCLUSION

6.1. Discussion

This research supports the previous studies on the effect of movie identity coherency and place attachment on behavioral intentions. An interesting finding of the research is the relationship between movie identity coherency and place attachment, which has not been focused on by any studies before. Regarding the unsupported hypotheses, all are based on the variable "movie engagement". This result is due to the issues of Vietnam's market compared to other countries, including xenophilia, consumers' income, viewing habits, limited film-related facilities, prejudices on Vietnamese historical films and disinterest in history.

6.2. Implications

6.2.1. Theoretical Implications

Historical movie identity theory explores how movies shape audience perceptions and connections with history. It emphasizes the relationship between movie identity, place attachment, and behavioral intention. Understanding these theories helps to understand the impact of historical movies on intentions related to historical sites and cultural heritage.

6.2.2. Practical Implications

Successful historical films evoke audience memories, foster identity, and impact various sectors. The prevalence of pirated movies in Vietnam hinders cinema funding. To overcome this, increased investment, innovative communication, and socialization efforts are crucial. Government support and private investment create a dynamic partnership, driving industry growth and cultural preservation. The goal is societal well-being, with behavioral intentions positively influencing sectors and strengthening national identity.

6.3. Limitations and Future Research

Study limitations include a restricted online sample, limited variables, and challenges in calculating response rates. Future research should use larger and more diverse samples, explore additional variables, and consider alternative survey methods for more accurate data.

6.4. Conclusion

Historical films evoke emotions, spark curiosity, and deepen interest in history. They promote social engagement, cultural understanding, and shape informed and engaged societies. Showcasing their identity attracts audiences, addresses industry challenges, and promotes national identity. Historical films complement traditional learning methods and bridge the gap between academic knowledge and popular culture. They have a significant impact on society and the global reach of Vietnamese cinema.

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DIGITAL MARKETING: INFLUENCE ON THE BUYING BEHAVIOR OF GENERATION Z IN VIETNAM

Author: Nguyen Thi Dieu Linh, Vuong Thi Thu Ha, Nguyen My Huong¹

ABSTRACT: *The study deals with the concept of buying behavior of Gen Z concerning Digital marketing. The results of the research test indicate the factors that influence digital marketing on the buying behavior of Gen Z. To achieve the research objectives, the authors use qualitative research methods combined with quantitative research. In fact, research results provide insights about consumers, helping businesses as well as regulators to understand the impact of factors affecting attitudes, intentions, and behaviors. As a result, it is possible to plan more appropriate and effective programs and policies to encourage this consumption behavior among young people today.*

Keywords: *Digital Marketing, Gen Z.*

1. GENERAL INTRODUCTION

Apparently, mankind has experienced two industrial revolutions and most countries in the world are experiencing the third revolution. Meanwhile, some developed countries have begun to deploy the fourth industrial revolution (also known as the industrial revolution 4.0). It can be said that electronic devices, smart tools, or the Internet with explosive, rapid, and popular development have had a strong influence on all fields, leading to changes in habits and human activities. Therefore, consumer buying behavior is also increasingly diverse in many ways and on many different media channels. Traditional Marketing or Online Marketing is no longer an optimal choice for organizations and businesses. Instead, “Digital Marketing” is gradually taking over the priority of organizations and businesses when choosing a method of approaching customers and is a trend in the digital age.

In Vietnam, according to We Are Social in 2022, Vietnam has 98.56 million people; the number of mobile connections is 156.0 million subscribers (accounting for 158.3% of the total population of the country); the number of Internet users was recorded at 72.10 million (accounting for 73.2% of the population); the number of social network users is 76.95 million (equivalent to 78.1% of the national population). On average in a day, also in Vietnam, users spent 6 hours 38 minutes accessing the Internet; 2 hours 47 minutes to watch the broadcast; 2 hours 28 minutes using social networks; 1 hour 55 minutes reading media; 38 minutes of listening to the radio...

Apparently, the above figures are a testament to the explosion and strong wave of the Internet and electronic devices in today’s era. Especially, the Gen Z generation, a generation considered “Grow with technology”, strongly influenced consumer behavior through the rapid dissemination of information and grasping of trends. Hence, Gen Z is a very important consumer that needs attention.

In recent times, business concerns is especially directed toward Gen Z because this generation will become the largest group of consumers. Existing studies mainly analyze the personality characteristics, values, and consumption trends of Gen Z to propose marketing strategies for businesses. Actually, finding out the core factors affecting the buying behavior of today’s young generation, especially Gen Z, will be an important part of the development of businesses while also helping to save costs. and implement marketing right.

¹ Academy of Finance

2. THEORETICAL BASIS

2.1. Digital Marketing

Known as Digital Marketing, includes both Online Marketing (Online Marketing) and Offline Marketing (Traditional Marketing). Online marketing as defined by Philip Kotler (Philip Kotler, 2017) is seen as the process of product planning, pricing, distribution, and promotion of products, services, and ideas using electronic media. and the Internet. Meanwhile, Offline Marketing is a form of direct advertising to introduce products and services to customers. Digital Marketing uses both of these forms to convey information and promote products and services to customers.

Digital Marketing is a unique way to connect with customers through interaction, customer measurement or customization capabilities, and access to extensive information sources (Deighton, 1996; Edelman). & Heller, 2015; Merisavo et al., 2007; Salehi, Mirzaei, Aghaei, & Abyari, 2012). Marketers are using Digital Marketing to dominate the market, as this tool can attract, communicate and influence consumers in an attractive yet subtle way to increase customer satisfaction. goods (Gay, Charlesworth & Esen, 2007). A connection to interact with and target customers through a Digital Marketing strategy will be more effective than traditional Marketing (Hawks, 2015). Moreover, Digital Marketing is also a way to connect businesses with the right target customer segments. In the digital age, the best strategy for businesses is to connect with their customers through the Internet environment – where they spend most of the day. In fact, Digital Marketing activities have many different forms, depending on their purpose, businesses will choose the appropriate form. Among the current Digital Marketing activities, Vietnamese enterprises are quite invested and focus on 3 areas: Content Marketing, Social Media Marketing, and Search Engine Marketing to promote buying behavior as well as arouse buying demand of consumers through the effective use of these means.

Actually, Digital Marketing is considered the use of digital tools to advertise, attract customers, and target an audience for a business or organization. According to the definition of the Asia Digital Marketing Association (Asia Digital Marketing Association) in 2021, Digital Marketing is seen as “a strategy of using Internet tools as a means for Marketing activities and carrying out information exchange”. All existing digital media channels, and businesses will implement Digital Marketing to build, develop and promote brands and products online. In essence, Digital Marketing is a form of advertising that uses digital platforms to convey the brand’s message to the target audience.

Thus, Digital Marketing is a method of introducing, advertising, and using electronic devices such as personal computers, smartphones, mobile phones, tablets, and other devices to interact with users. It uses digital technologies through platforms such as websites, email, apps, and social networking platforms...

2.2. Behavior of Gen Z

Buying behavior is the activities related to the process of need recognition, search, information gathering, purchase execution, possession, and use. In other words, consumer buying behavior is the actions that consumers take in finding, purchasing, using, and evaluating products and services that they expect to satisfy their individual desires. According to Kotler and Armstrong (2012), buying behavior is the specific behavior of an individual when making decisions to purchase, use and abandon products/ services. It is the study of the process by which individuals and organizations select, purchase, use, or discard products, services, ideas, and experiences to satisfy needs and wants. their own (Solomon, 2017). In summary, consumer behavior is the thoughts, feelings, and actions that take place in the consumer’s decision-making process to purchase goods and services under the mutual influence of stimuli from the external environment, and their internal psychological processes. Häubl and Trifts (2000) define online buying behavior as a consumer’s shopping activity through computer interfaces and internet-connected devices, which are connected to and interact with the retailer’s electronic store over the internet. The

attributes of the online shopping environment are highly interactive, information exchange, on-demand information, random response, customizable content, and instant response (Alba) et al., 1997; Ariely, 2000; Häubl & Trifts, 2000; Zack, 1993). It can be rational or emotional to help a person enjoy and satisfy needs, which is also the basis of reason why people buy. (Rohm & Swaminathan, 2004; Sarkar, Butler, & Steinfield, 1995). These benefits relate to location, flexible time, fast and convenient payment, fast shipping, and abundant product (Rohm & Swaminathan, 2004). For instance, it is possible to classify consumers by type of shopping motivation into 6 groups, including convenience shopping group to save time, information search group, social interaction group, and leisure shopping group, the group looks for many options, and the group aspires to own the product right away

In terms of Generation Z, it is referred to as Gen Z or also known as Generation Z, is a group of people born between 1996 and 2012, with slight variation in studies depending on perspectives. Other terms like Post-Millennials, Digital Natives, Gen Tech, Gen Wii, Internet Generation, Neo-Digital Natives, iGen, Homeland Generation, Net Gen, Plurals, and Zoomers are all used to refer to this group.

Many different definitions of Generation Z exist today, but the most common definition for this group of people is those born between the mid-90s and early 21st century, and are considered the most developed generation. developed with the advancement of science and technology, such as the Internet and mobile phones. The study authors used the United Nations Population Fund (UNFPA, 2021) criteria to define Generation Z, determining that this generation includes people born between 1997 and 2013.

Table 1. Division of generations

Generation	Birth year range
The most traditional generation	1900 - 1945
Baby boomer generation	1946 - 1964
Generation X	1965 - 1980
Generation Y	1981 - 1996
Generation Z	1997 - 2012

(Source: authors synthesize)

According to recent statistics, Generation Z accounts for about a quarter of the world’s population, or more than 2.6 billion people, and in Vietnam there are about 15 million Gen Zs, accounting for about 26% of the country’s workforce. They can be divided into two main groups: financially independent (those who work and have income) and financially dependent (those who receive financial support from their family but have no income).

2.3. The Relationship between Digital Marketing and Gen Z’s buying behavior

Apparently, the development of Digital Marketing has drastically changed the marketing landscape. Digital marketing allows businesses and organizations to promote their brands on a variety of platforms and mainly to attract the target audience. The digitalization of marketing affects the way consumers interact and associate with various existing organizations and brands. There are many factors of Digital Marketing affecting the buying behavior of consumers, in the research on the topic will focus on the following factors of Digital Marketing:

(1) Convenience of Digital marketing platform: consumers make purchases after doing online research. Today, consumer shopping is more than simply going to a store and choosing to buy a product. Before making a buying decision, they often conduct online research to gather information and compare different products and brands. Their purchasing decisions are highly dependent on the information they find in their research. This makes the online presence of brands and businesses become an important factor in

building trust and credibility with customers. Furthermore, an online presence also allows brands to convey their messages more clearly and accurately, as they can control what is posted online. This has a great impact on consumer buying behavior, brand promotion is not only the expression of product value but also includes the ideals that consumers create after interacting with that brand. Furthermore, online platforms are also a means to communicate directly with customers, both satisfied and dissatisfied customers, which helps enterprises better understand their customer's needs and opinions for improvement, and develop its products and services. In this day and age, print advertising is suffering a significant decline. Experts have estimated that print advertising revenue will drop to just \$5.3 billion by 2024, from the result of \$25.20 billion in 2012. Hence, the current virtualpresence is more important than ever. This is because digital communication channels have become the first point of communication between the brand and the customer. By using digital platforms, brands can respond to and interact with customer feedback, including praise and criticism. Therefore, the Digital Marketing of a brand becomes an extremely important factor for its survival.

(2) Design of shopping interface/website: Digital marketing allows brands to promote their products at the right time and place where consumers are most likely to make spontaneous or impulsive purchases. Deals, discounts, and offers from brands are used to entice customers to buy their products. This is very unlikely in an offline environment, but it can be used by marketers as a marketing tactic. In fact, digital marketing allows consumers to tailor their shopping experience.

It has been observed that customers prefer instant gratification rather than researching new products. A brand's digital content can be created and modified to deliver a tailored shopping experience. This will have a significant impact on consumer purchases. According to Think With Google, Gen Z especially spends a lot of time on the mobile Internet. About 71% of Gen Z teens use mobile devices to watch videos, while 51% use phones to surf social networking sites and shop online. To attract the attention of Gen Z, enterprises need to make sure their website's mobile version or mobile-based experiences are simple and easy to use. Therefore, businesses need to focus on optimizing for mobile devices first. In addition, the website needs to be easy to navigate, have all the necessary information that Gen Z wants to find, and reach a certain level of aesthetics.

(3) Form and foundation for product evaluation/review: Customers can share their questions and thoughts on social media with a wide range of viewers. Positive and negative customer reviews greatly influence the purchasing decisions of other consumers. By empowering customers and providing them with tailored experiences, digital marketing allows brands to establish more transparent and stronger relationships with them. Therefore, digital marketing is a powerful motivator for consumers. Trusted recommendations through digital word of mouth, also known as influencer marketing. Consumers today seek referrals, and endorsements from colleagues, friends, relatives... In addition to customer reviews, influencer marketing, testimonials, and comments, other types of recommendations can also boost consumer trust in a brand. Customers are more likely to trust a brand if it has a good digital word of mouth. Apparently, word of mouth has a direct impact on a brand's sales. Moreover, businesses can rest assured that digital marketing has put consumers in control.

In fact, customer loyalty is no longer reliable. Before the digitization of the marketing world, customers tended to be more loyal to the brand of their choice. They choose to stick with the brand they are already familiar with. This is the result of less exposure to the different products available in the market. Today, customers actively seek out different products that cost the same but offer them a compelling value proposition. Customers now feel less hesitant to replace their familiar brands with new ones. This is because customers can now rate a product based on a variety of criteria including sales and discounts, and customer support. Since customers can research everything they need to know, when they find a better deal they are more likely to change their choice.

(4) The safety and security of online purchases: A survey and assessment of the information security situation of e-commerce websites were conducted by VECOM on several e-commerce websites that are members of VECOM operating in two fields of retail and payment. With a high level of brand awareness and a large number of visitors, it has been shown that in Vietnam, there are still 33% of e-commerce website systems operating in the market with serious errors. This is a large percentage and corresponds to thousands of consumers putting their data at risk. Therefore, for Gen Z young people, ensuring the safety of personal information when shopping online is a factor that strongly influences their shopping behavior. In fact, the mentality of Vietnamese Gen Z feels very unsafe when shopping online, leading to an unwillingness to pay online as well as not buying high-value items online.

3. RESEARCH METHODS

The research methods used include the Qualitative method: Use qualitative method through three steps:

(1) Theoretical research includes defining problems, and research objectives, reviewing theoretical bases, making theoretical models, and building preliminary questionnaires;

(2) Develop a formal questionnaire based on a 5-point Likert scale from “Strongly disagree” to “Strongly agree”, and collect and process data;

(3) Conduct a convenient sampling survey by surveying via the Internet in the form of sending a survey to the research subjects.

Quantitative methods: Descriptive statistics method: to describe the research sample through characteristics such as mean, and standard deviation. Furthermore, the exploratory factor analysis method is utilized to identify the components that reflect. In which, statistical analysis and data processing were performed using SPSS software version 20.0, together with Cronbach alpha reliability test and Exploratory Factor Analysis (EFA) factor analysis. The research was carried out in 2 steps: (1) exploratory research and (2) formal research. Exploratory research is accomplished through quantitative research. It is used to identify subjects suitable to the research objectives of the topic. Simultaneously, the research’s writers identify research subjects to conduct formal research.

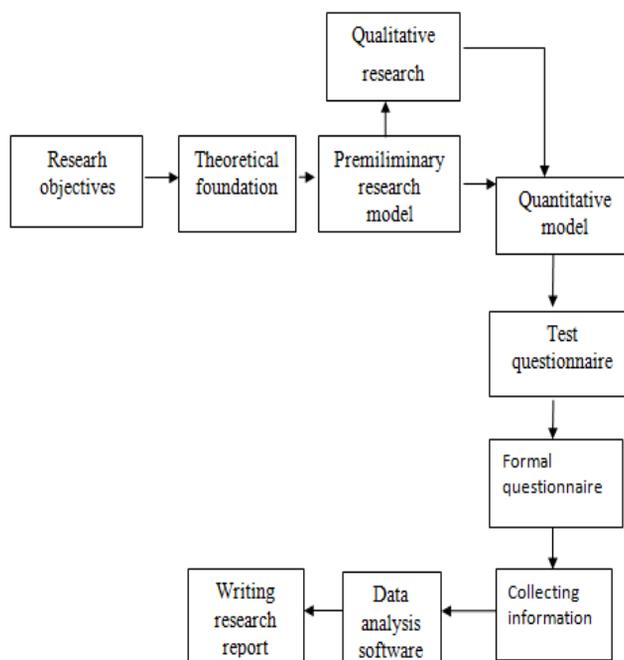


Figure 1 Research process

Source: Authors suggested

4. RESEARCH RESULTS

The research results based on selecting the theory of intended behavior to develop an appropriate research model. After distributing survey questionnaires to young people of Gen Z in Vietnam, the authors obtained 185 valid questionnaires with sample characteristics with the female: male sex ratio of 122:65; The main age group participating in the survey is 18-21 years old (82.4%); The level of education of the target group is high with 92% being at the University/College/Vocational level, currently mainly students from universities or colleges across the country. Moreover, nearly 80% of the target group is still financially dependent or has low income (less than 3 million VND/month). The remaining income level is 3 million VND/month or more. The ratio of purchasing on digital platforms is high (sometimes: 47.1% and often: 39%). Importantly, customer satisfaction level on digital platforms is positive (only 1.6% dissatisfied).

The research team has tested the theory, and actual data and obtained positive results. In respect to the theory of influencing factors, when the proposed model is completely suitable, the scale is considered to be a good measure with 04 independent variables that have explained 65.246% of the variation of the data. In which, the factors of Digital Marketing affecting the buying behavior of Gen Z Vietnam are in decreasing order which are Form and platform for product evaluation/review, Convenience of platforms, Digital, Design of shopping interface/website, Safety, and security when buying online, respectively.

Researching the factors of Digital Marketing affecting the buying behavior of Gen Z by descriptive statistics are calculated including characteristics of measuring tendency to focus. Additionally, the characteristics of measuring the standard deviation of each observed variable is presented in the following table:

Table 2: Descriptive statistics of the variables included in the model

Analytical variables	Indicators	Mean	Std. Deviation
Convenience of digital platform	TL1	3.74	.936
	TL2	3.66	.971
	TL3	3.50	1.021
	TL4	3.89	.975
	TL5	3.57	.942
Design of the interface/ shopping website	TK1	3.54	.886
	TK2	3.75	.934
	TK3	3.66	.907
	TK4	3.67	.974
	TK5	3.87	.973
Form and platform of product appraisal/ review	HT1	3.75	1.001
	HT2	3.41	.991
	HT3	3.85	.988
Safety and security when purchasing virtually	AT1	3.88	1.014
	AT2	3.49	1.057
	AT3	3.78	.976
	AT4	3.29	1.025

Source: Authors calculate from the survey data

In general, according to data observations, the assessment of buying behavior, as well as influencing factors from Digital Marketing to Gen Z, is relatively high. Values which is higher than 3 indicate that the factors mentioned are the consensus of the majority of young Gen Z Vietnamese surveyed.

5. CONCLUSION

Generation Z is often referred to as “digital natives”, because of their exposure and familiarity with digital technology since birth, and their worldview has also changed significantly compared to the previous generations. In fact, enterprises identify this fact as an important customer group with great influence and purchasing power. The authors have successfully built and tested the EFA model, and identified the factors of Digital Marketing that affect the buying behavior of Gen Z youth in Vietnam.

Research has confirmed that the form and platform for product reviews/reviews are the factors that have the strongest impact on Gen Z’s buying behavior, followed by the convenience of digital platforms, the design of the shopping interface/website, and the safety and security of online purchases. The solution proposals are highly feasible and practical, contributing to enhancing the positive influence of Digital Marketing to stimulate the purchasing behavior of Gen Z.

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FACTORS AFFECTING THE SATISFACTION OF CUSTOMERS BUYING FOOD WITH LAST-MILE DELIVERY SERVICE ON E-COMMERCE PLATFORM IN VIETNAM

Author: Le Thi Hong Nhung¹, Le Mai Phuong, Nguyen Thi Huyen

Mentor: TS. Nguyen Huu Tan

ABSTRACT: *The study aims to explore specific factors that affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platform in Vietnam. The authors develop a research model consisting of 5 independent variables: service capacity of the transport unit, complaint and refund policy, freight cost, the factor about delivery staff, the form of goods upon receipt. The research model explains 60.9% of the overall relationship of the above 5 factors with the satisfaction of last-mile delivery service when purchasing food. Implications and recommendations for further research are also discussed.*

Keywords: *Food, last mile delivery, Online purchase, Satisfaction.*

1. INTRODUCTION

Societies are undergoing significant changes in the age of globalization, and they are approaching the complexity of modern society socio-cultural and socio-economic (Yusoff et al., 2020). In recent years, the rise of e-commerce platforms has changed the shopping behavior of goods in general and food in particular of customers. At the same time, the rapid development of the internet has affected the way business is conducted (Kaur, 2011). With a growth rate of 20%/year, Vietnam is ranked by eMarketer in the top 5 e-commerce growth countries in the world. Accordingly, with the continuous increase in the size of online shopping participants, many businesses have chosen e-commerce as the largest gateway to reach customers via the Internet (Yusoff et al., 2020).

In addition, the Covid-19 pandemic is like a double-edged sword, although negatively impacting the macroeconomy, but creating opportunities for e-commerce to develop, to grow, making them accept e-commerce more widely. It has changed people's shopping habits and created new challenges for logistics providers (Bubner et al., 2014). According to Hayashi et al. (2014), delivery service significantly affects the success of online shopping. Today, the quality of life is enhanced and personalized, consumer demand for saving time and upgrading shopping facilities through online purchases of ever-expanding food products, so the satisfaction of customers buying food with last-mile delivery service on e-commerce platforms in Vietnam becomes an important issue that businesses should focus on.

In Vietnam, there are currently not many studies on the factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platforms. Therefore, the authors decided to choose the topic "Factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platforms in Vietnam" to carry out research, in order to analyze the factors affecting the satisfaction of food customers with last-mile delivery services on e-commerce platforms in Vietnam, contributing to providing data for logistics businesses so that they can improve services, satisfy customers so that they can survive in a tough competitive environment.

¹ Academy of Finance

2. THEORETICAL FRAMEWORK

2.1. E-Commerce Last-Mile Logistics

The phrase “Last-mile” was first widely used in the telecommunications industry to describe the difficulty of connecting households and retail end-users to the network. Then, this term has the same meaning in the field of Logistics and Supply Chain Management.

Last-mile delivery has drawn the attention of researchers and stakeholders due to the rise of business-to-consumer (B2C) deliveries. Lindner (2011) postulates that LMD refers to a set of last activities in the delivery cycle, which involves a series of activities and processes conducted for the delivery process from the last transit point to the final drop point of the delivery chain. The e-commerce surge has indirectly perfected the concept of LMD in the Logistics sector. The research of Gevaers (2009) shows that the previous definition of the terminology “the last mile” is not exhaustive and proposes that “the last mile may be defined as the final leg in a business-to-consumer delivery service whereby the consignment is delivered to the recipient, either at the recipient’s home or at a collection point.” (2011) (Fig. 1). Last-mile delivery has a direct impact on the customer experience and the competitiveness of enterprises.

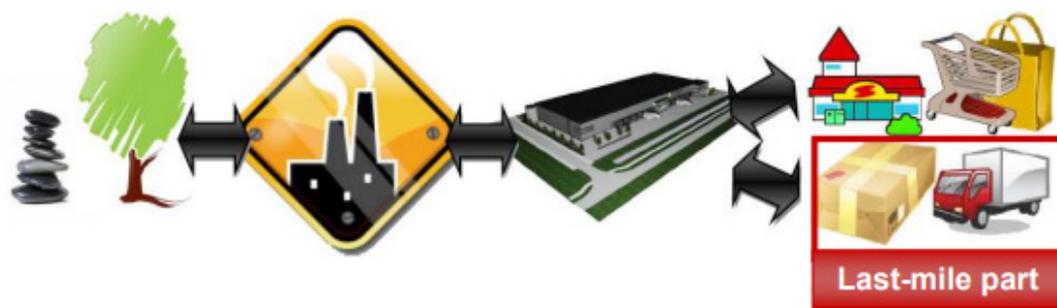


Fig. 1: Basic structure of a supply chain and the position of last-mile

(Source: Own reproduction based on De Smedt, Gevaers, 2009)

Along with the explosion of the Fourth Industrial Revolution and E-commerce, LMD plays a crucial role in order fulfillment (Esper et al, 2003; Boyer et al, 2009) and customers’ purchasing decisions (Xing et al, 2010). The customers do not care about the process of transporting and distributing goods, but high or low delivery costs, fast or slow delivery speed, whether delivery time is office hours or all day, how many days to receive the goods and whether there is delivery notice or not.

There are multiple definitions of food. The book called “Food Additives” (Dam Sao Mai et al, 2012) is written: “Food is natural products in a raw, single form, or processed or complex; must be edible and satisfy the requirements of the human: provide nutrients; be safe for health; create delicious sensations; consistent with habits and traditions.” According to the book named “Food and Beverage Service, 9th Edition” (John Cousins, Dennis Lillicrap, Suzanne Weekes, 2014), food can include a wide range of styles and cuisine types (these can be classified by country, type of cuisine, or a particular specialty). In conclusion, food is a necessity to maintain human existence and development, which is consumed directly by humans through eating. Food can be divided into two main groups: fresh food with ingredients containing a large quantity of water (60-70%) and industrial food, which is known as processed food, whose portion contains little water.

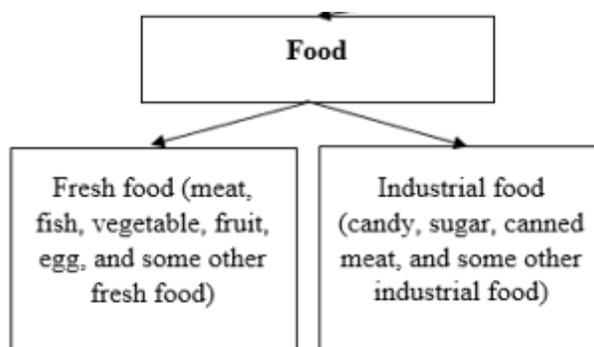


Fig. 2: Classification of food

2.3. Customer satisfaction

Early concepts of satisfaction research have defined satisfaction as a post-choice evaluative judgment concerning a specific purchase decision (Oliver, 1980; Churchill and Suprenant, 1992; Bearden and Teel, 1983; Oliver and DeSarbo, 1988). Especially, customer satisfaction is a top goal for the creation of sustainable growth in organizations (Afework, 2013) because customers are a key factor determining the success of businesses. Customer satisfaction is defined as an overall evaluation based on the total purchase and consumption experience with the good or service over time (Fornell, Johnson, Anderson, Cha & Bryant 1996). Particularly, customer satisfaction is shown as the result of a cognitive and affective evaluation, where some comparison standard is compared to the actually perceived performance. If the perceived performance is less than expected, customers will be dissatisfied. On the other hand, if the perceived performance exceeds expectation, customers will be satisfied (Chi Lin 2003). Jiang and Rosenbloom (2005) suggest that delivery has an impact on overall customer satisfaction because determining the level of customer satisfaction depends on the stages of online retail checkout and after delivery. Reliable delivery has been accepted as a sources of customer value in e-commerce (Keeney, 1999). Factors such as on-time delivery (Heim and Sinha, 2001), price, and total delivery time (Fisher, Gallino, and Xu, 2016) have been named as antecedents to customer satisfaction and loyalty to an electronic retailer. Besides buying more, they also work as a network to reach other potential customers by sharing experiences (Hague & Hague 2016). In other words, customer satisfaction is a principal component of a business strategy as well as customer retention and product repurchase. When customers are satisfied with the price and quality of service, customers tend to rebound and recommend to others. As a result, businesses can not only consume more products but also affirm their position in the harsh market.

2.4. Hypothesis development and proposed research model

Parasuraman and partners (1985) found that the external appearance that customers can see affects the customer's perception of the image of the delivery business. Therefore, we propose the hypothesis as follows:

H1: The product appearance has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

Responsiveness is the response from the service provider to what the customer wants (Parasuraman and Partners, 1988). Accordingly, the supplier that can respond better will make customers feel more satisfied. Empathy can be the offering of products that have been tailored to meet customer needs or make suggestions to improve customer experience as a key factor for the next use of the product (Lee and Partners, 2011). More directly related, research by (Iberahim, 2016) has shown that on-time delivery, the right address, and several other factors such as the ability to provide full information to customers with delivery progress have a great influence on customer satisfaction. Hence, we develop the hypothesis as follows:

H2: Service capacity of the transport unit has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

Providing service with politeness and respect for customers, which is reflected in the professional level to evaluate service effectiveness with customers - research by Lee and Lin (2005) has implied, this has a strong influence on customers' online shopping through e-commerce platforms. Therefore, we propose the hypothesis as follows:

H3: The factor about delivery staff has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

According to Amad và Karmal (2002), apart from the quality of the service, customer satisfaction is also influenced by price, personal and situational factors. Hence, we develop the hypothesis as follows:

H4: Freight cost has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

On e-commerce floor, customers' perception of risk has an inverse relationship with their attitudes, whereby return and complaint policies will reinforce trust and satisfaction (Jarvenpaa and Partners, 2000). According to a survey of (Loureiro, Umberger, 2007)), up to 91% of interviewees answered that the return policy of online shopping services is an important factor determining their consumption. In addition, the feedback is reflected in how the service provider and performer is willing to help customers with a positive, enthusiastic and responsible attitude and serve quickly and promptly (model SERVQUAL by Parasuraman et al., 1988) and the study carried out by (Zeithaml, 2000) have shown that feedback is the pivotal factor in determining service quality related to electronics. Therefore, we propose the hypothesis as follows:

H5: Return and complaint policies have a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

Based on the theoretical framework and research hypotheses, the proposed research model is as follows:

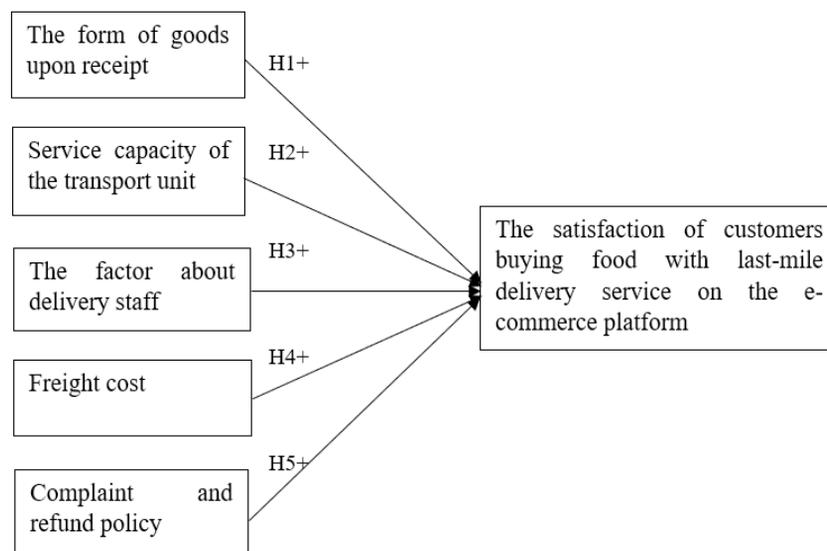


Fig. 3: Proposed research mode

Source: Compiled by the author

3. RESEARCH METHODS

3.1. Data Collection

This is survey-based research, and we conducted a convenient sampling survey in which the data was collected through both online and offline. The samples in survey mostly in the age of 18-28. Because

in Vietnam, gen Z is regarded as the generation that shapes the trend and they frequently buy food online (Decision Lab).

The survey questionnaire include three parts. The first part consists of demographic questions, such as their age, gender, professional situation, monthly consumption. The second part focuses on the frequency of food purchases via e-commerce platforms, and the last part covers questions on the factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

3.2. Measure

Table 1: Measures

Measures	Symbol	Measurement criteria	Source
The form of goods upon receipt	HT1	Packaging ensures aesthetic value	Parasuraman et al. (1985)
	HT2	Clean form of food preservation	
	HT3	The product is fully attached with the shipping unit's information	
Service capacity of the transport unit	NL1	Delivery on time as expected	Iberahim et al. (2016), proposal of the authors' team
	NL2	Delivery to the right address	
	NL3	Item delivered intact	
	NL4	Regular and accurate updates on the delivery progress of orders	
	NL5	Ability to fulfill orders with special requirements (e.g. time, distance, etc.)	
The factor about delivery staff	NV1	Delivery staff wears the correct uniform	Lee & Lin (2005), proposal of the authors' team
	NV2	Delivery staff polite attitude to customers	
	NV3	Delivery staff are always ready to listen to customer feedback and reviews	
	NV4	Delivery staff handle situations quickly/promptly that arise	
Freight cost	CP1	Calculate freight rates clearly and understandably for each type of goods	Proposal of the authors' team
	CP2	Have a reasonable delivery price	
	CP3	There are preferential pricing policies (discount codes, free shipping codes, incentives according to membership levels, etc.)	
Complaint and refund policy	KN1	There are clear rules for making complaints	Loureiro & Umberger (2007), proposal of the authors' team
	KN2	There are clear instructions for making complaints	
	KN3	Resolve complaints quickly	
	KN4	Complaints policy brings many benefits to customers	
The satisfaction of customers buying food with last-mile delivery service on the e-commerce platform	HL1	You are satisfied with the last-mile delivery process for the food item	Proposal of the authors' team
	HL2	You will continue to buy food on the e-commerce platform because of the preferential policies/ customer service/ prices	
	HL3	You will continue to use the delivery service for food orders	

3.3. The Sample

The survey yielded 306 responses. After removing 11 surveys that provided unreliable information, the team obtained 295 valid answer sheets, corresponding to 96,41%. According to Hair et al. (2014), the ratio of observations to an analytical variable should be 5:1 or 10:1 is reasonable. In this study, the questionnaire has 21 questions using the 5-degree Likert scale, corresponding to 21 observed variables, so these 295 valid answer sheets are used as data for the study.

Table 2: Summary of research samples

Criterion		Quantity (people)	Percentage (%)	Criterion		Quantity (people)	Percentage (%)
Gender	Male	63	21,4	Age	Under 18	2	0,7
	Female	232	78,6		18-24	237	82,2
					24-28	52	17,7
					Over 28	4	1,4
Occupation	Student	209	70,8	Monthly consumption	Under 3 million VND	32	10,8
	The office group moves less	45	15,2		3 – 6 million VND	199	67,5
	The office group moves a lot	9	3,1		6 - 10 million VND	58	19,7
	Heavy work group	2	0,7		Over 10 million VND	6	2
	Freelance labor	30	10,2				

Source: Compiled from survey

From the above table of statistical analysis of demographic frequencies, the ratio of male:female participating in the survey is approximately 79:21. The age group participating in the survey is concentrated in the age group of 18-24, accounting for 82,2%. The majority of respondents are students with 70,8% of respondents. In terms of monthly consumption, the group accounted for the most is 199 people corresponding to 67,5%, with a spending level of 3-6 million VND/ month.

The survey also shows that 86.8% of the respondents have ever had experienced buying food on e-commerce platform and the remaining 13.2% answered “Never” to the question “Have you ever bought food on an e-commerce platform?”. In terms of frequency, 56.2% of survey participants, corresponding to 144 people who have the frequency of buying food through e-commerce platforms 4 times/month; 35.6% equivalent to 91 people using delivery services on the e-commerce platform with food items 4-8 times/month; the remaining 8.2% corresponds to 21 respondents saying that they have a frequency of more than 8 times/month.

4. RESULTS AND DISCUSSION

4.1. Analysis results

4.1.1. Measure reliability and validity

To evaluate reliabilities and validities of the measures, exploratory factor analysis (EFA) was carried out and Cronbach alpha (α) were determined. According to the proposed research model, there are 5 scales on the factors affecting last-mile delivery on the e-commerce platform and 1 scale on customer satisfaction with food purchases for last-mile delivery on the e-commerce platform measured by a total of 22 observed variables. Reliability should be evaluated by the variable-total correlation coefficients and Cronbach’s Alpha.

Table 3: Descriptive statistics of variables

Analytical variables	Factors	Indicators	Mean	SD
The factors affecting last-mile delivery on the e-commerce platform	The form of goods upon receipt	HT1	3.99	0.793
		HT2	3.94	0.719
		HT3	3.95	0.763
	Service capacity of the transport unit	NL1	4.01	0.918
		NL2	3.94	0.896
		NL3	3.95	0.935
		NL4	4.06	0.890
		NL5	3.98	0.875
	The factor about delivery staff	NV1	3.54	0.806
		NV2	3.36	0.804
		NV3	3.51	0.820
		NV4	3.75	0.721
	Freight cost	CP1	3.97	0.882
		CP2	4.00	0.909
		CP3	4.03	0.843
	Complaint and refund policy	KN1	3.98	0.833
KN2		3.40	1.048	
KN3		3.48	1.062	
KN4		3.37	1.019	
Satisfaction of customers buying food products with last-mile delivery on e-commerce platforms	Satisfaction with last-mile delivery service with food items on the e-commerce platform	HL1	3.95	0.785
		HL2	3.96	0.844
		HL3	3.88	0.835

Source: Author calculated from survey data

According to Table 3, The “Freight cost” has the highest average of 4, which indicates that food customers are very concerned about how much they pay for the last-mile delivery service. The indicator with the highest average is CP3 (4.03), which shows that support policies on last-mile delivery costs are of great interest. Other factors such as: “Service capacity of the transport unit” (M=3.988), “Form of goods upon receipt” (M=3.96) all have above-average mean score.

Regarding “Satisfaction of customers buying food products with last-mile delivery on e-commerce platforms”, said the average appropriate score, about 3.93. In particular, the HL2 indicator has an average score of up to 3.96, which proves that preferential policies, customer service, and price have a strong impact on customer satisfaction for last-mile delivery of food items.

Table 4: Measurement reliability

	Coefficient of correlation of total variables	α if the variable is excluded		Coefficient of correlation of total variables	α if the variable is excluded
α : 0.926			α : 0.666		
HT1	0.799	0.936	CP1	0.425	0.640
HT2	0.887	0.866	CP2	0.483	0.564
HT3	0.867	0.878	CP3	0.529	0.504
α : 0.889			α : 0.834		

NV1	0.694	0.880	KN1	0.669	0.788
NV2	0.713	0.873	KN2	0.669	0.774
NV3	0.823	0.830	KN3	0.696	0.777
NV4	0.804	0.842	KN4	0.595	0.820
$\alpha: 0.909$			$\alpha: 0.923$		
NL1	0.818	0.878	HL1	0.884	0.852
NL2	0.725	0.898	HL2	0.836	0.894
NL3	0.783	0.886	HL3	0.812	0.914
NL4	0.736	0.895			
NL5	0.786	0.885			

Note: α : Cronbach alpha's Coefficient

Source: Author's complication

Cronbach's Alpha test results show that one variable, HT1, has a Corrected Item-total Correlation coefficient greater than Cronbach's alpha coefficient of the scale ($0,936 > 0,926$) so this variable needs to be removed. All measures have Cronbach's alpha coefficient > 0.6 . The remaining correlation coefficients of the variable-total (Corrected Item-total Correlation) are greater than 0.3 and are consistent with these scales. Thus, it can be assessed that the above are good and suitable measurement scales to conduct EFA analysis with 20 indicators.

4.1.2. Exploratory factor analysis (EFA)

The purpose of this step is to reduce the number of observed variables, remove unnecessary variables, and keep only those variables that are really meaningful to the model.

a) EFA for independent variables

Table 5: KMO & Bartlett test and total variance results

KMO. coefficient		0.762	
Bartlett's test	Chi-Square		2829.550
	DF		153
	Sig.		0.000
Factor	Eigenvalue		
	Total	% Variance	% accumulated
The form of goods upon receipt	3.676	20.421	20.421
Service capacity of the transport unit	3.021	16.782	37.203
The factor about delivery staff	2.696	14.976	52.179
Freight cost	1.844	10.245	73.198
Complaint and refund policy	1,939	10.774	62.953

(Source: Calculation results using SPSS software)

Analysis by SPSS shows that the KMO test results = $0.762 > 0.5$ satisfy the requirements for performing EFA, factor analysis is suitable with the research data. Bartlett test results: Sig = $0.000 < 0.05$, showing that the variables are correlated with each other on the overall scale, so EFA can be performed. (Table 4)

The EFA results show that there are 5 groups of factors with 20 observed variables. The total cumulative variance of these 5 groups reached 73,198%, showing that the factor explained 73,198% of the variability of the data (Table 4). We have the following rotation factor matrix table:

Table 6: Rotation Matrix

	Component				
	1	2	3	4	5
NL1	,886				
NL5	,868				
NL3	,862				
NL4	,830				
NL2	,820				
NV3		,906			
NV4		,898			
NV2		,833			
NV1		,821			
KN2			,840		
KN3			,832		
KN1			,829		
KN4			,752		
HT3				,966	
HT2				,963	
MG3					,803
MG2					,785
MG1					,716

(Source: Calculation results using SPSS software)

According to the results in Table 5, all variables have Factor loading coefficient > 0.5, which means it has practical significance, so it is suitable for the scale. After the analysis, we can re-affirm 5 groups of factors affecting the formation of last-mile delivery service for food items on the e-commerce platform as follows:

- Factor 1 is The form of goods upon receipt, including the following 2 variables:
 - HT2: Clean form of food preservation.
 - HT3: The product is fully attached with the shipping unit’s information.
- Factor 2 is Service capacity of the transport unit, including the following 5 variables:
 - NL1: Delivery on time as expected
 - NL2: Delivery to the right address
 - NL3: Item delivered intact
 - NL4: Regular and accurate updates on the delivery progress of orders
 - NL5: Ability to fulfill orders with special requirements (e.g. time, distance, etc.)
- Factor 3 is The factor about delivery staff, including the following 4 variables:
 - NV1: Delivery staff wears the correct uniform
 - NV2: Delivery staff polite attitude to customers
 - NV3: Delivery staff are always ready to listen to customer feedback and reviews
 - NV4: Delivery staff handle situations quickly/promptly that arise

- Factor 4 is Freight cost, including the following 3 variables:
 - MG1: Calculate freight rates clearly and understandably for each type of goods
 - MG2: Have a reasonable delivery price
 - MG3: There are preferential pricing policies (discount codes, free shipping codes, incentives according to membership levels, etc.)
 - Factor 5 is Complaint policy, including the following 4 variables:
 - KN1: There are clear rules for making complaints
 - KN2: There are clear instructions for making complaints
 - KN3: Resolve complaints quickly
 - KN4: Complaints policy brings many benefits to customers
- b) EFA for the dependent variable

Table 7: KMO and Bartlett test

KMO. coefficient		0.744
Bartlett's test	Chi-Square	689.520
	DF	3.00
	Sig.	0.000

(Source: Calculation results using SPSS software)

The results of EFA showed that there was 1 group multiplied by 3 observed variables. We have the component matrix table as follows:

Table 8: Component matrix table

	Component
	1
HL1	,951
HL2	,929
HL3	,915

(Source: Calculation results using SPSS software)

As can be seen from table 6, the KMO test results = $0.820 > 0.5$, satisfying the requirements for performing EFA, factor analysis was appropriate with research data. Bartlett test results: Sig = $0.000 < 0.05$, for variables that are correlated with each other on the overall scale, EFA can be performed. One main component reflects the satisfaction with last-mile delivery service with food items on the e-commerce platform as follows:

- HL1: You are satisfied with the last-mile delivery process for the food item
- HL2: You will continue to buy food on the e-commerce platform because of the preferential policies/customer service/ prices
- HL3: You will continue to use the delivery service for food orders

4.1.3. Linear regression analysis

Linear regression analysis by Enter method with 5 independent variables HT, NL, NV, KN, MG and dependent variable HL gave the results as Table 9.

Table 9. Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-,406	,285		-1,421	,156		
HTtb	,089	,040	,084	2,214	,028	,929	1,076
NLtb	,710	,036	,731	19,780	,000	,976	1,024
NVtb	,076	,041	,069	1,872	,062	,979	1,021
MGtb	,099	,036	,104	2,768	,006	,938	1,067
KNtb	,130	,039	,122	3,338	,001	,990	1,010

Source: Calculation results using SPSS software

The regression equation with the normalized Beta coefficient has the following form:

$$HL = 0,084*HT + 0,731*NL + 0,069* NV + 0,104*CP + 0,122*KN$$

Table 10. Analysis of variance ANOVA regression equation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	102,180	5	20,436	92,393	,000 ^b
Residual	63,923	289	,221		
Total	166,103	294			

(Source: Calculation results using SPSS software)

Table 11. Regression analysis synthesis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,748 ^a	,615	,609	,4703045	1,907

(Source: Calculation results using SPSS software)

The regression result yielded a corrected R² value of 0.609 with a value of 60.9% the variation of HL is explained by 5 independent variables HT, NL, NV, KN, MG; the model has no autocorrelation (DW=1.907) and no multicollinearity (VIF<2). At the same time, the test Sig values of all 5 factors are <0.05 significantly, indicating that the factors included in the model are consistent and statistically significant at 5%. Thus, the hypotheses H1, H2, H3, H4, H5 are accepted.

4.2. Discussion

The authors conduct data analysis after collecting a sample size of 295, with 5 independent variables, 1 dependent variable and 20 observed variables. The data analysis process is as follows: The variable-total correlation coefficient and Cronbach’s Alpha coefficient were used to test the reliability of the scale. The test results show that the scale proposed by the author is good and the variables are suitable for the scale. The EFA is then used to identify the factors that affecting with last-mile delivery on e-commerce platforms. The results considering the correlation between variables are very good. After analyzing EFA, the results show that there are 5 groups of factors of the independent variable and 1 factor of the dependent variable with a total of 20 observed variables and all variables are assessed as being in accordance with the scale.

The authors use the linear regression method to construct the dependent variable regression equation and independent variables to test the correlation and suitability of the model. The results of the analysis show that all 5 hypotheses are accepted. This result is consistent with similar studies that has been conducted before in other countries, although there are differences in the degree of impact due to demand, culture, etc.

5. CONCLUSION AND IMPLICATION

5.1. Conclusion

The study developed and verified a model of factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platforms in Vietnam with 5 factors representing the degree of influence from strong to weak: Service capacity of the transport unit, Complaint and refund policy, Freight cost, The factor about delivery staff, The form of goods upon receipt. The research model explains 60.9% of the overall relationship of the above 5 factors with the satisfaction of last-mile delivery service when purchasing food. This means, the better service capacity of the transport unit, complaint and refund policy, freight cost, the factor about delivery staff and the form of goods upon receipt, the more satisfied consumers will feel with last-mile delivery service when buying food on the e-commerce platform in Vietnam.

5.2. Implication

To boost customer satisfaction when buying food for last-mile delivery services on the e-commerce platform in Vietnam, the authors propose some of the following solutions:

For government: The Government should promulgate policies to promote the growth of e-commerce, simultaneously, perfect the legal framework, and create favorable conditions. Products sold on the e-commerce floor must comply with the Food Safety Law and other relevant laws.

For the sellers: Sellers on the e-commerce floor need to choose shipping units that are suitable for geographical distances and product characteristics. Food is a relatively specific industry with requirements for preservation in complex conditions and fast delivery, thereby sellers on the e-commerce floor should choose delivery units with express delivery services to meet the customers' immediate needs. Simultaneously, they should refer to the feedback from customers who have chosen the delivery service of that transport unit. The authors recommend that vendors can use the form of crowdsourcing transportation, integrating with Grab, Ahamove, and Lalamove partners to ensure the best ability to transport goods as well as limit risks.

For the e-commerce platforms: The e-commerce platform has to act as a bridge between manufacturers, vendors, transport units, and consumers. Moreover, it needs to make specific regulations and policies on responsibilities and privileges between entities.

For shipping units:

- *Firstly*, shipping units need to improve their own capacity by expanding their network of operations, providing a full range of bags, containers, preservation tools for each type of food. Supplementing urgent delivery forms, delivery forms with special requirements to meet all customer needs. At the same time, it is also necessary to update green logistics solutions to keep up with the requirements and trends of the times.

- *Secondly*, regularly update, check and supplement complaint and refund policies to suit the changing needs and satisfy the maximum requirements of customers. Complaint and return policy is the basis for customers to feel secure to use the unit's services. Therefore, having a clear policy that benefits customers when problems occur during delivery is essential.

- *Third*, at present, freight cost is still high, so the transport units need to optimize the process, minimize unnecessary costs while adding promotion policies, offering vouchers, loyalty mode to reduce delivery fees, thereby attracting more customers and drivers to stick with the transport unit.

- *Fourth*, transport units need to strictly control over delivery staff. It is necessary to have a track list of their work history and have specific standards for their profession. Through customer feedback and reviews to have penalties, warnings, exclusions for violations and rewards for achievement milestones to boost the morale and serious working attitude of the delivery staff.

- *Fifth*, products delivered to consumers need to be guaranteed in terms of form. If the product shows signs of spillage, breakage, or disturbance outside the norm, the transport unit can launch cargo insurance packages, decisions deducted on the commission received by delivery drivers to ensure the interests of customers and improve the quality of their services. At the same time, clearly provide information of the delivery unit to promptly receive communication and handle incidents from customers reflecting.

For the consumers: Consumers need to comply with the regulations on the e-commerce platform. Before making a consumption decision, they need to understand the regulations and scrutinize purchased products and shipping services. After purchasing, it is necessary to objectively evaluate the quality of products and shipping services with a view to providing all necessary information for the next customer and e-commerce specialist.

Consumers need to comply with the regulations on the e-commerce platform. Before making a consumption decision, they need to understand the regulations and scrutinize purchased products and shipping services. After purchasing, it is necessary to objectively evaluate the quality of products and shipping services with a view to providing all necessary information for the next customer and e-commerce specialist.

The research on this subject has achieved certain results, but there are still some limitations due to the authors' theoretical knowledge, time and resource constraints, social research capabilities, and other factors. First, this study only focuses on the factors affecting last-mile delivery from the consumer's perspective, but it did not study the perspectives of e-commerce companies and third-party logistics service providers. Second, although the authors have tried to use a coherent writing style in the process of making the questionnaire to carry out survey, the content and wording of the questionnaire may be misleading, affecting the accuracy of the answer because of the certain geographic and cultural dispersion. Third, besides the independent variables given in the research model, in fact, there are many other factors influencing the satisfaction of customers buying food on Vietnamese e-commerce floors that have not been considered in the study. Fourth, the proposed recommendations are only qualitative, not tested on the degree of completion.

We admit that the data obtained are cross-sectional and hypothetical because of the use of stated preference surveys. Future research can expand the research scope across the provinces and cities of the country over a long period, and change the sampling method and the number of samples so that the sample is sufficiently representative. In addition, further studies need to add other up-to-date factors. Finally, subsequent research can delve into the impact of particular factors mentioned in this study, thereby finding and developing more detailed and updated recommendations for the business.

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Part 6
THE ECONOMIC INFORMATION SYSTEM

COLLECTION AND USAGE OF CONSUMER INFORMATION IN ELECTRONIC COMMERCE ACTIVITIES UNDER VIETNAMESE LAW

**Author¹: Do Thi Nam Binh, Vu Luong Hong Chau, Nguyen Thi Kim Ngan,
Nguyen Thi Thanh Phuong, Bui Nguyen Khanh Vy**

ABSTRACT: *The objective of this study is to analyze the current situation and practice of collecting and using consumer information in e-commerce activities in Vietnam, besides, the analysis also incorporates legal references of some typical countries such as the EU, Japan. Research results show that individuals engaged in e-commerce activities, competent state agencies as well as consumers themselves have not really ensured the efficiency of the process of collecting and using consumer information used in e-commerce transactions. From the inadequacies analyzed, the authors make some suggestions to improve the legal regulations.*

Keywords: *collection, usage, e-commerce, consumer, transaction, personal information.*

1. INTRODUCTION

In the era of information technology boom, electronic commerce (e-commerce) is an extremely convenient commercial transaction model, which is increasingly popular and above all during the Covid-19 pandemic, e-commerce is considered the salvation of businesses and people to maintain the circulation of goods. It can be said that e-commerce has been and will continue to grow due to the obvious benefits that this method brings. However, the e-commerce platform has only appeared and developed strongly in terms of operation and participants in recent times, the law still does not have many regulations to regulate the relationships in this platform. Therefore, the issue of protecting the interests of consumers in the field of e-commerce in general and the management of the collection and usage of consumer information in e-commerce activities should be seriously concerned, researched and analyzed to be able to see the shortcomings and reach solutions to perfect the legal system in line with reality.

2. CONSUMER INFORMATION AND THE NEED TO PROTECT CONSUMERS IN THE COLLECTION AND USAGE OF CONSUMER INFORMATION IN E-COMMERCE ACTIVITIES

2.1. Consumer information

Law on Protection of Consumers' Rights 2010 did not refer to the definition of "consumer personal information" but only used the term "consumer information" in regulation which was protection of consumer information². In fact, in the current modern economic era, consumer information not only plays the role of identifying basically identifiable information such as name, age, contact address of consumer or financial information such as credit card numbers, account numbers, etc..., but it also contains information about the behavior and information that consumers performed in the transaction process.

¹ Student at University of Economics and Law - Vietnam National University, Ho Chi Minh City – VNU-HCM; Email: binhdtn20504cp@st.uel.edu.vn.

University of Economics and Law, Vietnam National University Ho Chi Minh City

² Article 6 Law on Protection of Consumers' Rights 2010 amended, supplemented in 2018.

It can be understood that consumer information includes information to identify the personal identity, information about the transaction behavior and tastes of consumers that businesses want to collect in order to meet the needs of customers in an immediate transaction; on the other hand, it also facilitates businesses to easily access their old customers through exploiting the existing customer information base.

2.2. E-commerce activities

E-commerce is defined by the World Trade Organization (WTO) as: “E-commerce is the production, distribution, marketing, sale or delivery of goods and services by electronic means¹”.

For e-commerce activities, Vietnamese law is stated in Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP on e-commerce, amended and supplemented by Decree No. 85/2021/ND-CP specifically as follows: E-commerce activities mean conducting part or the whole process of commercial activities by electronic means connected to the Internet, mobile telecommunications networks or other open networks. This definition refers to another concept, the concept of commercial activities, according to which, commercial activities are activities for profit purposes, including buying and selling goods, providing services, investing, promoting. commercial and other profitable activities.

There are many different viewpoints on the definition of e-commerce activities, however, from the authors’ point of view, they all agree on the common point that the performance of commercial transactions through an electronic means (including electric, electronic, digital, magnetic, wireless, optical, electro-magnetic technologies or similar technologies²).

2.3. Activities of collecting and using consumer information in e-commerce

In the process of e-commerce transactions, the collection of personal information of consumers is necessary to serve the business activities of traders, organizations or individuals. Accordingly, consumers are required to provide necessary personal information for service providers to access, exploit and use for the purpose of performing transactions. The appearance of this collection and use activity is because e-commerce activities are a completely different transaction method compared to traditional methods of direct transactions between buyers and sellers. Therefore, to achieve the purpose of the transaction, the seller will provide information about its goods, products and services and the buyer will have to provide his personal information to perform the transaction. . For example, full name, phone number, email address, ... in addition, there is additional payment information such as bank account to set up an account at that e-commerce platform, depending on the requirements of each party. The information required is also different.

After collecting, thanks to the data of previous transactions along with the development of technology, organizations can easily and proactively store and analyze information data and use it for many purposes. Various purposes such as marketing goods, sending invitations to use goods and services via mobile phone-activated email, especially credit card information can be used to forge cards and obtain money. in accounts.

It can be seen that the collection and use of the above information in e-commerce activities have raised some concerns about the need to protect consumer information. Therefore, in the content of the article, the authors will analyze the current situation and practice of collecting and using consumer information in e-commerce activities and make some recommendations.

2.4. The need to protect consumer information from collecting and using in e-commerce activities

¹ Yasmin Ismail, E-commerce in the World Trade Organization: History and latest developments in the negotiations under the Joint Statement, International Institute for Sustainable Development and CUTS International, Geneva, 2020, p.1.

² Clause 10, Article 4 Law on E-transactions 2005.

E-commerce increasingly asserts its position when developing rapidly in both its form and application. Along with the development when many consumers choose, the actual situation of consumer information infringement has also become more complicated. Therefore, the necessity to protect consumer information in e-commerce activities should be intensively studied for the following reasons:

(i) Protecting consumer information from collecting and using in e-commerce activities contributes to ensuring the privacy and interests of consumers.

(ii) Protect consumer information from collecting and using in e-commerce activities to promote e-commerce development.

(iii) Protecting consumer information from collecting and using in e-commerce activities helps to enhance the responsibility of state agencies in the field of protection of consumer's ts.

(v) Protecting consumer information from collecting and using in e-commerce activities contributes to the construction of a sustainable economy and the maintenance and stability of social order.

From the above urgent reasons, the issue of protecting the interests of consumers in the field of e-commerce needs to be seriously concerned, researched and analyzed to be able to recognize the shortcomings and obtain solutions to complete the legal system in line with reality.

3. THE CURRENT STATE OF LAW FOR THE COLLECTION AND USAGE OF CONSUMER INFORMATION

3.1. Current status of Vietnamese law on collection and use of consumer information

In e-commerce transactions, consumers are required to provide necessary personal information for service providers to access, exploit and use for the purpose of performing transactions¹. Because the nature of the e-commerce platform is not the same as direct transactions between people, consumers also have to provide additional payment information such as a bank account to set up an account at that e-commerce platform. Depending on the difference between e-commerce platforms, the information that needs to be provided is also different. However, in general, those platforms are all required to provide the above information.

Law on Information Technology 2006 amended, supplemented in 2017 had extensive provisions on collection and processing of personal information for the network environment. In which, organizations and individuals that collect and process information of others must be consented, unless otherwise provided for by law.² In case personal information is used for the purposes of signing, modifying or executing contracts on the use of information, products or services in the network environment; calculating charges for use of information, products and services in the network environment; performing other obligations provided for by law, the consent of the individual is not required³. Because the above cases are the modifications after the collection of personal information and these modifications do not change the personal information. Simultaneously, according to the Draft Decree on Personal Data Protection, personal data processors and third parties can disclose personal data without the consent of the data subject in the following cases:

(i) According to the provision of law;

(ii) Information disclosure is necessary for the interests, national security, social order and safety;

(iii) In the media for the purposes of national defense and national security, social order and safety, social ethics, and community health;

¹ Vietnam Competition and Consumer Authority, Ministry of Industry and Trade. "Luu y cac cong ty thuong mai dien tu trong viec bao ve thong tin, du lieu cua nguoi tieu dung", <http://vcca.gov.vn/default.aspx?page=news&d_o=detail&category_id=e0904ba0-4694-4595-9f66-dc2df621842a&id=b9366f99-8fe0-4d1c-a4ea-9d33ed0549f9> accessed on 26/01/2023.

² Article 21 Law on Information Technology 2006 amended, supplemented in 2017

³ Clause 3 Article 21 Law on Information Technology 2006 amended, supplemented in 2017

(iv) On the media, according to the provisions of the Press Law, do not cause economic, honor, spiritual or material damage to the data subject;

(v) In cases it is required by law to be urgent, life threatening or seriously affecting the health of the data subject or public health.

The Law on Protection of Consumers' Rights 2010 regulated that in the case of collecting consumers information, organizations and individuals trading goods and/or services are responsible for clearly and publicly announcing the purpose of collecting consumer information and ensuring safety, accuracy and completeness when collecting consumer information¹. Such regulation helps consumers to know what their information will be used for and to be more secure when participating in transactions. Concurrently, the above provisions of the Law on Protection of Consumers' Rights 2010 are specified for the field of e-commerce in Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP on e-commerce through the collection of consumer information which is done through Information collector's e-commerce website, personal information protection policy must be publicly announced at a conspicuous location on this website². Thus, it can be understood that the information collection of e-commerce platforms must be in a "visible position" on the website; as in the Tiki e-commerce platform, the information collection section is specified in the terms of use³, in the Shopee e-commerce platform, the information collection part is specified in the privacy policy⁴.

In addition, in order for consumers to express their consent to the provision of information, Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP on e-commerce regulates that information collectors must establish a mechanism for information subjects to express their consent, expressly agree, through online functions on the website, email, instant messaging, or other methods as agreed between the two parties. The law stipulates that merchants, organizations and individuals that collect and use personal information of consumers must clearly display the contents of the collection and use of consumer information to consumers at time before or when information is collected, including the following⁵:

(i) Purpose of collecting personal information;

(ii) Scope of information use;

(iii) Information storage time;

(iv) People or organizations can access to such information;

(v) The address of the unit that collects and manages the information, including the contact method so that the consumer can inquire about the collection and processing of information related to personal information;

(vi) Methods and tools for consumers to access and correct their personal data on the e-commerce system of the information collector.

Thus, organizations that collect and use personal information of consumers on e-commerce websites must obtain prior consent of consumers with such information⁶. However, consumers, especially Vietnamese consumers with the position of the weaker party, seem to be too indifferent, if not irresponsible to themselves when willing to agree to all terms of websites and applications that you want to access without reading

¹ Article 6 Law on Protection of Consumers' Rights 2010

² Clause 3 Article 69 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

³ Term of use, <<https://hotro.tiki.vn/s/article/dieu-khoan-su-dung>> accessed on 03/3/2023.

⁴ Shopee Policy and Rules, <<https://help.shopee.vn/portal/article/77244>> accessed on 03/3/2023.

⁵ Clause 1, clause 2 Article 69 Decree 52/2013/NĐ-CP

⁶ Article 70 Decree 52/2013/NĐ-CP

and researching what those terms are, whether it affects your legal rights and interests. Leading to the regulation that must go through consumers to collect and process information, which has enhanced the legal responsibility of traders and business organizations; but also not effective in protecting the interests of consumers because of the carelessness of the consumers themselves.

Merchants often tend to take advantage of all information obtained from consumers to exploit, search and maximize profits¹. The need to exploit information of merchants and organizations is the cause of the large amount of consumer information stored on e-commerce platforms, which will potentially pose risks in the process of information security. Specifically, the situation of information leakage.

A typical case is that in 2018, the world's largest social network Facebook had successively encountered major scandals about breach of responsibility for user information security, causing hundreds of millions of users to face up with the risk of being harassed and defrauded. Although Facebook is not an e-commerce platform, it is an electronic application that holds and has the ability to use customer information for making profit without being aware of the consequences of carelessness in security of customer confidentiality. Major e-commerce platforms such as Shopee, Tiki, etc. have all developed personal information privacy policies in accordance with the law². However, whether customer information is kept confidential according to the above commitment, consumers cannot know and there is no official monitoring and reporting channel. Because in fact, there is no shortage of cases where consumers, after registering for accounts and participating in transactions on e-commerce platforms, encounter offers and advertisements related to products searched on the Internet³. Thus, whether consumer information in the process of being exploited and processed is leaked or commercialized contrary to the privacy policy of e-commerce platforms or not is a fact that needs to be legalized carefully and adjusted.

3.2. Current status of foreign laws on collection and use of consumer information

Regarding the tendency to regulate the laws of countries around the world, specifically the European Union (EU) and Japan on the issue of collection and use of personal information in general as follows:

Regulation on “Right of access by the data subject” in the European Union (EU). Accordingly, the data subject shall have the right to obtain from the controller confirmation as to whether or not personal data concerning him or her are being processed. And, where that is the case, access to the personal data and the following information: the purpose of the processing; the categories of personal data concerned; the recipients or categories of recipient to whom the personal data have been or will be disclosed, in particular recipients in third countries or international organizations⁴... Where personal data are transferred to a third country or to an international organization, the data subject shall have the right to be informed of the appropriate safeguards pursuant to Article 46 relating to the transfer⁵.

In addition to the European Union's (EU) General data protection regulations, Japan was the first country in Asia to enact the Act on Protection of Personal Information (APPI). The scope of APPI is applicable to “Business operator handling personal information”⁶. The collection of personal information

¹ Dinh Thi Hong Trang. “Mot so van de phap ly ve bao ve nguoi tieu dung trong cac giao dich tren san giao dich thuong mai dien tu”, <<https://tapchicongthuong.vn/bai-viet/mot-so-van-de-phap-ly-ve-bao-ve-nguoi-tieu-dungtrong-cac-giao-dich-tren-san-giao-dich-thuong-mai-dien-tu-68815.htm>>, accessed on 26/01/2023.

² Article 69 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

³ Dinh Thi Hong Trang, “Mot so van de phap ly ve bao ve nguoi tieu dung trong cac giao dich tren san giao dich thuong mai dien tu”, <<https://tapchicongthuong.vn/bai-viet/mot-so-van-de-phap-ly-ve-bao-ve-nguoi-tieu-dungtrong-cac-giao-dich-tren-san-giao-dich-thuong-mai-dien-tu-68815.htm>>, accessed on 26/01/2023.

⁴ Clause 1, Article 15, General Data Protection Regulation (GDPR)

⁵ Clause 2, Article 15, General Data Protection Regulation (GDPR)

⁶ Clause 3, Article 2 The Japan Act on the Protection of Personal Information (APPI)

must be collected legally and the business managers handle the information for the purpose of utilization; a business operator handling personal information shall not change the Purpose of Utilization by other deception¹. A business operator handling personal information has already publicly announced the Purpose of Utilization. With a few exceptions as follows: (i) Cases in which notifying the person of the Purpose of Utilization or publicly announcing it are likely to harm the life, body, property, or other rights or interests of the person or a third party; (ii) cases in which notifying the person of the Purpose of Utilization or publicly announcing it are likely to harm the rights or legitimate interests of the business operator handling personal information; (iii) cases in which it is necessary to cooperate with a state organ or a local government in executing the affairs prescribed by laws and regulations and in which notifying the person of the Purpose of Utilization or publicly announcing it are likely to impede the execution of the affairs; (iv) cases in which it is considered that the Purpose of Utilization is clear in consideration of the circumstances of the acquisition².

Thus, it can be seen that legislators of Vietnam have learned from the experience of regulations on the protection of consumer information from countries such as the EU and Japan. In general, the provisions on the basic rights of consumers are similar to Japanese law such that information must be obtained legally³; handling information for proper purposes⁴; the party collecting and using information must publicly announcing the purpose of utilization⁵. In addition, our country's law can refer to EU law when stipulating the right to receive verification from the data control system about whether personal data related to you is being processed or not. This regulation enhances the rights of consumers when consumers can be proactive with the information collected and used by the system.

4. THE PRACTICE OF COLLECTION AND USE OF CONSUMER INFORMATION

In the process of performing activities in e-commerce, especially activities related to buying and selling in the online transaction environment, most consumers have to provide personal information at many different levels of detail, which aim to help the seller identify and authenticate with the buyer when concluding an electronic contract⁶. Currently, the privacy policies on the collection and use of customer information on major e-commerce platforms such as Shopee, Tiki, and Lazada are quite detailed and specific:

For example, Shopee policy on privacy policy covers the content and purposes of collecting and using personal data on Shopee's website⁷:

(i) About Personal data that Shopee may collect is the information provided by the customer such as full name, email address, phone number, payment information.

(ii) The purpose of the collection is to contact, manage accounts, process transactions, and answer questions from customers; upgrade the exchange and improve the service; personalize the process of customers using the service; related update notifications.

For Lazada's consumer information privacy policy, it regulates the content and purpose of collecting and using personal information. In particular, the subject of the content of information data collected by the Lazada platform is divided into two groups: customers and sellers⁸:

¹ Article 15 The Japan Act on the Protection of Personal Information (APPI)

² Clause 4, Article 18 The Japan Act on the Protection of Personal Information (APPI)

³ Article 70 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

⁴ Article 71 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

⁵ Article 6 Law on the Protection of Consumers' Rights 2010

⁶ J.J.Inman and H. Nivoka, "Shopper-facing retail technology: A retailer adoption decision framework incorporating shopper attitudes and privacy concerns" . *Journal of Retailing* 93 (1), 2017, 7-28.

⁷ Private Policy of Shopee, <<https://help.shopee.vn/portal/article/77244?previousPage=other%20articles>> (accessed on 05/3/2023).

⁸ Privacy Policy of Lazada, <<https://sellercenter.lazada.vn/seller/helpcenter/chinh-sach-bao-mat-12451.html>> ,

(i) If it is the customer, the personal data includes: identification data, contact data, biometric data, account data, transactional data, technical data, profile data, usage data, location data, marketing and communications data, additional information.

(ii) If it is a third party (sellers), the collected data includes: identification and contact data, account data, transactional data, technical data, profile data, data usage data, location data, marketing and communications data, additional information. Accordingly, the Lazada platform also specifies the purposes of collecting and using consumer and third-party information for order processing, service provision, marketing and advertising, legal purposes, management and operations, business analysis and research, and more.

One of the criteria to evaluate the protection of consumer information in e-commerce is implemented effectively and seriously, namely the legal system must be specified in detail and uniform. Currently, there are many legal documents regulating the collection and processing of consumer information. However, in fact, the infringement of consumer's personal information in e-commerce is becoming more and more widespread. Typical acts of illegal infringement of consumer information such as unauthorized collection and use of consumer information; acts of taking advantage of fraudulently appropriating consumer property.

Firstly, about the illegal collection and use of consumer information.

In fact, any collection and use of information without the consent of consumers is illegal¹. However, with growing developments such as IoT (Internet of Things), AI (Artificial Intelligence), VR (Virtual reality), AR (Augmented Reality), Cloud Computing, big Data... organizations can easily actively collect, store, and analyze data and information². As technology has made great strides, identifying and dealing with the unauthorized collection and use of consumer information becomes complicated and difficult to control.

According to the survey conducted by the authors, a total of 360 people participated in the survey. The subjects mainly reside in Ho Chi Minh City, most of their occupations are students, civil servants, employees in office workers and other jobs participated in the survey. We surveyed on the extent to which users see the products they previously searched for on e-commerce platforms advertised for similar topics and products when using social networking sites, other associations such as Facebook, Youtube, Instagram. Accordingly, the survey is divided into 5 levels of users, each level corresponds to the frequency of consumers when they see the products they have searched for before appearing advertisement on social networking platforms, respectively strongly disagree (level 1), disagree (level 2), neutral (level 3), agree (level 4), completely agree (level 5). The results obtained from the survey show that out of a total of 360 surveys conducted, 140 respondents (rate 38.9%) have level 4 (agree) and 86 respondents (rate 23.9%) have a level of 5 (strongly agree). Based on the survey results, a total of 226 respondents (62.8% rate) are “agree” and “completely agree” to see the products they have searched for before appearing in advertisements on the social networks like Facebook, Youtube, Instagram.

Thus, it can be seen the prevalence and seriousness of the current state of consumer information leakage.

Second, the act of taking advantage, defrauding, appropriating consumer property.

This is the consequence of illegal infringement of consumer information. The current law regulates that businesses doing business on e-commerce platforms are allowed to collect and use personal information of consumers in accordance with the “purpose and scope” based on the agreement of the consumer and businesses when using services on the e-commerce platforms³. However, in fact, many e-commerce floor business organizations can use customer information for illegal purposes to appropriate assets of small to very large value.

(accessed 05/3/2023).

¹ Article 70 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

² Nguyen Thi Thu Van, “Bao ve du lieu ca nhan trong boi canh cach mang cong nghiep 4.0”, the Journal of Democracy and Law, No.10. 2017, pg.3.

³ Clause 1, Article 65 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

According to Tuoi Tre News, there are nearly 10,000 identity cards and citizen identities of Vietnamese people for sale on forums specializing in buying and selling data of hackers. On the forum, an account named Ox1337xO appeared to be in possession of a KYC (Know Your Customer) data package. Security experts estimate the data package contains up to 17 GB and can hold the information of 10,000 users¹. The starting price of the data plan is \$9,000, then the price drops to \$4,300. Commenting on the incident, many cybersecurity experts believe that KYC data packages can be collected from many different sources, not from a single place, such as e-commerce platforms, banks, etc. financial services, mobile carriers, technology vehicle applications².

Third, the lack of initiative and indifference of consumers.

Enterprises doing business on e-commerce platforms are responsible for legally collecting, managing and using personal information of consumers. In addition to the duty on the business side, consumers need to be proactive and vigilant, not to be subjective in the face of the risk that personal information may be disclosed or leaked at any time. In fact, most consumers participating in transactions on e-commerce platforms often do not carefully learn about the terms to protect customer information, which .

The author team conducted a survey with a total of 360 survey participants, the subjects mainly reside in Ho Chi Minh City, most occupations are students, civil servants, working. freelance and other jobs to participate in the survey. Through the survey, we examine the extent to which consumers carefully read the “terms of policy” required from e-commerce platforms before agreeing to provide information. Accordingly, survey results are divided into 5 levels, each level corresponds to the frequency that users often do not carefully read the “terms of policy” that e-commerce platforms prescribe before agreeing to provide information. believe. In turn, the levels are completely disagree (level 1), disagree (level 2), neutral (level 3), agree (level 4), completely agree (level 5). The results obtained from the survey show that there are a total of 176 respondents (48.1%) at level 4 (agree) and 32 respondents (8.9%) at level 5 (completely agree). Based on the survey, a total of 208 respondents (57%) are “agree” and “completely agree” to the fact that consumers often forget to read the “terms of policy” carefully before making online shopping on websites of e-commerce platforms..

So, most consumers do not read the “terms of policy” carefully. As a consequence, consumers do not identify and understand what personal information is collected by businesses and the purpose of that collection.

Currently, the legal policies governing the protection of personal information in general and consumer personal information in e-commerce in particular are developed by countries around the world in two basic tendencies. : (i) enact common law, e.g. the European Union (EU), Japan; (ii) promulgated together with specialized laws: Vietnam is a typical example.

Accordingly, in the content of the research, the authors relate to the provisions of law of the two leading countries in the world on protection of personal information, the European Union and Japan. From there, based on the reference to the regulations of these countries to improve Vietnamese law.

First, the European Union’s General Data Protection Regulation (GDPR). In the content of the collection and use of consumer information, according to the regulation on “Right of access by the data subject” in the European Union (EU), the data subject shall have the right to obtain from the controller confirmation as to whether or not personal data concerning him or her are being processed. Where personal

¹ D.Trong - Đ.Thien (2021), “Gan 10.000 CMND, CCCCD nguoì Viet bi rao ban tren mang: Bo cong an len tieng”, Tuoi tre News <<https://tuoitre.vn/gan-10-000-cmnd-cccd-nguoi-viet-bi-rao-ban-tren-mang-bo-cong-an-len-tieng-20210517081925182.htm>>, (accessed on 27/02/2023).

² Ministry of Information and Communications (MIC), “Tu vu 10.000 thong tin ca nhan bi rao ban: Can co trach nhem hon voi thong tin cua chinh minh”.

data are transferred to a third country or to an international organization, the data subject shall have the right to be informed of the appropriate safeguards pursuant to Article 46 relating to the transfer¹. Specifically, according to the principles relating to processing of personal data of GDPR, the purpose of processing personal data shall be collected for specified, explicit and legitimate purposes². GDPR also makes a clear distinction between “personal data” and “sensitive personal data”. The processing of sensitive personal data must have the consent of the data subject, if there is no consent, it will only be processed when there are grounds in accordance with the law³.

Second, the Act on Protection of Personal Information (APPI) of Japan. The scope of APPI is applicable to “Business operator handling personal information”⁴. The collection of personal information must be collected legally and the business managers handle the information for the purpose of utilization, a business operator handling personal information shall not change the Purpose of Utilization by other deception. A business operator handling personal information has already publicly announced the Purpose of Utilization. Except for some exceptions specified in Clause 4, Article 18 (APPI). In particular, information that business managers are not allowed to collect without the consent of the data owner is “special care-required personal information” including social status, medical records, criminal records, or history of the victim’s criminal history⁵.

In general, current Vietnamese law provides for the collection and use of consumer information in e-commerce for individuals and organizations doing business in this field. However, compliance with the law on collection and use of customer information is still not serious and clear. At the same time, there are many potential manifestations of violations, making it difficult to clearly define the mechanism of such behavior to handle violations. Therefore, making suggestions and recommendations in creating a solid foundation for a mechanism to have a direction to adjust the legal regulations on protection of consumer information in e-commerce activities in Vietnam is absolutely necessary.

5. RECOMMENDATIONS

Consumer information is an important data source for the development of e-commerce platforms. Therefore, the issue of exploitation and use of consumer information must be paid special attention to protect the interests of consumers but still satisfy the development needs of e-commerce platform providers, consumers. sell. Based on the inadequacies in law enforcement on the collection and use of consumer information, the authors make some recommendations to the subjects involved in the process of collecting and using commercial transactions in order to complete the inadequacies in the legal provisions on protection of consumer information in e-commerce activities in particular.

Firstly, for organizations and individuals engaged in e-commerce activities: One of the important factors in promoting the process of consumer information exploitation of individuals and organizations participating in commercial activities. It is necessary to build a mechanism to use and exploit customer information in a clear and specific way. E-commerce transaction operators ensure the development of this policy by issuing a transparent and clear internal classification and control system of customer information.

(i) In which, this policy should be clearly defined on the classification of groups of information as well as groups of subjects that individuals and e-commerce organizations need to collect and use information of consumers. At the same time, the mechanism of decentralization of the use of information groups to

¹ Clause 2, Article 15, General Data Protection Regulation (GDPR)

² Clause 1, Article 5 General Data Protection Regulation (GDPR)

³ Article 9 General Data Protection Regulation (GDPR)

⁴ Clause 3, Article 2 the Japan Act on Protection of Personal Information (APPI)

⁵ Clause 2, Article 2 the Japan Act on Protection of Personal Information (APPI)

ensure the privacy and security of customer information must be strictly controlled. The internal processes of merchants, organizations and individuals accessing and using consumer information are strictly adhered to the policies that have been issued internally by the enterprise. This helps consumers easily update their information collected by individuals and e-commerce organizations, exploit them for any specific purpose, and avoid unauthorized infringement of their interests when conducting e-commerce transactions. Customers have the right to allow or not allow merchants, organizations and individuals to access in order to protect information from being leaked to the outside through their self-identification based on their personal accounts on an e-commerce website.

(ii) Individuals and organizations engaged in e-commerce activities apply important security measures to ensure the safety of the website. E-commerce individuals and organizations actively create favorable conditions for consumers when accessing the website system to receive detailed information about the reason and purpose of the collection, using personal information. Instructing consumers to be aware of potential behaviors that pose a risk of unauthorized personal information being violated so that they can prevent and remedy the situation when something goes wrong.

Secondly, for consumers: This is an important subject in protecting their own interests, consumers need to raise their awareness and better control the policies offered by e-commerce platforms before agreeing to provide information. Individuals raise their awareness of data protection before providing information to any subject conducting transaction activities. The provision of information is only done to subjects that we have thoroughly researched and have a certain understanding. In addition, always be proactive and highly alert in protecting data and information, quickly responding to the subject conducting the transaction if any problem is suspected.

Thirdly, for state management agencies: In order to achieve effectiveness in protecting consumer information, it is also necessary to have strict control and supervision by state management agencies over activities of e-commerce platforms in general and activities related to consumer information in particular. In addition, although the State has promptly issued specific regulations on the policy of asking for permission from consumers, when collecting information, the consent of consumers is required, even when sharing, disclosing, transferring information to third parties¹. However, the above provisions are still inconsistent with the general law on the Law on Protection of Consumers' Rights 2010 as well as the Draft amendments to the Law on Protection of Consumers' Rights 2010 still do not stipulate that organizations and individuals doing business must obtain the consent of consumers when their information is collected, stored and used through a third party².

Therefore, the Law on Protection of Consumers' Rights in 2010 needs to be amended to keep pace with regulations to ensure the interests of consumers, as well as to bind the responsibilities of organizations and individuals in the collection and use of consumer information. Specifically, the Law on Protection of Consumers' Rights in 2010 should have provisions on "Policy to protect consumer's personal information" which clearly states that organizations and individuals must obtain the consent of consumers when their information is collected, stored, used through a third party, and at the same time limit the scope of the use of consumers information through the third party to only for business purposes of the organization doing business³.

Besides, the reference to information protection laws of countries in the world such as the European Union (EU), Japan helped perfect the legal regulations of Vietnam in strengthening data protection

¹ Article 70 Decree No. 52/2013/ND-CP amended and supplemented by Decree No. 85/2021/ND-CP

² Trung Hung (2023). "Can quy dinh chat che bao ve thong tin nguoi tieu dung", <<https://nhandan.vn/can-quy-dinh-chat-che-bao-ve-thong-tin-nguoi-tieu-dung-post724251.html>> accessed on 11/05/2023.

³ Trung Hung (2023). "Can quy dinh chat che bao ve thong tin nguoi tieu dung", <<https://nhandan.vn/can-quy-dinh-chat-che-bao-ve-thong-tin-nguoi-tieu-dung-post724251.html>> accessed on 10/05/2023.

of personal data in general and protection of consumer information data in e-commerce activities in particular. As can be seen, General Data Protection Regulation in the EU (GDPR) and The Japan Act on the Protection of Personal Information (APPI), the collection of sensitive information data must be consented by the data owner. According to the Draft Decree on Protection of Personal Data 2021, there is also a classification between “basic personal data” and “sensitive personal data”. Regarding the classification of “sensitive personal data” is regulated to include more types of information than GDPR such as personal data about biometrics, about crimes, criminal acts collected and stored by the law enforcement agencies, personal financial data, location personal data is information about an individual’s geographic location in the past and present, data about social relationships¹... However, Vietnamese law needs to refer to the provisions of GDPR to consider adding regulations on “personally identifiable information” in the digital environment such as usernames on social networks, address IP address (internet protocol), cookie identifier, radio frequency identification (RFID) tag, ad account, pixel tag, device fingerprint, video²... It would be easier to control information in the digital environment for the subject of personal data and data processing.

6. CONCLUSION

In e-commerce transactions, consumers are required to provide necessary personal information for service providers to access, exploit and use for the purpose of performing transactions. Because the nature of e-commerce transactions is not the same as direct transactions between people such as buying and selling goods in the market or in stores, depending on different e-commerce platforms, The information that needs to be provided is also different. However, in general, exchanges are required to provide basic information such as full name, phone number, email address, bank account and some other personal information.

Consumer information in the process of being exploited and processed may be leaked or commercialized contrary to the security policy of e-commerce platforms or not is a fact that needs to be considered. In fact, there are cases where consumers, after registering for accounts and participating in transactions on e-commerce platforms, encounter offers and advertisements related to products searched on the commercial platform³. Currently, the law has regulations on the need to get approval of consumers to collect and process information, which has partly increased the legal responsibility of merchants and business organizations, but that does not bring any effectiveness in protecting the interests of consumers because of the consumer’s own lack of care. Compliance with the law on collection and use of consumer information is still not serious. The fact shows that the legal regulations on handling violations and law enforcement practice still have many obstacles and inadequacies because of the illegal collection and use of consumer information in commercial transactions. E-commerce takes place a lot but is not clear and continuous, there are many potential manifestations of violations, making it difficult to clearly define the mechanism of behavior to handle violations.

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³ Dinh Thi Hong Trang, “Mot so van de phap ly ve bao ve nguoi tieu dung trong cac giao dich tren san giao dich thuong mai dien tu”, Tạp chí công thương, <<https://tapchicongthuong.vn/bai-viet/mot-so-van-de-phap-ly-ve-bao-ve-nguoi-tieu-dung-trong-cac-giao-dich-tren-san-giao-dich-thuong-mai-dien-tu-68815.htm>>, accessed on 05/06/2023.

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PREDICTING POTENTIAL BACKORDERED PRODUCTS FOR BUSINESS USING MACHINE LEARNING

Author: Phan Ngoc Bao Tam¹, Le Phung Cac², Nguyen Quang Hoc², Le Thi Van Anh², Do Hoai Trinh²

Mentor: Ho Trung Thanh³

ABSTRACT: *One of the main elements influencing the existence and growth of a firm is its customers. To create profitable business plans, companies, especially those in the retail industry, need to pay more attention to consumer requirements and consumption habits. To bridge the gap between enterprises and consumers, supply chain management and logistics services are critical. A common supply chain issue is that material backorders influence the efficiency and service level of an inventory system. An excellent opportunity to boost a company's performance is to foresee items that are most likely to be back ordered and identify them before it happens. The use of data processing and machine learning algorithms to forecast probable back-ordered products for organizations is presented in this study. The study analyzes and predicts the possibility of back-ordered products using methods including SMOTE oversampling and supervised learning models like Neural Networks, Logistic Regression, Random Forest, XGBoost, and LightGBM. In the study, several performance metrics, such as accuracy, precision, recall, F1-score, sensitivity, and specificity, are used to examine the performance of the five supervised learning models. The findings demonstrate that ensemble learning models, such as Random Forest, XGBoost, and LightGBM, outperformed other models regarding accuracy scores. However, the training times for big datasets for the Random Forest and XGBoost models are constrained. Additionally, the study only partially examined the association between independent factors, which could have an impact on how business decisions are made. Although the research has some limitations, it gives a promising solution for predicting potential backorders and provides insights for businesses in managing inventory.*

Keywords: *Supply chain management, material backorders, machine learning, supervised learning models, ensemble learning models, inventory management.*

1. INTRODUCTION

Over the past few decades, the explosion of e-commerce has had a dramatic impact on almost every business sector. In particular, the most obvious influence of E-commerce can be seen in the financial and retail sectors. In retail, E-commerce is changing the production system from mass production to just-in-time, customizable, on-demand production (Gunasekaran et al., 2002). This change comes from the fact that human needs are always changing rapidly day by day, hour by hour, and even minute by minute. Therefore, catching the change in consumer demand to respond promptly is the top task that a business operating in the retail industry needs to perform. One of the bases that help businesses track changes in consumer demand is inventory management. Inventory management involves recording and observing inventory levels, predicting future customer needs, and deciding to allocate stock in appropriate quantities and at the right time. However, a big challenge in inventory management that any business must face is balancing the supply of inventory with the actual demand of customers (Atnafu & Balda, 2018). At a certain time, the demand of customers may spike due to wanting to follow the trend of the market or due to unexpected situations leading to out-of-stock and businesses being unable to supply goods to their customers. A good example can be mentioned, due to the unexpectedly strong outbreak of the Covid-19 epidemic, the increased demand for masks and disinfection tools led to shortages of goods because businesses could not anticipate an increase in demand for these products. Even so, because of low product availability and not many

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: tampnb21406c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City

³ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: thanhhht@uel.edu.vn

alternatives, customers will be willing to wait until the product is available and promised delivery. This is a common phenomenon in inventory management - “backorder”.

“Backorder” can be understood as a situation that occurs when a customer places an order for a product that the business does not have or is temporarily out of stock and the customer decides to wait until the product is available and promised to be delivered (Islam & Amin, 2020a). Backorders play a crucial role in the management of the company’s inventory because they have the potential to impact the overall cost of manufacturing as well as other potential risks in the whole supply chain. With the rapid increase in consumer demand, the volume of customer data will increase, and the uncertainty in analysis and making accurate predictions can make forecasting “backorder” in the traditional direction face many difficulties. In a few related studies, researchers have applied machine learning to predict “backorder”. Machine learning allows more accurate estimation of results in various aspects of the supply chain management system such as production, profitability, trade, demand, and backorder (Malviya et al., 2021).

In this study, five supervised machine learning models including Neural Network, Logistic Regression, Random Forest, XGBoost, and LightGBM were applied. It allows researchers to compare and evaluate the performance of different algorithms and provides insights into which algorithms excel in terms of accuracy, precision, and performance. recovery and other indicators. These findings guide future model selection and assist in choosing the most suitable algorithm for specific requirements. As a result, researchers can effectively predict backorders, thereby reducing cost risks, establishing a good supplier-customer relationship, minimizing product backorder cost, and optimizing revenue. However, another problem that arises in the prediction process is that if the data set contains incorrect information or happens to be worse than the imbalanced data, the machine learning model will misclassify and give incorrect prediction results (Islam & Amin, 2020a). Therefore, the SMOTE oversampling technique has been proposed to deal with the imbalance problem in the data set to make the prediction more accurate (Shajalal et al., 2023).

Building a machine learning model to predict pre-orders can bring a lot of benefits to businesses in managing their organization and competing in the fierce market. Accurate backorder prediction can help with proper inventory management and allocation, efficient supply chain operations, and timely communication with customers to meet demand and improve their satisfaction. Some machine learning models in the study such as Random Forest and Gradient Boosting Machine (GBM) are applied in this case to provide accurate prediction results as well as increase prediction performance when there is a sudden fluctuation in unexpected customer needs or data set errors. Anticipating situations in which inventory may be at risk of being ordered before out-of-stock situations occur will provide inventory managers with an appropriate amount of time to react to unexpected situations. From there, come up with appropriate business strategies to create a competitive advantage in the market.

The rest of the research paper will consist of four sections. Section 2 will represent a theoretical framework on back order as well as the application of machine learning models in inventory prediction. In Section 3, exploratory analytics and data mining will be presented. Section 4 will evaluate and describe the experimental results as well as present the applications of the research in real and future development directions. Finally, Section 5 will be the summary of the entire research topic.

2. THEORETICAL FRAMEWORK

2.1. Backorder

Backorder refers to the situation when a customer places an order for a product that is temporarily out of stock or not available in the warehouse, and they place an order in advance to wait for the product to be imported and ready for delivery to them (Islam & Amin, 2020a). Predicting backorders plays an important role in the inventory management activities of retail businesses. Without accurate prediction of backorder

status, businesses will find it difficult to accurately calculate the number of products to produce and store to meet customer demand. Shortage or surplus of goods will cause resource waste and financial loss for the business. On the other hand, pressure to complete orders for later delivery can cause significant tension for different stages of the supply chain, leading to depleted supply chain processes or requiring additional labor, production costs, and related transportation costs. (Carter & Rogers, 2008) Additionally, if customer demand is not met, businesses will have difficulty maximizing profits and may lose market share. Therefore, predicting the likelihood of backorders for a product is essential for businesses to develop effective and optimal management and distribution strategies (Islam & Amin, 2020b).

2.2. Models

2.2.1. Logistic regression

Logistic regression is a probability-based, statistically valid classification approach that makes use of supervised learning (Wang et al., 2022). Using a sample of previous observations (training data), logistic regression is used to categorize a categorical variable. It seeks to regress to a mathematical function that describes the relationship between the response variable and the explanatory variables.

In predictive analytics, logistic regression models are used to create probabilistic models between a class/response variable and one or more explanatory/predictor variables, which might be a combination of continuous and categorical data (Sharda et al., 2021).

The result of the linear regression model is a probability that the response variable will have a value from 0 to 1. In this study, the result of the logistic regression is a binary variable (the product will be repurchased or not) (Zabor et al., 2022). So a probability less than a defined threshold (e.g. 0.5) will be classified as equal to 0, while a probability greater than 0.5 will classify as equal to 1 (Xiahou & Harada, 2022).

2.2.2. Random forest

Random forest is a supervised machine learning algorithm of association. The “forest” it builds is an ensemble of decision trees, usually trained with the bagging method. More specifically, Random Forest uses bagging to generate sub-datasets by randomly taking the number of observations and explanatory variables. For each sample set with an equal number of observations and variables, a decision tree model is created for training. Finally, the results of these trees will be combined to get the final sort result.

Since each decision tree in the Random Forest algorithm does not use all the training data, nor does it use all the attributes of the data to build the tree, each tree may make a worse prediction than each model. (Sharda et al., 2021) The decision tree is not overfitting but can be underfitting, in other words, the model has high bias and low variance. However, the final result of the Random Forest algorithm is aggregated from many decision trees, so the information from the trees will complement each other, leading to a model with low bias and low variance, or a model with low bias and low variance, giving good predictive results. The way Random Forest works has enabled it to possess high classification accuracy, tolerates outliers and noise well and never got overfitting. In addition, Random Forest has the ability to find out which attributes are more important than others, even if some attributes are not useful in the decision tree.

2.2.3. Neural Network (DNN - Deep Neural Network)

Artificial Neural Network (ANN) is a machine learning model that operates based on algorithms that mimic the functioning of nerve cells in the human brain. ANN can be seen as a powerful tool for data analysis, especially for modeling relationships between variables to obtain the best predictive results (Zhang et al., 2018). Deep Neural Network (DNN) is a type of deep learning method, a layer of machine learning algorithms similar to artificial neural networks. The neural network architecture in Deep Learning

is applied in tasks that require high computational power, processing large and complex data. Therefore, in this study, with a relatively large and complex dataset, DNN will be one of the suitable choices to perform this task due to its superior advantages in solving problems with high accuracy, high automation, self-adjustment and optimization, parallel computing capability, good performance, and the ability to process large amounts of data (Ghimire et al., 2022).

2.2.4. XGBoost and LightGBM

In most cases, machine learning models, especially those used in classification or regression problems, cannot achieve perfect accuracy when operating independently due to the complex correlation between the data and the model, known as the bias and variance trade-off. These models may be weak in bias or variance. To solve this problem, we need to perform methods to balance bias and variance to create an optimal model. These methods include increasing the amount of data, using ensemble models, selecting appropriate models, and tuning hyperparameters. However, selecting the appropriate method must be based on the characteristics of the dataset and the specific classification problem (Belkin et al., 2019). To mitigate the issues of bias and variance, Ensemble Learning methods have been applied. Boosting, one of the three variations of ensemble learning can significantly reduce bias in addition to decreasing variance, making it often more effective for unstable machine learning models such as Decision Trees (Zhou, 2021).

XGBoost (Extreme Gradient Boosting) is an algorithm built on the basis of the Gradient Boosting algorithm, improved with superior advantages in data processing speed, algorithm optimization, significantly limiting current Overfitting object by applying a mechanism that GBM does not have - “Regularization” (W. Liu et al., 2022). In addition, XGBoost also includes a mechanism to automatically handle “missing value”, so, during data processing, this step can be skipped when preparing data for XGBoost. (Gajjar et al., 2022).

LightGBM (Light Gradient-Boost Machine) is also a machine learning algorithm based on the Gradient Boosting algorithm. However, the biggest difference between LightGBM and XGBoost lies in the processing time for large datasets. Therefore, LightGBM is mainly used to save processing time in environments with large-dimensional data. (Zhang & Gong, 2020) The difference stems from the different operating mechanisms of XGBoost and LightGBM. While XGBoost uses the level-wise mechanism to split all nodes within each layer and then further split the nodes in the resulting layer into smaller nodes, which consumes a significant amount of resources and processing time, LightGBM uses the leaf-wise mechanism to split nodes that have the maximum potential for increased separation at the selected point, resulting in faster and more efficient data processing. However, for small datasets, building nodes based on the leaf-wise mechanism in LightGBM often leads to early overfitting. Therefore, LightGBM includes an additional hyperparameter, max depth, to try to mitigate this, but it is still recommended for use with sufficiently large datasets (Abou Omar, 2018).

3. RESEARCH METHOD

The overall architecture of the proposed model is presented in Fig 1, which illustrates the phases of the model’s development.

The purpose of the research model is the result of classifying products with backorder or not. The model is conducted by building machine learning models and comparing them against each other based on the following metrics: F1-score, AUC, and time metrics to find the most optimal model. The methods of data balancing (SMOTE) and hyperparameter optimization are also used in this study.

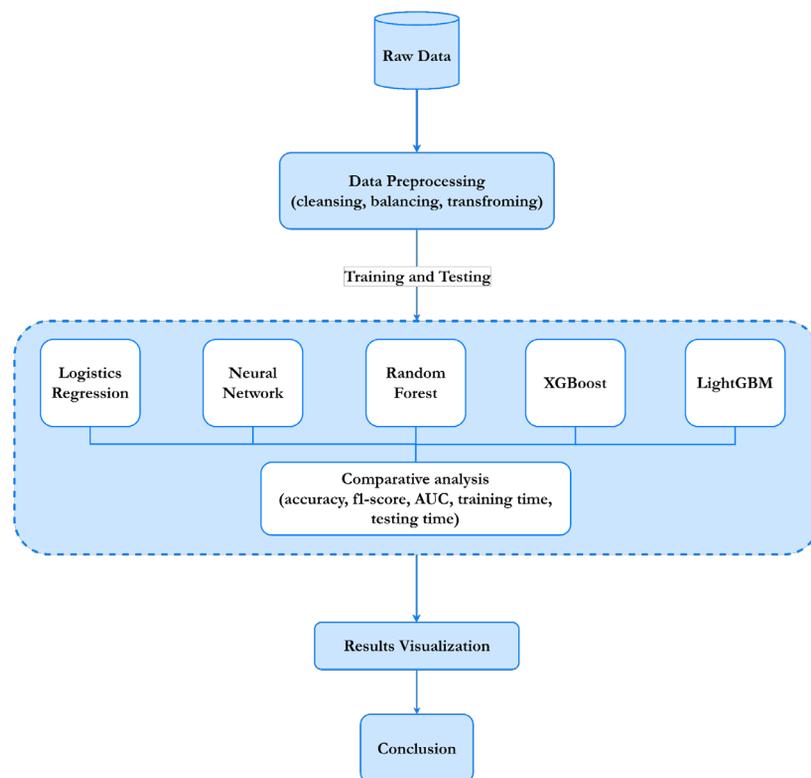


Figure 1. Research model

Source: Authors

3.1. Data preparation and explore data analysis

3.1.1. Understanding the dataset

The study uses a dataset available on Kaggle’s competition “Can You Predict Product Backorders?”. The dataset is separated into two sets for training and testing purposes, with each set containing 23 attributes. The training set has 1 687 862 observations, while the testing set has 242 077 observations. The dataset includes historical data from several weeks which the study will predict (May 2020-June 2020). It consists of 23 columns, including 22 features and one target column (went_on_backorder). After searching, the study found 8 categorical variables and 15 numerical variables in the dataset.

3.1.2. Explore data analysis

Exploratory Data Analysis (EDA) is an essential step in data analysis and modeling as it provides an overview of the data, identifies key features, correlations between variables, and assumptions about the data, and helps prepare for analysis or model building. The article analyzes four variables from the “Predict Product Backorders” dataset, including “went_on_backorder”, “national_inv”, “lead_time”, and “in_transit_qty”.

The variable “went_on_backorder” indicates whether a product has fallen into a backorder state or not. Upon analyzing the dataset, it can be inferred that this is an imbalanced classification problem as the frequency of the value 1 (falling into the backorder state) is very low. When building a model to predict backorder status, it is essential to pay attention to data balance using techniques such as oversampling, undersampling, or using classification algorithms specifically designed to deal with data imbalance to increase model accuracy.

The variable “national_inv” indicates the number of products currently in the company’s inventory and is a continuous variable. Upon analyzing this variable, it can be seen that the distribution is skewed to the right, indicating that most products have a relatively low quantity in stock. This can make it difficult to meet customer demand if some products sell out in a short period of time. The company may need to increase production or import products to meet customer demand. It is also critical to track and manage a company’s inventory to ensure product availability and minimize the risk of product loss.

The variable “lead_time” represents the waiting time from when a customer places an order to when the goods are delivered to them and is measured in days. The mean value of this variable is 7.89, indicating that the majority of products are manufactured or shipped within average and not too long a time. However, there are some products that take a very long time to ship, which needs to be considered when including them in the model. Bivariate analysis shows that favorable shipping time is within 12 days, and the study can use boxplot analysis to identify outliers.

The variable “in_transit_qty” represents the number of products being shipped to the warehouse and is a continuous variable. The histogram analysis shows that the distribution of this variable is right-skewed, indicating that more products are concentrated at lower values and gradually decreasing towards higher values. This can have implications in determining future shipping system load or stock availability. We can use a boxplot to analyze the relationship between “in_transit_qty” and “went_on_backorder”.

The research shows that the majority of data points for forecast features are zero, indicating outliers. The same is true for sales variables, with at least 25% of the data points equal to zero. The minimum bank has a huge gap between 75% of the data and the remaining 25%, indicating the presence of outliers. The proportion of products with potential problems is quite high in the out-of-stock group, indicating that the possibility of a potential problem may be contributing to the product being out of stock. The past due pieces feature has a large number of instances as zero, and 98% of the data points are zero. Both perf_6_month_avg and perf_12_month_avg have a lot of NaN data and are highly correlated with each other.

In the correlation matrix in Figure 2, it was found that transit quantity is related to forecast, sales, and min bank, and that min bank is highly correlated with sales and forecast. Sales are also highly correlated with each other, and pieces past due are weakly correlated with sales and forecast.

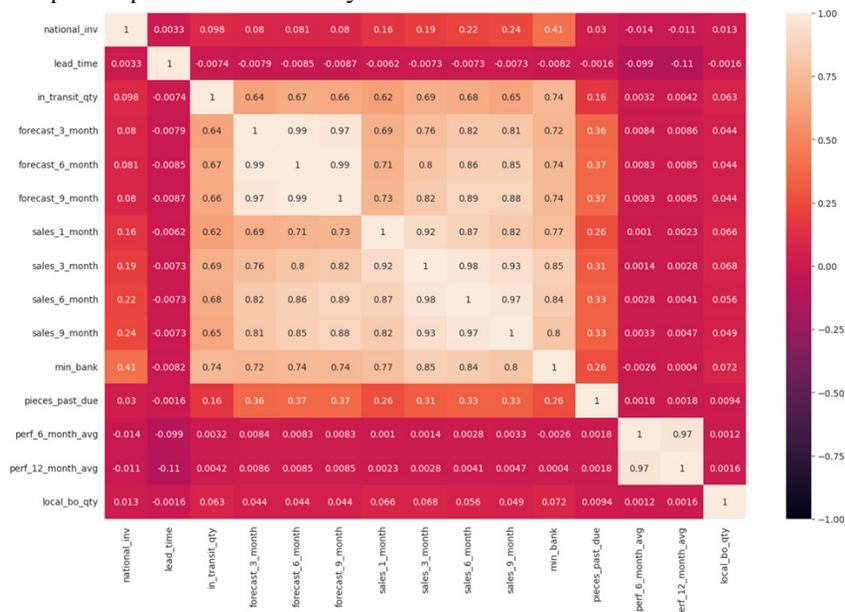


Figure 2. Correlation matrix between variables

Source: Authors

The study uses ANOVA and Chi-Square tests to examine the relationship between categorical and continuous features with the target variable “went_on_backorder.” The ANOVA test is used to check the correlation between categorical and continuous variables, while the Chi-Square test is conducted to check the correlation between two categorical variables. The results show that national_inv, lead_time, forecast_3_month, forecast_6_month, forecast_9_month, sales_1_month, sales_3_month, pieces_past_due, perf_6_month_avg, perf_12_month_avg, and local_bo_qty are correlated with the target variable. On the other hand, in_transit_qty, sales_6_month, sales_9_month, and rev_stop are not correlated with the target variable. It is also found that deck_risk, oe_constraint, ppap_risk, and stop_auto_buy are correlated with the target variable, while rev_stop is not. The analysis suggests that the variable “rev_stop” may not affect the outcome variable prediction and can be removed from the model.

3.1.3. Data preprocessing

a) Optimize the dataset

The first step involved removing unnecessary columns, with the “sku” column either used as the index column or dropped. Categorical variables were then converted to numerical variables to improve the efficiency of machine learning models and facilitate data analysis. The variables were converted from string values to numeric values using the pandas “map” method. Certain columns, such as “perf_6_month_avg” and “perf_12_month_avg,” were observed to have missing values, and the -99 values in the performance columns were replaced with NaN. Features not useful for prediction based on exploratory data analysis were removed, resulting in a data frame of 14 columns that may influence the model results.

b) Remove outliers

In Table 1, the study discusses the presence of outliers in the 100th percentile of the “in_transit_qty” and “national_inv” columns, leading to the decision to remove values within that range. It also highlights the high number of missing values in the “lead_time”, “perf_6_month_avg”, and “perf_12_month_avg” variables. Instead of deleting these rows or replacing them with mean or start/end values, the missing values were replaced with median values, which are less sensitive to outliers and preserve the shape of the distribution. This approach helps to reduce bias and maintain data variability.

Table 1. Percentile values for the percentage values ranging from 90 to 100 of the variable “in_transit_qty”

Percentile	90	91	92	93	94	95	96	97	98	99	100
Value	15	15	26	35	48	66	96	145	250	565	489 408

Source: Authors

Similar to the treatment applied to the “in_transit_qty” column, the “national_inv” column exhibits the same situation. Due to the wide range of values between the 99.9th and 100th percentiles for both variables, it was deemed appropriate to remove the values within that range.

As discussed in the EDA section, the variables “lead_time”, “perf_6_month_avg”, and “perf_12_month_avg” have a high number of missing values, accounting for nearly 6% of the dataset. Simply deleting the rows with missing values would result in significant data loss and replacing them with mean or start/end values may introduce bias and reduce data variability. To mitigate these issues, we opted to replace the missing values with median values. This approach is less sensitive to outliers and is a more robust estimator of central tendency, helping to preserve the shape of the distribution and reduce the impact of missing values on the analysis.

c) Data balancing and normalization

Data normalization is a crucial step in data analysis to ensure that variables with different scales and ranges are standardized for effective comparison. Normalization can help reduce the impact of outliers and prevent inaccuracies in modeling and analysis. In this research, the min-max scaling method is used to normalize variables to a range of 0 to 1. This method transforms the values of variables into new values within this range, with the smallest and largest values transformed into 0 and 1, respectively.

The problem of imbalanced datasets in machine learning can significantly impact the performance of classification models (Vluymans & Vluymans, 2019). One potential solution is to transform an uneven set of classes into a balanced distribution. This idea has led to the development of various sampling methods that fall into two major groups: under-sampling and oversampling (Hajek & Abedin, 2020). Under-sampling involves eliminating instances of the majority class to achieve balance while over-sampling replicates instances of the minority class to meet the majority one. In this study, SMOTE (Synthetic Minority Over-sampling Technique) was employed to balance the data. This technique creates synthetic samples for the minority class by finding samples in the minority class and creating new samples based on their nearest neighbors, thus increasing the diversity of the dataset and ensuring that the synthetic samples are different from the existing samples in the dataset. In Table 2, the column data “went_on_backorder” is shown after being balanced.

Table 2. “went_on_backorder” after being balanced with 2 classes: class 0 and class 1

Class 0	1 868 576
Class 1	1 868 576

Source: Authors

To facilitate the training process, the dataset is partitioned into a training set, a test set, and a validation set. The sklearn.model_selection library’s train_test_split() function is used to split the data into 80% for training and 20% for testing. Next, the training set is further split using the same function into a training set and a validation set with an 80:20 ratio.

3.2. Model training

Based on the preprocessed data set, analyze the data using 05 machine learning models, including Random Forest, Neural Network, XGBoost, LightGBM, and Logistic Regression with the aim of predicting which goods are likely to rise in demand and the number of goods to distribute accordingly.

In the evaluation the study is going to discuss, it can be concluded that the ensemble models produce highly satisfactory results, and hyperparameter tuning is not necessary since it would increase the training time of the models compared to traditional machine learning methods. In the case of the LightGBM model, adjusting the parameters improved the evaluation indicators by 1-2%, but the training time of the model was significantly longer. Although parameter tuning could potentially optimize the model results, it is inefficient in terms of training time for the Random Forest, XGBoost, and LightGBM models, which already produced high-performing results without hyperparameter tuning. Therefore, the study only performed hyperparameters for two models which are Neural Network and Logistic Regression.

Table 3. Hyperparameter

Models	Hyperparameter	Train AUC	Test AUC	F1 Score (Macro)
Logistic regression	(C: 100, penalty: l2)	0.897	0.897	0.801
Neural Network	(epochs = 10, batch_size = 32)	0.945	0.945	0.89

Source: Authors

From table 3, the Logistic Regression model was trained with a hyperparameter of C=100 and penalty=12, leading to a train AUC of 0.897 and test AUC of 0.897. The F1 Score (Macro) of the model was 0.801. In contrast, the Neural Network model was trained for 10 epochs with a batch size of 32, resulting in a higher train AUC of 0.945 and the same test AUC of 0.945 compared to Logistic Regression. Moreover, the F1 Score (Macro) of the Neural Network model was superior at 0.89. As a result, the Neural Network model demonstrated better performance in terms of both AUC and F1 Score than the Logistic Regression model. However, it is essential to acknowledge that the hyperparameters for Logistic Regression were not exhaustively searched, and the performance could potentially be enhanced with more tuning.

3.3. Evaluation model

The research uses F1-Score, AUC, training time, and testing time as evaluation metrics to compare models:

- F1-Score: Calculates the harmonic mean between the Precision and Recall of each label’s predicted and actual results.
- AUC: Assessing the classification performance of a model can be done by calculating the area under the Receiver Operating Characteristic (ROC) curve, which is a graph representing the relationship between the True Positive (TP) rate and the False Positive (FP) rate of a classification model on a test dataset.
- Training and testing time: Determines the performance of the model.

4. RESULTS AND DISCUSSION

4.1. Results

The research team proposed 5 specific models: Random Forest, XGBoost, LightGBM, Neural Network, and Logistic Regression. After training and evaluating the results, the following outcomes were performed in Table 4:

Table 4. The predictive performance of models

Model	Confusion Matrix		Testing time	Training time	F1-Score	Accuracy	AUC	
	P0	P1						
RF	A0	1 341 380	4129	26,5006	2000,6230	0,9960	0,960	0,9996
	A1	6673	1 338 566					
XGB	A0	1 310 834	34 675	1,5287	1136,6510	0,9781	0,9780	0,9978
	A1	24 525	1 320 714					
LGBM	A0	1 283 529	61 980	4,0139	47,1850	0,9559	0,9558	0,9930
	A1	56 876	1 288 363					
LR	A0	909 215	436 294	0,0463	53,6790	0,8261	0,8039	0,8970
	A1	91 451	1 253 788					
NN	A0	313 705	59 861	82,5698	21260370	0,8847	0,8800	0,9438
	A1	29 837	344 028					

Source: Authors

Figure 3 shows the AUC score of Random Forest model which has a train dataset of 0.9999 and test dataset of 0.9996. This indicates that model is performing quite well.

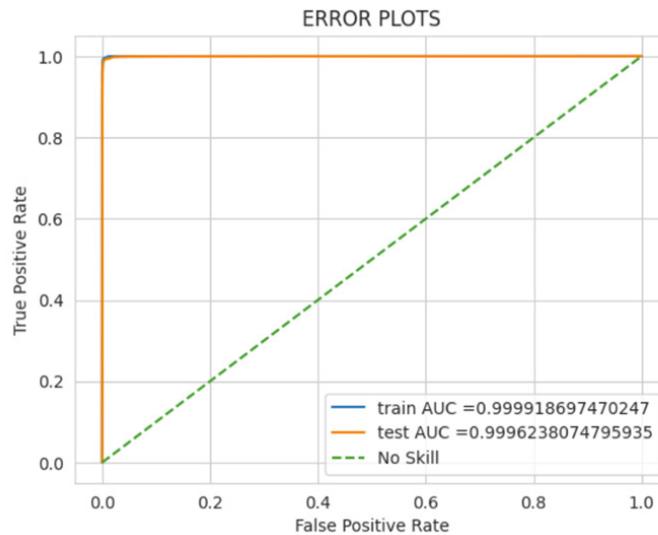


Figure 3. AUC of Random Forest model

Source: Authors

When evaluating each model, the Random Forest model achieves the highest result with F1 score and accuracy of 99.6% and AUC of 99.96%. In terms of testing time, the Random Forest model has a long prediction time of 26,5006 seconds which is the second rank after Neural Network (82,5698s). In terms of training time, the Random Forest model (2000,6230s) ranks fourth before the Neural Network model (2126,0370s). Although there is a difference in training and testing time, all evaluation scores of the Random Forest model are still higher.

The LightGBM has a training score of 0.9931, which is quite close to the Test dataset AUC score of 0.9930. Although this score is not as high as Random Forest, it is still a quite good score. This indicates that the train and test datasets are a good fit.

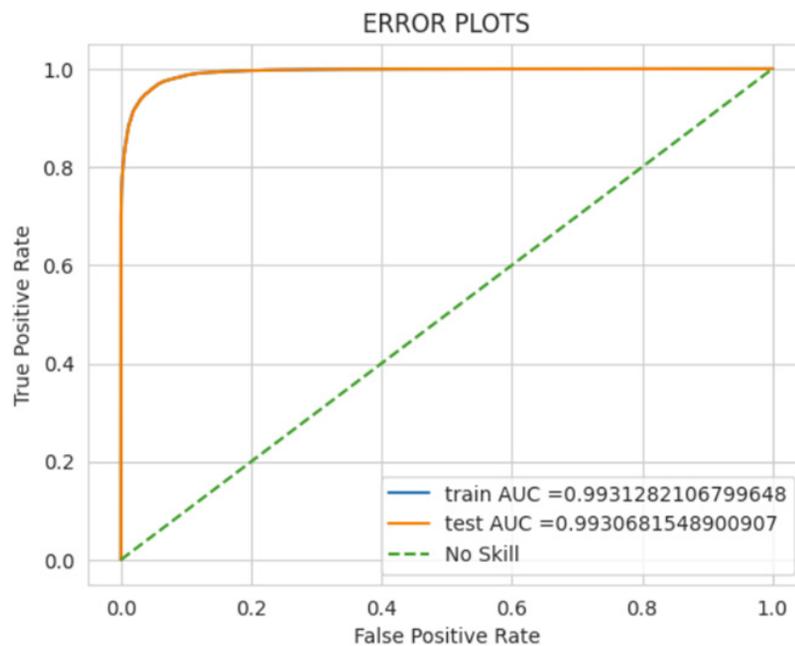


Figure 4. AUC of LightGBM model

Source: Authors

This finding suggests that there is a need to consider other models with slightly lower performance metrics but with shorter training and testing times. This will ensure that a balance is struck between the valuable performance metrics and the practicality of using the model. In this regard, LightGBM meets these criteria, with training (47,1850s) and testing (4,0139s) times that are shorter than Random Forest.

The forecast 3 months and current inventory are the most important variables for prediction, followed by many of the sales history and forecast variables, and min_bank and lead_time indicators are on the low end of the importance graph, all shown in Figure 3. However, The Gini method of computing importance is biased towards continuous variables and variables with many categories, so it is not surprising that the binary categorical variables have low importance compared to the quantitative variables, many of which are on a very large scale.

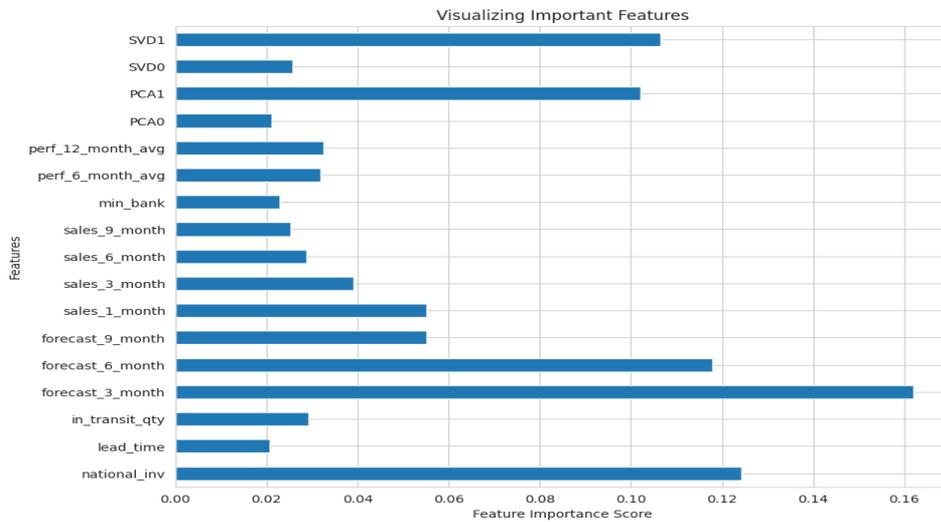


Figure 5. Feature Importance score of Random Forest model

Source: Authors

Next, our team analyzes the 2 features that have the highest impact on backorders. These are “forecast_3_month”, and “national_inv”. We see that only when the number of orders predicted 3 months in advance fluctuates in the range below 0.18e6 can a backorder situation occur. This means that if the item’s quantity is predicted above 0.18e6 there will be no backorder.

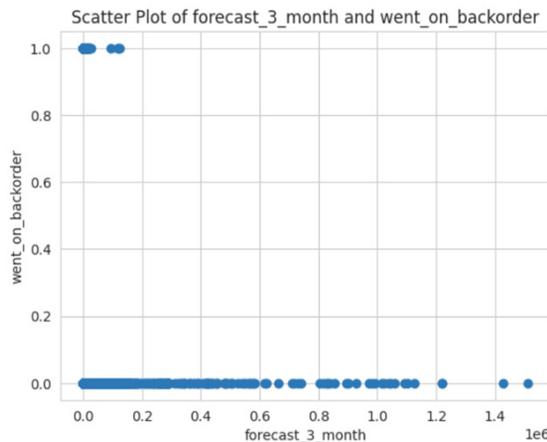


Figure 6. Scatter Plot of forecast_3_month and went_on_backorder

Source: Authors

We see most backorders occur when the “national_inv” inventory level of the product is zero. This means that if the product has a stock level greater than zero, there is less chance of back-ordering.

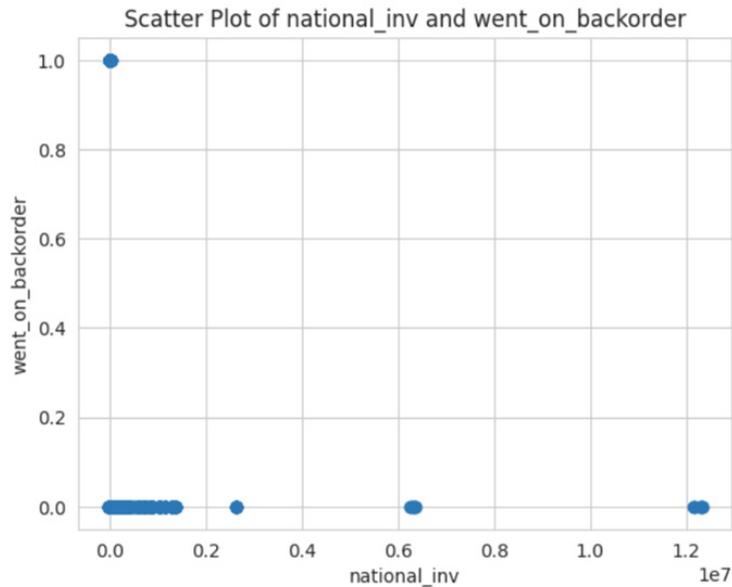


Figure 7. Scatter Plot of national_inv and went_on_backorder

Source: Authors

4.2. Discussion

The near-perfect accuracy of the research results has demonstrated the high reliability of the study. The experimental analysis shows that predicting the likelihood of a product being back ordered depends on various factors, such as the lead time for the business to supply the product, the amount of inventory on hand, the number of products sold in the past, etc. Therefore, when considering the demand for repeat orders, businesses need to identify which factors have influenced the increase or decrease in the number of repeat orders for each product group, so that they can quickly and timely come up with solutions to address and resolve the issues.

With a machine learning model predicting products that may experience backorders, businesses can efficiently manage their inventory by predicting when the stock of an item will reduce and placing timely orders with suppliers to meet customer demand. This helps avoid stockouts, minimizes the amount of excess inventory, and saves on warehouse management costs. Furthermore, the backorder prediction tool also helps businesses to quickly and accurately fulfill customer demand. Companies can provide products in full and on time as per customers’ preferences, increasing customer satisfaction and loyalty.

The effectiveness of a model is influenced by several factors, among which the quality and size of the training dataset are crucial. A model may yield satisfactory outcomes when applied to one dataset, but it might perform inadequately when applied to another. Consequently, it may be worthwhile in the future to train the machine learning models used in the study with different datasets to gain a more comprehensive and precise understanding of their predictability and efficacy. Furthermore, keeping the anomalies that were removed during data mining may be worth considering to produce more realistic predictions.

Predicting the likelihood of a product being reordered brings many benefits to a business’s inventory management operations. However, current research is only able to predict the likelihood of a product being reordered without exploiting the specific quantity of the item. This is a limitation, as the business only knows whether the product is likely to be reordered or not but does not have a system to suggest and

propose appropriate quantities of goods to be imported. Therefore, at present, research can only support businesses in predicting which items should be reserved early, and the decision on the number of goods to be imported still requires human intervention and manual decision-making, which can sometimes be subjective and lacks a suitable basis.

One way to improve this limitation is by training a machine learning model that can estimate the appropriate quantity of goods to order for each group, thus preventing the issue of overstocking and backorders. This can be done by analyzing the relationship between the sales volume of each product during previous periods and the number of times they were ordered in the past, and then allocating the necessary amount of goods to be imported for each specific period and segment. Additionally, forecasting the inventory turnover, or the time required to reorder a fixed quantity of goods, is also a potential area for further research. Being able to predict when to import stock will allow businesses to better manage their inventory, avoid stockouts, reduce backorders, and improve customer satisfaction.

5. CONCLUSION

This research has shown the significant potential of machine learning in predicting back-ordered products for businesses. By combining expertise in inventory management, statistical knowledge, and data processing techniques, the study demonstrates the effectiveness of various machine learning models in classifying back-ordered products with high accuracy. The study also highlighted the importance of addressing data imbalance issues and feature selection to optimize model performance. The research paper highlights that supervised machine learning models such as Neural Network, Logistic Regression, Random Forest, XGBoost, and LightGBM with bagging, and boost techniques were used and compared to predict the probability backorder function of an order, which helps to increase the accuracy of the dataset for model training. The results show that the Neural Network and Logistic Regression models achieve good results with the evaluation indexes from 80% to 95%, while the 3 models using the ensemble learning method are Random Forest, XGBoost and LightGBM for Evaluation results ranged from 95% to 99%.

However, the article also mentioned some limitations in the study, including the training time of some models, and did not provide an analysis of the correlation between the independent variables. Therefore, research needs to continue to focus on training machine learning models on other data sets with the aim of comparing and enhancing the accuracy of prediction results. Research should also consider excluding unimportant variables and better understanding the correlations between independent variables to optimize prediction results.

In the future, further research can be conducted to validate the findings of this by testing the models with different data sets. Additionally, selecting key features and estimating inventory turnover can help improve the accuracy of the models and make better business decisions. Furthermore, predicting reordering quantities can provide businesses with more information for resource allocation and avoid stockouts. In conclusion, this research emphasizes the importance of machine learning in inventory management and highlights the potential benefits it can bring to businesses in making more informed decisions.

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USING RPA AND AI TO DESIGN AN AUTOMATIC EMAIL CLASSIFYING AND FORWARDING SYSTEM IN BUSINESS

Author: Nguyen Quang Hoc¹, La The Anh, Vu Luu Hoang Lan², Gia Ngoc Thao Ly², Phan Ngoc Bao Tam²

Mentor: Nguyen Thon Da, Ph.D³

ABSTRACT: Enterprises may receive thousands of emails every day. It must be processed briefly to respond to customers and partners. However, this process is time-consuming in classifying emails to be handled by the right departments. Therefore, a model to automate the email classification process in the enterprise is proposed in this study. This model will rely on Artificial Intelligence (AI) techniques with supervised Machine Learning algorithm and Nature Language Process (NLP) to classify emails - right for the specialized work of each department in the business - and build Robotic Processing Automation (RPA) bot to receive and forward them to the department. The experimental data set is collected from Song Linh Trading and Service Co., Ltd. It includes 4270 emails from 3 departments: Sales, Customer care, and External Relations. We have tested and compared four text classification machine learning techniques (SGD Classifier, Linear SVC, Gradient Boosting Classifier, and Extra Trees Classifier) combined with two classification methods (Multi-class, Multi-tasking) to determine the most suitable classification model. Through model testing, the results show that Linear SVC with the Multi-class method gives the best accuracy and the automation system saves ten times more time than manual classification. RPA email forwarding also results in high accuracy. This model will benefit the time, accuracy, and security of email processing.

Keywords: Email, Artificial Intelligence (AI), Robotic Process Automation (RPA), Email Classification, UiPath.

1. INTRODUCTION

In recent years, with the development of technology, electronics, networking, and digital transformation trend, emails have played an increasingly important role in life, not only widely used as an official communication channel of individuals and organizations, but their usage demand is also high (Mujtaba et al, 2017). According to the report of Statista, 306,4 billion emails were sent in 2020. The prediction of emails sent in 2025 will grow up to 376,4 billion (Source: Statista). Enterprises are constantly faced with a large number of emails every day, along with the task of classifying them into the right specialized departments. The challenge for businesses is how to classify and process a large amount of information with the least amount of time and cost. Enterprises deployed conduct the manual email processing to solve that matter by using a representative email or specialized emails. However, they still have many shortcomings such as consuming a lot of time, human resources, and cost. Moreover, the manual classifier is difficult to guarantee the time that emails are classified. There may even be the possibility of an incorrect classification, missing emails, and delayed processing due to the subjectivity of classifiers.

Based on that context, the research team posed questions to be resolved such as: “How does the traditional email processing method affect business performance?”; “How to save time and resources while still ensuring efficiency when handling email?” and “What effect does that method bring?”. The main goal of the research is to find a method to help handle the email sorting process quickly, accurately, and efficiently and save a lot of resources. Therefore, we proposed an automated email classification process using Artificial Intelligence (AI) and Robotic Processing Automation (RPA) techniques.

The automatic process includes 2 parts: (1) a machine-learning model that can classify email by

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: hocnq21406c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City

³ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: dant@uel.edu.vn

expertise of each department, (2) an automatic process forward to departments and store them. Emails written by humans in natural language are unstructured language. Therefore, for computers to understand the semantics of emails, Natural Language Processing (NLP) techniques are used to transform them into structured data - a low-level language or computer language. Thereby, the computer can analyze and classify them according to the appropriate context. After preprocessing data, the system relies on Machine Learning to learn and recognize the characteristics of each email and each category to determine which category the email belongs to. The Supervised Machine Learning model applied in this study will be based on the classified email data set from Song Linh Trading and Service Co., Ltd to learn the characteristics. Then, for each new email sent to the business, the RPA model will receive, read and pass it to the trained Machine Learning model for classification and labeling. After completing the classification, the RPA bot forwards the email to the department that has been labeled and saves them. However, each email has a confidence index calculated after the classification process, if this index does not reach the required confidence threshold, the RPA bot will notice for humans to manually classify.

There is a lot of research related to email classification. However, according to Mujtaba et al.'s research overview report on email classification (2017), most of the research is spam classification. The topic of multi-folder categorization of email has not been relatively little researched and unnoticed in the world, especially is also a new topic in Vietnam. Besides, most of the studies stop at "classification" without any other special treatment such as forwarding or feedback (Mujtaba et al., 2017). Some other studies have proposed an email processing model, but there are still some shortcomings such as not applying Machine Learning to increase accuracy or no practical application in business. RPA technology has little applied research and has not been popularized in Vietnam. Furthermore, most studies rely on highly calibrated sample data sets such as Enron, PU, TREC, etc. This can affect the accuracy and applicability of those models when apply to reality.

The new point of the study is to use and compare many classification techniques and algorithms in ML to build a classification model with high accuracy. This includes testing and comparing 4 algorithms (Extra Trees Classifier, Gradient Boosting Classifier, Linear SVC, and SGD Classifier) and 2 classification techniques (multi-class and multitasking). The research focuses on improving the email processing process in the enterprise with high practicality, perfecting a robotic system that can be immediately applied to the business. Different from other studies, the group's dataset was collected at a real company (Song Linh) which helps to ensure the applicability of the study compared to previous studies. Research on RPA in Vietnam is still limited. This is a new study in this field and proposes a practical application of RPA in Vietnam.

In summary, this study has brought many theoretical and practical contributions as follows: Firstly, in terms of science-technology, the results of the study partly contributed to satisfying the trend of digital transformation globally, especially in businesses, as well as contributed to terms of methods and techniques into the field of text classification, a part of natural language processing (NLP). Dive deeper into the field of machine learning in data mining (Data Mining) and natural language processing (NLP), and promote research into a new technology platform (RPA) about intelligent automation. Secondly, in practical terms, the research has designed a system of applying Machine Learning technology for NLP, spam email classification, and email subject classification integrated into robot processing automatic (RPA) to read and forward Emails to the respective functional departments within the enterprise and save them. This is an idea that helps solve the complex problem of sorting a large number of emails that businesses receive in a day. Third, in terms of performance, the system will help optimize workflow, reduce errors or delays when sending to departments, and increase morale and efficiency in the work process of employees pellets. From the research results, work efficiency is increased 10 times.

2. THEORETICAL FRAMEWORK

2.1. E-mail and Natural Language Processing

According to (Mujtaba et al., 2017). Processing these emails demands company so much time and cost. In addition, (Toàn et al., 2011) has pointed out that the rapid development of email is also a double-edged sword for users. Taking advantage of the benefits of email, some individuals and organizations have used email for improper purposes such as sending too many promotional messages, reactionary letters, and even malicious code, which we call that email spam.

E-mail is the natural language - the type of unstructured data, which does not conform to any data models. Therefore, it is necessary to use natural language processing (NLP) to transform them into a structured form so that computers can understand and analyze them. Natural language processing (NLP) may be divided into 2 non-independent fields completely, including speech and text processing. Companies have also used this technology for automated tasks, such as processing, analyzing, and storing large documents; customer feedback analysis; and running chat bots for automated customer service.

2.2. Machine Learning

2.2.1. Text classifier machine learning

Machine Learning is a field of artificial intelligence that deals with the research and construction of techniques that allow systems to “learn” automatically from data to solve specific problems (Mahesh, 2020).

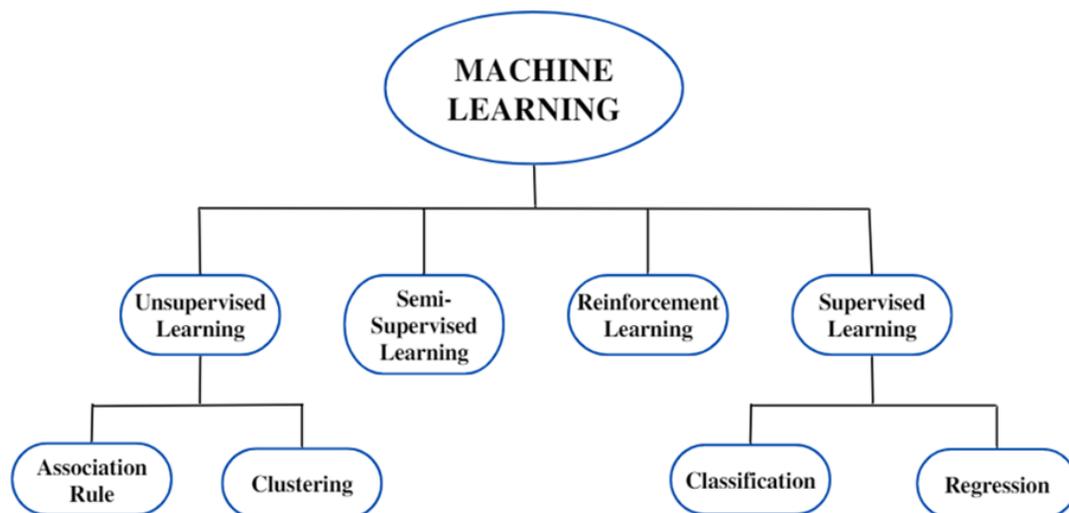


Figure 1. Machine learning taxonomy

Source: (Bi et al., 2019)

Supervised Learning is a form of machine learning that predicts the output for a new data set based on a given training data set in which each data sample has a known output or value destination. Classification, which is the supervised learning algorithm, is the case where the output values of the input data are divided into a finite number of classes (discrete value domain), for example determining whether the animal image is a dog or a cat. The process of building a machine learning system usually has 3 main steps, such as collecting and processing data; algorithm selection and training for the model; actual testing and evaluation. Some machine learning solutions incorporate NLP such as Sentiment (Mejova, 2009), Automatic Text Classification (Dalal & Zaveri, 2011), ... These technologies will help organizations and businesses analyze data, mine information, automate processes and gain competitive advantage.

2.2.2. Text classification methods

a) Multi-class classification

Multiclass classification is the classification of more than two classes. Each sample can only be labeled as a class. The higher the number of classes, the more difficult it is to have high accuracy. For example, categorize emails include internal, customer, and spam.

This study uses 2 methods for multi-class classification are One-vs-Rest (OvR) and One-Vs-One (OvO). They use binary classification algorithms for multiclass classification but differs in the number of training samples. OvR compares one class with many classes, while OvO compares only one class.

b) Multiclass – multioutput classification

Multiclass - multioutput classifier (also known as multitasking classifier) is a classification task that labels each sample with a set of non-binary attributes. This is both a generalization of the multi-label classification task, which considers only binary attributes, and a generalization of the multi-class classification task, in which only one attribute is considered. For example, email is classified into two categories: spam email and non-spam email. Non-spam emails carry a lot of content such as business, foreign affairs, or marketing. So, there will be 2 labels that need to be correctly identified.

2.2.3. Text Classification algorithms

a) Stochastic Gradient Descent Classifier

Literally, descending means moving downhill to reach the lowest point on the curve. This is done repeatedly until the minimum point is reached. The three variants of gradient descent include batch (Batch), random (Stochastic), and mini-batch (Mini-Batch) gradient descent approaches.

SGD Classifier is a simple but effective optimization algorithm that provides the best results for the data. Instead of using the entire training set, this method will randomly take an element in the training set and recalculate the slope vector based on a data point, then iterate until the end. SGD Classifier is faster than conventional gradient descent because the updates are performed immediately after training each sample.

b) Linear Support Vector Classification

Support Vector Machine (SVM) is a monitoring algorithm that can be used for either classification or regression but is mainly used for classification. The goal of SVM is to find a hyperplane in multidimensional space to divide the data into parts corresponding to their number of layers, one of the proposed methods is a Linear Support Vector Classifier (Linear SVC).

Linear SVC applies a linear multiplication function to perform the classification and it works well with a large number of samples. The training of linear SVM is much faster than non-linear SVM due to their difference in computational complexity (Chauhan et al., 2019).

c) Gradient Boosting Classifier

Gradient Boosting is a method used to develop classification and regression models to optimize model learning, which is mostly non-linear in nature and known. More commonly known as decision trees or regression trees.

Gradient Boosting Classifier (GBC) is a group of machine learning algorithms that combine multiple weak learning models together to create a strong predictive model. GBC tries to reduce errors by resampling and changing the weights of each weak “learner” to increase classification accuracy. (Bowd et al., 2020) pointed out that “GBC had the best overall performance”.

d) Extra Trees Classifier

Extra Trees Classifier is a synchronous machine learning method that trains multiple decision trees and aggregates the results from a group of decision trees to make predictions (Abhishek, 2020). Extra Trees

Classifier uses the entire data set to train the decision tree. As such, to ensure enough difference between individual decision trees, it randomly selects values for analysis. This helps the model reduce bias and save time, checking the computational cost, Extra Trees is much faster than Random Forest.

2.3. Robotic Processing Automation

Robotic Process Automation (RPA) is a software technology that can simulate how humans interact with software to perform high-volume, repeatable tasks. The use of RPA helps reduce costs for human resources, save time, as well as limit the risks of errors in the business process through workflow automation. Users can build bots using RPA automation by analyzing human behavior on IT applications. Show the bots what to do, and leave them to it. For businesses, RPA can bring immediate value to core business processes including the payroll, hiring of new employees, receipts and payables, invoice processing, inventory management, report generation, software installation, data, vendor migration onboarding, and so on (Madakam, Holmukhe, & Jaiswal, 2019).

3. RESEARCH METHOD

The diagram in Figure 6 provides an outline of the proposed model’s architecture and highlights the different phases involved in its development.

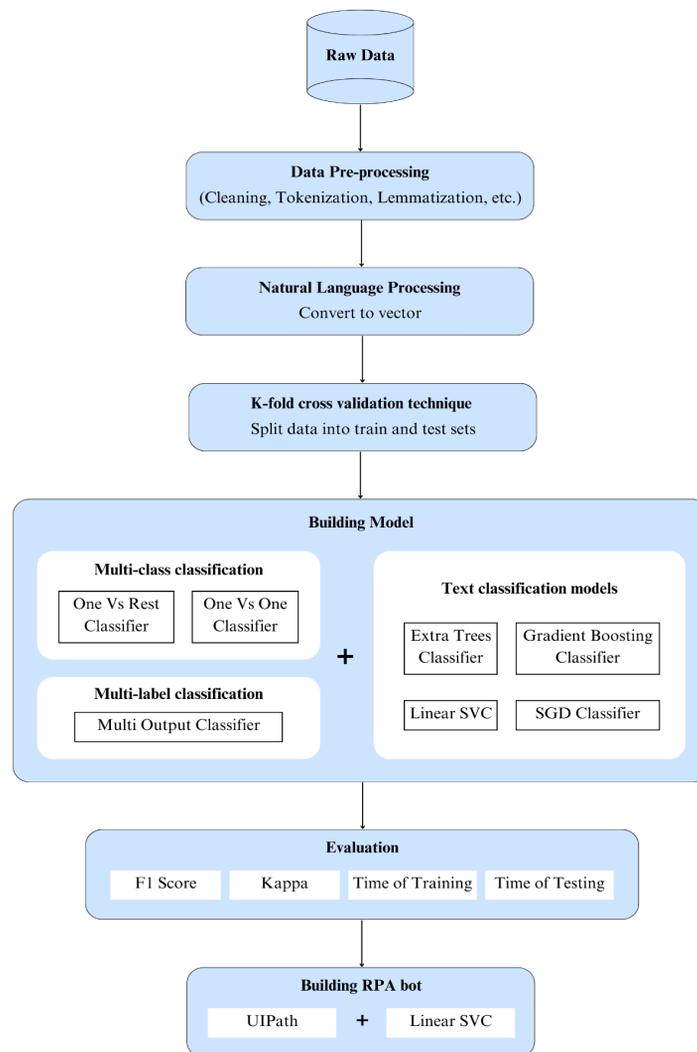


Figure 2. Research method

Source: Authors

The main purpose of this process is to build a bot that can forward and save emails automatically. The email classification model is built by constructing machine learning models and comparing them to find the optimal model for classification. Then, integrated this model into UiPath software to automate the classification and forwarding of emails. To build a model for effectively classifying and forwarding emails to different departments in the enterprise, the study used private data sets from Song Linh Trading and Service Co., Ltd and Enron Company.

3.1. Data cleaning

This step includes 2 tasks, such as:

(1) Remove missing values: In this dataset, missing values may occur when an email is not labeled, a label is attached to an email with no content, or a row of data is empty.

(2) Checking duplicate data: Duplicate values are identical values that are repeated in multiple rows. Removing duplicate values helps eliminate unnecessary values and improves the quality of the dataset.

3.2. Natural Language Processing

3.2.1. Data pre-processing

Tokenization is a pre-processing method that separates a text into words, phrases, symbols, or other meaningful elements called tokens. Tokenization allows computers to understand the basic units of a text, making the analysis and processing of text easier. Tokens can be used to calculate the frequency of words, create feature vectors to feed into models or perform other tasks such as translation or text summarization.

3.2.2. Lowering capitalization

Uppercase and lowercase letters do not differ in meaning, but they can cause significant issues and affect the results of text classification tasks. The most common approach to handling this is to convert all letters to lowercase. This technique projects all words in the text into the same feature space, but it causes an important issue when interpreting some words, such as “US,” which becomes “us” after being converted to lowercase (Gupta & Lehal, 2009).

An abbreviation is a shortened form of a word or phrase which contains mostly the first letters of the abbreviation and slang words is converting them into formal language. Most of the text and document data sets contain many unnecessary characters such as punctuation and special characters, which can be detrimental to classification algorithms. They are unimportant components, which are easy to confuse and greatly affect the performance of the model. The method to overcome this limitation is to remove them.

Lemmatization is the NLP process that replaces the suffix of a word with a different one or removes the suffix of a word completely to get the basic word form. This method will help determine the structure and context of the text.

3.2.3. Convert to vector

Representing data as vectors help computers understand and process them. Some commonly used models for text vectorization are Bag of Words, TF-IDF, Distributional Embedding, etc. In this study, we used the TF-IDF model for implementation. TF-IDF (Term Frequency - Inverse Document Frequency) is a basic technique for calculating the weight of a word in a text. The weight represents the level of importance of that word in the text, which is in a collection of many texts.

3.3. K-fold sampling technique

K-Fold is a method of randomly dividing data into training and testing sets to evaluate machine learning models. This is an extremely optimal method for datasets with few observations, making it suitable

for our research. The value of k is fixed at 10, a commonly used value that has been proven to result in low errors and low variance. Our group also uses this index to divide the data.

3.4. Building model

3.4.1. Text classification methods

This study uses 2 methods to convert multi-class, multi-label classification problems into binary classification problems: (1) Classify to filter out spam emails, non-spam emails will be passed to the next process; (2) Classify the topics of non-spam emails to forward them to relevant departments for processing.

This study used the Multi-Output-Classifier technical to evaluate its effectiveness. Combining the two processes mentioned in Multi-label classification into one to classify topics (including 3 department labels and 1 spam label) at once. Those technical are One-Vs-One Classification and One-Vs-Rest Classification.

3.4.2. Text classification algorithms

The study builds a classification model by combining 4 machine-learning algorithms with the 3 text classification techniques mentioned above. In other words, the study constructs 12 text classification models to find the optimal model after evaluating the results and uses that model to classify the departments.

3.5. Evaluation

Classification is an example of supervised learning so evaluating the models will help improve overall predictability before we deploy this model for production on unseen data.

Table 1. Confusion Matrix for Binary Classification and the Corresponding Array Representation used

	Actual Positive Class	Actual Negative Class
Predicted Positive Class	True positive (TP)	False negative (FN)
Predicted Negative Class	False positive (FP)	True negative (TN)

Source: Authors

From Table 1, several commonly used metrics can be generated as shown in Table 2 to evaluate the performance of classifiers with different focuses of evaluations.

Table 2. Threshold Metrics for Classification Evaluations

Metrics	Formula	Evaluation Focus
Precision (<i>Mujtaba et al.</i>)	$\frac{TP}{TP + FP}$	P measures the positive patterns that are correctly predicted from the total predicted patterns in a positive class.
Recall (<i>R</i>)	$\frac{TP}{TP + FN}$	R measures the fraction of positive patterns that are correctly classified.
F ₁ -Measure (<i>F₁</i>)	$\frac{2 * P * R}{P + R}$	F ₁ represents the harmonic mean between recall and precision values.
Kappa (κ)	$\frac{2 * (TP * FN - FN + GP)}{(TP + FP) * (IFB + TN) + (TP + FN) * (EN + TN)}$	

Source: Authors

Cohen’s kappa coefficient (Mohammadi et al., 2013) measures the agreement between two raters who each classify N items into C mutually exclusive categories. It is considered an efficient method in multi-class classification to calculate the percentage of consensus.

3.6. Proposing an automation process flow for RPA bot

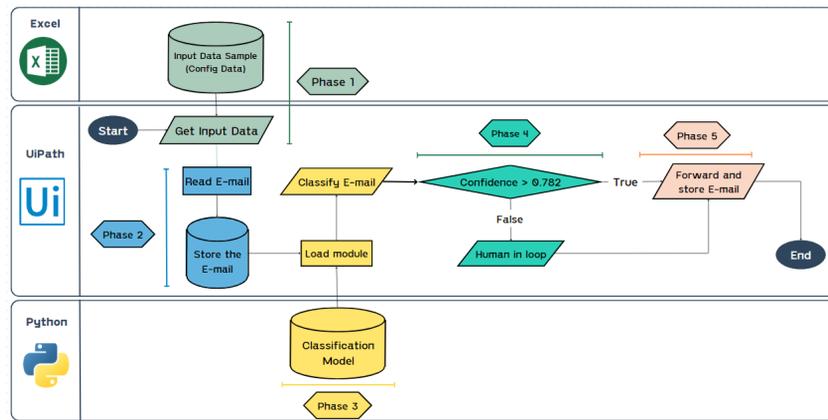


Figure 3. Automation process flowchart

Source: Authors

3.6.1. Phase 1: Inputting configuration data

The objective of this phase is to provide essential input parameters in Table 3.

Table 3. Input data table

Name	Description	Type
Mail Account	Outlook Account	String
Mail Folder	Folder Name	String
Department	Department Name	String
Email Department	Department Email	String
Confidence	Evaluate the classification result	Float

Source: Authors

3.6.2. Phase 2: Reading and storing emails

This phase uses the IMAP protocol and UiPath’s Get IMAP Mail Message activity to retrieve emails from Outlook. The IMAP protocol offers many advantages such as efficient handling of large volumes of email and saving local storage space. Furthermore, business emails are stored on Mail Servers, improving storage and security capabilities.

3.6.3. Phase 3: Integrating UiPath with Python

This study utilized the UiPath.Python.Activities extension to connect Python with UiPath. Then, the text classification model was passed to perform the classification. When utilizing this extension package, it is necessary to execute the following activities in sequence: Python Scope, Load Python Script, Invoke Python Method, and Get Python Object. Then, the text classification model was passed to perform the classification.

3.6.4. Phase 4: The process of classifying

Each email will be classified by the model and return two results: the department classification and the accuracy of the classification. The accuracy score of each email will be compared with the confidence index mentioned in Phase 1. If the accuracy score of that email is higher than the input confidence index, the email will be automatically forwarded to the corresponding department, otherwise, it will do the “human in loop” (requires human intervention for classification).

To determine the confidence index, this study ran a test of 1000 emails and obtained the classification accuracy results of each email as follows:

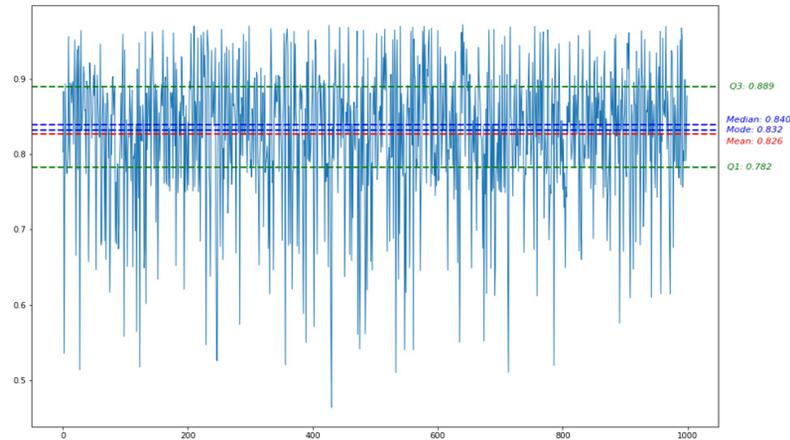


Figure 4. Test results for calculating confidence index over 1000 emails

Source: Authors

Based on the results of the quartile analysis, it was found that over 50% of the emails had a classification accuracy of over 82,6%, and over 75% of the emails had a classification accuracy of over 78,2%. Prioritizing the concentration of classification values, the research team decided to set the model's confidence value at 78,2% or 0,782.

After the emails had been classified with their accuracy, the process proceeded to compare the accuracy of each email with the confidence value (set at 0,782). If the accuracy of an email was equal to or greater than 0,782 it was automatically forwarded to its classified department. Otherwise, the "human in loop" step was performed. The "human in loop" step will require human intervention to select the appropriate department again to forward emails.

3.6.5. Phase 5: Forwarding and storing email

The UiPath software will notify the user of the number of emails sent to each department and the number of unclassified emails requiring human intervention. However, this feature only helps users manage emails for each department and cannot track all emails of the business. To facilitate tracking and storing email content after the process is complete, the research team will manage and store emails as a dataset and save them in an Excel file including email content, forwarding method, department name, email address, and email status. After email storage, the automated email classification process is completed and the email data is added to the training data source to support the next email classification process

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Model processing and text classification (email)

a) Evaluation and selection of classification methods

To determine the appropriate classification method, the researchers compared the effectiveness of two methods:

(1) Multi-class classification: Emails are classified into a single label, which includes four categories representing three departments and spam emails. For this method, the research team used two techniques: One-Vs-One and One-Vs-Rest.

(2) Multi-label - multi-class classification (multi-task classification): Emails are classified into two labels. The first label includes two categories: spam (1) and non-spam (0). For non-spam emails, the second label includes three categories representing the three departments in the problem. For this method, the Multi-output method is used.

The data was trained using each method, and accuracy was analyzed to determine the results:

Table 4. Accuracy of classification methods

Model	One-Vs-One Classifier	One-Vs-Rest Classifier	Multi Output Classifier
Extra Trees Classifier	0,839	0,834	0,682
Gradient Boosting Classifier	0,797	0,793	0,282
Linear SVC	0,845	0,842	0,589
SGD Classifier	0,847	0,842	0,580

Source: Authors

Based on the analysis results, the multi-class classification method is more effective with an average accuracy of 83,2%, which is 1,56 times higher than the multi-label classification method (only 53,3%). Therefore, the research team decided to choose the multi-class classification method. It was observed that in the multi-label method, both One-Vs-One and One-Vs-Rest techniques give almost the same results (a difference of 0,48%). Therefore, it is necessary to use other evaluation metrics to choose the algorithm that provides the highest classification efficiency instead of solely relying on accuracy.

b) Evaluation and selection of classification model

The research team proposed 4 specific models: Stochastic Gradient Descent (SGD) Classifier; Linear Support Vector Classification (Linear SVC); Gradient Boosting Classifier; and Extra Trees Classifier. After training and evaluating the results, the following outcomes were achieved:

Table 5. Results of the experiments with each model

No.	Model	F ₁ Score	Coefficient K	Training time	Testing time
1	Extra Trees Classifier	0,8301	0,7726	27,0909	0,4232
2	Gradient Boosting Classifier	0,8033	0,7488	26,9546	0,0164
3	Linear SVC	0,8445	0,7908	0,1122	0,0032
4	SGD Classifier	0,8385	0,7857	0,0877	0,0037

Source: Authors

When evaluating each model, the Linear SVC model achieved the highest result with an F1 score of 84,45% and a Kappa score of 79,08%. In terms of training and testing time, the Linear SVC model had the shortest prediction time of 0,0032 seconds. In terms of training time, the Linear SVC model (0,1122s) ranked second after the SGD Classifier model (0,0877s), although there was a difference in training time, the accuracy evaluation scores of the Linear SVC model were still higher. To have an overall evaluation, the research team will analyze the evaluation of the model combined with the multi-class classification algorithms.

Table 6. Results of the classification model experiments

No.	Model	Multi-label classification	F ₁ Score	Coefficient K	Training time	Testing time
1	SGD Classifier	One Vs Rest	0,840722	0,78908	0,072776	0,002096
		One Vs One	0,836281	0,782281	0,102569	0,005373

2	Linear SVC	One Vs Rest	0,842792	0,789881	0,106054	0,001171
		One Vs One	0,84616	0,79181	0,118343	0,005287
3	Gradient Boosting Classifier	One Vs Rest	0,808445	0,760089	29,277877	0,007448
		One Vs One	0,798188	0,73748	24,631226	0,025356
4	Extra Trees Classifier	One Vs Rest	0,826313	0,767709	31,557434	0,232401
		One Vs One	0,833984	0,777471	22,624302	0,613979

Source: Authors

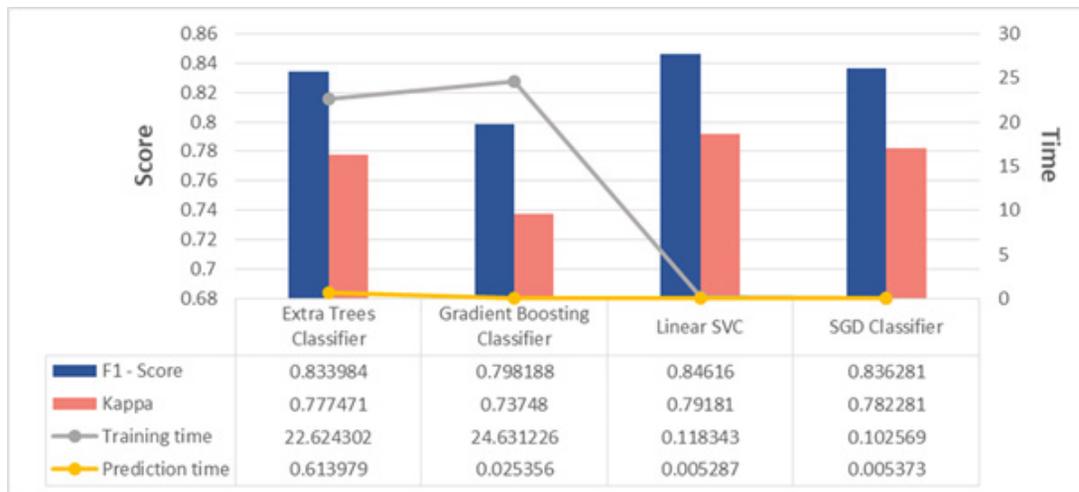


Figure 6. Applying One-Vs-One multiclass classification method

Source: Authors

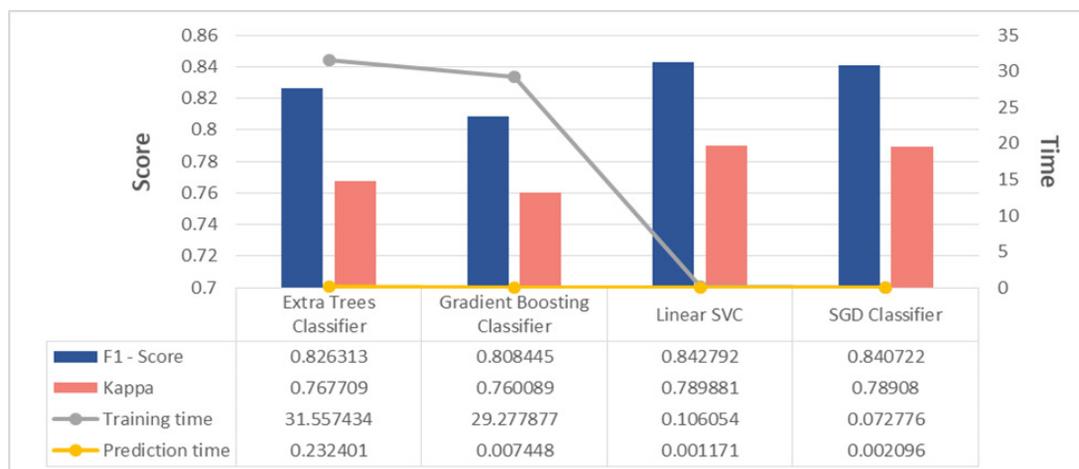


Figure 7. Applying One-Vs-Rest Multiclass classification method

Source: Authors

When evaluating the 4 models with 2 multi-label classification techniques, the Linear SVC model continued to achieve the highest scores in both algorithms, with an F1 score of 84.616% for OvO and 84.279% for OvR, and a k score of 79.18% for OvO and 78.99% for OvR. Regarding training time, although it was lower than the SGD Classifier model, the difference was very small (less than 0.5 times), and the training time was the shortest among the 4 models. Regarding the training-evaluation time of the Linear

SVC model with 2 algorithms, the OvO technique was longer than OvR with an average difference of 1.815, but in terms of F1 and k evaluation scores, OvO was higher than OvR. As accuracy was prioritized, the research team decided to choose **The Linear SVC model combined with the One-Vs-One multi-class classification technique.**

4.1.2. Automated email recognition and forwarding process

To start the process, the RPA system will read the subject and content of the email to be checked and display a notification box as shown in Figure 12.

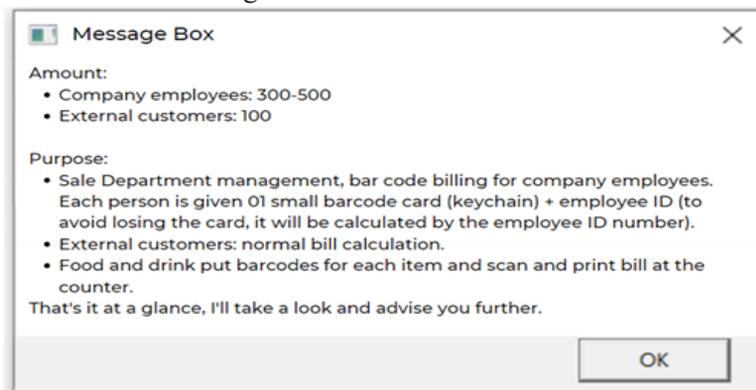


Figure 8. Reading email content and notification

Source: Authors

The reliability of each department will be predicted and displayed in this dialogue box. Figure 13 shows that if the reliability is less than 0,782; the user will receive a notification to review and process the email. Then, the bot will operate in human in loop mode.

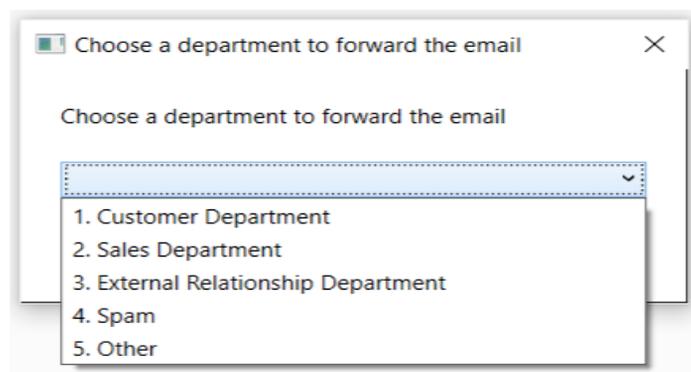


Figure 9. The operation requires human intervention “human in loop”

Source: Authors

If the “Other” option is selected, the user will be prompted to enter an email address to send to. After completing the email classification and forwarding process, the system will notify the administrator.

Once the email has been successfully forwarded, the system will store the email for easy retrieval and use when necessary.

Testing the process, the average effectiveness of the process is 82,6% (Figure 4-18). Applying this model to a dataset (1000 emails) taken from the team’s data file, the results show that 89% number of the emails were automatically classified within 3 minutes and 30 seconds. According to statistics from the Service Now Community website, the average time from receipt to completion of processing actions for an email is 2-5

minutes (120-300 seconds) [1]. This means that to process 1000 emails, the classifier would take up to 33 hours. In contrast, based on the processing time results of the team on 1000 emails, the system only takes an average of 2,2 seconds to automatically process an email (including those that require human intervention). This shows that the automation process helps increase work efficiency by **up to 10 times**. The automation process has a fast classification speed and high accuracy compared to humans when performing the task.

After the email has been successfully forwarded, it will be stored in an excel file for easy tracking and can be used to supplement the training data to improve email classification results and enhance the efficiency of the forwarding process.

No	Email Content	Forwarding Method	Department Name	Address	Status
1	Cảnh báo bảo mật [image: Google] Mặt khân ting dng đã được tạo để đng	Auto	Customer Care Department	CustomerCare@gmail.com	Success
2	[Pay Les For w ! indows 2000 server]	Auto	Span Email	Span Email	Success
3	[Delivery Time and Production Limitations]	Auto	Sales Department		Success
4	1025+ job interview questions & answers	Human in loop	External Relationship	ExternalRelationship@gmail.co	Success
5	Request for Clarification on KH Level Gauge and Transmitter Parameters. Dear Mr. Kha, I thank you for your request, the parameters described KH describing both Level Gauge and Level Transmitter, but the	Auto	Sales Department	Sale@gmail.com	Success
6	[Offer Attached for Your Consideration, Swagelok Items Update to Follow] Dear Mr Vu / Ms Vi,	Human in loop	Customer Care Department	CustomerCare@gmail.com	Success
7	Subject: best meds around , paliourg haven 't we met somewhere before ? :))) isolation is the sum total of wretchedness to a man . love is like pi - - natural , irrational , and very important . paliourg , highquality medication for you ,	Auto	Span Email	Span Email	Success
8	Subject: same thing . . different prices . . . save on prescriptions dear lucky reader . today you are about to learn about the future .	Auto	Span Email	Span Email	Đã gửi thành công

Figure 10. Result of the process of storing forwarded emails

Source: Authors

4.2. Discussion

Enterprises often have a single email to represent the entire company - a basic email with an address based on the enterprise’s name. However, in reality, enterprises have many departments and representatives, so customers and partners are often required to contact specific emails to fasten the problem-solving process. This is the way enterprises today often apply to avoid overloading official emails or avoid ambiguity in the process of receiving and processing emails. This method, although being agreed upon by customers and enterprises, still causes certain disadvantages such as customers did not receive responses when sending emails to the wrong department, or employees of different departments having to deal with email confusion, etc. In contrast, enterprises that only provide customers - partners with an official email, face inadequacies in adding clerical staff. Both of these methods are wasteful of human resources and time for both enterprises and customers.

Therefore, this study proposed an RPA bot with a fully automated email forwarding and saving system that integrates Machine Learning - Linear SVC model with the Multi-class method on One-Vs-One technique. With this system, enterprises only need to provide an official representative email address for all their customers - partners. The system will replace the current manual email processing. Emails sent to the representative mailbox will be automatically forwarded to the respective department, limiting errors from both customers and enterprises. This system will improve the customer experience as well as free up human resources for the enterprise.

In addition, the research could be developed in some directions:

Collecting data from multiple enterprises and other departments: In fact, enterprises often have many departments such as the Finance department, Accounting department, Human resources department, etc. depending on the field of operation. The dataset in this study includes only three departments: “Customer Care”, “External Relations” and “Sales”. Expanding the field and size of the dataset would bring more exact and applicable results.

Developing NLP to handle other languages: Expand the language range of NLP such as Vietnamese, bilingual English - Vietnamese, etc. to expand the scope of application to more enterprises.

Storing data on a professional system: Instead of storing data in Excel, designing a database management system or cloud data storage is able to manage large data sources of the enterprise.

Tracking emails: Designing a system to track the status of emails such as received, forwarded, forward failed, etc.

5. CONCLUSION

The study researched successfully an automated process to classify, forward, and save emails in enterprises. This process has high applications, saves costs and resources, and increases operational efficiency up to 10 times. The research comprises two fundamental components: constructing a classification method and establishing a classification process. The classification method involves NLP processing of the sample email dataset, utilizing a text classifier machine learning model in conjunction with multiclass classification techniques. The research compared four techniques combined with three techniques on two methods and used machine learning metrics to select and construct the most appropriate classification model. In the classification process, the RPA system, integrated with the Machine Learning classification method, will automatically open, read, extract, analyze, classify, evaluate, forward, and archive each email sent to the business.

By installing only one email address representing the business, the system minimize confusion in what email address customer have to send, and in the business email classification process. With over 10 times the efficiency of manual sorting, the system contributes to the global trend of digital transformation and automation, optimizing enterprise resources, and enhancing customer experience. Due to its completeness, high applicability, and feasible development direction, the system has immense potential and can be directly applied to enterprises. In the future, the system can enhance its implications by processing other languages, or bilinguals and designing a database management system or cloud data storage to manage large data sources of the enterprise.

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PREDICTING CUSTOMER CHURN IN E-COMMERCE USING MACHINE LEARNING COMBINED WITH CUSTOMER SEGMENTATION

Author: Phan Thi My Kim¹, Nguyen Ha Trong Tu, Nguyen Thi Truc Quynh, Dinh Ngoc Tra My
Mentor: Nguyen Van Ho, Nguyen Phat Dat

ABSTRACT: In recent years, the industrial revolution has become the driving force for the growing world's e-commerce, accompanied by the tremendous growth of data. This, in turn, requires e-commerce platforms to maximize the potential of customers, come up with appropriate business strategies, and rely on analysis of customer data to stabilize business operations and maintain revenue. In this paper, the authors propose to use a customer clustering model based on machine learning algorithms such as K - Means and DBSCAN, the features participating in machine learning method are parameters of the RFM model; besides that, the authors also use machine learning to predict customer churn by Random Forest algorithm. Experimental results have selected a good model to analyze and predict the risk of customers leaving the business. Based on that result, businesses can build more effective business strategies to retain customers, reduce the costs of finding new customers, and increase revenue and profit sustainably by accurately focusing on each customer segmentation.

Keywords: Churn prediction, customer segmentation, machine learning, e-commerce, classification models.

1. INTRODUCTION

The explosive period of the Internet in recent years has brought about a series of new inventions and changed people's lives. One of them is the development of e-commerce, the first concept of e-commerce appeared in the world in 1979 by Michael Aldrich's idea of connecting TV and computer. After more than four decades of existence and development, this form of business - transactions through digital platforms has had a significant impact on the economy in general and people's consumption habits in detail. Consumers can now save a lot of time and money because shopping can happen anywhere at any time.

In parallel with the development of e-commerce, the purchase history of customers is getting much bigger, enriching data sources for research. If businesses invest in this data well that can lead to many competitive advantages as well as understanding customer behavior.

The process of analyzing customer behavior includes seven steps proposed by Megan Wells (Wells, n.d.) as follows:

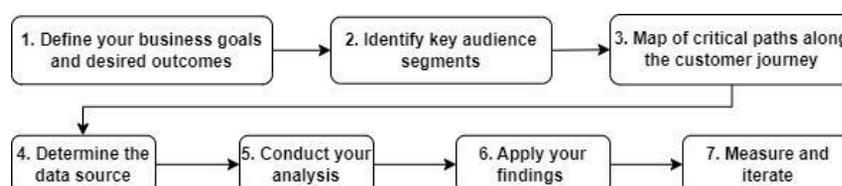


Figure 1. Megan Wells's customer behavior analysis process

(Source: Insights, S. (2023). *How to Conduct a Behavioral Analysis (in 7 Steps)*. Retrieved 20 June 2023, from <https://www.scuba.io/blog/how-to-conduct-a-behavioral-analysis>)

Step 3, called “Map of critical paths along the customer journey”, is also known as the stage where researchers synthesize quantitative and qualitative data of customers in the business process to guide the next

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City

choice in order to provide appropriate solutions to meet the demands, provide the best products - services, or prevent possible cases. To tackle this problem, it is necessary to study and explore customer behavior through descriptive data about customer characteristics, seller characteristics, order information, and delivery processes as well as payment methods to understand how their decisions are affected. Today, the problem of data collection today for organizations is no longer difficult because most businesses are equipped with enough tools to store basic data about their customers; with the innovation of businesses, the amount of stored data is increasing, a big question for businesses is how to explore and understand customers through existing data; therefore, not only the field of e-commerce but also other industries are promoting to meet the customer's demand and improve the performance of the whole enterprise. (Nikita Bagul, 2021)

Understanding the behaviors of users when experiencing products at e-commerce platforms will be a big step for businesses in long-term activities. One of the top concerns of businesses is the rate of customer churn, as this rate increases, executives make investments in production lines, technology, and improved management models value to retain customers and maintain revenue. There are many reasons why users decide not to continue using the company's products or services, but typically it will stem from reasons such as customers finding a more suitable investment object, experiencing a quality of new services is better, the level of competition is intense when more and more competitors appear in the market. (Ishpreet Kaur, 2020)

The main objectives are to propose a model to predict customer churn at e-commerce platforms based on a combination of machine learning and customer segmentation through detailed data about their transactions. Consequently, the current paper seeks to make the following contributions to the existing literature. First, the study will make customer segmentations based on machine learning techniques such as K-Means, DBSCAN, and Random Forest, and choose the best model through evaluation metrics. Second, it will conduct customer churn prediction from segmented customer clusters. Third, the article will evaluate and analyze the model results. Finally, it will provide useful recommendations and suggestions for businesses in managing customer relationships and improving revenue.

Research studies worldwide have been conducted on the concept of identifying customers who do not continue to accompany the business in fields such as finance, telecommunications, and retail. For example, a group of authors in India utilized machine learning models such as Logistic Regression, Decision Tree, and K-Nearest Neighbor to predict the likelihood of customer non-continuation in the financial-banking sector. Another study in the telecommunications field used algorithms like Decision Tree, Random Forest, GBM, and XGBOOST to classify customers and predict churn probability. In the retail sector, methods such as logistic regression, SVM classification, and SGD have been employed to build recommendation systems and improve customer relationships. Although domestic research on this topic has not been thoroughly explored, there have been some studies such as Tran Thi Thanh Dao's research on "Predicting churn in the retail sector." This study utilized three machine learning methods: Decision Tree, Random Forest, and Logistic Regression, to analyze and predict the risk of customer churn in businesses. Overall, research worldwide has provided theoretical and empirical insights into predicting customer churn in various fields. However, in Vietnam, research in this field has not been extensively explored and comprehensively implemented.

In this paper, the authors apply the customer segmentation results to analyze and identify customers who are likely to leave or no longer use the products of enterprises based on some machine learning algorithm such as K - Means and DBSCAN, using Silhouette Index, DB Index, and CH Index to choose a good model; then proceed to build a model to predict customer churn using Random Forest algorithms. For the previous studies, most of the research mainly research in two independent parts including customer segment or customer churn,

but with the topic “Predicting Customer Churn in E-Commerce Using Machine Learning Combined with Customer Segmentation”, the authors combined both customer segment and customer churn together. The study tested the model with many algorithms, evaluated by some different metrics.

The structure of the article consists of 5 main parts: **part 1** presents an overview of the research context and the organizational direction that the authors have built; **part 2** presents the research related to the segmentation issues and the topic of identifying customers who are likely to leave the business in some typical fields such as finance - banking, telecommunications, retail and new points of this study; **part 3** presents the concepts mentioned in the article as well as details the theoretical basis of the applied algorithms; **part 4** has experimented with a sequential model in steps including data collection, data preprocessing, model application, analysis and visualization of model results; **part 5** discusses the results.

2. THEORETICAL FRAMEWORK

2.1. Overview of Customer Churn

The definition of Customer Churn occurs when a specific group of customers is no longer loyal or continues to use a business’s product or service. Losing this group of customers not only impacts revenue but also poses many dangers to the organization.

An article published in October 2022 in the Economic - Business section of the Journal of Justice and Society (Phuong, 2022) states that customer churn rate is the percentage of customers who no longer accompany your products or services. The higher the churn rate, the more customers enterprises lose. No matter how high the recurring revenue of the business, if the customer abandonment rate is high, the company will be in trouble because this quantity directly affects the revenue of the business. The simple formula for calculating churn rate for a fixed period is calculated as the ratio of total customers leaving during the survey period divided by the total number of existing customers during the survey period (WallStreetPrep).

$$\text{Churn Rate} = \frac{\text{Total customers leaving during the survey period}}{\text{Total existing customers}} \times 100 \quad (1)$$

2.2. Basic algorithms of research

2.2.1. K - Means clustering algorithm

K - Means clustering is one of the most fundamental algorithms of unsupervised machine learning introduced by James MacQueen in 1967 - a professor who has devoted his career in the Graduate School of Management of University of California, Los Angeles. The goal when implementing this algorithm is to divide the data into different clusters so that the data in the same cluster has the same properties, from the input data and the desired number of output groups, the center of each group will be indicated and the data points are assigned to the respective groups (Mohammed A. Ahmed, 2020)

The outstanding point when using the K - Means method, or machine learning methods in general, is the self-learning ability of the method. Methods in machine learning are a set of data processing steps based on mathematical and statistical foundations.

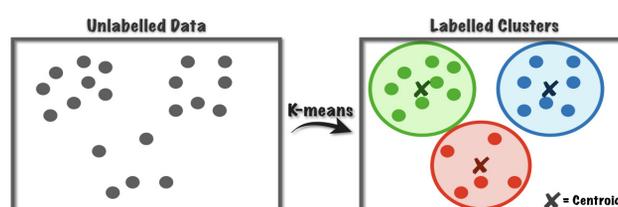


Figure 2. K - Means Clustering explanation

(Source: <https://towardsdatascience.com/k-means-a-complete-introduction-1702af9cd8c>)

In the K - Means algorithm, each data cluster is characterized by a center, the center will be the most representative value for a cluster and equal to the average of all observations in the cluster. Based on the distance from each observation to the centers to determine labels for them, determine based on the nearest center. The initial algorithm will randomly initialize a certain number of cluster centers, then proceed to determine the labels for each data point and continue to update the cluster centers. The algorithm will stop when all data points are assigned to the correct cluster, and the number of center updates reaches the threshold.

The K-Means algorithm proposed by MacQueen in 1967 (Marek Bundzel, 2010) performs the following:

Step 1: Initialize K elements representing $\{\mu_h\}_{h=1}^K$ for K clusters, each μ_j plays a role as center for cluster C_j

Step 2: Repeat the process of repositioning the data object to the cluster with the nearest center and recomputing the center until the clusters do not change. This process is essentially local minimization of the objective function (the distance index here is the Euclidean index as follows:

$$E = \sum_{h=1}^K \sum_{x_i \in X_h} \|x_i - \mu_h\|^2$$

2.2.2. DBSCAN algorithm

DBSCAN (Density-Based Spatial Clustering of Applications with Noise) is a density-based clustering algorithm proposed in 1996 by Martin Ester, Hans-Peter Kriegel, Jörg Sander, and Xiaowei Xu, which can detect clusters of different shapes and sizes from a large amount of data containing noise. The DBSCAN algorithm has two important parameters including:

- Eps (ϵ) - a distance value
- Min_samples - the minimum number of points in the Eps distance, excluding the center point.

The above two parameters are used to determine the epsilon neighborhood and the accessibility between data points, thereby helping to connect the data series into the same cluster. Based on the above two parameters, three types of points can be determined:

- Core: Point with at least min_samples points in distance Eps
- Border: Point with at least one core point within Eps distance but not enough density min_samples
- Noise: Points that are not core or boundary points

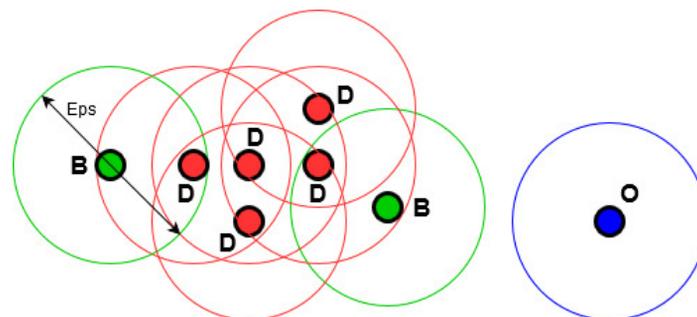


Figure 3. DBSCAN algorithms illustration

(Source: Otis.gov)

In this case, min_samples = 3, the red D points are core points because they are within the Eps distance, and each Eps distance has a minimum of 3 points. The green B points are boundary points because in every Eps distance containing the boundary point there is at least one core point, and the density of these distances is always less than 3. The blue point O is the noise point because in Eps distance region has no other points.

2.2.3. Choosing the number of k cluster

Silhouette Index

The Silhouette Index is an index of popular clustering results. Analysis of this index is intended to measure the optimal level when a data point is classified into any clusters, telling us whether the observations lie within the cluster (with good meaning) or near the edge of the cluster (has a bad meaning) to evaluate the clustering efficiency.

If a cluster is qualified, the points in the cluster will have Silhouette approaching one and vice versa. For a quick assessment of whether a point is properly clustered, Silhouette can be relied upon:

- Data point with high Silhouette, close to 1, is definitely in the cluster
- The data point has a Silhouette close to 0, is located between two clusters
- Data points with low Silhouette or negative values are likely to be in the wrong cluster

CH Index (Calinski - Harabasz Index)

The CH index is an index that evaluates the clustering algorithm using the inherent quantity and features of the dataset. This index is calculated as the ratio of the total dispersion between clusters and the total dispersion within the cluster divided by all clusters (where dispersion is the sum of the squares of the distances). High CH means better clustering because the observations in each cluster are closer together (more dense).

DB Index (Davies Bouldin Index)

The DB index is an index to evaluate clustering algorithms, confirming how well the clustering has been performed. The lower the DB index, the better the clusters are split and the better the results of the clustering performed.

2.2.4. Random Forest algorithms

Random Forest is a collection of decision trees that are statistically enumerated using supervised machine learning, each of which is selected by a random-based algorithm, developed for the first time (Breiman, 2001), (Lowe B. and Kulkarni A., 2015). Through training multiple decision trees on random subsets of data, then combine the predictions to select and make the final prediction. This improves the performance of the model compared to just using a single decision tree.

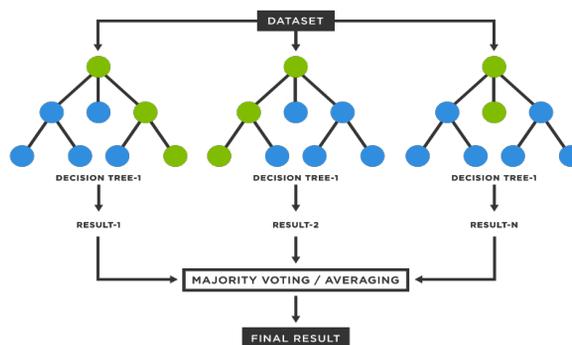


Figure 4. Random Forest example

(Source: <https://www.tibco.com/reference-center/what-is-a-random-forest>)

Summary of random forest algorithm for data classification:

Step 1: Generate random data from the pre-existing training data.

Step 2: Build a Decision Tree using sampled data subsets randomly.

Step 3: Combine mining, using trees by voting or averaging the predicted values from the tree.

Step 4: Select the most predicted result as the final result.

2.2.5. Evaluation Metrics

The research used Accuracy, Precision, and Recall evaluation indexes to evaluate the Random Forest model based on the confusion matrix of the following form (Ullah, I., Raza, B., Malik, A. K., Imran, M., Islam, S. U., & Kim, S. W., 2019), (Sokolova, M., Japkowicz, N., & Szpakowicz, S., 2006), (Rosyid, Harits Ar, Utomo Pujianto, and Moch Rajendra Yudhistira, 2020):

Table 1. Confusion matrix

	Actually Positive (1)	Actually Negative (0)
Predicted Positive (1)	True Positive (TP)	False Positive (FP)
Predicted Negative (0)	False Negative (FN)	True Negative (TN)

From the table, the confusion matrix can be used to evaluate the algorithm with three indexes which are:

Accuracy tells us the percentage accuracy of the algorithm. Accuracy can be calculated by formula 2.

$$Accuracy = \frac{(TP + TN)}{(TP + TN + FP + FN)} \quad (2)$$

Precision (Positive Predictive Value - PPV) is a measure that tells us about the quality of positive predictions. Of the customers predicted to leave, how many of them actually left? It is calculated using formula 3.

$$Precision = \frac{TP}{(TP + FP)} \quad (3)$$

Recall shows how well the model identifies the positives. Out of all the customers leaving, how many were correctly identified? A low recall meant that many customers left, but the model incorrectly predicted not to leave. It is calculated using formula 4.

$$Recall = \frac{TP}{(TP + FN)} \quad (4)$$

Advantages of the enhanced RFM-based approach: *first, improved customer segmentation*: While traditional RFM analysis is commonly used to cluster customers based on their purchasing behavior, our enhanced approach combines RFM with machine learning techniques to achieve more accurate and granular customer segmentation. By leveraging the power of machine learning algorithms, we can identify hidden patterns and relationships within customer data, resulting in more meaningful and actionable customer segments. *Second, enhanced churn prediction*: In addition to customer segmentation, our approach utilizes machine learning algorithms to predict customer churn. By incorporating the outcomes of customer segmentation into the churn prediction model, we can leverage the identified customer segments to enhance the accuracy of churn predictions. This integration allows us to uncover potential churners with greater precision, enabling businesses to proactively address customer attrition and implement targeted retention strategies.

3. RESEARCH MODEL AND IMPLEMENTATION METHOD

3.1. Research model

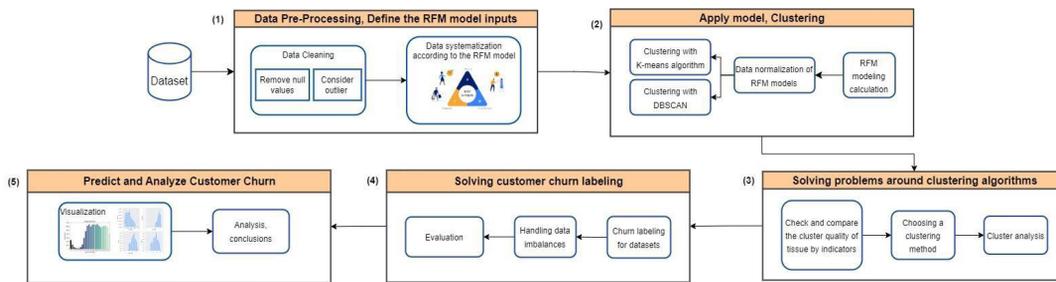


Figure 5. Research model (Source: Authors)

Figure 5 presents the research model with the following 5 main stages:

(1) Stage 1, the input dataset is checked, data preprocessed, and data systematized with the aim of removing nonconforming features and selecting suitable features for the calculation of RFM method.

(2) Stage 2, the application of RFM computational model and customer clustering. Following the data discovery in the first stage, the characteristics and values related to the values in the RFM model were identified. This is one of the important factors affecting the input data for the K - Means and DBSCAN methods as well as ensuring the accuracy of the clustering results. Therefore, the study selects methods and models suitable for data objects to solve the normalization of input data before putting it into clustering to achieve the best results.

(3) Stage 3, solves the problems surrounding the clustering algorithm in order to choose the correct clustering method and number of clusters with proven comparative indicators from which to conduct in-depth analysis of customer segments. Stages 2 and 3 are the most critical and complex stages in the entire study.

(4) Stage 4, solves the abandonment labeling problem for customer clusters analyzed in phase 2 and, and builds a Random Forest model that predicts customer churn.

(5) Stage 5, the analysis phase, predicting conclusions based on visualized data and descriptive statistics.

3.2. Data preprocessing

The dataset has nine small data sets, each set contains fields with specific meanings for that set and has the following specific relationships:

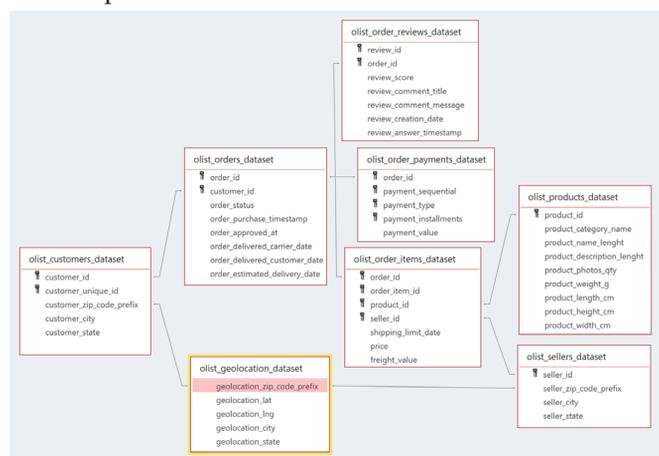


Figure 6. Relationship between datasets

(Source: Authors)

The dataset contains 103887 transactions of the Brazil-based e-commerce platform Olist from 2016 to 2018 with 71 categories in many fields, in which the industry that generates the most revenue is health-care, beauty, home appliances, technology products, decorations, and gifts.

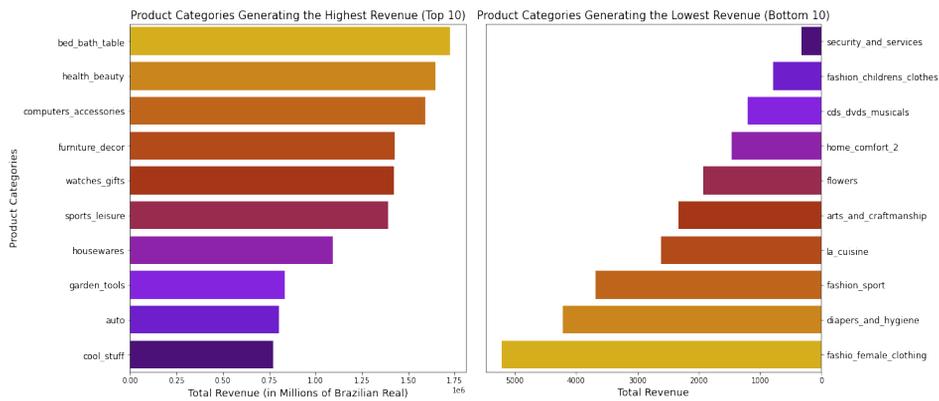


Figure 7. List of highest (left) and lowest (right) revenue products

(Source: Authors)

After analyzing and mining the original dataset with nine small datasets, the authors filtered out four important attributes belonging to different data sets for main use in RFM calculation, including order_id (code of orders), customer_unique_id (unique customer identifier), order_purchase_timestamp (purchasing time), payment_value (payment value) to compute R, F, and M values for segmentation.

Unnamed: 0	order_id	order_purchase_timestamp	payment_value	customer_unique_id
0	e481f51cbdc54678b7cc49136f2d6af7	2017-10-02 10:56:33	38.71	7c396fd4830fd04220f754e42b4e5bff
1	53cdb2fc8bc7dce0b6741e2150273451	2018-07-24 20:41:37	141.46	af07308b275d755c9edb36a90c618231
2	47770eb9100c2d0c44946d9cf07ec65d	2018-08-08 08:38:49	179.12	3a653a41f6f9fc3d2a113cf8398680e8
3	949d5b44dbf5de918fe9c16f97b45f8a	2017-11-18 19:28:06	72.20	7c142cf63193a1473d2e66489a9ae977
4	ad21c59c0840e6cb83a9ceb5573f8159	2018-02-13 21:18:39	28.62	72632f0f9dd73dfee390c9b22eb56dd6
...

Figure 8. Part of the input dataset

(Source: Authors)

After determining the required attributes for the model and also completing the data preprocessing, and keeping the appropriate values, the post-processed values have been included in the RFM model with the following results:

customer_unique_id	Recency	Frequency	Monetary Value
0000366f3b9a7992bf8c76cfd3221e2	161	1	141.90
0000b849f77a49e4a4ce2b2a4ca5be3f	164	1	27.19
0000f46a3911fa3c0805444483337064	586	1	86.22
0000f6ccb0745a6a4b88665a16c9f078	370	1	43.62
0004aac84e0df4da2b147fca70cf8255	337	1	196.89

Figure 9. The result of the model after preprocessing

(Source: Authors)

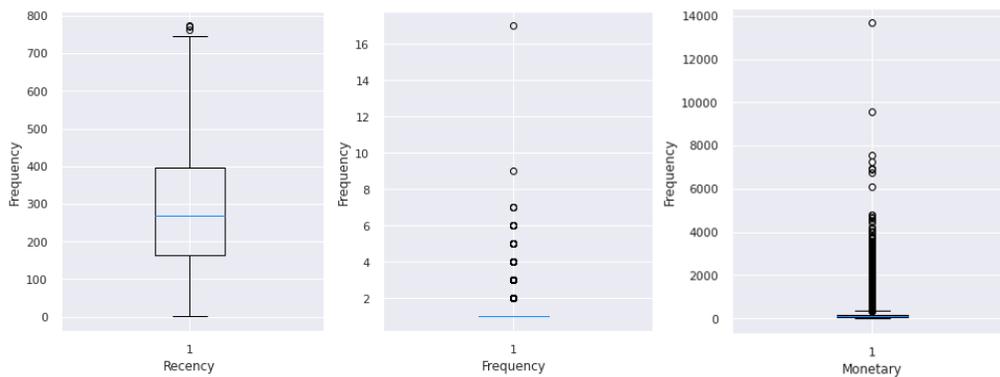


Figure 10. Distribution of R, F, and M values

(Source: Authors)

From the figure above, it can be seen that there are quite a few values outside the two ends of the boxplot; all three fields contain some outlier values. However, these values are relevant for the purchase and sale of goods, especially in the e-commerce industry. Therefore, these outliers are kept and continue to be used in the research process.

customer_unique_id	Recency	Frequency	Monetary
0000366f3b9a7992bf8c76cfd3221e2	19.568182	0.0	3.154310
0000b849f77a49e4a4ce2b2a4ca5be3f	19.750997	0.0	2.422820
0000f46a3911fa3c0805444483337064	36.845571	0.0	2.958400
0000f6ccb0745a6a4b88665a16c9f078	29.547130	0.0	2.657094
0004aac84e0df4da2b147fca70cf8255	28.240004	0.0	3.272940

Figure 11. RFM data after normalization by boxcox method

(Source: Authors)

However, in practice, it is difficult to compare data because they have different values and different units of measurement. Therefore, in the normalization process, we use the StandardScaler() function - a function in the Sklearn library of Python to convert the ratio of different values to aid in comparison.

customer_unique_id	Recency	Frequency	Monetary Value
0000366f3b9a7992bf8c76cfd3221e2	-0.774618	-0.179421	0.365793
0000b849f77a49e4a4ce2b2a4ca5be3f	-0.748831	-0.179421	-1.957795
0000f46a3911fa3c0805444483337064	1.660115	-0.179421	-0.256517
0000f6ccb0745a6a4b88665a16c9f078	0.628398	-0.179421	-1.213621
0004aac84e0df4da2b147fca70cf8255	0.443560	-0.179421	0.742624

Figure 12. The result after conversion rate

(Source: Authors)

4. RESULTS AND DISCUSSION

4.1. Results

After completing the data preprocessing steps, normalizing data, and checking outliers, then proceed to cluster data using models including K - Means, DBSCAN to form optimal customer clusters. Then, compare the clustering performance of the two models by outcome evaluation indexes such as Silhouette Index, CH Index, DB Index in order to choose the most suitable clustering model for the data set (Brahmana, RW Sembiring, Fahd Agodzo Mohammed, and K. Chairuang, 2020), (Addagarla, Ssvr Kumar, and Anthoniraj Amalanathan, 2020).

4.1.1. Clustering by K - Means models

In the case of the K - Means algorithm, the authors used Silhouette Plot and Elbow Plot to find k clusters by graph visualization. For Silhouette Plot, choose the appropriate number of clusters by looking at the silhouette graph, how many clusters the Silhouette index is closest to, the clusters in the graph must exceed the average Silhouette score, with a balanced thickness and without large fluctuations in size (Burney, SM Aqil, and Humera Tariq, 2014).

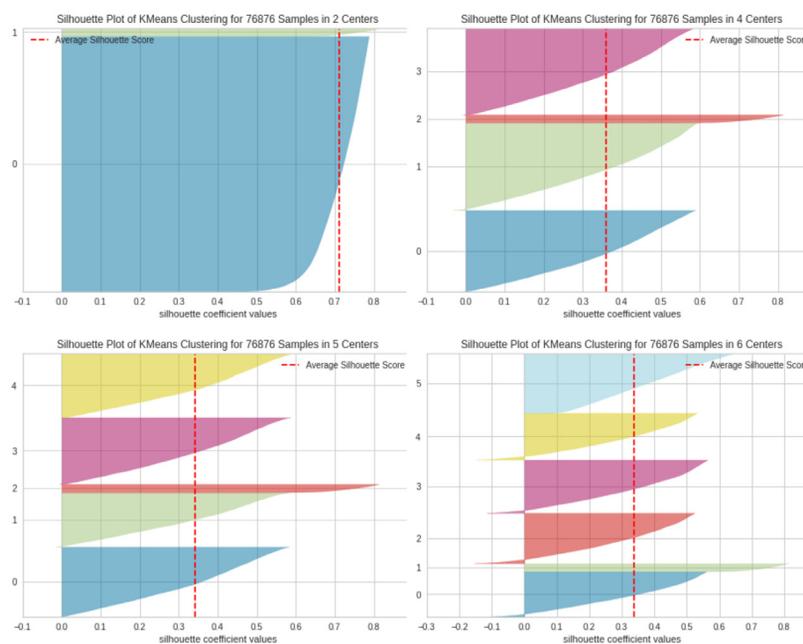


Figure 13. Cluster k coefficient results with Silhouette method

(Source: Authors)

From Figure 13, it is found that the number of clusters is 4 or 5 is the most suitable because of the equal thickness between clusters.

To ensure accuracy, the study used Elbow Plot to select the most suitable number of clusters. For this method, the inertia of a few clusters from 2 to 10 will be calculated. The rule would be to choose the number of clusters where a line with a bend or “elbow” appears in the graph (Yuan, Chunhui, and Haitao Yang, 2019).

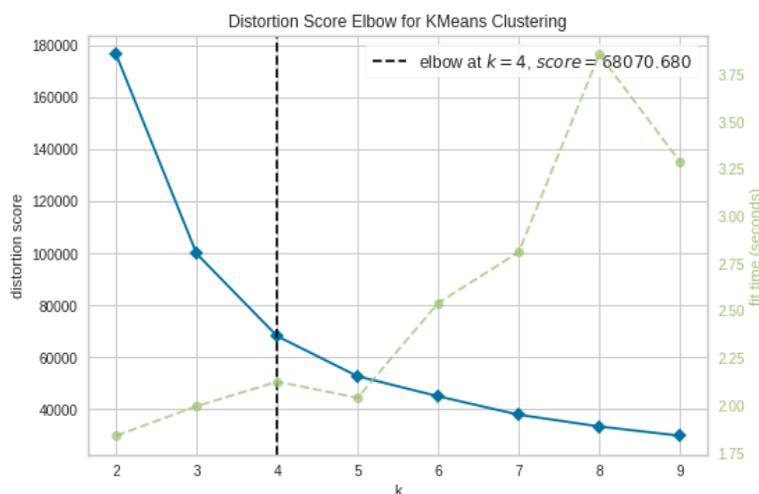


Figure 14. Cluster k coefficient results with Elbow method

(Source: Authors)

According to Figure 14, at k=4, the bend line sharply decreases. Thus, combining the results of Elbow and Silhouette, it is reasonable to choose k=4. The results of segmentation to form 4 clusters by K - Means are presented in the following table:

Table 2. Clustering by using the K-Means model

Cluster	The percentage of customer (%)	R (Average)	F (Average)	M (Average)
1	33,31%	134.0	1.0	149.0
2	3,11%	268.0	2.0	316.0
3	30,84%	360.0	1.0	56.0
4	32,74%	382.0	1.0	274.0

(Source: Authors)

4.1.2. Clustering by DBSCAN method

For the DBSCAN algorithm, there are two main parameters required, including eps and min_samples. With this dataset, firstly getting the appropriate number of clusters for the dataset and then comparing it with the K - Means model. The DBSCAN model results in four clusters as shown in the following table:

Table 3. Clustering by using DBSCAN model

Cluster	The percentage of customer (%)	R (Average)	F (Average)	M (Average)
1	96,53%	288.0	1.0	161.0
2	3,03%	268.0	2.0	301.0
3	0,33%	741.0	1.0	187.0
4	0,11%	216.0	2.0	50.0

(Source: Authors)

4.1.3. Comparing and choosing the model

Table 4. Model performance comparisons

	Model	Sihouette	CH index	DB index
1	K-Means	0.358641	61191.523737	0.776044
2	DBSCAN	0.280022	10139.227549	1.771347

(Source: Authors)

Based on Table 4, the authors found that K - Means segmentation of 4 customer clusters is the best to fit Olist's dataset.

4.1.4. Analysis of customers clusters

Based on the clustering results of the K - Means model, the authors named the Olist's customers into four groups and had the following approaches:

Cluster 1: Strangers. These customers do not contribute much to revenue and do not have a connection with the e-commerce platform. This group of customers are like visitors, not compatible with much of what the e-commerce floor offers, so they may consider not investing much in this customer group.

Cluster 2: True friends. These are the most loyal customers, they contribute a lot to revenue, as well as have a high frequency of purchases and recent purchases. It can be seen that this is a group of VIP customers who need to be taken care of with membership programs so that they feel they have certain values when they are loyal customers of the Olist e-commerce floor.

Cluster 3: Butterflies. Butterflies are high-volume consumers who are not engaged and are not loyal to the brand, who are ready to leave when they see great deals from other brands. These are usually short-term customers, and it is difficult to become loyal customers, Olist e-commerce platform should take advantage of this group's bargain-loving feature to make a profit.

Cluster 4: Barnacles. These are the customers who spend little but still come back to buy again and again. They are loyal customers but do not bring much profit. So businesses can upsell, introduce other products to encourage this group to buy more products, or offer appropriate promotions.

4.1.5. Customer churn prediction by Random Forest

The clustering results based on the K - Means model and the analysis of clusters, it is clear that the customers in cluster 3 have the lowest revenue, the lowest frequency, and highest recency, so the authors left labels for customers in cluster 3. The basis for the group to label cluster 3 is based on other studies, as in research paper (Wu, J., Shi, L., Lin, W. P., Tsai, S. B., Li, Y., Yang, L., & Xu, G, 2020), (Dawane, V., Waghodekar, P., & Pagare, J., 2021), (Dawane, V., Waghodekar, P., & Pagare, J., 2021), (Wei, J. T., Lin, S. Y., Yang, Y. Z., & Wu, H. H. , 2020), the authors named clusters based on RFM indices.

Thus, cluster 3 indicates that customers with very low spending, very low frequency, and high last visit will indicate that the customer may have left. The experimental data set consists of 5 fields, with 96095 observations, and is described below (Table 5). The data field "Churn" represents customers leaving, in which there are 29636 leaving observations labeled as "1" accounting for 30.84%, and 66459 non-disengaging observations labeled as "0" accounting for 69.16%.

Table 5. Experimental data description

Fields	Observation	Type
customer_unique_id	96095	object
Recency	96095	int64
Frequency	96095	int64
Monetary	96095	float64
Churn	96095	int64

(Source: Authors)

Observing and processing unbalanced data

When using machine learning, data needs to be balanced because machine learning models are data-driven tools. If the data is uneven and unbalanced, the model’s results may not be as effective. Imbalance handling can also help reduce undesirable situations, such as changes in model accuracy and longer training times (He, H., & Garcia, E. A., 2009).

- Surveying the dataset of customers who leave the service accounts for 30.84% compared to 69.16% of non-leaving customers, the ratio between customers who do not leave the service is much higher than that of customers who leave.

- Using SMOTE (Synthetic Minority Over-sampling Technique) method to handle data imbalance since SMOTE is a very popular data processing method used in data analysis (Chemchem, A., Alin, F., & Krajecki, M. , 2019) .

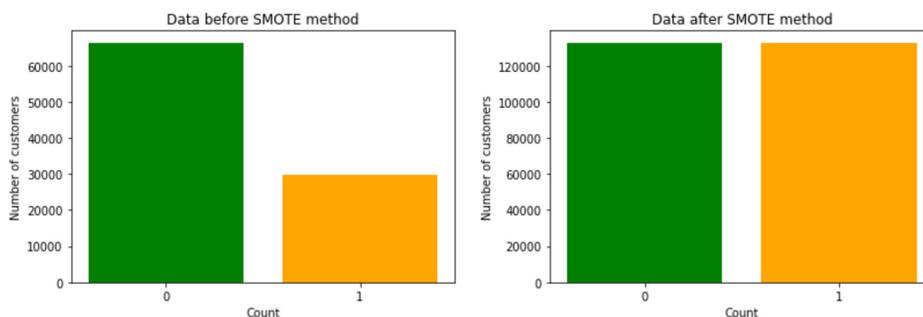


Figure 15. Balanced data after SMOTE method

(Source: Authors)

Build training data and testing data

The dataset is divided in the ratio of 75:25 with the training set (75%) and the testing set (25%), this ratio helps the model achieve good performance because if the training data ratio is large, it leads to a larger variance in the model’s parameter estimates. Larger error in the model’s parameter estimates, while less testing data leads to larger variance in model’s performance. The goal is to ensure that the data being split leads to a variance that is not too high (Charandabi, 2020).

Experiment with Random Forest model to evaluate model

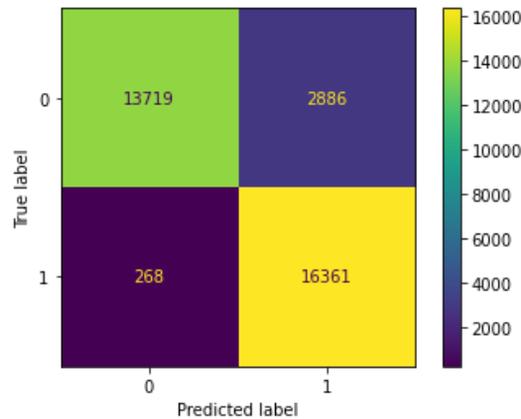


Figure 16. The confusion matrix of the Random Forest model

(Source: Authors)

Table 6. Random Forest model evaluation results

Model	Accuracy	Recall	Precision
Random Forest	0.9051	0.9839	0.8501

(Source: Authors)

The results of the evaluation of the Random Forest model based on the Confusion Matrix show that the Accuracy, Recall, and Precision indexes have reached a very good level. This proves that the model has created large relationships between input variables and output results. Thus, the Random Forest model is suitable for predicting customer departures in Olist’s customer dataset.

4.2. Discussion

The e-commerce environment in particular or the economy in general is growing day by day, businesses need to research every day so as not to be left behind in the fierce marketplace. There are many remedies for businesses to solve that economic problem; in particular, analyzing each customer segmentation to have the right marketing campaign or suitable promotion, or identifying customer churn in order to determine the company’s next direction or increase their satisfaction are the best ways to maintain and win the market competition. Analyzing customer churn allows businesses to build a solid basis for future decisions, ensuring the feasibility of implementing marketing strategies and stabilizing revenue.

This study has provided e-commerce platforms with a tool to make customer segmentations by using K - Means, DBSCAN, and RFM model, predict customer churn by Random Forest machine learning models combined with related computational models such as RFM. During implementation, the study incorporated many models typical of unsupervised machine learning methods, implementing such multiple models increased the ability to recognize customer departures and predictive results with higher level of accuracy. The proposed model obtains the highest evaluation index when using Random Forest classifier with accuracy index of 0.9051, recall of 0.9839, and precision of 0.8501.

In the future, the study will continue to expand the model, conduct in-depth research and exploit other behavioral variables of customers, such as highly purchased product lines, trusted brands, etc. to find customer experiences to help build marketing campaigns and support decision-making correctly. In addition, the study will test many other data sets in new, less previously mentioned areas and aim to analyze customer behavioral data and comments to answer the question, “Why do customers leave the business?”

5. CONCLUSION

E-commerce is getting more and more attention and investment to be able to bring back give businesses greater value, it plays an important role in the economy in countries. To help businesses improve sales as well as relationships. With customers, the authors collect data from an e-commerce platform of Brazil to identify the basic factors that cause customers to stop accompanying business products and services.

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ANALYZING AND DESIGNING A PORTAL CONNECTING THE UNIVERSITY OF ECONOMICS AND LAW (UEL) AND ENTERPRISES VIA A WEBSITE PLATFORM

**Author: Dang Bao Uyen Nhi¹, Hoang Khanh Van², Nguyen Quoc Khang²,
Nguyen Truong Loi Phuong², Vo Hoang Lam²
Mentor: Nguyen Quang Phuc³**

ABSTRACT: *The promotion of linkages between universities and enterprises is crucial in fostering economic development, improving the quality of education, and enhancing the employability of graduates. Based on a multi-dimensional approach both on the results of in-depth interviews, the article assesses the current state of linkage between UEL with small and medium-sized enterprises (SMEs). However, based on the research situation, it has shown that the difficulties and advantages in the relationship between UEL and enterprises have affected the limited students' exposure to real-world experiences and hindered their career prospects. Hence, in addition to investigating the portal connecting UEL and enterprise, the topic proposes solutions for designing a website platform to improve and expand the relationship. This research demonstrates the importance of designing a portal connecting UEL and potential enterprises via a website platform, enhancing students' employability, and bridging the gap between academia and the job market.*

Keywords: *University of Economics and Laws; portal connecting; small and medium enterprises (SMEs); website.*

1. INTRODUCTION

Preparing students for careers from an early age is crucial for universities, especially in the post-Covid world (Olabiyi et al., 2022). Ly et al. (2023) mentioned that Youth unemployment rates have decreased significantly, with a decrease from 0.267% to 1.108% in the first half of 2023. To meet the demands of the modern workforce, universities must develop a curriculum that equips students with life and employability skills, alongside academic qualifications. As noted by Erkol and Erkol (2019), a website platform can provide a convenient and accessible channel for students to connect with enterprises, access job, and internship opportunities, and showcase their skills and abilities to potential employers. Implementing a website platform in the digital age fosters collaboration between UEL students and businesses, ensuring they are equipped with the necessary skills to succeed in the modern workforce.

The University of Economics and Law (UEL) in Vietnam faces challenges in establishing strong connections with enterprises, leading to a lack of connection between students and employers. Research shows that many graduates struggle to find employment or adapt to job requirements, with a high percentage facing difficulties in submitting job applications (65.5%). Establishing strong ties with enterprises can bridge the gap between theoretical knowledge and practical expertise, promoting innovation, economic growth, and sustainable development.

This paper explores a website solution for connecting UEL students and enterprises, focusing on specific requirements and challenges. The proposed interactive hub aims to facilitate seamless connections between faculty, students, researchers, industry professionals, entrepreneurs, and businesses. The goal is to enhance communication, knowledge exchange, and mutual partnerships, promoting UEL students' academic and professional development. The SCRUM methodology was used to analyze tasks and identify areas for improvement.

The board story methodology and conceptual model were used to scrutinize user interface and UX aspects, ensuring the website meets user demands and provides convenience. An appropriate design can

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: nhidbu21411ca@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City.

³ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: phucnq@uel.edu.vn

be formulated to create a user-friendly, secure, and efficient website platform catering to UEL and its enterprise partners' unique requirements.

The ultimate goal is to create a platform that enables seamless communication, promotes knowledge exchange, and fosters mutually beneficial partnerships between UEL and enterprises, enhancing the academic and professional development of UEL students. Understanding the technology to analyze the tasks required to operate the website effectively, helped to identify potential areas for improvement in the website's design and functionality, using the SCRUM methodology to manage the study. Also, by scrutinizing the aspects of user interface (UI) and user experience (UX) of a website solution via the method of using the board story methodology, and the conceptual model, it is agreed that the website meets the demands of users and provides convenience to them. This also means that an appropriate design can be formulated to create a user-friendly, secure, and efficient website platform that caters to the unique requirements of UEL and its enterprise partners.

Consequently, the current paper seeks to make the following contributions to the existing literature. First, this paper provides an overview of the job analysis of UEL's students to supplement the information for the university's administrators. Second, the website describes how graduates make great strides in applying for a job online and thus explains the reasons why the traditional method of job application of UEL students is insufficient for recruitment purposes (Breugh, 2017). Third, this research aims to shorten the hiring cycle, lower the process of UEL's students in finding jobs and decrease the amount of time an employer finds potential candidates (Suvankulov et al., 2012). Fourth, with careful consideration of the UI and UX of the website, this paper can leverage the aesthetics of UEL's existing website platforms and then improve the quality of UEL branding in the focal point of recruiters. Finally, this paper is a valuable resource for the university to readily implement in reality in the long run.

Furthermore, to achieve the predetermined objectives and effectively contribute to the recent situations of UEL's connection between its graduates and enterprises, this paper is organized into 5 (five) sections. The 1st section provides an overview of the current situation at UEL regarding linkages between students and enterprises. Section 2 presents the theoretical basis used in the following sections. The method of conducting the research in the study, including data collection and analysis, is presented in section 3. The findings of the study and evaluation of the effectiveness of the website solution are also presented in the 4th section. Finally, the study is concluded in section 5.

2. THEORETICAL FRAMEWORK

2.1. Related studies in linkages between university and enterprises

2.1.1. Overview of Foreign Research

Numerous domestic and international experts are interested in the role of establishing a system for career counseling for students owing to its potential for civic engagement and practical worth. Sun & Dong (2018) emphasize the need for a connecting portal for career information services. Research highlights the operational benefits of web-based job search systems but also reveals uncertainties about data-gathering permissions. Abisoye et al. (2015) analyze the implementation strategy of a web-based career guidance system in Nigeria, but limitations in information openness and lack of transparency in methodologies and technology are noted. Early business-student connections are recognized internationally as a foundation for future careers and community development. Liu (2018) explores innovation system management for undergraduates and startup initiatives. Although international studies offer theoretical insights, challenges remain in terms of breadth, transparency, and user rights.

2.1.2. Overview of Research in Vietnam

Vietnam has produced valuable works for data-driven website development, such as Thanh (2018) analyzing employment networks of sociology graduates and Mai (2008) highlighting the importance of university alumni networks in job opportunities. These networks play a crucial role in helping recent graduates find jobs across

disciplines. The educational relationship between students, corporations, and universities is essential for cohesive student work. These assessments highlight the need for a connection platform between students and businesses in career exploration. Most studies emphasize the importance of information transparency and a middle ground that promotes practical responses and functional integration. The research conducted with UEL focuses on inheriting, clarifying, and optimizing the foundation of career development for students.

2.2. The linkages between the University of Economics and Law and Enterprises

2.2.1. Overview

The linkages between UEL and enterprises reflect the close and mutually binding relationships between them toward a common goal. The targeted orientation is the motivation for the linkage between the two sides (Trang et al., 2019).

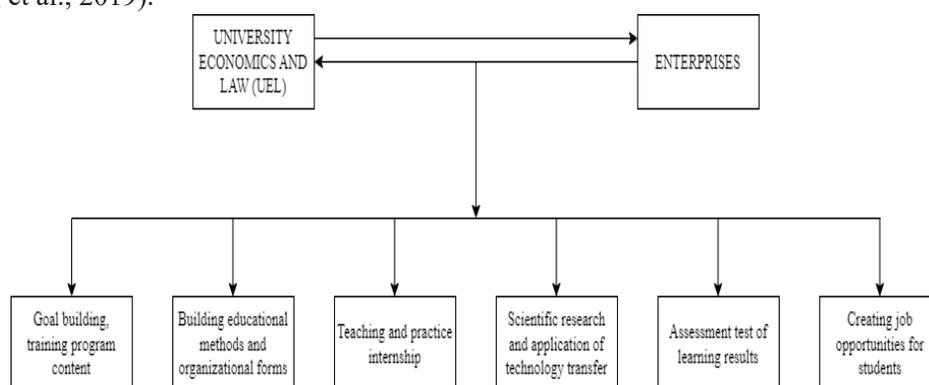


Figure 1. Diagram of the training link between UEL and enterprises

A training link diagram between UEL and enterprises demonstrates the connection between the two parties in providing training opportunities for students. This diagram demonstrates how the two parties can collaborate to develop training programs that meet the needs of both students and enterprises. By identifying training needs, designing, delivering, and evaluating programs, the linkages between UEL and enterprises foster collaboration, cooperation, and knowledge transfer between academia and research, resulting in significant advantages for both parties involved.

The collaboration between enterprises, students, and universities yields mutual benefits. Enterprises gain access to potential employees and improve their brand recognition, while students acquire real-world experience and enhanced job prospects. In addition, universities receive increased funding and resources, elevating the quality of education and their reputation. The symbiotic relationship fosters growth, knowledge exchange, and professional development for all parties involved.

2.2.2. Motivations and barriers for the linkages

Connections between universities like UEL and enterprises offer compelling motivations and significant benefits for both parties. By collaborating, they can drive innovation and economic growth while providing valuable opportunities for students to gain real-world experience. Addressing barriers and establishing effective communication channels is crucial for success. UEL's resources, talent pool, and emphasis on research and development benefit enterprises, while enterprises contribute to students' professional growth through internships and mentoring. These linkages foster a collaborative environment supporting growth and mutual success.

The linkage between universities and enterprises is identified as an important requirement; however, there are still some barriers during the implementation process including differences in research orientations, passive attitudes towards training linkages, lack of collaboration experience, communication and cultural

challenges, limited resources, and government policies and regulations. Addressing these obstacles will require proactive efforts from both parties to foster successful partnerships that harness their combined potential for growth and innovation.

2.3. Methods in linkages

2.3.1. Enterprises

In general, cooperation between universities and businesses takes various methods below [Figure 2]. These methods of cooperation between UEL and businesses lead to the creation of valuable partnerships and promote the exchange of knowledge and expertise.

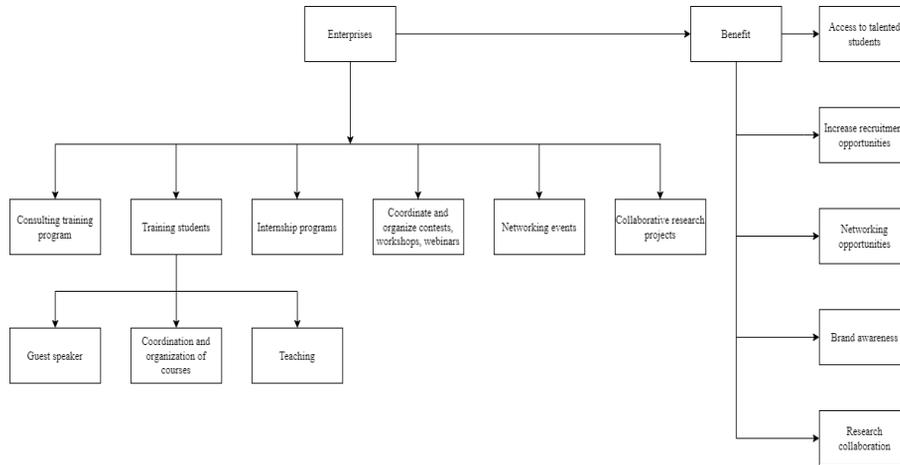


Figure 2. Method of Cooperation from Enterprises

2.3.2. University of Economics and Law

In general, cooperation between universities and businesses takes various methods below [Figure 3]. These methods of cooperation between UEL and businesses lead to the creation of valuable partnerships and promote the exchange of knowledge and expertise.

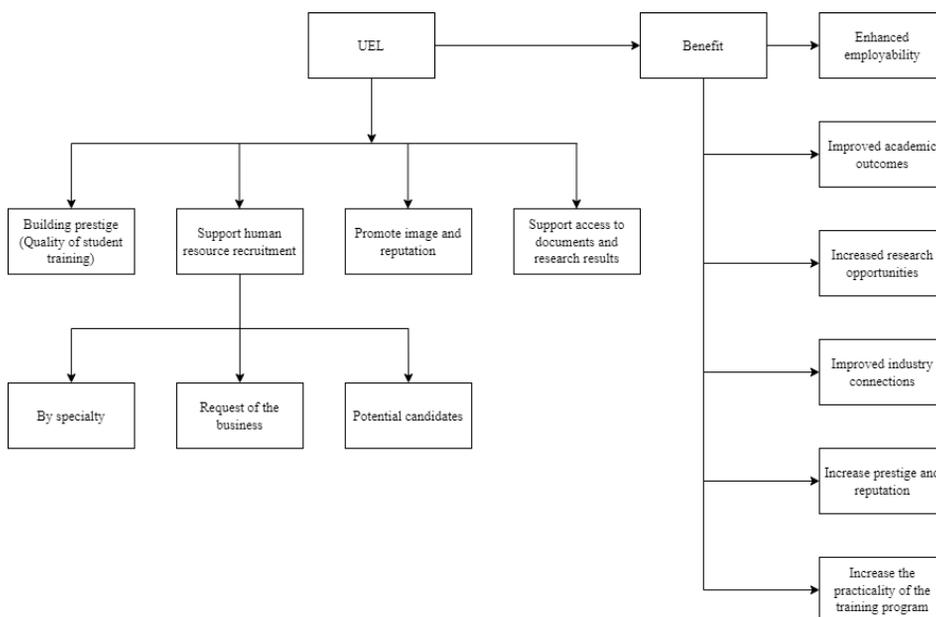


Figure 3. Method of cooperation from the UEL

3. RESEARCH METHOD

3.1. Research Design

3.1.1. Information Systems

Vidgen (2002) suggests that information systems in web applications in networking and education will influence development work. A thorough pre-analysis is necessary to create a website platform with streamlined operations, enhanced online presence, and effective interaction between stakeholders. Website features like chatbots, messaging systems, SEO, and forums enhance real-time communication and linkages between UEL and enterprises. Information systems also help organizations manage data efficiently, including online courses, webinars, and seminars.

3.1.2. Unified Modeling Language (UML)

YANG (2011) confirmed that Unified Modeling Language (UML) is a visual language used in software engineering to represent software architecture and design. It improves website design and functionality by creating diagrams that illustrate functionality, data flow, and system interactions. These methods, such as Use Case Diagram, Class Diagram, Sequence Diagram, and Active Diagram, help developers understand website design and identify potential issues. Applying these methods to estimate functions for linkage websites can reduce development time and costs, resulting in scalable, maintainable, and adaptable websites tailored to the needs of both UEL and businesses.

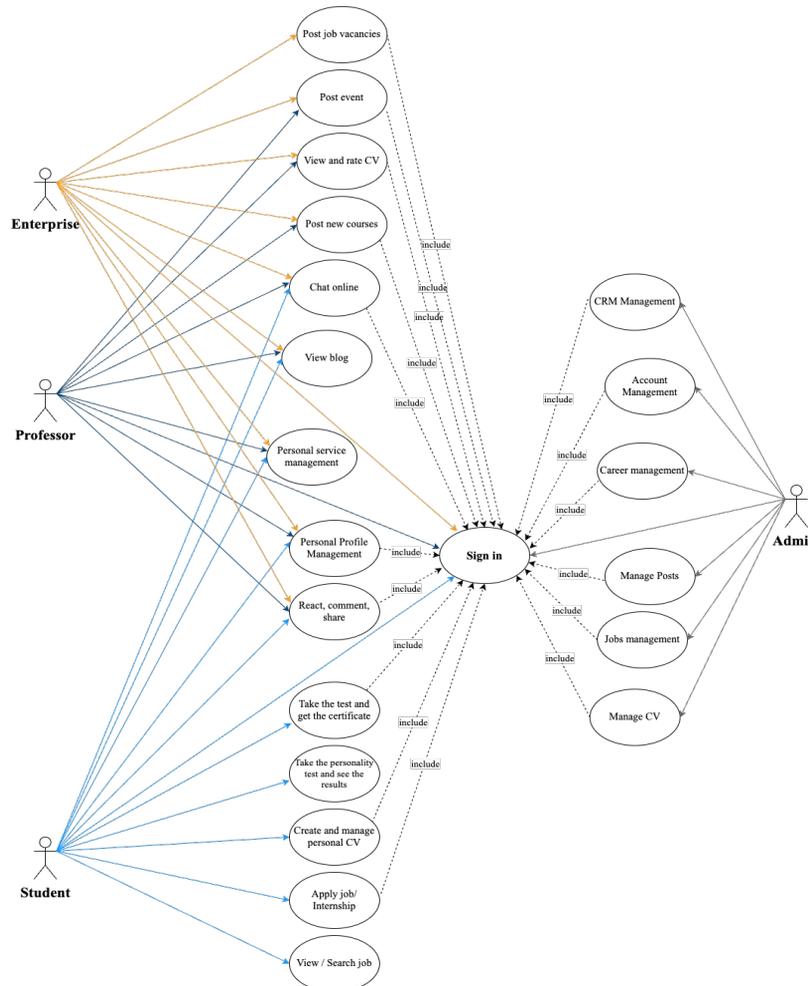


Figure 4. Overall Website Use Case Diagram

Under the design of use cases denoted by ellipses and association arrows describing the different relationships in color, the main functions of the Diagram have been outlined in detail through the way of common, unique features and required flows. This section gained insights into the permission of four objects such as (i) Enterprise account, (ii) UEL Professor account, (iii) UEL Student account, and (iv) Admin account.

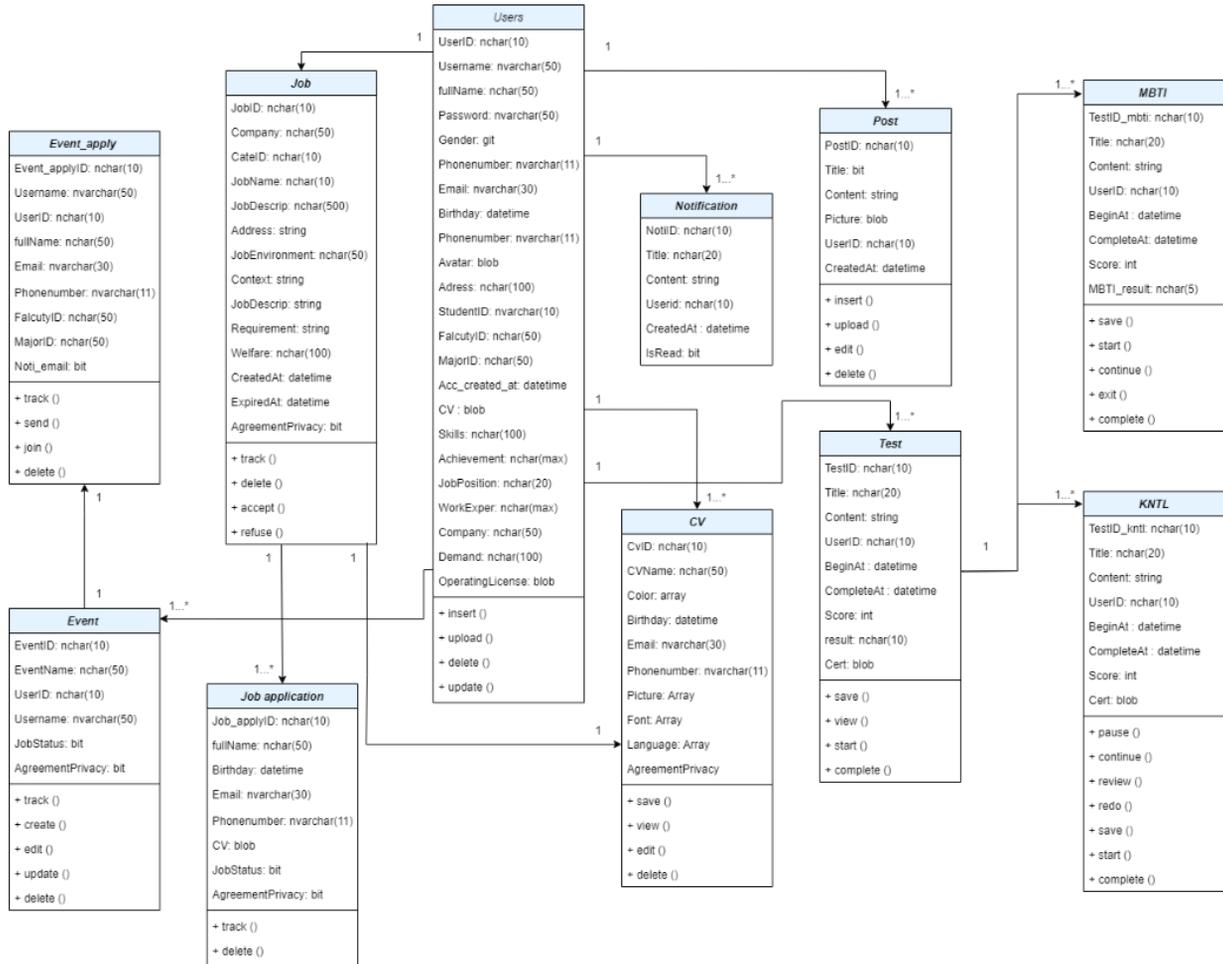


Figure 5. Overall Website Class Diagram

A class diagram is a dynamic system that divides a website’s database into classes based on characteristics and methods. These classes enhance prediction accuracy and provide users with the latest information. Modals describe site activities and influence, helping developers understand requirements for new systems or document existing processes. They affect front-end, back-end, and database processes through usage scenarios, logic, and sequence diagram vision.

3.1.3. Agile Methodology

Agile methodology is used for research, website design, goal setting, and forecasting UEL students’ and businesses’ results. It involves short-term system development techniques and quick developer response to modifications (Cockburn and Highsmith, 2001).

3.1.4. Scrum Framework Model working principles

According to Yu (2018), the prevalent agile development process for creating major software studies, including websites, is called the Scrum Framework Model. The Product Owner, the Scrum Master, and the Development Team are the three main positions in this framework. Moreover, the variety of working

principles promotes a culture of continuous improvement and team empowerment in collaborating and managing the website.

- **Product Backlog.** Involve identifying goals, purpose, target objects, and key features of the study. User stories are defined after surveys and interviews. T

- **Sprint Planning Meeting.** Plan the work for the Development Team during the sprint, defining the Sprint Goal and determining the work to be completed. This process aligns with the overall product vision

- **Sprint Backlog.** Established during the Sprint Planning Meeting, includes user stories and tasks for the Development Team to perform during the sprint.

- **Sprint Goal.** Defined by the Product Owner, aligns with the overall product vision and prioritizes the most valuable work. For website research, goals include enhancing linkages between UEL and enterprises, improving connection quality, and developing an online community.

- **Daily Scrum.** This is a crucial event in the Scrum Framework Model, occurring daily during the Sprint to inspect and adapt progress towards the Sprint Goal. This 15-minute meeting helps the team stay aligned and focused, ensuring high-quality work.

- **Sprint Review.** Showcase completed work to the Product Owner and stakeholders, allowing feedback on changes and improvements before moving forward. After Usability Testing, Sprint Review targets feedback and updating in function.

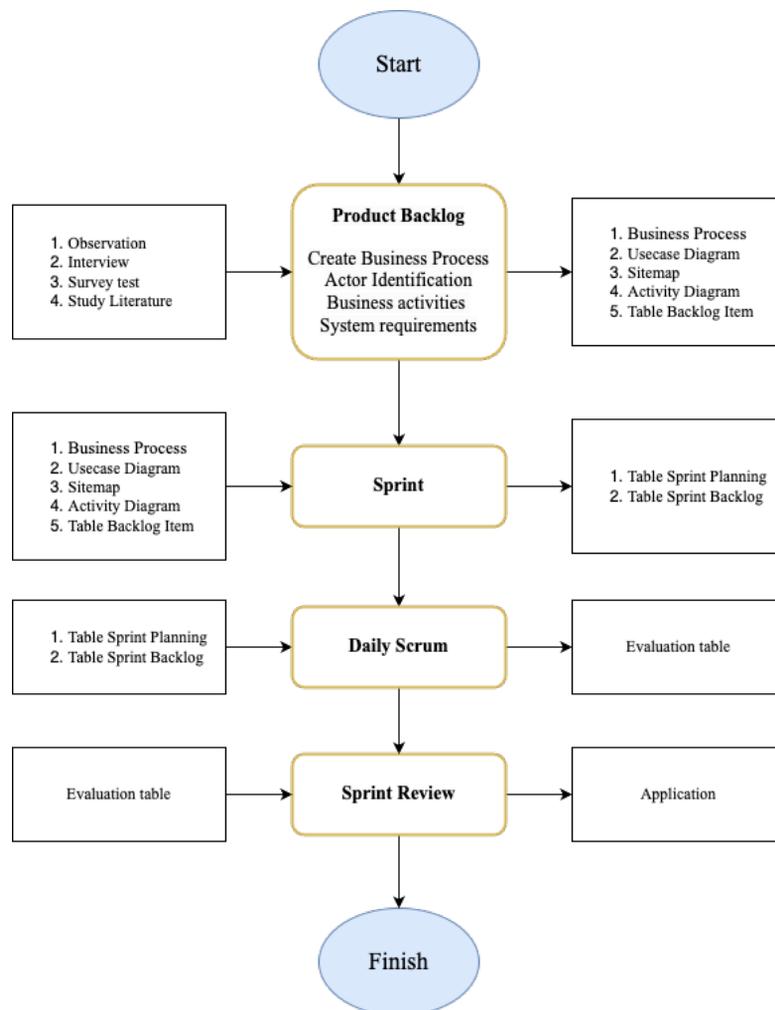


Figure 6. Scrum framework model

3.1.5. Website design deployment

A well-designed website is a prerequisite for a university’s relationship development and maintenance with a wide variety of stakeholders. Nonetheless, despite the Internet’s growing importance in recruitment and employer branding, website evaluation research appears to be inadequate and requires additional consideration (Morrison et al., 2004). As a result, there needs to have a valid and reliable construction of website design, especially in the framework of the website that constructs the connecting portal of UEL and enterprise partners.

On the other hand, it may be crucial to design a specialized website that contributes to the university’s branding with a unique brand identity: the website’s name is UEL CAREERS, with the slogan “For Your Future”. Thus, to completely reflect on the usefulness of this website solution, this section proposes to gain insights into the process of building the company-connecting website for undergraduate students at UEL with the following processes: classifying website dimensions at an appropriate level, classifying website dimensions into features, then, building a conceptual model of web interfaces, afterward, analyzing website characteristics, and finally, it is important to explain the design of the real website.

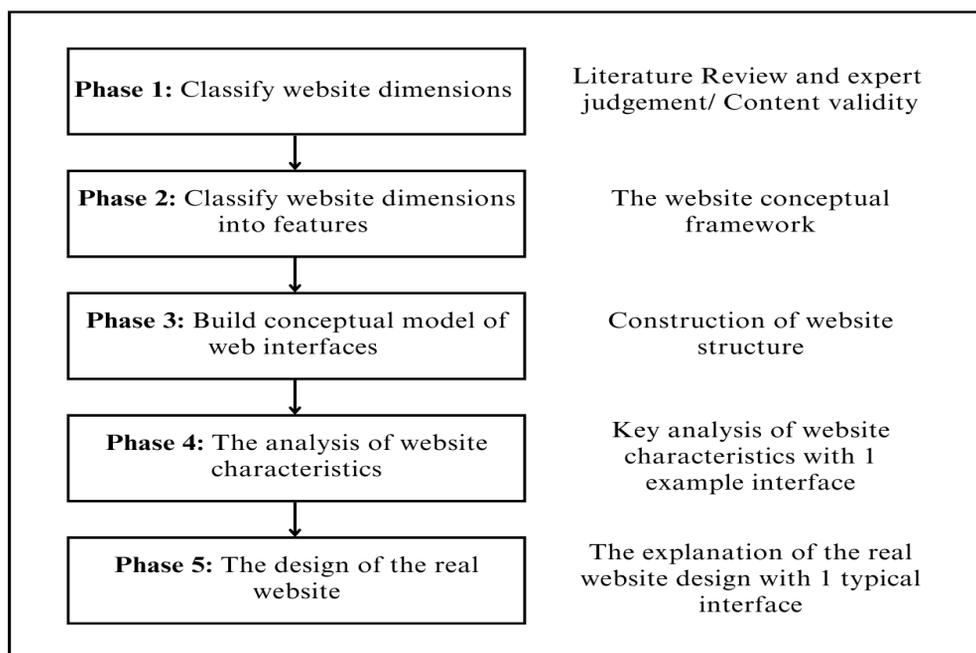


Figure 7. The process of UEL CAREERS’ deployment

- Classifying website quality dimensions and features

After a thorough review of previous studies, it is obvious identify the five critical dimensions of UEL CAREERS’ quality: information, interactivity, relationships, trust, and design and usability. In validating and generalizing these dimensions to the website, it is essential to conduct in-depth interviews in UEL, in 2023. As a result, to consolidate the level of user experience, the top features will mainly rely on the five predetermined dimensions: information and process, value-added, relationships, trust, and design and usability.

Table 1. Key features of UEL CAREERS, based on predetermined website dimensions

Dimensions	Key features
Information and Process	Contact info: email, physical address, phone, fax
	Information on recruitment: jobs, enterprise introduction, and commitment, job application
	Partnerships: webinars, online courses, events
	Vocational guidance: personality tests, online lessons, and tests

Value Added	Recruitment-related information: external links, news
Relationships	Personal interest: comments, reviews, online chat box, Customized Curriculum Vitae (CV), customized application form
Trust	Branding: branded URL, branded email, trademark, branded profile
	Timeliness: date last update, expiry date, current and timely info
	Security: private statement, copyright, corporate identity, site usage term
Design and Usability	Navigation: sitemap, FAQs, consistent theme
	Technical: website or Web page size, browser compatibility
	Architecture: HTML Coding, element order, and arrangement

- Building a conceptual model of web interfaces

A website interface is a complex mix of text, links, graphic elements, formatting, and other aspects that affect the site’s overall quality. As a result, it requires a wide range of tasks to meet these various concerns - information, navigation, graphic, and experience design.

First, information design focuses on identifying content items and developing category labels to reflect the site’s information structure. Secondly, navigation design focuses on developing mechanisms (such as navigation bars and links) that ease interaction with the information structure. Thirdly, graphic design is concerned with visual display. And finally, all of these categories are included in experience design, as well as qualities that impact the overall user experience (download time, popup windows, and so on).

- Characteristics analysis and design of a real website

To characterize page designs for each dataset, the patterns of the website interface is present with the use of some key components: links, text formatting, interactivity, color, graphic, stylesheets, scripts, HTML Coding, and formatting consistency. Figure 8 depicts an example mockup that is intended to organize this discussion.

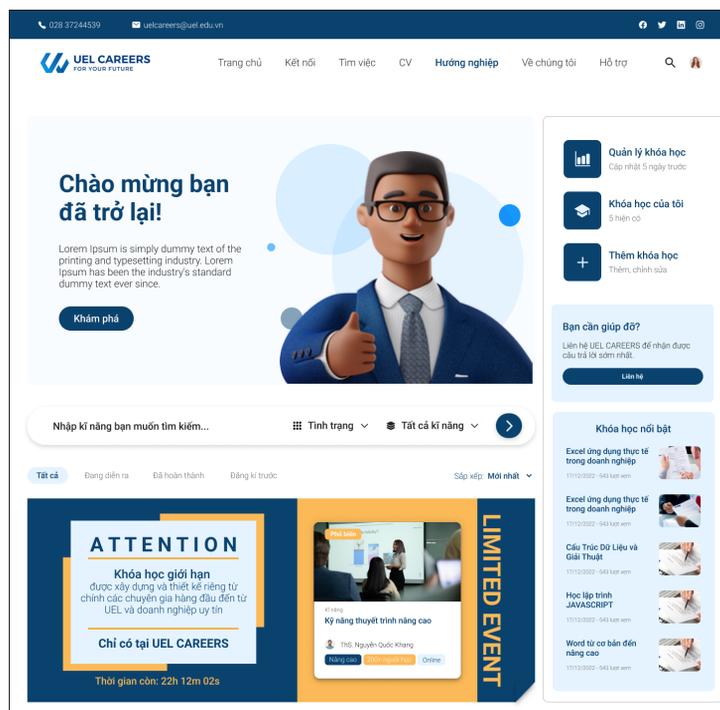


Figure 8. An example of UEL CAREERS’ interface

Links. Effective page design commonly used text for hyperlinks, rather than graphics. These links are helpful for users to navigate to the enterprises’ sites or the details of any external information from third-party websites.

Text formatting. An ideal page design is not expected to contain italicized body text and utilize small font sizes for certain content and at least one accent color. The sample page includes no italicized body text words and has an accent color.

Interactivity. Users can use interactive items to transmit information to the site rather than merely obtain it. Excellent page design tended to have interactive objects (i.e., text fields, buttons, and other form elements).

Color. Effective pages utilized high-contrast text color combinations, whereas low-contrast combinations. The illustration of Figure 8. employs six high-contrast text color combinations (blue and black text on white, medium-yellow, and light-white backgrounds).

Graphics. Good page design commonly used a substantial number of graphics. For instance, the example page had numerous graphics, the remainder is utilized for navigation and other decorative purposes.

HTML Coding. HTML files merely represent text documents with the file extension .html instead of .txt. With tags and elements of HTML Coding, users can define the headings and other contents of the UEL CAREERS. Allowing interaction with the operating system, thus improving the responsive rate.

Formatting consistency. The formatting of links and page layouts varied among sites in the exceptional category that Figure 8 demonstrates this variation. For instance, pages have identical layouts but differ in text columns and text style.

3.2. Research methods

Creswell (2014) defines a mixed methods approach as collecting and analyzing both quantitative and qualitative data in a study to address research questions from different perspectives. This paper uses a mixed methods methodology, involving stages depicted in Figure 9.

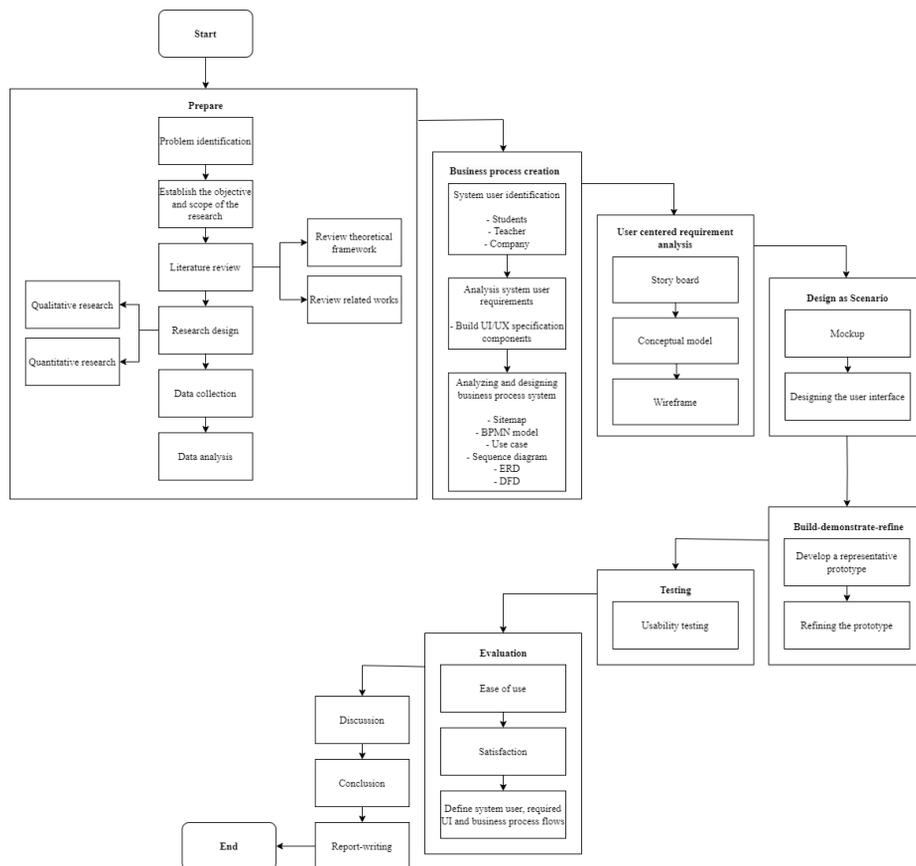


Figure 9. Research process

3.2.1. Qualitative research

The qualitative method will be used to gather data on the experiences and perceptions of users on the website solution. Data will be collected through in-depth interviews, focus group discussions, and observation. The sample size for this study will be 14 users. The participants will be selected through purposive sampling. The interviews and focus group discussions will be recorded, transcribed, and analyzed using thematic analysis.

3.2.2. Quantitative research

This study uses a quantitative method to assess the impact of a website solution on students' employability and career prospects. A pre-test and post-test design will be used, with a sample size of 220 UEL students. A survey questionnaire will be used to collect data, and descriptive and inferential statistics will be used. Results show that 78% of students do not regularly receive job information from their university, and 65.5% face difficulties in submitting job applications. Additionally, 95.9% of students desire a website connecting them with potential employers for internships and apprenticeships. This suggests the need for improved communication channels and a more efficient platform for connecting students with potential employers.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Descriptive statistics

Survey data shows that UEL students have limited job information access from universities, with 78.6% accessing it through websites and 76.8% through social media. Over 90% of UEL students face difficulties finding suitable companies, and 65.5% still face difficulties in submitting job applications. To address these challenges, a legitimate recruitment channel between students and employers is needed.

4.1.2. Usability testing

To enhance the applicability and improve user responsiveness when using the website, a survey was conducted to gather feedback and evaluation of UI/UX from three groups: students, alumni (representing businesses), and faculty members.

❖ Qualitative

Based on the interviews conducted with 57 users, the following results were obtained:

- 90% of users found the website interface and layout very user-friendly, with the system displaying complete and clear information.
- 80% believed that the platform's features were very useful in saving time and effort in searching for information.
- 60% felt that the website's search function effectively met users' needs, enabling them to quickly and efficiently search for job and internship opportunities. However, 20% of the survey respondents provided feedback on the difficulty of navigating the website due to unclear navigation bars.
- 80% of users believe that the search and filtering feature on the website is very convenient and meets their needs.

❖ Quantitative

The evaluation of UI design through usability testing involves the application of heuristic principles to assess user behavior while the researcher is present with the user in the same physical location. The purpose of

this methodology is to gain comprehensive feedback on all user actions. The usability heuristic comprises 10 key indicators which serve as the basis for measuring the efficacy of the UI design (Nielsen, 1992).

Table 2. Usability Heuristic Indicators

No.	Sub dimensions	Usability Heuristic Description
1	K1	Visibility of System Status
2	K2	Match between the system and the real world
3	K3	User control and freedom
4	K4	Consistency and standards
5	K5	Help Users to Identify, Diagnose and Solve Problems
6	K6	Error Prevention
7	K7	Recognition rather than recall
8	K8	Flexibility and efficiency of use
9	K9	Aesthetic and minimalist design
10	K10	Help and Documentation Features

Source: Finding usability problems through heuristic evaluation

According to Likert (1932), the Likert scale is a method utilized for gauging the viewpoints and perceptions of participants towards a particular subject through the distribution of questionnaires. The results of the usability test conducted on a UI/UX website design involved 150 participants, and their level of agreement with the questionnaire statements in Google Forms generated diverse data. The collected data from the usability test is presented in Table 9.

Table 3. The results of usability testing

Code	Usability testing evaluation					Total	Total ideal number	Index value
	SA	A	H	D	SD			
K1	23	83	43	1	-	578	750	77.01%
K2	18	65	62	4	1	545	750	72.7%
K3	31	98	21	-	-	610	750	81.3%
K4	71	64	12	3	-	653	750	87.1%
K5	28	93	29	-	-	599	750	79.9%
K6	47	72	31	-	-	616	750	82.1%
K7	52	65	33	-	-	619	750	82.5%
K8	61	63	24	2	-	633	750	84.4%
K9	39	77	34	-	-	605	750	80.7%
K10	58	68	32	2	-	662	750	88.3%
Total						6120	7500	
Average						81.6%		

Usability testing is crucial in the design process, allowing designers to assess their designs' effectiveness from a user-centric perspective. This study conducted thorough testing with users, observing their interactions, and collecting feedback. The results showed high user satisfaction, with an average value index of 81.6%. The testing methodology captured meaningful insights, allowing for further refinement and improvement to ensure the design remains effective and user-friendly.

4.2. Discussion

4.2.1. Limitations of the study

The study achieved some success in designing website linkages for UEL students with enterprises but encountered difficulties due to a lack of technical competence and knowledge of technology. In particular, the website's interface design layout needs improvement, and some functions were not fully optimized due to time constraints. Also, data models and procedures were implemented and utilized. Further refinement is possible to optimize the website for all user needs.

4.2.2. Further research direction

The research suggests developing the UEL CAREERS website on multiple platforms, utilizing user usage and frequency data for connection-making functionality. Expanding recruitment and creating an exclusive community for UEL students can facilitate career development and networking. Innovative solutions, such as mobile applications, AI, predictive analytics, and chatbots, can enhance communication and cooperation. Providing authentication certificates and support in features can build trust and recognition between UEL and enterprises.

5. CONCLUSION

In conclusion, analyzing and designing a portal connecting UEL and enterprises is crucial for students to apply their academic knowledge and practical skills in real-world contexts. The UEL CAREERS website provides job opportunities, internships, and career-related resources. The completed implementation has been perfected in terms of design, ensuring UX/UI, and the development of a responsive website. However, there are limitations that need further refinement. It presents a valuable platform for students to connect with potential employers and build professional networks. Despite the positive feedback, further efforts to promote linkages between UEL and enterprises, along with improvements to website design and functionality, can enhance UEL students' career prospects and employability.

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HOW HAS VIETNAMESE STUDENTS' FINANCIAL LITERACY CHANGED UNDER THE IMPACT OF FINTECH DEVELOPMENT?

Bui Phuong Linh¹, Nguyen Ngoc Anh, Nguyen Vu Phuong Anh,
Nguyen Thi Mai Anh, Nguyen Thanh Huyen

ABSTRACT: *The purpose of this study is to assess the Financial Literacy (FL) of Vietnamese students in the context of financial technology development. Applying Cronbach's Alpha, EFA, and One_Way ANOVA testing techniques on data collected from 755 students at universities in Hanoi, the obtained results show that current students have Financial Knowledge, Financial Attitude Financial Behavior, and FL, in general, are all at good levels and improved compared to previous survey results. Besides, the demographic characteristics leading to the difference in FL of students are Gender and Education. Accordingly, male students have higher FL than female students. Students in Economics & Business Administration majors have higher FL than those in Language majors. In addition, the development of financial technology is also confirmed to increase students' FL. Specifically, students having banking accounts, using Smart Banking, having interest and making online investments have higher FL than groups without these characteristics. These new and valuable findings represent an unrecognized positive influence on fintech.*

Keywords: *financial literacy; students; financial technology; Fintech development.*

1. INTRODUCTION

There are different interpretations of Financial Literacy (FL). However, the most recognized and used concept in recent studies is that of the OECD (2013). According to the OECD (2013), Financial Literacy (FL) is the combination of awareness, knowledge, skills, attitudes, and behaviors required to make meaningful reliable financial decisions to achieve personal financial satisfaction. Improving an individual's FL not only ensures the reduction of financial risks when participating in and using financial services but also has an important meaning and positive impact on the financial inclusion of each country (Grohmann et.al, 2018). However, on the 2018 financial inclusion index, Vietnam ranked only 112/176 in the world and 23/37 in Asia². According to a research sample by Dougn (2019), Do Hong Nhung and Nguyen Ngoc Hai Chau (2021), the FL of Vietnamese people is still limited, only 24% of those surveyed had an above-average FL. This fact motivates researchers to consider and evaluate the level of FL of Vietnamese residents, particularly young people, who are currently the main force (accounting for 21% of the population in 2019). The change in FL will be precise evidence to test the effectiveness of several solutions that have been actively applied by the government of Vietnam such as strengthening financial education, financial technology development...

Financial technology (Fintech) is understood as the application of innovative, creative and modern technologies for the financial sector to provide customers with distinctive, efficient and convenient financial services at a lower cost than traditional ones (Mackenzie, 2015). In recent years, Fintech has developed rapidly in Vietnam, with diversified areas: (i) Pay with apps such as Moca, Payoo, VinaPay, Momo... or provide POS/mPOS⁴ digital payment solutions such as Hottab, SoftPay; (ii) Fundraising through companies which provide capital raising platforms such as FundStart, Comicola, Betado or FirstSetp...; (iii) Online lending such as LoanVi, Timal; (iv) Personal financial management such as BankGo, Moneylover, Mobivi; (v) Data management such as Trusting, Social, Circle Bii; (vi) Transfer money such as Matchmovie, Cash2v;

¹ National Economics University

² https://mof.gov.vn/webcenter/portal/tncdtbh/pages_r/l/chi-tiet-tin?dDocName=UCMTMP119670

(vii) Blockchain such as Bitcoin Vietnam, VBTC Bitcoin¹. By 2021, according to Global Fintech Rankings, Vietnam's Fintech score ranked 70th in the world, of which Ho Chi Minh City and Hanoi ranked 28th and 33rd respectively in the Asia – Pacific area². In terms of transaction value, Vietnam's Fintech market also grew impressively, from \$4.4 billion in 2017 to \$12.9 billion in 2021³. Vietnamese commercial banks themselves are also actively transforming and operating digital banking systems based on modern technology such as BIDV, Vietinbank, TPBank, etc. to meet customer service requests quickly and smoothly.

The fact that commercial banks and financial institutions focus on transforming financial technology towards improving customer experience and satisfaction, has resulted in Vietnamese students these days can search and order anything via websites, e-commerce platforms, social networks, and shopping apps. In particular, they easily compare prices and use sales promotion programs to get satisfied products at the lowest cost. In addition to the popularity of e-wallet applications, Smart Banking is an important premise for transactions to be carried out entirely online. Besides, the development of Fintech also helps students save and invest in online platforms and smartphones. Consequently, the process of consuming and managing personal finances is quick, convenient and flexible.

Based on the above analysis, the research group believes that the development of Fintech enables Vietnamese young people to access financial issues earlier and more conveniently, improving the FL of this group compared to previous generations. In Vietnam, there have been many recent studies evaluating the students' FL such as Le Hoang Anh et.al. (2018), Pham Thi Hoang Anh et.al. (2021), Tran Thanh Thu et.al. (2021). However, there has been no research examining young people's FL under the influence of financial technology development. Therefore, this article is conducted for two main purposes: (i) Measure students' FL, compared to previous studies to record changes, and (ii) Verify the influence of Fintech development on students' FL through variables including purchases on e-commerce platforms, use shopping and online payment applications, use Smart Banking, and invest online.

2. LITERATURE

So far, many researchers have offered different concepts and explanations of "Financial Literacy" (FL) (Holzmann, 2010; Hung et.al., 2009; Morgan and Trinh, 2017...). However, the most commonly used concept of FL is still the concept of OECD (2013) mentioned above, focusing on measuring FL using 3 main aspects: Financial Knowledge, Financial Behavior, and Financial Attitude. The content of each aspect is understood according to the interpretation of the World Bank (2013), specifically: *Financial knowledge* is an individual's understanding of basic financial concepts (inflation, compound interest,...) and how to recognize financial products/services as well as basic financial skills (payments, bank account...). Therefore, financial knowledge is a prerequisite for shaping the financial attitudes and behaviors of each individual. *Financial Attitude* is an individual's view of the surrounding financial situation, including attitudes about saving, investing, borrowing, attitudes toward the future, self-confidence toward retirement plans, saving trends, and lending... Determining an individual's attitude towards economics and finance is a consequence of that individual's financial knowledge and creates a premise for financial behavior (financial decision-making). Finally, *Financial behavior* is understood as an individual influence on the volatility of financial issues such as daily money management, long-term planning, making financial decisions (the ability to choose the right financial products), or seeking financial advice. Through individuals' responses to financial issues, we can evaluate an individual's sensitivity to finances in the face of change.

Based on such an approach, measuring FL also focuses on 3 aspects: Financial knowledge, attitude, and behavior. In 2013, OECD conducted a 21 – question survey to assess the FL of people in different

¹ <https://tapchitaichinh.vn/vai-tro-cua-cong-nghe-tai-chinhdoi-voi-thuc-day-tai-chinh-toan-dien.html>

² https://findexable.com/wp-content/uploads/2021/06/Global-Fintech-Rankings-2021-v1.2_30_June.pdf

³ <https://marketreport.io/fintech-vietnam-report>

countries. By 2022, the OECD adjusted several points, but the structure still consists of 3 aspects on a 20-scale, including 7 points for knowledge, 9 points for behavior, and 4 points (instead of 5) for attitude to assess FL level. This questionnaire is used by many researchers as the basis for experimental studies (Lusardi et.al., 2017; Khuc The Anh et.al, 2020, ...)

In addition to evaluating the level of FL, scientists are also interested in identifying factors influencing this problem. In which, the demographic characteristics confirmed in most studies are age, gender, and education level. Specifically, for students aged 15 to 22, Edwy et.al. (2022) proved that FL increases with age. According to the author, as age increases, people become more knowledgeable, leading to a change in their attitudes and behavior. Besides, FL is affected by gender. According to Le Hoang Anh et.al. (2018), Nguyen Dang Tue (2017), Nguyen Thi Yen (2014), Pham Thi Hoang Anh et.al. (2021), women have better FL than men. Meanwhile, research by Chen and Volpe (2002), Eitel and Martin (2009), Nguyen Thi Hai Yen (2015), Philippas and Avdoulas (2019) found the opposite result.

Regarding education, Utami (2021) pointed out that university students have better FL than those in high schools. Philippas and Avdoulas (2019), Le Hoang Anh et.al. (2018), Morgan and Trinh (2017), Pham Thi Hoang Anh et.al. (2021), Tran Thanh Thu et.al. (2021) confirmed particularly that 3rd and 4th year students have better FL than 1st and 2nd year students. Additionally, university students with Economics majors have better FL than students with other majors because they have access to financial knowledge at school.

In addition to the above typical characteristics, Pham Thi Hoang Anh et.al. (2021), Philippas and Avdoulas (2019), Thapa et.al. (2015) also pointed out several other factors that have positive impacts on individuals' FL such as income, occupation, and culture and living environment. However, the factors associated with financial technology development have not been considered clearly and comprehensively, especially in Vietnam. Several researchers around the world have proposed the relationship between the benefits of establishment through applications of financial technology and the FL of young people. According to Suratno et.al. (2021), students having the habit of online shopping are more agile when comparing prices on e-commerce platforms and understand product information better, so they have higher levels of FL than those who do not shop online. Furthermore, Seldal and Nyhus (2022) state that today's young people are the group of people who use online payments most often, and that students who use online payment services have better FL than those who do not use this service. Regarding saving and investment behavior, Michaela et.al. (2022) concluded that students who participate in investment activities have higher levels of FL because they have knowledge of choosing the right investment tools as well as an understanding of the benefits and risks of investment.

3. METHOD

3.1. Financial literacy scale

To measure Financial Literacy (FL), the authors use the concept and the questionnaire from OECD (2022), which, however, is selectively adapted to the age of 18 to 22 in Vietnam. FL is measured on three dimensions including Financial knowledge, Financial attitudes, and Financial behavior, which are presented in table 1 to table 3 respectively. Specifically, the Financial knowledge variable is measured using 7 scales which are questions that test respondents' understanding of the time value of money, inflation, interest rates, savings, loans, investments, and risk. Each question has specific answers and is then converted to a 5-point Likert scale from (1) respondents have no knowledge to (5) Respondents have reasonable knowledge of the question asked.

Table 1. Scale of Financial Knowledge variable

Symbol	Contents of the scale
K1	If you were given 100 million VND, would you like to receive it now or in 5 years, knowing the price of everything you want to buy stays the same in those 5 years?

K2	When the inflation rate increases, how will the money that you have to spend on daily living?
K3	Assume that you need to buy a laptop for 15 million. Store A offers a discount of 2 million, store B 10% off. Which store do you choose to buy from?
K4	You have 100 million VND in savings at the bank with an interest rate of 8%/year. After 2 years, what amount will you get?
K5	Today, you save money at the bank with an interest rate of 8%/year. If the inflation rate is 10%/year, after a year, what will this money be worth compared to now?
K6	You borrow 100 million from the bank, and after 1 year you have to pay 106 million. What is the loan interest rate?
K7	Is it always better to split your investment into several different asset classes than to invest in a single one?

The Financial Attitude variable measures the thoughts or beliefs of each person about financial matters, measured by a 6 Likert scale with 5 points from (1) Totally disagree to (5) Totally agree.

Table 2. Scale of Financial Attitude variable

Symbol	Contents of the scale
A1	I find setting up a spending plan is necessary
A2	I find comparing and finding out the price before buying is necessary
A3	I find saving part of my income instead of spending it all is necessary
A4	I only borrow money when absolutely necessary (for compulsory expenses for living and studying)
A5	I think it is better to deposit my savings in a bank to receive a stable and safe interest rate than to invest in the stock market, cryptocurrency, or business.
A6	I find diversifying investment activities is necessary

Financial Behavior variable represents an individual's specific response to changes in economic and financial fields, measured by a 6 Likert scale with 5 points ranging from (1) Totally disagree to (5) Totally agree.

Table 3. Scale of Financial Behavior variable

Symbol	Contents of the scale
B1	I strictly adhere to the spending plan
B2	I always compare prices before buying
B3	I regularly leave part of my monthly earnings for urgent future needs
B4	I rarely have to borrow money to spend
B5	I deposited savings instead of investing in stocks, cryptocurrencies, business, ...
B6	I usually diversify my investments

3.2. Scale of factors influencing Financial Literacy

Based on the literature and the limited survey conditions, factors influencing FL considered include Gender, Age, Education, and financial technology development factors (table 4).

Table 4. Scale of influencing factors

Variable	Symbol	Contents of the scale
Gender	Gender	Gender
Age	Age	Age
Education	Edu	Major
Financial technology development	FT1	Buy on e-commerce platform
	FT2	Use shopping and payment apps on smartphones
	FT3	Have own bank account and use Smart Banking service
	FT4	Interested in and making online investments

3.3 Research sample

Based on the allocation of 1,000 surveys directly to students in different universities in Hanoi in the period from December 2022 to February 2023, the research group received 755 responses qualified for analysis, which are Economics & Business Administration and Language majors. The results are shown in Table 5.

Table 5. Structure of the research sample

Factor	Classification Criteria	Quantity	Percentage
Gender	Male	181	23.97%
	Female	570	75.50%
	Other	4	0.53%
Age	18	253	33.51%
	19	140	18.54%
	20	200	26.49%
	21	107	14.17%
	22	55	7.28%
Major	Language	160	21.19%
	Economics & Business Administration	595	78.81%
Buying on e - commerce platform	No	138	22.35%
	Yes	617	81.72%
Using shopping apps and online payment	No	95	12.58%
	Yes	660	87.42%
Having bank accounts	No bank account	20	2.65%
	Having a bank account, not using Smart Banking	67	8.87%
	Having a bank account and using Smart Banking	668	88.48%
Investing online	Not interested in online investment	220	29.14%
	Interested, but not invested online yet	454	60.13%
	Interested and have online investment	81	10.73%

The above sample structure shows that the percentage of surveyed females is higher than that of males, mostly between the ages of 18 and 20. The number of surveyed students studying Economics and Business Administration is dominant among those studying language majors, which corresponds to the educational scope of the universities in Hanoi. Regarding financial technology development background, businesses that are actively changing financial technology applications to change the way they provide services have been making online purchases and payments, using Smart Banking and online investment become popular, especially after the outbreak of Covid 19 pandemic in early 2020. In the survey sample, 81.72% of students shop on e-commerce platforms, 87.42% of them use online shopping and payment apps, and 88.48% of them have Bank accounts and use Smart Banking. This number is much higher than the average of 68% of the Vietnamese population who have a bank account¹. Also, regarding online investment activities, due to new capital requirements, and a certain level of understanding, the percentage of students investing online reaches 10.73%, while the proportion of students interested in online investment (although not yet implemented) is 60.13%, accounting for more than a half of the research sample, demonstrating the sharp sensitivity and quick grasping to new trends of young people.

¹ <https://vnexpress.net/68-nguoi-truong-thanh-co-tai-khoan-ngan-hang-4477351.html>

3.4. Data processing techniques

The following are the primary data processing techniques used for the research:

First, descriptive statistics. Frequency statistics to determine the sample structure. Mean statistics are used to describe the survey subjects' overall assessment of how many points are used on the scale (Likert 5), with an emphasis on the Mean, Max, Min, Standard Deviation.

Second, evaluate the reliability of Cronbach's Alpha. Cronbach's Alpha is used to evaluate termite relationships between variables in the same group. According to Hoang Trong and Chu Nguyen Mong Ngoc (2008), the value of Cronbach's Alpha coefficient from 0.6 or higher is the qualifying scale. Corrected Item – Total Correlation represents the relationship between an observed variable and all other observable variables on the same scale. According to Loiacono (2000), this coefficient should be set to ≥ 0.4 to select the best observational variables for a measurement scale.

Third, Exploratory Factor Analysis (EFA). EFA is used to reduce a set of many variables to measure interdependence into a smaller set of variables (called factors), ensuring that they are more significant but still contain most of the information content of the original set of variables. According to Hair et.al. (2009), Factor loading ≥ 0.5 , the new observed variable is evaluated as "statistically significant". In addition, the value of KMO must reach a value of 0.5 or higher as a sufficient condition for the factor analysis to be appropriate. Bartlett's assessment is statistically significant (Sig. < 0.05), showing that the observed variables are correlated. In addition, the total variance explained $\geq 50\%$ indicates that the EFA model is appropriate.

Fourth, One-way ANOVA. This analysis shows differences in FL between different groups in the same factor as shown in Table 5. In the Homogeneity test table, if Sig. value of Levene Statistic ≥ 0.05 shows that the variance between the choices of the qualitative variable is not different, see the results in the ANOVA table. If F's Sig. value in ANOVA rating table is < 0.05, it can be concluded: There are statistically significant differences in the FL levels of different students in each group. In the case Sig. value of Levene Statistic < 0.05, the equation hypothesis between groups of qualitative variables is violated. Then, look at the Robust Tests test table, if Welch's Sig. value is < 0.05, it shows that there is a statistically significant difference in the levels of FL between the groups being considered. Specific differences between groups are expressed in the size of the Mean values in the Descriptives table (if there are only two classified groups) or Mean Difference and Sig. values on the Multiple Comparisons table of the Post Hoc query (if two or more classified teams are included).

4. RESEARCH FINDINGS AND DISCUSSION

4.1. Assess the reliability of the scales for each aspect of Financial Literacy

By conducting the Cronbach's Alpha reliability test for each group of Financial Literacy, Financial Attitude, and Financial Behavior scales, the following results were obtained, as shown in Table 6.

Table 6. Summary of Reliability Statistics

Variable	Scale	Corrected Item – Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Financial Knowledge	K1	0.175	0.633	0.623
	K2	0.243	0.615	
	K3	0.327	0.593	
	K4	0.359	0.580	
	K5	0.455	0.540	
	K6	0.528	0.523	
	K7	0.298	0.598	

Financial Attitude	A1	0.506	0.538	0.634
	A2	0.508	0.548	
	A3	0.539	0.532	
	A4	0.389	0.584	
	A5	0.073	0.702	
	A6	0.301	0.615	
Financial Behavior	B1	0.412	0.538	0.609
	B2	0.316	0.576	
	B3	0.474	0.508	
	B4	0.315	0.576	
	B5	0.211	0.621	
	B6	0.346	0.563	

The results from Table 6 illustrate that Cronbach’s Alpha coefficient of all groups is > 0.6 , showing that the groups of variables Financial Knowledge, Financial Attitude, and Financial Behavior are all qualified to represent the overall variable Financial Literacy. However, in each group of variables, some scales do not meet the standards (Correct Item-Total Correlation < 0.4) and should be disqualified. Finally, the best scales for the Financial Literacy variable are K5 and K6. The best scales for the Financial Attitude variable are A1, A2, and A3. The best scales for the Financial Behavior variable are B1 and B3.

4.2. Group of scales using EFA

The scales selected as the best in Step 1 continue to be analyzed by EFA to verify convergence. The KMO coefficient reaches 0.641 (> 0.5) showing that the factor analysis is appropriate. Bartlett’s test has statistical significance (Sig. = 0.000 < 0.05), showing that the observed variables in the population are correlated with each other. The Total Variance Explained is 69.228% $> 50\%$, proving that seven separate scales in three groups can converge and reflect 69.228% of the change in all observations. The grouping of the scales is shown in the Rotated Component Matrix table.

Table 7. Rotated Component Matrix

	Component		
	1	2	3
A3	0.815		
A2	0.811		
A1	0.787		
K5		0.850	
K6		0.842	
B1			0.860
B3			0.799

Because the scales chosen to perform the factor analysis are already the best (according to Cronbach’s alpha reliability test), the grouping results ensure that the scales are in the correct representative group and all convergent. Factor loading coefficients are all very high, ranging from 0.787 to 0.860, showing the ability to measure the overall variables.

4.3. Measure and evaluate Financial Literacy

From the selected scales, the value of each scale in each group is extracted to calculate the Mean score of the aspects of Financial Knowledge, Financial Attitude, and Financial Behavior. From there, calculate the level of Financial Literacy as the average of the three aspects above. The means of the component variables and the total variable are presented in Table 8.

Table 8. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Financial Knowledge	755	1.00	5.00	4.266	1.020
Financial Attitude	755	1.00	5.00	4.523	0.574
Financial Behavior	755	1.00	5.00	3.544	0.794
Financial Literacy	755	1.50	5.00	4.111	0.502

Table 8 shows that Financial Attitude has the highest average score, followed by Financial Knowledge and Financial Behavior. However, the average values are all within or above about 3.4 to 4.2 (equivalent to the good level of the Likert 5 scale), so it can be confirmed that all 3 aspects are good, leading to good financial literacy among Vietnamese students. This is a good sign, showing that the results have been significantly improved compared with previous studies by Le Hoang Anh et.al. (2018), Pham Thi Hoang Anh et.al. (2021), Tran Thanh Thu et.al. (2021). Besides, good financial literacy is also possible because the respondents of this study are mainly students from the major universities in Hanoi such as National Economics University, Foreign Trade University, and University of Languages & International Studies. With high admission scores, students at these universities are expected to have higher qualifications and skills than the current youth average.

4.4. Identify factors affecting Financial Literacy

Comparing the difference in financial literacy by One_Way ANOVA with all demographic variables and variables that represent the development of financial technology. The results in Table 9 show that there is only a statistically significant difference in Financial Literacy among Genders, Majors, and Use of Smart Banking and Online investing.

Table 9. One_Way ANOVA

Criteria	Sig. of Levene Statistic in Homogeneity	Sig. of F in ANOVA	Sig. of Welch in Robust tests
Gender	0.204 (> 0.05)	0.006 (< 0.05)	
Age	0.039 (< 0.05)		0.015 (< 0.05)
Education	0.109 (> 0.05)	0.000 (< 0.05)	
Buying on e-commerce platforms	0.387 (> 0.05)	0.628 (> 0.05)	
Using shopping apps and online payment	0.034 (< 0.05)		0.810 (> 0.05)
Having a bank account and Smart Banking	0.000 (< 0.05)		0.048 (< 0.05)
Investing online	0.055 (> 0.05)	0.000 (< 0.05)	

Look at the difference in Financial Literacy between groups of students using the mean in the Descriptive Table or Multiple Comparison Table (Post Hoc test) provided in Table 10 to Table 13.

Table 10. Difference of FL in Gender

Gender		Mean Difference	Std. Error	Sig.
Male	Female	0.13691	0.04262	0.001
	Other	0.20047	0.25250	0.427

Female	Male	-0.13691	0.04262	0.001
	Other	0.06356	0.25063	0.800
Other	Male	-0.20047	0.25250	0.427
	Female	-0.06356	0.25063	0.800

Table 10 shows a statistically significant difference (95% confidence level) between the financial literacy of male and female students, showing that male students have higher levels of financial literacy than female students. This result reconfirms the existing opinion of Chen and Volpe (2002), Eitel and Martin (2009), Nguyen Thi Hai Yen (2015), and Philippas & Avdoulas (2019).

Table 11. Difference of FL in Education

Criteria	N	Mean	Std. Deviation
Economics & Business Administration	595	4.153	0.480
Language	160	3.956	0.552

The results in Table 11 show that students with Economics & Business Administration majors have higher Financial Literacy than Languages (99% and 95% confidence, respectively). Thus, the education sector is still a factor that leads to the disparity in financial literacy, agreed with the opinion of Philippas and Avdoulas (2019), Le Hoang Anh et.al. (2018), Morgan and Trinh (2017). Given the importance of financial literacy, schools from secondary school upward need to be careful to integrate financial literacy teaching into the curriculum at levels ranging from simple to complex. At the university level, there is a need to include compulsory or elective subjects related to financial services, investments, and insurance in the educational program.

Table 12. Difference of FL in Having and using Smart Banking

		Mean Difference	Std. Error	Sig.
No bank account	Having a bank account, do not using Smart Banking	-0.22291	0.12700	0.080
	Having a bank account and using Smart Banking	-0.35746	0.11311	0.002
Having a bank account, do not use Smart Banking	No bank account	0.22291	0.12700	0.080
	Having a bank account and using Smart Banking	-0.13454	0.06387	0.036
Having a bank account and using Smart Banking	No bank account	0.35746	0.11311	0.002
	Having a bank account, do not using Smart Banking	0.13454	0.06387	0.036

All Sig. values shown in Table 12 have Sig. < 0.05 or < 0.1 indicates a statistically significant difference (95% or 90% confidence level) in financial literacy between groups of students who have bank accounts and use Smart Banking have higher financial literacy than students who have bank accounts but do not use Smart Banking. Besides, students who have accounts but do not use Smart Banking still have better financial literacy than unbanked students.

Considering in detail the change in FL, having a bank account increases the FL average score by 0.22291 compared to not having accounts. Besides, having a bank account and using Smart Banking increases the average score of FL by 0.13454 compared to having a bank account without using Smart Banking. The total difference in average FL score between the group with a bank account and using Smart Banking and the group without bank account is 0.35746. The statistical results of the average score on FL of each group of these students are presented in Table 13.

Table 13. The average FL score of students having bank accounts and using Smart Banking

Criteria	N	Mean	Std. Deviation
No bank account	20	3.775	0.887
Having a bank account, do not use Smart Banking	67	3.998	0.560
Having a bank account and use Smart Banking	668	4.132	0.476

The average FL score of students in table 13 has significantly improved thanks to having a bank account and using Smart Banking. Therefore, having a separate bank account (with or without independent income) and using the Smart Banking application together have a positive impact on financial literacy as the research team suggested. This can be explained by the convenience of having a bank account in everyday spending and the usefulness of Smart Banking in making payments, managing balance fluctuations, and saving online. Students who use Smart Banking regularly have the opportunity to control their own money (supported by their parents or self-employed) more conveniently and easily than those who do not have bank accounts or do not use Smart Banking.

Table 14. Difference of FL in Investing online

		Mean Difference	Std. Error	Sig.
Not interested in online investment	Interested, but not invested online yet	-0.15312	0.04051	0.000
	Interested and have online investments	-0.33486	0.06409	0.000
Interested, but not invested online yet	Not interested in online investments	0.15312	0.04051	0.000
	Interested and have online investments	-0.18173	0.05948	0.002
Interested and have online investment	Not interested in online investment	0.33486	0.06409	0.000
	Interested, but not invested online yet	0.18173	0.05948	0.002

With 99% and 95% confidence levels, Sig. value < 0.01 or 0.05 , Table 14 clearly shows the statistically significant difference that the financial literacy of interested students with online investing is better than interested students who have not yet made online investments. Additionally, students who are interested but have not done online investing before still have higher financial literacy than students who are not interested in online investing. Such a positive effect corresponds exactly to the expectations of the research group.

Looking at the details of FL change, being interested in online investing but not invested online yet causes the financial literacy average score to increase by 0.15312 compared to not being interested in online investment. Besides, having interest and making online investments increases the average FL score by 0.18173 compared to having interest but not investing yet. The total difference in average FL score between students investing and those not interested in investing is 0.33486. The statistical results of the average score on FL of each group of these students are presented in Table 15.

Table 15. The average FL score of students being interested and making online investment

Criteria	N	Mean	Std. Deviation
Not interested in online investment	220	3.983	0.549
Interested, but not invested online yet	454	4.136	0.465
Interested and have online investments	81	4.318	0.486

Table 15 shows that the average FL score of students with interest and online investments ranges from 4.2 to 5, equivalent to Very good levels on the Likert-5 scale, whereas the figures of other groups are at Good levels. This average FL score is also higher than that in Table 13, proving that being interested and having online investments helps students improve FL more than having bank accounts and using Smart Banking because Online investing is a higher level than spending management in personal financial management.

The results also show the impact of the wide availability of investment products on online platforms on the financial literacy of young people. These days, students can easily and quickly learn and register to open an investment account, make transactions, summarize balances, and transfer principal/interest on a smartphone or computer connected to the internet. Investing online, even with a limited amount of money, is a helpful experience for students to practice risk assessment, determine expected returns, and manage portfolios. These are all essential and at a higher level of personal financial literacy. In addition, the online investment experience from the student days also creates the prerequisite for effective management of one's asset portfolio in the future. Over time, these assets accumulate more and more. So, if they are well managed and continue to be profitable within the allowable risk threshold, it will increase the value of a person's wealth.

5. CONCLUSION

By using an adjusted questionnaire, referenced from OECD (2013) and OECD (2022), the research team collected data on the financial literacy of 755 students at universities in Hanoi. Applying Cronbach's Alpha, EFA, One_Way ANOVA & Post Hoc techniques, the result shows that Vietnamese students have good financial knowledge, financial attitude, financial behavior, and FL in general, a significantly improved result compared to previous studies and is above the general FL level of Vietnamese people. Regarding the demographic factors, male students have higher FL than female students. Students in Economics & Business Administrative majors have higher FL than those in Language majors. In terms of the impact of Fintech development on students' FL, we found: (i) having a bank account causes the average FL score to increase by 0.22291 compared to not having an account, and having bank accounts and using Smart Banking helps the average FL score increase by 0.13454 compared to having bank accounts without using Smart Banking; (ii) Being interested in online investments helps the average FL score increase by 0.15312 compared to not investing online, and being interested in and making online investments helps the average FL score increase by 0.18173 compared to being interested, but not yet investing online; (iii) Being interested and investing online helps to improve FL much more than having bank accounts and using Smart Banking.

These aforementioned results suggest solutions to improve young people's FL and people in general, including (i) create equal access to FL education for both genders, (ii) add educational content about FL in the curriculum from high school to university, (iii) in particular, continue to promote cashless payment and (iv) create opportunities for individuals to conveniently access and use modern transaction methods and financial instruments at low cost.

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INCORPORATION OF ARBITRATION CLAUSE FROM CHARTER PARTY INTO BILL OF LADING IN VIETNAMESE LAW AND LESSONS FOR VIETNAM

Authors: Du Thoai Ngoc¹, Pham Hoang Thuc Doan², Nguyen Huynh Diep Quyen²,
Nguyen Phuong Nha Doan², Chau Do Ngoc Uyen²
Mentor: Tran Thanh Tam²

Abstract: *Along with the development of international trade, especially in the maritime industry, it is critical to have a more complete framework of dispute resolutions under arbitration to help Vietnamese enterprises deal with issues arising from the usage of the two most necessary documents which are Charter Party and Bill of Lading. Based on the theoretical framework that scholars in the world have examined with two different system – Chinese and English law, based on civil law and common law respectively, we can analyze the legal frameworks of Vietnamese law regarding the incorporation of arbitration clause in Charter Party into Bill of Lading. As can be observed, the legal frameworks of Vietnam and the two nations described above differ significantly; yet, the authors believe that this is sufficient and appropriate for the development degree of firms and the Vietnamese economy. Therefore, we can infer practical experience for Vietnamese enterprises so that they can know how to incorporate validly arbitration clauses from Charter Party into Bill of Lading in a reasonable and enforceable manner along with adding some recommendations to the involved dispute settlement bodies and government.*

Keywords: *charter party, bill of lading, arbitration clause, incorporation clause, English law, Chinese law, Vietnamese law*

1. INTRODUCTION

In Vietnam, the maritime industry plays a critical role in promoting economic growth; however, a rising market as Vietnam is considered a country with an immature legal system. Therefore, in some cases it does not keep up with the current trend of the maritime industry, including the issues regarding the incorporation of arbitration clause from the charter party into the bill of lading.

As we know, both charter party and bill of lading have been used for many years as a common practice worldwide and are known to be among the most important documents in maritime transport. In volume 7 of the Carriage and Carriers, a C/P is identified as a contract signed between an effective owner or a disponent owner regulating the right to use the capacity of the entire vessel or some specific parts of her of the charterer, for a voyage or a specified period (Haylvey and Helen, 2020). Whereas a B/L is a document issued by a carrier to a shipper, signed by the captain, agent, or owner of a vessel, furnishing written evidence regarding receipt of goods, the conditions on which transportation is made and the engagement to deliver goods at the prescribed port of destination to the lawful holder of the B/L (Hinkelman, 2008). In terms of dispute resolution, arbitration clauses are general provisions found in contracts stating when arbitration is required as a form of alternative dispute resolution (Goldby, M., 2007). It is common to mention the terms and conditions into shipping document which includes the action of incorporating the arbitration clauses from C/P into B/L. However, many issues shall arise such as whether the incorporation arbitration clause is valid from the point of view of the applicable law and whether it is binding on a third party. The act of incorporation to be valid and the dispute to be settled under arbitration, two conditions must be satisfied that both the incorporation clause in B/L and the arbitration clause in C/P must be valid and accepted. The charterer may endorse the bill of lading and transfer the ownership to another third party not bound by the charter party, thus leading to an issue of deciding who has the right to rule on the dispute.

¹ Foreign Trade University; Email: duthoaingoc02@gmail.com

² Foreign Trade University

However, it is acknowledged that the validity, interpretation and performance of incorporation clause are different according to different applicable law. These differences can make incorporation invalid and null in certain countries and it is impossible for parties to settle disputes under arbitration as expected.

To the extent of our research, the main objectives are classified into two levels as follows. General objectives: Based on how other scholars examined and analyzed the validity and enforcement of the incorporation of arbitration clause in two different law systems England and China, we clearly analyze the relevant legal frameworks governing this issue in Viet Nam to better consider the necessary requirements and legal codes. Based on the general objectives, our research will obtain two following aims. Firstly, the authors examine the practice and legal framework governing the incorporation of arbitration clause in bills of lading under Vietnamese law in comparison with those of English and Chinese laws based on theoretical framework from previous studies. Then, we give some recommendations for the law amendments governing some arising issues around the incorporation of arbitration clause in B/L and for the Vietnamese enterprises to successfully incorporate arbitration clauses from charter party to bill of lading.

The research's subject matter is the legal issues relating to the incorporation of an arbitration clause from a charter party into a bill of lading which mainly concentrates on the validity and enforcement of the arbitration clause in the sales of goods contract and the validity of incorporation clause into B/L; the research will synthesize from previous scholars' research papers on the legal framework governing arbitration in two completely different legal systems – Chinese and English law; Based on this framework, our study carry some comparative analysis between regulations governing these issues in Vietnam law and Chinese, English law, then, highlights implications for Viet Nam's enterprises when drafting a B/L under seaway to be more thorough and favorable to the Viet Nam side if any disputes occur.

2. THEORETICAL FRAMEWORK

Within a potentially emerging market such as Viet Nam, along with the speed of international integration, the maritime industry has long been a primary engine in promoting economic growth. Viet Nam has become widely known as a regional maritime trade hub, with one of the highest liner shipping connectivity indexes in Asia. Given its advantageous location and shipbuilding potential, the Vietnamese maritime industry has been particularly appealing to foreign investors (Minh-Ngoc Nguyen, 2023). With such a fast pace, dispute resolution regarding the maritime industry also plays a critical role to protect Viet Nam's companies. However, when it comes to a dispute regarding international contracts, the rate of foreign court judgements or arbitral awards to be recognized and enforced in Vietnam is rather low (Stephen Le, 2021). Therefore, although the urgency and usefulness for Vietnamese enterprises to use arbitration as a dispute resolution have been proven by many previous studies, the research background for the topic "Incorporation of arbitration clause from in C/P into B/L" under Vietnamese law has not yet been thoroughly researched and analyzed.

However, legal framework in other countries in associated with this topic has long been discussed and researched by various scholars, especially under English law and Chinese law which are two of countries having the most developed arbitration systems and based on two completely different law systems, particularly the common law system and civil law system respectively. The reason why the research chooses English and Chinese law as theoretical framework to analyze Vietnam law is that England is well known for its longer and more complete history of arbitration (Georgios, I.Z, 2008). With a well-established framework for arbitration, England is obviously a top priority to be chosen as the seat of arbitration. On the other hand, although maritime arbitration in China began relatively late compared to other countries, it is gradually developing with a more unified and standardized arbitration system and heading towards respect for party autonomy (Zhenzhou Jiang, 2011).

2.1. Theoretical and legal framework governing the validity of arbitration clauses under Chinese and English law

To compare the two arbitration law effectively, we need to look through the validity of arbitration clause under the two laws. It serves as the founding step for the arbitration clause to be considered valid in incorporation. Many authors have agreed on the level of importance of recognition and enforcement of arbitration clause (CHRYSOULA, 2017; Kim Liang, 2006; Poudret, J. F. & Besson, S., 2007; Born G., 2021).

According to Kim Liang, the agreement to arbitrate serves as the foundation stone for recognition and enforcement of arbitration clauses. The agreement is based on 2 main functions: (1) proof of intent to arbitrate between parties and (2) is to give jurisdiction on an arbitral tribunal. For example, under The New York Convention (The Convention), the award could be refused if the agreement is invalid under its governing law or if the parties are under some incapacity.

Another important point discussed by the scholars is the valid format of arbitration agreements (Kim Liang, 2006; CHRYSOULA, 2017). Under English law, the comprehensiveness of definition of “writing” is well written in a separate clause. It could be any form that results in agreement and then being able to be written down as a visible form, for example, digital recordings of oral agreement, or a recording of an oral offer. However, this is not the case for China with no clear definition in the lex.

Kim Liang also discussed the proof of intent when making a comparative analysis between the two laws. This means that any proof of intentions and agreement to arbitrate. Under English law, the requirements are relaxed to match with current modern forms of communication. No signs or stamps are needed for the arbitration clause to be considered valid. This means both parties only need to have proof that the other parties did not disagree with the arbitration clause can also be considered an agreement. On the other hand, in China, they have a very strict requirement for a signature. This creates a barrier to modern forms of communication such as emails. It is very abnormal to make both parties sign on every email they exchange information. Moreover, China has a substantial requirement for validity that has been said to be out of the scope to prove the intention to arbitrate, which is the requirement on content related to arbitration commission (Jian Zhou, 2006).

Finally, Peerenboom (2001) has emphasized the enforceability of an arbitration under legal framework is just as important as the validity of it. Under the English law of arbitration, the enforcement of an arbitration award has the same jurisdictional power as the court's¹. However, under Chinese law, it is easy to identify the inferiority of arbitral awards to the court when stipulate the domestic case (Jian Zhou, 2006). Another thing to consider regarding the enforcement stage of the award is the public interest regime refusing the enactment of the award. It is a ground allowing the court to refuse the award based on public policy under the Convention. Coming to Chinese law, the public policy has been extended to public interest. The difference is that the former only covers the basic notions of morality and justice, but the latter also includes the financial and societal health of the public, not isolated to a small group. This has been said to be convenient for local protectionists in China (Jian Zhou, 2006).

2.2. Theoretical and legal framework governing the validity of incorporation clause under Chinese and English law

B/L often does not have arbitration clauses, but they can be incorporated into B/L from the C/P which the B/L is issued accordingly (Echebarria, Fernández, Jonatan, 2021). The incorporation clause plays an important role because an invalid incorporation will make the arbitration agreement invalid and not bind all parties. Although most arbitration laws recognize the action of incorporating an arbitration clause from the C/P into B/L by reference, each of county has different approaches with different conditions and regulations. The authors Liang Zhao and Lianjun Li (2016) have do a comparative analysis about this issue between

¹ The article 66 of Arbitration Act of English law states that: “(1) An award made by the tribunal pursuant to an arbitration agreement may, by leave of the court, be enforced in the same manner as a judgment or order of the court to the same effect...”

English and Chinese Law. They found that once the requirements in are met, the arbitration clause from the C/P can be successfully incorporated into the B/L under English law, whereas Chinese law has many complex and unclear cases. Many scholars have performed the analysis on the Maritime Code of People's Republic of China and Section 6 the 1996 UK Arbitration Act and reached similar conclusions about the level of strictness in the two-country law.

Liang Zhao and Lianjun Li (2016) suggested that the validity of the incorporation clause would be determined on factors such as wording and description on the face or back of the B/L, intention of both parties, consistency rules between the B/L and the C/P, etc. About the wording on the incorporation clause in B/L, Sandra Lielbarde (2010) stated that for both English and Chinese law, only specific words clearly mentioning the arbitration agreements (“including arbitration clause”, etc.) are appropriate for incorporated. Arbitration clauses couldn't be successfully incorporated by generic expressions, like “all conditions and exceptions”, “all terms”, etc. Besides, the authors suppose Chinese law applies more restrictive regulations. Because unlike English law, Chinese law clearly stipulates that the name of the parties as well as the time of signing the C/P should be indicated on the front side of the B/L.

Another requirement discussed by scholars is the consistency rule. They are required in most of country-law, including Chinese and English law. It means that the charter party clause, when incorporated, must be consistent with the remainder of the B/L (Liang Zhao and Lianjun Li, 2016, p. 649). According to Nguyen Quang Anh (2005), the consistency rule means that the terms from the C/P once incorporated should be consistent. There are two types of inconsistency errors: when the wording of the incorporated arbitration clause is inconsistent and can limit the scope of application of the arbitration clause and arbitration clause incorporated in the B/L does not exist in the C/P.

Besides, Serpil Yılmaz (2016) supposed that the effectiveness of the incorporation is mostly based on the intentions of the parties involved. The intention of the parties to the B/L can only be evidenced by expressed clauses and terms in the bill. Both the English and Chinese law have the same provisions about this issue. However, there are different approaches as it depends on the court's decision for certain cases. Because the criteria that determine whether the B/L holder must accept the B/L or merely pretend to be aware of the incorporated arbitration clause are not mentioned in either English or Chinese law (Serpil Yılmaz, 2016, p. 19).

Besides, in terms of the binding effects of the incorporated arbitration clause on the third parties, the Chinese law and English law demonstrate totally contrary perspectives.

Under the English law, an incorporated arbitration clause in B/L can bind upon the holder if it states an explicit reference to the C/P arbitration clause. The English courts intend to protect the B/L holders by requiring the original parties to expressly incorporate the arbitration clause in B/L and thus can provide the B/L holders with the notice of the arbitration clause (Echebarria, Fernández, Jonatan, 2021). The first explanation of that perspective is that the B/L holders are the non-original parties to the contract of carriage. Besides, the arbitration clause is an ancillary dispute resolution provision that is not directly relevant to the main subject matter of the C/P. According to the UK Carriage of Goods by Sea Act 1992, the person to whom all rights of suit under the contract of carriage are transferred will become the lawful holder of the B/L as if a party of that contract. Therefore, it is necessary for the B/L to be bound by the terms and conditions including the incorporated arbitration clause from the C/P.

Under the Chinese law, there is no integrated system to protect a third party in the Chinese civil legal system. It is stated that the privity of the contract is broken where the terms of C/P are incorporated into a B/L. In practice, the judges usually utilize Civil Law or any other Commercial Law, such as Contract Law instead of the Maritime Code because of some gaps and defects in the depiction of the international conventions. Besides, once the Court denies the validity of the incorporated arbitration clause, the binding effect on the third party obviously does not exist.

One typical situation to illustrate the importance of understanding binding effects on the third party is the subrogation in insurance service. As for the English law, it states that the arbitration clause in the B/L may bind the insurer. On the contrary, the Chinese law views that the incorporated arbitration clause does not bind over the subrogated insurer. The SPC states that the arbitration clause is totally independent of the main terms of the contract. Therefore, it should be negotiated between the relevant parties of B/L. Because the right of subrogation simply transferred the substantive right of B/L to the insurer, unless the insurer expresses clear acceptance of the clause, the arbitration clause then can applicably bind the insurer.

3. RESEARCH METHOD

The authors start from real situation in Vietnam where the legal framework has not yet thoroughly governed issues of incorporation of arbitration clause from the C/P into B/L. This legal framework will be analyzed and resolved based on comparative analysis according to theoretical framework that other scholars have used with English and Chinese law. Besides, the authors also describe and analyze the different sources of law relating to this issue.

4. RESULTS & DISCUSSION

In Vietnam, the main legal framework for arbitration agreement is the LCA 2010. In Vietnam, legal framework governing the incorporation the arbitration clause from the C/P into B/L is covered mainly in the Maritime Code 2015 and the LCA 2010. We shall discuss the LCA regarding the recognition and enforcement of arbitration clause first then we discuss the validity of arbitration and incorporation clause concepts and related regulations from Maritime Code 2015 and other legal code.

4.1. Validity of the arbitration clause

Regarding the validity of arbitration clause, the three most important requirement that scholars keep in mind when analyzing are (1) valid format of the arbitration agreement, (2) sufficient content requirement for valid arbitration agreement under governing law and (3) enforceability of the award (Kim Liang, 2006; Jian Zhou, 2006; Sébastien Besson, 2007).

Regarding the format requirement of an arbitration clause to be considered valid, it is noted that the “in writing” format under LCA accepts all kinds of record in writing, making it more flexible compared to its Chinese counterpart. Nowadays, the electronic forms of everything have witnessed a development, the bill of lading is not standing a side on the trend. With the usage of electronic B/L, the arbitration clause could be incorporated into the system to approve its validity and its rightfulness.

Lastly, regarding the enforcement of the arbitration award, Viet Nam has a not so favoured position. One of the main reasons for weak enforcement of non-domestic awards in Viet Nam is the fact that the Court still has much room for interpretation (Nadia, 2017). Inconsistency with basic Vietnam legal principles has become one of the most cited reasons for refusing the recognition and enforcement of foreign arbitration award (Fred Burke, 2015)

The proof of agreement via signature is also not practical under B/L. Since on the face of B/L, there could only be the signature of the shipper and the carrier, while there would be no signature between the carrier and the consignee. Therefore, if any disputes between the latter would be hard to validate the arbitration clause. The LCA also does not govern such detailed cases.

Under the 2010 LCA, domestic disputes shall be governed by LCA and Law of Enforcement of Civil Judgements and the foreign-related one is regulated with the Convention and Code of Civil Procedure. The latter has received criticism that Viet Nam still uses its national law in the process of arbitration, which

may harm the enforcement of the arbitration decision. With that being said, the validity requirement for arbitration clause under LCA is considered to be updated with the world's practice with the usage of Model Law and comply with the Convention in which Viet Nam is a party of.

It is of importance to distinguish between governing laws to validate the arbitration clause and the applicable law that the arbitral tribunal shall have jurisdiction based on. According to Jian Zhou (2006), the former one would have an impact on the validity of the agreement and invalidity of it is the first ground of refusal under the Convention and parties need to be very careful when drafting their contract to make sure the foreign award procedure could be applied to the arbitration agreement.

4.2. Validity of the incorporation clause from the C/P into B/L

To analyze the legal framework governing validity of incorporation clause, some scholars based in three criterias. According to Liang Zhao and Lianjun Li (2016), the validity of incorporation clause should be analyzed on the basis of (1) the words required to incorporate, (2) description and parties' intent, (3) the consistency rule, and exception where more than one C/P exist with one B/L. Dr. Jia Shengnan analyzed Chinese cases based on description, express incorporating arbitration clause on the B/L, explicit parties, and date of the C/P on the B/L and intention of the B/L holder. We agree with Liang Zhao and Lianjun Li. So, the subsequent subsection will discuss on this basis.

About the requirement for wording, it is acknowledged that there is no clear provision regulated about this issue in a certain Vietnamese article. However, the article 177 of the Maritime Code 2015 stipulates "..., the B/L shall be regulated by terms and conditions specified in that B/L; if terms and conditions of this charter-party have been inserted into the B/L, these terms and conditions shall prevail". It can be seen that Vietnamese law does not require any special words like English and Chinese law ("including arbitration clause"). By contrast, the B/L will automatically comply with the terms and conditions already stated in the C/P, including arbitration clause.

In addition, the provisions about printing the date and names of the parties together with the incorporation clause stipulated in Chinese Law are not mentioned in Vietnamese law. Initially, the purpose of the above regulation is to help the dispute settlement agencies determine which C/P is incorporated with the B/L in case more than one C/P is issued with the B/L. However, in fact this rarely happens in Vietnam. Thus, it is also not necessary to require the date and name in B/L. Moreover, another issue mentioned in Chinese and English Law is "the consistency rule" and "the manipulation of words". But as mentioned above, B/L issued according to the C/P under Vietnamese law does not need to mention again any terms and conditions which have already been stated in the C/P, so there is no need to consider the above two issues.

One of the requirements for an incorporation clause to be valid made in Chinese Law is to provide evidence showing the parties' intention or the acceptance of the third party the existence of the incorporation clause (Liang Zhao and Lianjun Li, 2016). But an opposite pattern can be seen in the Vietnamese law. Article 386-387 of the Civil Code 2005 states that when conducting civil transactions, the responsible parties must know and clarify together in order not to understand differently the terms and conditions specified in the contract. In other words, when there is a dispute, they will be fully responsible for every word written in the contract, agreement, etc.

Regarding the binding effects of the incorporated clause from C/P to B/L on the third party, Article 176 and Article 177 of the Viet Nam Maritime Code 2015 are two main sources of law. According to the Article 176, the shipper may transfer his contractual rights to the third party without the consent of the Carrier but

remain responsible for carrying out the signed contract. It is demonstrated that the transfer of rights in the voyage C/P is legally enforced in Viet Nam, which means that the Vietnamese law shows an agreement on the binding effects of the incorporated clause on the third party such as the subsequent B/L holders, the subrogated insurer, ... In addition, the Article 177 has shown the fact that Viet Nam does not follow the principle “doctrine of privity” as the Chinese law, which means that the terms and conditions in B/L shall regulate the rights and obligations of the Carrier and the subsequent party.

With respect to the subrogated insurer, three legal frameworks in Viet Nam including Civil Code 2015¹, Law on Insurance Business 2022², Law on Commercial Insurance 2010³ show the same perspectives. This all means that if there is an arbitration agreement in the contract between the insured and a third party (the person causing the damage), this agreement is also binding on the transferee/the insurer (insurance company), which means that the transferee has the right to submit the dispute to commercial arbitration for settlement. Overall, Vietnamese law system does not pose any restriction on the rights transferring process except for the specific case prohibited by the law. In practice, this businesses’ aspect is very common and in most of cases, the involved parties show a great assistance and cooperation with each other to facilitate the business transaction with their partners.

In conclusion, in both regulations governing the validity of arbitration clause and incorporation clause, there are some differences between legal regulations in Vietnamese law compared to Chinese and English law. However, the authors firmly believe that these differences are not necessarily a hindrance or difficulty for Vietnamese enterprises in international trade. The absence of some strict requirements compared to Chinese and English laws helps to create convenience for Vietnamese enterprises when drafting and issuing B/L as well as reducing the possibility of the incorporation clause being invalid. In other words, the legal framework governing these current issues of Vietnamese law is relatively enough and appropriate for the maritime trade situation and the development level of Vietnamese enterprises. They don’t need to focus on small and complicated regulations. However, to avoid unnecessary conflicts when settling disputes under foreign arbitration, Vietnamese enterprises need to constantly learn and enhance their knowledge about the legal system in other countries.

4.3. Arbitration and jurisdiction in Viet Nam

Based on the negotiation and characteristics of the law cases, two parties can choose arbitration or jurisdiction as their resolution method. The arbitration exercises final decision, while the court’s decision is not final and is needed to go through many system. In addition, the arbitration is more confidential and faster than the court. Therefore, recently, some companies prefers to use arbitration than the court. Furthermore, since differences in legal regulations between Vietnamese law and Chinese and English law can be found which, in some situations, may cause some unnecessary conflicts. These differences are mostly about the validity of arbitration clause and incorporation clause. However, these differences can not be considered as the shortcomings in Vietnamese law since they are appropriate with the growth level of Vietnamese enterprises and the whole Vietnamese economy. On the other hand, the governments should consider to modify the Vietnamese law governing the incorporation of arbitration clause since these modification may minimize the gaps about arbitration system between Viet Nam and other arbitration-favored countries so as to encourage the development of arbitration as well as the recognition and enforcement of arbitration awards.

¹ Article 365, Civil Code 2015 retrieved from <https://thuvienphapluat.vn/van-ban/Quyen-dan-su/Law-No-91-2015-QH13-The-Civil-Code-303230.aspx>

² Article 54, Law on Insurance Business 2022 retrieved from <https://thuvienphapluat.vn/van-ban/Bao-hiem/Luat-Kinh-doanh-bao-hiem-2022-465916.aspx>

³ Article 16, Law on Commercial Insurance 2010 retrieved from <https://thuvienphapluat.vn/van-ban/Thu-tuc-To-tung/Law-No-54-2010-QH12-on-commercial-arbitration-114053.aspx>

5. RECOMMENDATIONS

5.1. Recommendations for Viet Nam law

Regarding the LCA amendments, we have recommendations on 4 perspectives. Firstly, amendments to a clear definition of in writing and reference making to other documents containing the arbitration clause to allow the incorporation sentence in the Charter Party B/L more valid. Secondly, the authors highly recommend the clearer definition of intention and agreement to arbitration to avoid one of the sides in the case of arbitration clause incorporation into Charter Party B/L using that reasoning against arbitration clause validity. Thirdly, we suggest adding a subsection about the case of Charter Party B/L under the Law of Commercial Arbitration leading to our additional article UNDER the Maritime Code that the authors shall introduce in the next section. Lastly, relating to the enforcement of the arbitration award, Viet Nam could clearly define the scope of public policy in accordance with the Convention. This could help Viet Nam legal systems become more efficient and the Courts could have the same ground to refuse or approve the foreign award.

In terms of the regulation governing the incorporating arbitration clause from C/P into B/L, the authors contend that the addition of the requirement for specified words for valid incorporation to Article 177 of the Maritime Code 2015 is a proposal that Viet Nam should consider. The authors find that the lack of requirements for specified words (“including arbitration clause”) causes inadequacies and difficulties for parties and dispute settlement agencies in defining whether the B/L is bound to the C/P as a jurisdiction clause or arbitration clause, and settlement agency is a court or arbitration.

From the perspective of enterprises, the action of stating clearly incorporated clause from the C/P into B/L will help non-original parties more easily recognize the existence of the incorporation clause. From a legal perspective, the addition of the requirement about specified words and clauses may make the dispute resolution process of the jurisdictions and arbitrations smoother, avoiding unnecessary legal problems arising, saving time and cost in determining which the authority has the power to accept and handle the case. From a national interest perspective, the addition of the requirement will help boost import and export activities, demonstrating Viet Nam’s goodwill for global integration. Some foreign enterprises may form a fear and cautious mentality when realizing that Vietnamese law cannot guarantee their interests when transferring B/L.

However, in order to realize the addition of this requirement to the Maritime Code 2015, Viet Nam will have to make necessary amendments and supplements to relevant law to ensure the consistency and uniformity of the national legal system, in line with the spirit of Resolution No. 99/NQ-CP 2017. The addition of new provision must be based on the premise and comply with the correct legal order and procedures.

Furthermore, because of the disunion between the LCA 2010 and other Code of law as well as between the arbitral resolution for domestic and foreign disputes, Viet Nam should refer the UNCITRAL Model Law. This is a document used by many important financial systems around the world to amend important domestic law. Being able to clarify the point of view based on the UNCITRAL Model Law creates confidence for businesses in choosing arbitration and thereby developing arbitration. In fact, when formulating the LCA 2010, the UNCITRAL Model Law was referred to, but it was not strong and not clear enough, so the business community does not see that the LCA was up to international standards. Therefore, in the next modification, it is necessary to emphasize the role of the UNCITRAL Model Law and the introduction of the modified law should state clearly that the law is determined on the UNCITRAL Model Law as a basis (Do Van Dai, 2021).

5.2. Recommendations for Vietnamese enterprises

Firstly, Vietnamese enterprises need to ensure the governing law of the validity of the arbitration agreement could have easy and firm jurisdiction.

This is to avoid the fact that Vietnamese enterprises having to deal with unfamiliar domestic law instead of the uniform Convention. The act of checking for required content of the arbitration should become a must-have protocol before the companies sign off the contract. For big companies with regular international trade, they could draft out the acceptable arbitration clause under many lex frameworks for their employees to optimize the time working with the contract.

Secondly, using the standard forms of B/L with proper cautious and appropriate adjustments for each specific case and exception; complying with international conventions and constantly updating the latest forms.

The utility, convenience, and popularity of these B/L standard forms are undeniable. However, when participating in negotiations, the parties should use each term and condition with proper caution and ensure that they are adjusted for each specific case. Because there are slight differences in the regulations about incorporation clause of each country. In addition, Viet Nam enterprises also can refer to the provisions and regulations in the conventions and documents of international organizations (ICC, UNCITRAL, etc.) to ensure the validity of the incorporation clauses. Because each country's maritime legal system is also based on the above conventions and documents.

Thirdly, the parties should be equipped with adequate knowledge of the regulations, provisions, general rules, and common practices at the dispute settlement agency.

The choice of the place of proceedings in the case of a dispute remains an important issue for Viet Nam enterprises, depending on many different factors, including legal regulations, local customs or interests of the parties involved, costs and utilities on a case-by-case basis. Moreover, enterprises should take into consideration that each country has a different approach to the problem and different judgments, so this phenomenon is quite complicated and difficult to unify. For example, whether the law system in the chosen nation follows “doctrine of privity” or not to gain a better understanding of the resolution tendency of the dispute settlement agencies.

Fourthly, besides the original parties, the involved parties, especially the subrogated insurer, should be fully aware of the existence of the incorporated clause in B/L from C/P and should be careful about its binding effects on themselves to better mitigate further complicated disputes arising later. The insurance company should deeply comprehend the principle of subrogation which is that the insurer once signing the insurance contract, unless otherwise stipulated, must accept and comply with the rights as well as obligations of its clients in the related contract. Therefore, before signing the insurance contract with the insured, they must consider and evaluate all the potential aspects and limitations in the carriage contract.

5.3. Recommendations for Viet Nam dispute settlement agency

In Ministry of Justice's perspective, according to arbitrator Vu Anh Duong (2022), the revision of the LCA should be considered since it has revealed some shortcomings. The arbitrator also supposes the Government to a planning and development policy in favor of evolving arbitration along with conducting training program for arbitrators and encouraging arbitration training at universities and institutions. The researcher also states that arbitration and legal training institutions and law-practicing organizations should be promoted at the national scale so as to attract the business community. With regard to the Court and civil judgment enforcement agency's perspective, the Court should ensure the time limit indicated in the LCA when handling the recognition and enforcement of the arbitral award. The Court should notify fully and punctually the arbitrators in accordance with the LCA so as for the Arbitral Tribunal to acknowledge and provide its opinion to the Court. The Court and the civil judgment enforcement agency should support the Tribunal Arbitration to solve the loopholes in practice of the 2010 LCA.

6. CONCLUSION

It seems that English law is seen as arbitration-favor and Chinese law is also on the rise to adopt a pro-arbitration approach when it comes to international arbitration award. Before coming to the matter of

incorporation, the requirement for arbitration validity alone under the two laws is very different with the former being more flexible about content and the latter being impractical regulations. Notwithstanding the fact that both countries are Member States of the Convention, the national law also plays an important impact, especially at the stage to decide the validity of the arbitration clause. For Vietnam enterprises, it is crucial to explicitly include in the agreement the arbitration commission and the governing law as well as the applicable law for the arbitral tribunal, despite the exhaustivity it holds. In Viet Nam, the LCA is mostly adopted from the UNCITRAL Model Law and therefore the requirement for arbitration validity such as writing format and content is well defined. Despite that, it is crucial to define public policy to reach the uniformity for refusal and agreement of foreign arbitration award to increase the reputation and gain economic benefits from increasing number of arbitration case happening in Vietnam tribunal.

Regarding the validity of the incorporation clause, the approach taken by the English and Chinese courts to deal with this issue can be seen as more stringent than Vietnamese. Both parties are interested in issues such as the intentions of both parties, defining the main charter contract, the wording clearly mentioning the “arbitration clause” and so on. In contrast, Vietnamese law does not have any provisions for this. Therefore, learning and acquiring more knowledge about arbitration clauses and incorporating them from the charter party into the B/L is still an urgent responsibility of Vietnamese businesses. Along with that, the Vietnamese government also needs to supplement provisions and circulars related to the provisions of the validity of the articles of incorporation in order to promptly adapt to the rapid development of international trade maritime today.

Regarding the binding effects of the incorporated arbitration clause in B/L on the third party, English law and Vietnamese law have granted the approval in a clear way. On the other hand, Chinese law shows the contrary approach. Chinese law holds its view that the acceptance of the binding effects of the incorporated arbitration clause from C/P to B/L cause the privity of the contract to be broken. This firm perspective of Chinese law has been said to be the root of many unexpected disputes arising during the business traction. One common aspect of this legal issue is the subrogation in the insurance service.

Furthermore, many researchers have pointed out the loopholes of the 2010 LCA and suggested the modification for the above law to fill the gap between Viet Nam arbitration system and the other developed arbitration systems. Those suggestions worth mentioning are about the determination of the authorization of arbitration system and the supporting along with the monitoring roles of other dispute settlement agencies.

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AMBIDEXTERITY FOSTERS ORGANIZATIONAL RESILIENCE EVIDENCED BY RETAIL AND E-COMMERCE ORGANIZATIONS DURING THE COVID-19 OUTBREAK

Author: Nguyen Tu Anh¹

Mentor: Pham Thu Trang

ABSTRACT: *The purpose of this study is examining the effect of ambidexterity on organizational resilience. This study used a survey of 200 employees working in retail and e-commerce organization. The results showed that ambidexterity had a positive impact on the organizational resilience. Furthermore, this study explores the relationship between exploitation, exploration and resources availability (in ambidexterity) and adaptive capability, situation awareness and management of key vulnerabilities (in organizational resilience) to support retail and e-commerce organizations in maintaining operations while balancing the COVID-19 outbreak. These findings provide practical implications for retail and e-commerce organizations. Discussion and limitations will be presented at the end of this article.*

Keywords: *Ambidexterity, organizational resilience, exploitation, exploration, resources availability, adaptive capability, situation awareness, management of key vulnerabilities, retail and ecommerce, COVID-19.*

I. INTRODUCTION

The Covid-19 pandemic as a black swan event with a serious global impact (Taleb, 2020; Papadopoulos et al., 2020). It is an example that businesses have to face with Vuca environment (Volatility, uncertainty, complexity and ambiguity). This affects the traditional retail market and disrupts the supply chain (Taleb et al., 2020). Therefore, many companies tend to adopt business continuity and management strategies to combat the crisis and promote resilience (Dhoopar et al., 2021). One of the things businesses need is organizational resilience. However, this is an incomplete element and there are still some negatives. Obviously, when aimed at organizational resilience and the ability to change adaptation, it will prevent businesses from achieving their revenue and profit targets, because during this period they are too focused on changes and adaptation issues without focusing on cost, financial issues, etc. One of the important factors to determine the sustainability of businesses is how they make money, and generate revenue and profit. To solve these two problems, an organization's ambidexterity is the best solution to help businesses overcome, resilient and balance any internal problems during this Covid-19 crisis (Ebrashi, 2022). Therefore, there is a need for a study on the impact of ambidexterity foster organizational resilience. That is reflected in my research paper. There are diverse research (mainstreams) showing that in order to improve Organizational Resilience, it is very necessary to increase the factors affecting it. Organizational resilience are divided into 4 mainstream such as *perceptual stance, contextual integrity, strategic capacity, strategic acting* (Sutcliffe & Vogus, 2019).

Some of the above studies have has a main stream *similar* to me like are: Ambidexterity within Flexibility and resilience of organizations (Karman, 2020) and The Role of Flexibility on Organizational Resilience and Survival (Widiana & Soetjijpto 2022) and "Fostering firm resilience through organizational ambidexterity and resource availability amid the COVID-19 outbreak (Ebrashi, 2020). These 3 studies have demonstrated the need for Ambidexterity for organizational resilience through changing old strategies and using the company's knowledge base to find specific solutions of dealing with crises. However, the above e of those research papers use literature review method, one of the main disadvantages of Reviewing Literature is that some researchers develop documents that are primarily descriptive. Therefore, there is no research paper using survey method and in the Covid-19 pandemic in Vietnam.

¹ Banking Academy

Our research contributes to literature and practice of organizational resilience and ambidexterity in following new aspects. At present, there has never been any research related to the impact of Ambidexterity on organizational resilience organized and carried out in the Vietnamese context and in Covid-19 Pandemic. At the same time, the results of previous studies from other countries in the world cannot be applied because they have a very different context from Vietnam. Vietnam recognizes COVID-19 as a serious threat to economic growth in the period 2020-2022 (BBC, 2020).

To prove that, based on factors of economic context, culture, GDP index and living environment, research paper “Ambidexterity foster firm resilience in different ways: Configurations for team innovation in China, India, and Singapore” (Deng, Benz & Frese, 2022) demonstrated that the effects of independent variables in different countries have different results. Because Ambidexterity affects Organizational Resilience to different countries, it is not possible to get the results in China and India to apply to Vietnam. Therefore, there is a need for a research in Vietnam about this topic. The in India found the proposed link between organizational ambidexterity and resilience was found. There was both negative and positive monotonic correlation between ambidexterity and organizational resilience through more than 12.000 employees in SMEs companies. The results of this study cannot be applied to Vietnam because the management strategy as well as the opportunities and incentives of the Indian government for SMEs are very low and because Vietnam is a developing country, the access to foreign investment capital is still a difficult problem. Therefore, the maintenance of available resources by organizations combined with the development and change of strategies to help organizations recover, also known as Ambidexterity, is also approached differently in Vietnam (Jonathan & Mike, 2021). Another study in China points out the negative impact of Ambidexterity on organizational resilience in the country’s tourism industry (Soetjijpto & Chen, 2022). Because if the organization does not have excellent financial and human resources, it will not be able to sustain the firms through Ambidexterity. As a result, there has been no research on my topic of Ambidexterity’s ability to boost organizational resilience during the Covid-19 outbreak in retail and e-commerce. This is the first and only study to date that has good aspects about this industry that the above studies do not have. In addition, I also look at the challenges businesses will face as they are going to implement an organizational recovery strategy through Ambidexterity.

In short, the Integrative Framework of Organization Resilience is very important and my research is an integral part of which helps promote and support the resilience process of the organization to be successful and achieve the highest efficiency.

The novelty of this study was first conducted in the retail and e-commerce services industry with the research object being an employee from the retail and e-commerce organizations. By dedicating separate units to exploration and exploitation, an organization that is ambidextrous can support innovation while continuing to run its current operations. This helps retail and e-commerce organizations in maintaining a competitive edge and staying relevant in a market that is undergoing fast change. In particular, the Covid-19 pandemic has disrupted the supply chain and caused great damage to the traditional retail industry, but it has opened up opportunities for the retail industry on e-commerce platforms. Most of retail and e-commerce organizations is said to have made good use of its advantages when using an available website platform to sell online, besides that they also converted and adapted to new sales policies suitable to the context.

II. LITERATURE REVIEW

2.1. Theoretical background

The dynamic capability theory was first introduced by Teece et al., 1997. He developed this theory to help organizations easily adapt to changes in the business environment. This theory identify problems ability and change adaptation is the key concept that covers this theory. They refer to do with efficient exploitation and

exploration of existing resources and implementation of new opportunities affect to organization resilience (March, 2018). Teece et al. (1997) defined Dynamic capabilities theory has 3 main Dimensions that allow companies to innovate and adapt to changes in their environment: *sensing, seizing, and transforming to advocate decision-making*. Sensing refers to identifying, using and evaluating opportunities outside the organization; Seizing refers to mobilizing resources to improve meeting needs and opportunities and derive value from them; Transforming describes an enterprise's ability to continuously update and configure resources so that businesses can strategically seize opportunities and respond to threats. Dynamic capabilities theory posits that: It concerns the ability of an entire organization to fully and promptly adapt to a altering the environment by adjusting intrinsic or extrinsic resources and actions, with existing capabilities.

Teece et al. (1997) suggests that, in an uncertain situation, the decision maker always has the strategic vision of a manager in sensing difficult problems, identifying them, and assessing the level of their impact on the organization. Thus, it can be seen that in that uncertain and unsafe situation, the sense of perceived difficulties and opportunities affecting the organization increases significantly. Moreover, once an organization has identified the challenges or opportunities, it will know how to capture and handle the heart of the problem and face the uncertain situation will become easier. Finally, if an organization is constantly capturing and updating existing problems, they will have access to new and changing methods for effective decision-making for organizational resilience.

2.2. Hypotheses and research model

Organizational Resilience refers as the ability that every organization needs to adapt to a change in the business environment, which can become chaotic, requiring the organization to anticipate, plan to cope with it (Denyer, 2017). In addition, the organization's resilience is measured through 3 variables that described by McManus et al.(2008) include Adaptive Capacity (AC), Management the Keystone Vulnerabilities (MKV) and Situation Awareness (SA) (Lee et al., 2013; McManus et al., 2008). SA aids us with understanding, identifying, and enabling us to foresee future hazards and take appropriate action. For analyzing and finding holes in the organization's operations and management, MKV offers a more comprehensive perspective by effectively planning ahead, becoming more flexible, and providing creative solutions. Unforeseen circumstances can be successfully handled by organization, giving time and space for planning and decision-making. The ability of systems, institutions, people, and other factors to prevent possible harm, seizes opportunities, or react to dangers is another area where AC aids in adaptation (Brunsdon & Vargo, 2018).

Ambidexterity as a organization's capabilities are defined as its capacity to successfully carry out two opposing strategy at once, Exploration- the process by which a company looks for new opportunities, alternatives, diversity, flexibility, innovation and Exploitation - the organization's enhancement, utilization, or optimization of current assets, procedures, skills, knowledge, mindsets, and technology to maximize effectiveness and facilitate for development business (March, 2018; Ebrashi, 2021). This research aims to study the affect of Ambidexterity which is includes Exploration Capability (EXPRT), Exploitation Capability (EXPLT) and Resource Availability (RA) on Organizational Resilience.

According to Dynamic Theory, *sensing, seizing, and transforming* are 3 important concepts and the involvement of Ambidexterity can help an organization to better grasp the problems, effectively adapt to any chaotic environment to help resilient the organization. *First, O'Reilly and Tushman (2018) argue that Dynamic Theory solves the problem by leveraging the existing resources of the organization to stay afloat company, seize new opportunities, and adapt in the uncertain times.* In addition, Ambidexterity are recognized as essential for leveraging available resources and adapting innovation. They can take advantage of a variety of available resources built up by the organization's past and explore innovations that benefit the organization. This can help an organization anticipate and survive external constraints (Luz & Kretschmer, 2018). *Ambidexterity enhance sensing through exploiting, seizing through exploring, and transforming*

capabilities through using available resources in organization. All of these will help the organization improve its ability to adapt to uncertain circumstances thereby improving its ability to utilize existing resources, detect potential risks, anticipate discovering new strategies will help stabilize the organizational environment, also known as organizational resilience, measured by SA, AC, and MKV.

Next, in an uncertain environment, the organization must make new decisions. Therefore, organizations have the need to identify and understand the new context and it is extremely necessary to have new management strategies so that the organization can easily approach and adapt to it. It can be seen that the quality of decision making on using human resources capable of leading the organization, grasping difficult problems well or not well depends on the qualifications and experience of that human resource if it is good will be improved. Furthermore, (Kretschmer, 2018) also argues that not fully completing thousands of tasks and not being able to forecast for emergent events can negatively affect organizational performance. In addition, (Gibson & Birkinshaw, 2020) argues that businesses can be on the verge of collapse or great financial loss if managers do not make the right decisions about the use of available resources. Effectiveness both maintain the organization and innovate and the employees in the company do not meet the KPIs set by the organization. It can be seen that using quality human resources in maintaining company operations, forecasting upcoming plans to adapt well to changes can support more successful decision making, especially in uncertain situations. Therefore, it can be said that Ambidexterity has a positive effect on sensing, seizing, and transforming. It increases efficiency and exploitation- (defined as the ability of everyone in a company to utilize existing resources and focus on day-to-day tasks, developing strategies that can increase the likelihood of recognizing potential crises to strengthen the resilience of the organization), exploration- (Innovation and change are needed to address the environment's evolving turbulence), and use available resources to maximize the maintenance of the company's operations keep the company running, helping the company anticipate and stay afloat in a turbulent environment (Tushman & O'Reilly 2018, p. 24). Innovating and adapting to changes in their environments in the covid-19 pandemic: is seen as a possible solution, especially when the two business models are weakly linked (Harren 2017) as described in Figure 1.

Exploration capability and Adaptive Capabilities

Organizational ambidexterity is considered to be a dynamic capability theory (Teece, 2014; O'Reilly and Tushman, 2008). As a result, businesses can use their capabilities for exploration and exploitation to rebuild the resource base that supports their organizational structure and management strategy., adjust in a dynamic environment and succeed over the long haul (Mafabi et al., 2017; Lin, 2014; Kang and Snell, 2020; Levinthal and March, 2019). On the first aspect of Ambidexterity- Exploration capability, is the company's capacity to seek out innovative ideas. Follow the trend, develop cutting-edge goods or services, seek out inventive ways to satisfy client wants, enter new markets with vigor actively seek out new customer groups or set up new strategy management, thereby helping the company always create new values, keep pace with world trends so as not to fall behind, gradually becoming a steady progression helps to improve Adaptive Capability (Yalcinkaya et al., 2020; Lubatkin et al., 2017). Turning to the mentioned above, this section proposes that EXPRT important for getting AC, then I provide this study's first hypothesis is: **H1 Exploration capability positively foster on Adaptive Capability.**

Exploitation capability and Management of Keystone Vulnerabilities.

Besides the business stability thanks to Exploration, The second aspect of Ambidexterity- Exploitation capability is the capacity to commit to often raising quality and lowering costs, enhancing the dependability of goods and services, promoting automation levels, monitoring existing customers' happiness constantly, adjusting what is provided to satisfy customers, and expanding one's client ground. Liu et al suppose this is to be the ability to innovate to take advantage of existing aspects of the company to help *the* organization to well Management the Key Vulnerabilities with great potential appear, thereby helping to maintain and develop the company's operations (Liu et al., 2019; Lubatkin, 2020).

Both exploration and exploitation are considered self-reinforcing; where successful exploitation of a company's resources can find vulnerabilities and weaknesses to fix, thorough exploration ultimately leads to success and increased efficiency in finding solutions to adapt in a dynamic environment (Tian et al., 2020; Kafetzopoulos, 2020). Consequently, March (2018) affirmed that for the company to achieve long-term performance in order to adapt resilience, it is essential that it succeeds in both exploration and exploitation. Turning to the mentioned above, this section proposes that EXPLT important for getting MKV, then I provide this study's second hypothesis is: **H2 Exploitation capability positively foster on Management of Keystone Vulnerabilities.**

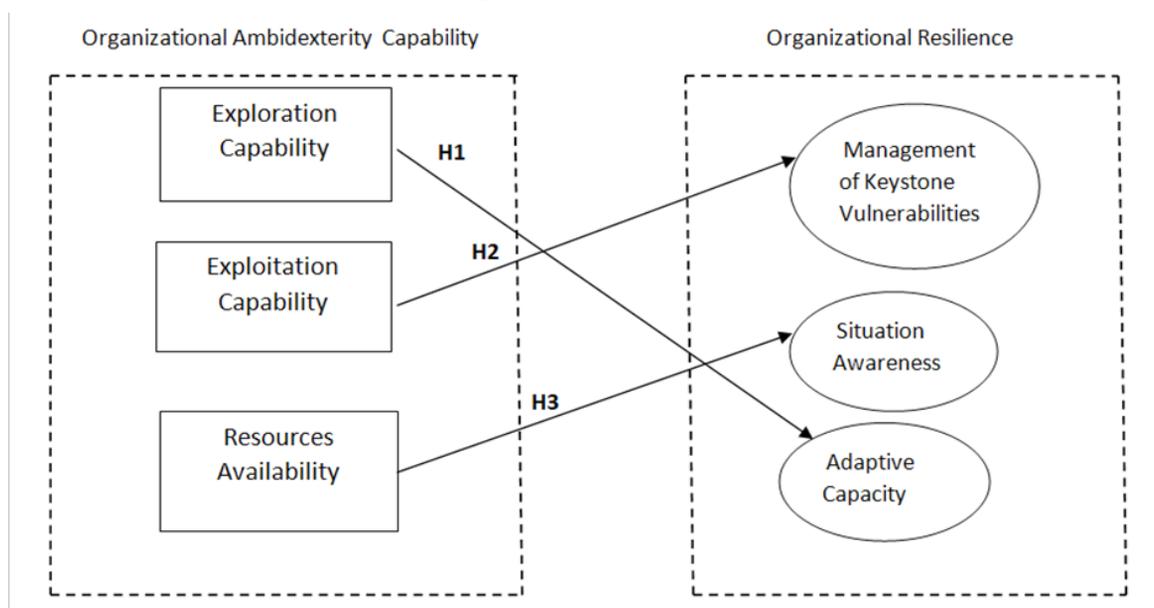
Resource availability and Situation Awareness.

The strategic capacity owned by the organization through RA, defined as the ability of everyone in a company to utilize existing resources and focus on day-to-day tasks, developing strategies that can increase the likelihood of recognizing potential crises to strengthen the resilience of the organization. To using resources and explore existing risk or opportunities is a part of Ambidexterity. Recent studies found RA in the field of retail and e-commerce service has evolved as a stranger kind of ambidexterity (Duchek, 2020).

In order to enhancing organizational performance and resilience, RA element attributes can be aggregated and optimized for organization. This research uses the conceptualization of SA as a capability that relies on the company's available resources to predict and fast respond to future issues employed as a means of adjusting and fast reacting to changes brought on by environmental unpredictability. SA is a concept that includes things like cash availability, a company's workforce, material sourcing, and top management's governance (Miller & Friesen, 2016), in addition to other soft skills and flexibility and creativity of human resources (Salwan & Gada, 2018). The company's resources and competencies give it a competitive edge to promote SA, which is consistent with the resource availability approach (Pal et al., 2021). To recapitulate, RA assist companies access resources and competencies every time they need those because those always exist there, especially during dark and uncertain times. So that, based on experience, managers can identify, capture and recognize future issues (Kantur & Say, 2021). In view of the justification provided, this study's third hypothesis is: **H3 Resource availability positively foster on Situation Awareness.**

As analyzed above, researcher hypothesize that Organizational Ambidexterity positively affects Organizational Resilience.

Figure 1: Research model



III. METHODOLOGY

3.1. Sample

In this research, researcher used Virtual access and Snowball sampling to access the data. Because this sample is suitable for the dataset research method and sample size. . The advantages of the Snowball sampling method are: Accessibility to small groups: By using one’s broad connections to then form large networks, snowball sampling can be an effective way to reach small populations of research subjects (Berndt, 2020). An online Google Form Survey has been sent to email of the CEO of retail and e-commerce organizations with Phone number and Gmail. As a CEO, they sent this survey to Hanoi, Ho Chi Minh and Da Nang managers and department heads (heads of human resources, finance, marketing, etc.) of those organizations and finally, they had responsible for conducting and sending the survey to their subordinates and employees with a minimum of 200 result sheets should be obtained out of a total of 400 sent to employees.. With each such submission in this Survey Online respectively, they provided to researcher the information for evaluation.

Table 1: Participations Demographic Results

No.	Variable name	Frequency	Percent
1	Sex:		
	Male	127	63.5
	Female	73	36.5
2	Department:		
	Missing data: Frequency 1, Percent 0.5		
	Human resources department	19	9.5
	Financial department	17	8.5
	Sale & Marketing department	34	17.0
	Operation department	16	8.0
	Management department	24	12.0
	Transportation department	46	23.0
Storage department	43	21.5	
3	Place:		
	Ha Noi	67	33.5
	Ho Chi Minh City	52	26.0
	Da Nang	81	40.5
4	Age:		
	Under 18	8	4.0
	18-30	107	53.5
	31-40	53	26.5
	41-50	17	8.5
	51-60	9	4.5
	Over 61	6	3.0
5	Position:		
	Senior manager	8	4.0
	Middle manager	12	6.0
	First line manager	13	6.5
	Employees	167	83.5

Source: from data analysis

The research sample is based on responses from 200 questionnaires answered by employees both 2 genders males and females at retail and e-commerce organizations. However, in order to most efficiently get 200 sample size, a total of 400 samples would need to be submitted, I expected to the respond rate will be 50%. As a result, the dataset will be 200 answered samples. This is a perfectly reasonable ratio and is quantitative enough for me to provide in-depth reviews for this study

Most of sample utilizes this research is male dominant. In detail, men accounted for 63.5% and women only accounted for 36.5%. In terms of Department data, Transportation and Storage department accounted for the highest percentage at 23% and 21.5%, respectively. Followed by Sale & Marketing and Management department accounted for 17% and 12% respectively. Finally in the lowest rank is HR, financial and operation accounting for 19%, 17%, 16% respectively. In terms of Place data, Da Nang ranks at the highest rank, accounting for 40.5%, the second is Ha Noi with 33.5% and the last is HCM city with 26.0%. Age data shows that the age group from 18-30 accounts for an outstandingly high rate of 53.5%, while the fewer than 18 and over 61 age groups account for a very small percentage of 4% and 3%, respectively. Finally, Position results, the highlight are clearly seen that Employees accounted for 83.5% of the rest, while senior managers accounted for only 4%.

3.2. Measurement

Ambidexterity is the independent variable and OR is the dependent variable. Ambidexterity measured by the sub-variables Exploitation and Exploration Capabilities; Resources Availability (March & Ebrashi, 2021). Ambidexterity is measured by EXPRT, EXPLT, and RA which EXPRT is measured by 6 questions, EXPLT is measured by 4 questions and RA is measured by 5 questions. Organizational Resiliencis measure by He et al (2022) and McManus (2008) including Situation Awareness (SA), Management Keystone Vulnerabilities (MKV) and Adaptive Capacity (AC). It is measured by SA, AC, and MKV. In which, SA is measured by 4 questions, AC is measured by 5 questions and 4 questions to measure for MKV. The respondents to the questionnaire will base their agreement on the following 5 levels based on Likert 5: 1= Strongly disagree, 2=Disagree, 3= Wavering, 4=Agree, 5= Strongly agree. For example of EXPLR, the Alpha coefficient was 0.858.

IV. RESULTS

4.2. Scale reality

Table 2: Scale reliability of variables

No.	Variable criteria	Cronbach's Alpha
1	EXPRT	0.858
2	EXPLT	0.806
3	RA	0.861
4	SA	0.835
5	AC	0.848
6	MKV	0.858

Table 4 shows that The Cronback Alpha coefficients independent and dependent variables are greater than 0.7 and less than 0.95, which is a very nice level, showing that the reliability of the scale is good. Therefore, all variables in the scale will be kept for future analysis.

4.3. Exploratory factor analysis

Table 10: EFA analysis results for independent variable

Rotated Component Matrix			
Code	1	2	3
EXPRT 1	0.780		
EXPRT 2	0.723		
EXPRT 3	0.710		
EXPRT 4	0.585		
EXPRT 5	0.762		
EXPRT 6	0.763		
EXPLT 1			0.798
EXPLT 2			0.738
EXPLT 3			0.734
EXPLT 4			0.658
RA 1		0.734	
RA 2		0.795	
RA 3		0.749	
RA 4		0.764	
RA 5		0.810	
KMO= 0.882 (> 0,5) , Sig Bartlett= 0.000 (< 0,05)			
Total Variance = 62.18			

The results of Table 10 show that the whole loading factor is between 0.6 and 0.8 (both greater than 0.5) and no variable is below the bad level of 0.3. The higher the factor loading coefficient, the greater the correlation between that observed variable and the factor and vice versa. According to Hair et al. (2010), factor loading is an observed variable of good quality with a clear structure. The KMO coefficient is an indicator used to consider the suitability of factor analysis. The value of KMO in table 10 is 0.882 and greater than 0.5 ($0.5 \leq KMO \leq 1$). Therefore, factor analysis is likely to be suitable for the research data set. To determine if the observed variables in the factor are connected with one another or not, Bartlett's test of sphericity is performed. The observed variables indicating different features of the same component must be correlated with one another in order to use factor analysis. Sig Bartlett's Test in table 10 was 0.000 (< 0.05), showing that the observed variables are correlated with each other in the factor. The number of factors in an EFA analysis is often determined using the criterion eigenvalue. With this criterion, all the factors in the table are >1 , so they are kept in the analytical model. Total Variance was 62.18% ($\geq 50\%$) indicating that the EFA model is appropriate. Considering the variation as 100%, this value represents 62.18% of the extracted factors and a loss of 37.82% of the observed variables.

Table 11: EFA for dependent variable analysis results

Rotated Component Matrix			
Code	1	2	3
SA 1			0.786

SA 2			0.807
SA 3			0.674
SA 4			0.772
AC 1	0.737		
AC 2	0.726		
AC 3	0.757		
AC 4	0.724		
AC 5	0.749		
MKV 1		0.706	
MKV 2		0.769	
MKV 3		0.849	
MKV 4		0.829	
KMO= 0.881 (> 0,5), Sig. Bartlett= 0.000 (< 0,05)			
Total Variance = 66.62			

The results of Table 11 show that the whole loading factor is between 0.6 and 0.8 (both greater than 0.5) and no variable is below the bad level of 0.3. Therefore, factor loading has a good quality observed variable with a clear structure. An indicator used to evaluate the suitability of factor analysis is the KMO coefficient. The value of KMO in table 11 is 0.881 and greater than 0.5 ($0.5 \leq \text{KMO} \leq 1$). Therefore, factor analysis is likely to be suitable for the research data set. Sig Bartlett's Test in the table 11 was 0.000 (< 0.05), showing that the observed variables are correlated with each other in the factor. The Eigen value in the table 11 shows that all the factors in the table are >1, so they are retained in the analytical model. Total Variance was 66.62% ($\geq 50\%$) indicating that the EFA model is appropriate. Considering the variation as 100%, this value represents 66.62% of the extracted factors and a loss of 33.38% of the observed variables.

4.4. Correlation matrix

Table 12: Correlation matrix results

	SA_TB	MKV_TB	AC_TB	EXPR_TTB	EXPLT_TB	RA_TB
SA_TB	1					
MKV_TB	0.492**	1				
AC_TB	0.560**	0.492**	1			
EXPR_TTB	0.730**	0.516**	0.529**	1		
EXPLT_TB	0.549**	0.467**	0.595**	0.555**	1	
RA_TB	0.428**	0.459**	0.433**	0.421**	0.454**	1

Note: * mean 0,1; ** mean 0,05

From the results table 12, it can be seen that the sig test of Pearson's correlation between three independent variables EXPRT, EXPLT, RA with 3 dependent variables SA, AC, and MKV all less than or equal 0.05. Thus, there is a linear relationship between these independent variables and the dependent variable and they are correlated with each other and that is a good sign to conduct a regression, the possibility that the independent variables will affect the dependent variable. in regression will be higher. From the analysis on Table 12,

the three independent variables EXPRT, EXPLT, RA are correlated with each other, but the correlation is low because the correlation coefficient between them is smaller than the allowed level of 0.8 (Carsten F. Dormann et al., 2010). 2013) and Sig are both less than 0.05. So this is an indication that there is no signal of multicollinearity. The Pearson Correlation box displays the sign * or ** when sig is less than 0.05. This pair of variables has a linear association at a 99% confidence level, as denoted by the symbol **. The presence of the asterisk (*) denotes a linear association between these two variables at a 95% confidence level.

4.5. Regression

Table 13: Regression Result

Model 1: AC_TB Dependent variables			
Independent variable	Adjusted β	Sig	Decision
EXPRT_TB	0.529	0.000	Accept H1
Adjusted R Square = 0.277			

The results from Table 13 have Adjusted R² = 0.277, showing that the independent variable explains 27.7% of the fluctuations of the dependent variable. In addition, the independent variable EXPRT has Sig test was 0.000 (<0.5) so this variable is statistically significant and affects the dependent variable AC. If the beta coefficient is negative, the independent variable is having a negative impact on the dependent variable. Conversely, if B or Beta has no sign (positive sign), it means that the independent variable positively affects the dependent variable (Hair et al., 2010). The β coefficient of EXPRT was 0.529 and has a positive sign, so the independent variable EXPRT has a positive effect on the dependent variable AC.

Table 14: Regression Result

Model 2: MKV_TB Dependent variables			
Independent variable	Adjusted β	Sig	Decision
EXPLT_TB	0.467	0.000	Accept H2
Adjusted R Square = 0.214			

The results from Table 14 have Adjusted R² = 0.214, showing that the independent variable explains 21.4 % of the fluctuations of the dependent variable. Moreover, the independent variable EXPLT has Sig test was 0.000 (<0.5) so this variable has statistical significance and affects the dependent variable MKV. If the beta coefficient is negative, the independent variable is having a negative impact on the dependent variable. Conversely, if B or Beta has no sign (positive sign), it means that the independent variable positively affects the dependent variable (Hair et al., 2010). The coefficient β of EXPLT was 0.467 and has a positive sign, so the independent variable EXPLT has a positive effect on the dependent variable MKV.

Table 15: Regression Result

Model 3: SA_TB Dependent variables			
Independent variable	Adjusted β	Sig	Decision
RA_TB	0.428	0.000	Accept H3
Adjusted R Square = 0.179			

The results from Table 15 have Adjusted R2 = 0.179, showing that the independent variable explains 17.9 % of the fluctuations of the dependent variable. Besides, the independent variable RA has Sig test was 0.000 (<0.5) so this variable has statistical significance and affects the dependent variable SA. If the beta coefficient is negative, the independent variable is having a negative impact on the dependent variable. Conversely, if B or Beta has no sign (positive sign), it means that the independent variable positively affects the dependent variable (Hair et al., 2010). The β coefficient of RA was 0.428 and has a positive sign, so the independent variable RA has a positive effect on the dependent variable SA.

V. DISCUSSION

The result indicate that the effect of ambidexterity capability on organizational resilience. This study clarifies the close relationship between exploration capability, exploitation capability (in ambidexterity), resources availability and situation awarness, adaptive capability, management key vulnerabilities (in organizational resilience) to support retail and e-commerce organizations in maintaining operations while balancing the COVID-19 outbreak.

Based on the analyzed results, Hypothesis Exploration capability positively impact on Adaptive Capability was accepted. This result proves that an increase in EXPRT will lead to an increase in AC. This proof is similar to the study “Local innovation ecosystem: structure and impact on adaptive capacity of firms” by Boyer, Ozor & Rondé (2021). These authors point out that Exploration capabilities are to maintain the sustainability of the organization, it covers the Innovation Ecosystem, which has a positive impact on the Adaptive capability by avoiding going to the limits of the application technology in the organization, businesses need to use the Exploration strategy. This requires them to create, reinvent and restructure the innovation ecosystem.

Hypothesis Exploitation capability positively foster on Management of Keystone Vulnerabilities was accepted. This result proves that an increase in EXPLT leads to an increase in MKV. This is similar to the assertion that Duchek, Bititci & Ates (2019) pointed out in the study “Organizational resilience: a capability-based conceptualization”. To be able to manage keystone vulnerabilities, organizations must build the ability to exploit new solutions and develop it in a turbulent environment. Specifically, it can be shown that an organizational change management process is fundamental for organizational recovery and vulnerability resilience.

For hypothesis Resource availability positively foster on Situation Awarness was accepted from above analysis. This hypothesis asserts that an increase in RA leads to an increase in SA. This statement is almost similar to the statement that authors McManus, Seville, Vargo & David Brunson pointed out in the study “Facilitated Process for Improving Organizational Resilience”. These authors have discovered that creating and maintaining company resources through day-to-day operations, support tools, has a positive relationship with Situation Awareness, giving the organization a foundation good to implement organizational resilience strategy.

In a series of analyzes, each author has the different views. Therefore, there is a hypothesis put forward to refute and contradict the H3 hypothesis above which is “The resources availability as well as the supporting of system, tools and human resources affects negatively on the situation awareness” (Coleman, Amadi & Izim, 2019). This hypothesis states that the nature of resource availability still contains contradictions. The available resources here include human resources, financial resources, and intangible resources. When an organization has human resources with sufficient knowledge, experience and time, the organization is eligible to be able to achieve Situation Awareness. A human resource is too busy with dense workload, lack of interaction with each other, so achieving Situation Awareness is impossible. Additionally, The available human resources of an organization are often divided into opposing factions and competitive aggressiveness with each other to compete for benefits, for the immediate group’s benefit, not the organization’s. Moreover, the tools available to help companies analyze and assess the risk situation are not really suitable for a variety of contexts. Therefore, it is not possible to confirm

that the Resource availability factor has a positive impact on Situation Awareness. However, the assertion of Coleman et al's study does not affect my hypothesis because I only study the skills of human resources as the premise that creates an incentive for SA, so the hypothesis that RA has a positive impact on SA is still relevant in my study. It is noticeable that three hypotheses H1, H2, H3 have been put forward to demonstrate the relationship between Ambidexterity and organizational resilience. Thus, there are three relationships in total: Exploitation capability positively foster on Management of Keystone Vulnerabilities, Exploitation capability positively foster on Management of Keystone Vulnerabilities and Resource availability positively foster on Situation Awareness. Specifically, with the new point is the first study on the topic Ambidexterity foster on organizational resilience evidenced from retail and e-commerce organizations with the analysis of independent variables and dependent variables correlated with each other to produce the above 3 hypotheses. I affirm that none of my previous research papers and hypotheses have a 100% overlap with this research paper of mine.

VII. CONCLUSION

To recapitulate, the above study analyzed and clearly demonstrated that the impact of Ambidexterity on Organizational Resilience is a positive effect based on 3 hypotheses related to independent and dependent variables. Based on the responses in the questionnaire of employee from retail and e-commerce organization, so that I can give a final result for this research. In addition, this study also gave me the overview and research skills to complete this project to help organizations identify the capabilities and needs by making a long-term plan that allows to scale, improve business value through building an organizational resilience strategy.

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Part 7
Other topics

LIABILITY ABOUT SELF-DRIVING CARS: INTERNATIONAL EXPERIENCES AND RECOMMENDATIONS FOR VIETNAM

**Authors: Nguyen Hong Thuan¹, Nguyen Y Uyen Phuong², Nguyen Thi Thu Thao²,
Nguyen Thi Thu Thao², Tran Thi Yen Thi²
Mentor: Dr. Dao Gia Phuc³**

ABSTRACT: *The overall objective of this study is to research and analyze the regulations of some countries on self-driving cars, both in achievements and challenges, then provide some proposals to tailor the proper legal framework for Vietnam. The study clarifies the issues about self-driving cars, including the definition, levels of driving automation, and liability based on international experiences. Then it proposes new issues for this vehicle in Vietnam's administrative, civil, and criminal law fields. This study makes an important legal premise to bring into account the liabilities related to self-driving cars in a correct, fair and objective manner.*

1. INTRODUCTION

According to an article in the *Technological Forecasting and Social Change*, self-driving car technology is believed to revolutionize road traffic by reducing the risk of accidents, increasing safety, and improving operational efficiency.⁴ Although self-driving cars are not yet in circulation in Vietnam, it can be believed that this will happen in the future.⁵ However, this new technology also raises some issues, including who is legally responsible in the event of an accident involving self-driving cars. In the context of the current legal framework in Vietnam that does not fully regulate this issue, this study analyzes the regulations of some countries, such as the United States, the United Kingdom, France, Germany, and Japan, including achievements and challenges. Thereby, it would evaluate the current legal framework of Vietnam on self-driving cars and provide some recommendations, including a definition of self-driving cars, classification of motorized vehicles, several new subjects, and violations to ensure the safe and responsible development of this breakthrough technology.

2. SELF-DRIVING CAR AND ITS LEGAL LIABILITIES

2.1. Definition of self-driving car

Currently, there is no official definition of self-driving cars worldwide. However, the regulations of some countries and some studies define self-driving cars or autonomous vehicles.

Society of Automotive Engineers International (SAE) is a professional association consisting of engineers and technical experts in the aerospace, automotive, and commercial vehicle industries⁶. The

¹ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: thuannh20501@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City.

³ University of Economics and Law, Vietnam National University Ho Chi Minh City; Email: phucdg@uel.edu.vn

⁴ Seppo Leminen, Mervi Rajahonka, Robert Wendelin, Mika Westerlund, Anna-Greta Nyström. (December 2022). Autonomous vehicle solutions and their digital servitization business models. *Technological Forecasting and Social Change*, Volume 185.

⁵ Manh Chung, Duc Long. (January 30, 2022). "What does the FPT Vice President say about the future of self-driving cars?". Vietnam Economic Times. Retrieved from: [https://vneconomy.vn/pho-chu-tich-fpt-noi-gi-ve-tuong-lai-cua-xe-tu-lai.htm].

⁶ Society of Automotive Engineers International (SAE International), founded in 1902, is headquartered in the United States, is a globally active professional association of engineers and related technical experts in the aerospace, automotive and commercial

literature researched and published by this association serves as reputable sources of information, commonly cited by scholars and practitioners in the field. Notably, the documents concerning the categorization of autonomous vehicles have been frequently utilized, but non-mandatory, as a fundamental reference for the legislative frameworks adopted by various nations. SAE has identified 6 levels of self-driving cars, including No Driving Automation, Driver Assistance, Partial Driving Automation, Conditional Driving Automation, High Driving Automation, and Full Driving Automation. However, SAE has not yet given a specific definition of self-driving cars.

In the Hiroba Law magazine of Japan, there is a research paper on self-driving cars has the view that “a self-driving car is the operation of a car with the driver with the support of the system in handling one of the following operations such as acceleration, control, brake pedal, until the system can gradually perform this operation is called the automated driving system”.¹ A German Professor, Armin Engländer, defines an autonomous vehicle as a motor vehicle in which driving and parking are fully automatic and are no longer controlled by the driver². Singapore gives a definition of autonomous vehicles in the Public Order And Safety (SPECIAL POWERS) ACT 2018³ that “autonomous vehicle” means a motor vehicle equipped wholly or substantially with an autonomous system (also commonly known as a driverless vehicle).⁴ In Vietnam, self-driving cars are still a new definition. However, some scientists have expressed their views on autonomous vehicles: “Autonomous cars, also known as self-driving, driverless or automatic cars, are vehicles capable of sensing the environment and moving safely with little or no human involvement.”⁵

Based on these perspectives, the research group concludes that a “self-driving car” can be understood as a normal motorized vehicle equipped with an automated driving system to partially or wholly support vehicle control during vehicle operation, including parking. With a specific definition of self-driving cars, the research group clarifies the levels of automation for this type of vehicle to determine legal liabilities of relevant subjects.

2.2. Levels of driving automation of self-driving car

SAE has identified 6 levels of driving automation through the SAE J3016 standard⁶, including 3 low and 3 high levels. SAE also refers to two important systems related to self-driving cars as “driving automation system or technology” and “automated driving system” based on the degree of automation provided to the vehicle. “Driving automation system or technology” supports the driver in various ways such as deviating warning, adaptive cruise control, but still requires supervision and human intervention. Meanwhile, the “automated driving system” is capable of performing all driving tasks without human supervision and intervention under certain conditions. SAE J3016 classifies driving automation levels on

vehicle industries.

- ¹ Fujiwara Shizuo. (2017). An Overview of Current Discussions and Legal Issues Concerning Autonomous Driving. Law Journal Hiroba. Volume 70 No. 5.
- ² Armin Engländer. München (2016). “The self-driving vehicle and the management of dilemmatic situations”. Journal of International Criminal Law Doctrine (ZIS). 9/2016, page.608.
- ³ Public Order and Safety (Special Powers) Act 2018. April 12, 2018. Retrieved from: [<https://sso.agc.gov.sg/Acts-Supp/26-2018/Published/20180420>], access to October 27, 2022.
- ⁴ Subsection 1, Section 2, Part 1 Public Order and Safety 2018.
- ⁵ Le Son. (2022). “Successfully developed intelligent self-driving car level 4 “Made in Vietnam””. *Vietnam Science and Technology Magazine*. number 4 in 2021. page.34.
- ⁶ Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles J3016_202104). SAE International publish April 30, 2021. Retrieved from: [https://www.sae.org/standards/content/j3016_J3016_202104: Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles - SAE International202104/], access to December 8, 2022.

the following standards: Dynamic driving task (DDT)¹, redundant dynamic control task (redundant DDT); Operational design domain (ODD)² and divided into 6 specific levels, including:

Level 0 - No Driving Automation: The driver takes full responsibility for driving. Therefore, the driver must control the vehicle and monitor any possible warnings; thus, the driver is responsible for braking, steering, accelerating, etc.

Level 1 - Driver Assistance: Vehicles are equipped with a number of steering assist features to respond to unexpected situations, but the driver remains responsible for driving. The driver has the task of driving the vehicle and monitoring the system, however, if activated, it could perform steering, acceleration, and braking functions.

Level 2 - Partial Driving Automation: Vehicles are equipped with an advanced driving assistance system that provides continual acceleration or braking and steering assistance but still requires the driver's attention and readiness.

Level 3 - Conditional Driving Automation: The system carries out all aspects of the driving functions, however the driver must be seated in the driver's position and ready to take control when necessary or requested.

Level 4 - High Driving Automation: The systems can handle all aspects of driving under certain conditions without human intervention.

Level 5 - Full Driving Automation: The systems handle all aspects of driving in any driving condition without human intervention.

For each level of driving automation, the control of the driver will be gradually reduced while the intervention of the automated driving system increases. Therefore, relevant entities will have liabilities corresponding with the different automation levels.

2.3. Definition of liability for self-driving cars

In the legal aspect, the liability's definition is understood in two senses. First, the liability is the duties of the subjects carrying state power or the obligations of citizens towards the state and society. Second, the liability is the legal consequences disadvantage that the subject has to suffer due to illegal³. Within the scope of the research, the legal responsibilities of conventional motor vehicles will focus on the second sense of this definition. For motorized vehicles, the liability will belong to the car owner and the driver. Besides, Lawyer Monthly⁴ has defined the legal liability for self-driving cars in accidents⁵, including tort liability, product liability, and imposing liability. Therefore, liabilities for self-driving cars can belong to the owner, driver, original equipment manufacturers, autonomous vehicle manufacturers, and hackers. Expanding the definition of liabilities for self-driving cars will help to determine responsibility for all parties fairly, resolving potential conflicts of interest among the related subjects.

¹ Dynamic driving task: All the driving activities a driver can perform while operating the vehicle, including operations such as steering, accelerating and braking, as well as monitoring the driving environment and responding to unexpected events, helps identify and determine the range of driving tasks that need to be automated.

² Operational design domain: Set of conditions and situations in which an autonomous driving system is designed to operate including factors such as road type, speed limits, weather conditions and traffic density to ensure that the system autonomous driving systems should only be used in safe and effective situations.

³ Ha Noi Law University (2007), Textbook of General theory of the state and law, Assoc. Prof. Dr. Doan Minh Nguyen, Judicial publisher, page 505, 506.

⁴ Lawyer Monthly is a news website and monthly legal publication with content that is entirely defined by the significant legal news from around the world, Retrieved from: "[<https://www.lawyer-monthly.com/about/>], access to December 13, 2022.

⁵ Lawyer Monthly, "What Is a Self-Driving Car Liability?", Retrieved from: [<https://www.lawyer-monthly.com/2020/10/what-is-a-self-driving-car-liability/>], access to December 13, 2022.

3. INTERNATIONAL EXPERIENCES ON LIABILITIES ABOUT THE SELF-DRIVING CARS

Through researching the laws related to self-driving cars in some countries, most countries divide the automation levels of self-driving cars into 2 or 3 groups to assign liability. Nevada (US), Germany and Japan choose to divide 6 levels of automation of self-driving cars into 2 groups; Meanwhile, France divides self-driving cars into 3 groups and does not rely on the level of automation of this vehicle according to SAE. With that division, the law will force some subjects to take full responsibility for replacing the person who directly drives the car or “share” responsibility with them when an accident about self-driving cars occurs. Therefore, classification affects the prosecution of the responsibility of the subjects in the legal regulations of the above countries.

In the UK, driver will be administratively responsible for operating a self-driving car without third party liability insurance¹, driving under the influence of alcohol or drugs² and without a valid license³ and not ensuring traffic safety⁴. Regarding to civil liability, drivers and owners are responsible for accidents⁵ caused by vehicles in a self-driving state due to unauthorized system changes or failure to update safety-critical software. The insurance company will be responsible for compensation for self-driving car accidents if there is a third-party liability insurance⁶; conversely, if it is not covered by insurance, the owner is responsible for compensating the damaged person even if the cause is from the car in a self-driving state⁷. Regarding criminal liability, drivers and owners must be criminally responsible for accidents caused by self-driving cars in case unauthorized system changes or failure to update safety-critical software

In Germany, the driver or the owner is liable for damages if they directly control the vehicle⁸ or do not take over a vehicle when the driving automation system warns, however, the owner can be disclaimed if the accident is caused by force majeure clause or is unknown to others using the vehicle⁹. The insurance company will be responsible for accidental damage caused by the motor vehicle and the manufacturer is responsible when the self-driving car causes an accident because of a system failure¹⁰. Regarding criminal liability, the driver will be criminally responsible for a number of crimes such as traffic violations leading to the death of others, causing serious harm to human health or danger for road traffic. However, if the cause of this violation is from the error of the self-driving system, the manufacturer will be criminally responsible¹¹. Manufacturers can be prosecuted for criminal liability if the accident’s reason is due to artificial intelligence¹². However, manufacturers are disclaimed by proving that the cause of the accident falls into a “dilemma” situation¹³.

According to Nevada state law¹⁴ of the United States, drivers must be imposed an administrative fine

¹ Subsection 1, Section 143 of the Road Traffic Act 1988, 15 May 1989, retrieved from: [<https://www.legislation.gov.uk/ukpga/1988/52/contents>], access to December 4, 2022.

² Section 4 of the Road Traffic Act 1988.

³ Subsection 1, Section 45 of the Road Traffic Act 1988.

⁴ Part 1 of the Road Traffic Act 1988

⁵ Subsection 2, Section 2 and Subsection 2, Section 4, Part 1 of Automated and Electric Vehicles Act 2018.

⁶ Subsection 1, Section 2, Part 1 of Automated and Electric Vehicles Act 2018.

⁷ Subsections 3 and 4, Section 4, Part 1 of Automated and Electric Vehicles Act 2018.

⁸ § 7 (1) Road Traffic Act 1988.

⁹ § 7 (2) (3) Road Traffic Act 1988.

¹⁰ § 1 of Law on Compulsory Insurance for Motor Vehicle Owners (PfVG).

¹¹ § 222, 229, 315c of Strafgesetzbuch - StGB. Retrieved from <https://www.gesetze-im-internet.de/stgb/index.html#BJNR001270871BJNE008302307>, access to 27/10/2022.

¹² Prof. Dr. Susanne Beck (October 27, 2022). *Autonomes Fahren: Herausforderung für das bestehende Rechtssystem*. Retrieved from: [<https://www.informatik-aktuell.de/management-und-recht/it-recht/autonomes-fahren-und-strafrecht.html>].

¹³ Prof. Dr. Susanne Beck, *ibid*.

¹⁴ Nevada Legislature (November 7, 2022). “*Nevada Revised Statutes 2021*”. Retrieved from [<https://www.leg.state.nv.us/Division/Legal/LawLibrary/NRS/index.html>].

given that they do not sit in the stipulated position¹ or do not submit to the Department of Public and Safety proof of insurance or self-insurance acceptable to the Department when testing the self-driving car². Testers must pay a fine if they fail to report to the Department of Public and Safety when damage occurs to others³. The vehicle driver must pay damages to others. The insurance company must pay damages⁴ caused by the driver in some specific cases within the limit amount. The vehicle's original manufacturer and the self-driving system's original manufacturer will be responsible if the fault is caused by the original vehicle or self-driving system⁵. Driver must be criminally responsible for causing an accident that almost causes the death of another person⁶. Nevada law has provisions to regulate relatively "hackers" to infiltrate self-driving systems to gain control and cause accidents to others. This behavior would constitute murder under Section NRS 200.020 of the Nevada Revised Statutes 2021. However, proving that the autonomous driving system was "hacked" or who was "hacked" does not seem easy for the authorities.

In Japan, there are no regulations on self-driving cars yet. However, a draft subject "Draft of the working group on liability for damage caused by autonomous driving, issued by the Ministry of Land, Infrastructure, Transport, and Tourism⁷" mentioned this type of vehicle. According to the regulations in this draft, the driver must pay damages if the vehicle causes a traffic accident resulting in death or injury unless a product failure or three element of disclaimer⁸ can be proven. Drivers must ensure safety standards while driving a self-driving car and can be criminally prosecuted if negligent driving leads to death or injury.⁹

In French law, regarding administrative liability, drivers must comply with traffic safety regulations to avoid fines, loss of points, or suspension of driving licenses. If causing damage to others, the driver and the manufacturer must compensate on a case-by-case basis. In criminal liability, only the manufacturer is liable for involuntary assaults committed by self-driving cars while operating "automatic" functions without warning or asking the operator to take over the vehicle. Driver shall be liable if the conditions are not met by the law.¹⁰

In addition, in cases when self-driving cars cause accidents that cause damage to property and life due to system failure, most manufacturers will be sanctioned. However, there is an exception where the owner of a self-driving car intentionally or negligently fails to bring the vehicle in for a periodic inspection of the safety elements of the autonomous driving system, thereby causing an accident. This is an open issue in the law on self-driving cars in countries because there is almost no specific regulation to assign responsibility when this case occurs. The failure of the system leads to an accident, but it is completely the owner's subjective opinion. They know and must know about how to use and maintain a car when owning it. This is not a right but an obligation of the owner when they allow a motor vehicle to circulate.

Another issue that needs to be considered is the compatible criminal penalty for the manufacturer when

¹ Section 1 Article NRS 482A.070 Nevada Revised Statutes 2021.

² Article NRS 482A.060 Nevada Revised Statutes 2021.

³ Article NRS 482A.095 Nevada Revised Statutes 2021.

⁴ Article NRS 679A.100 Nevada Revised Statutes 2021.

⁵ Section 1, Section 2 Article NRS 482A.090 Nevada Revised Statutes 2021.

⁶ Article NRS 484B.657 Nevada Revised Statutes 2021

⁷ Ministry of Land, Infrastructure, Transport and Tourism Automobile Bureau. *Liability for damages in automated driving*. Retrieved from: [<https://www.mlit.go.jp/common/001226365.pdf>]

⁸ Article 709 of the Japanese Civil Code (Law No. 89 of 1896) as amended by Law No. 44 of 2017.

⁹ Numerama (October 27, 2022). "In France, who is legally responsible in the event of an accident with a self-driving car?". Retrieved from: [<https://www.numerama.com/vroom/704665-en-france-qui-est-responsable-legalement-en-cas-daccident-en-voiture-autonome.html>].

¹⁰ Numerama (October 27, 2022). "Who is legally responsible in France in the event of an accident with a self-driving car?". Retrieved from: [<https://www.numerama.com/vroom/704665-en-france-qui-est-responsable-legalement-en-cas-daccident-en-voiture-autonome.html>].

the self-driving car causes a serious accident to another person. In criminal liability, imprisonment can be seen as a high level of liability that a subject must bear if they cause serious damage to property or human life. However, in essence, legal entities will never be sentenced to prison, but only individuals will bear this penalty. When an extremely serious accident involving self-driving system failure occurs, the punishment for legal entities will normally be fines and civil compensation for the victim. Therefore, the law is not really optimal when the provisions on penalties for legal entities are not enough to deter and educate.

4. RECOMMENDATIONS FOR VIET NAM

4.1. Legal issues arising from self-driving car operation in Vietnam

The legal framework for road traffic is an essential aspect of every country, including Vietnam, which includes regulations to ensure safety and efficiency for drivers, vehicle owners, and other related parties. These regulations include administrative, civil, and criminal violations that may occur when participating in traffic, thereby giving rise to corresponding responsibilities and being clearly defined in legal documents such as the Law on Roadway Traffic in 2008¹, Decree 100/2019/ND-CP², the Civil Code in 2015³, the Criminal Code in 2015 (amended and supplemented 2017)⁴, and some other related documents.

The regulations on administrative responsibilities in Vietnam require drivers and vehicle owners to be responsible for traffic safety violations and environmental protection regulations while driving. Some typical behaviors can be mentioned, such as driving at a speed exceeding the prescribed limit from 5 km/h to below 10 km/h; changing lanes without reducing speed or without signaling; failing to comply with traffic signs, and markings; having alcohol or stimulant concentration exceeding the prescribed limit while participating in traffic⁵. The level of administrative penalties corresponding to each specific act includes warnings, fines, confiscation of exhibits, revocation of driving licenses, and measures to remedy the consequences. In addition, other parties also have to take responsibility, such as inspectors of the Vietnam Register Center who commit acts of falsifying inspection results, failing to comply with relevant procedures and technical standards in the inspection process⁶; or, organizations that engage in unauthorized production or assembly of road motor vehicles must be held accountable⁷.

Regulations on civil liability in Vietnam include many basic provisions, such as equity ownership, civil contracts, and non-contractual liability for damages. However, within the scope of the study, the research group addresses the liability for compensating damages caused by road traffic accidents. According to Article 585 of the 2015 Civil Code, compensation for damages caused by road vehicles must be based on full and timely compensation for all losses incurred due to the accident. Compensation can be in the form of cash, objects, or services, based on the event that caused the damage and the economic capacity of the parties involved. However, the compensation amount may be reduced if the compensating party is found to be faultless or due to negligence or if the damage caused is serious compared to their economic capacity⁸.

¹ The Law on Roadway Traffic (Law No. 23/2008/QH12) dated November 13, 2008.

² Government Decree No. 100/2019/ND-CP dated December 30, 2019, on administrative penalties for violations in the field of road and railway transport, was amended and supplemented by Government Decree No. 123/2021/ND-CP dated December 28, 2021, amending and supplementing certain provisions of decrees on administrative penalties for violations in the fields of maritime; road and railway transport; civil aviation.

³ The Civil Code (Law No. 91/2015/QH13) dated November 24, 2015.

⁴ The Criminal Code (Law No. 100/2015/QH13) dated November 27, 2015, was amended and supplemented by the Law amending and supplementing some articles of the Criminal Code (Law No. 12/2017/QH14) dated June 20, 2017.

⁵ Article 11 Decree 100/2019/ND-CP.

⁶ Section 1 Article 38 Decree 100/2019/ND-CP.

⁷ Section 2 Article 29 Decree 100/2019/ND-CP.

⁸ Section 2 Article 585 The Civil Code in 2015.

According to the Criminal Code in 2015 (amended and supplemented in 2017), regulations on criminal liability in Vietnam are determined according to specific criteria, including the object, subject, objective, and subjective aspects of a crime. Drivers of vehicles, owners, and other relevant parties may be held liable for offenses such as murder, intentional injury, manslaughter or unintentional injury, and violations of road safety regulations.

Although current legal regulations in Vietnam effectively regulate the field of road transportation, there are still some challenges for self-driving cars. As the development and deployment of self-driving cars become increasingly feasible, it is necessary to amend and strengthen existing regulations to ensure safety and efficiency when using these vehicles. Legal regulations on self-driving cars need to address administrative, civil, criminal violations, and liability for accidents that may arise due to some new subjects and acts related to self-driving cars.

Firstly, regarding the classification of road motor vehicles and expanding the scope of drivers of road motor vehicles.

Self-driving cars are still a new concept in Vietnam, so the current regulations have not yet established a system for classifying vehicles for the convenience of control and assigning responsibilities to the parties involved. This is a challenge for Vietnam and needs to be addressed in order to allow self-driving cars to operate in the future. Meanwhile, many regulations on the classification of motorized vehicles have been established around the world. Notably, France has regulations on three categories of vehicles, while Germany and the United States have regulations on two types of vehicles. These countries do not classify vehicles based on the original 6 levels of automation of SAE, but instead rely on their own regulations on the degree of vehicle automation.

According to some countries' laws, there is not much difference between level 0, 1, and 2 cars, so they are often grouped together. The remaining three levels are typically classified as cars with the highest level of automation. However, for level 3 and 4 cars, they should not be classified in the same group as level 5 cars because level 5 cars (fully automated) have not yet officially appeared in the world. Furthermore, there is a significant difference between level 4 cars and level 5 cars in terms of whether or not they are human-controlled. Therefore, it can be seen that grouping cars according to the views of countries is progressive but not entirely appropriate.

Assigning responsibility for subjects belonging to each car group is relatively necessary and plays an important role in resolving situations where autonomous driving causes accidents. Therefore, Vietnam needs to develop appropriate regulations for self-driving cars to ensure optimal control of self-driving cars, starting with dividing them into separate groups.

Furthermore, the Law on Roadway Traffic in 2008 stipulates the object performing the driving task for road motor vehicles, but it is not complete for cases of using self-driving car cases. For level 3, 4, and 5 self-driving cars, the autonomous driving system is the subject performing the driving task. Therefore, if there are violations related to self-driving cars, responsible subjects will include those other than the driver. Therefore, to ensure accuracy in determining the legal responsibility subject, the scope of subjects applicable to the regulation of the object performing the driving task for motor vehicles on the road needs to be expanded.

Secondly, regarding the legal responsibility of the manufacturer.

The common point in the legal regulations for self-driving cars in the US (Nevada), France and Germany is that they all have specific provisions stating that the manufacturer will be held responsible in the event of a traffic accident caused by a malfunction of the autonomous driving system in both civil and criminal matters. However, current civil and criminal laws in Vietnam do not clearly define the legal responsibilities of self-driving car manufacturers, which is appropriate for the current context as self-driving cars have not

been permitted to operate on public roads. Meanwhile, the manufacturer plays a crucial role in determining the legal responsibility related to self-driving cars, especially in cases of level 4 and 5 autonomous vehicle accidents.¹ Therefore, with the existing legal framework, adjusting the regulations for conventional motor vehicles will not provide a sufficient legal basis to resolve issues related to self-driving cars. Therefore, the law needs to supplement provisions on the manufacturer's responsibility to ensure fairness, objectivity, and traffic safety and limit unfortunate consequences.

Thirdly, regarding the legal responsibility of the subject that attacks the automated driving system.

One issue that needs to be addressed with the advent of self-driving technology is the possibility of the system being attacked, or “hacking”, due to the use of AI technology in these vehicles. The consequences of hacking a self-driving system do not only stop at the information being disclosed, stolen, or altered but can also lead to serious repercussions such as endangering life and health. Accordingly, many issues arise, such as who will be held criminally responsible and liable for damages in the event of self-driving caused by attacks that result in harm to the health, life, or property of others or in the case of violations of road traffic rules, who will be subject to administrative fines if the vehicle is hacked.

However, the current legal system in Vietnam does not have any regulations to address the above issues. Administrative liability in the field of road traffic only applies to certain subjects such as drivers, vehicle owners, and others, but not hackers. With regard to non-contractual compensation provisions in civil law, hackers are clearly not among the parties obligated to compensate for damages caused by accidents that affect the health, life, or property of others. To ensure the legitimate rights and interests and fairness for all traffic participants, the national legal system needs to issue regulations to adjust the behavior of hackers.

Finally, regarding the liabilities related to the technical standards of the vehicle.

Based on the provisions in Article 16 and Article 30 of Decree 100/2019/ND-CP, the driver or owner of a vehicle will be administratively liable in cases where certain parts of the vehicle do not meet technical standards. Accordingly, lawmakers use a listing of the parts that need to meet technical standards as a basis for imposing administrative penalties for violations. However, self-driving cars are essentially ordinary vehicles equipped with AI to assist humans in operating and controlling the vehicle. They are more complex than regular motor vehicles as they require advanced sensors, complex software, advanced safety systems, and cybersecurity measures. Therefore, Vietnamese law needs to provide additional technical standard regulations to make it compatible with this new technology.

4.2. Proposals for the legal framework on liability for self-driving cars in Vietnam

The research group recommends that self-driving cars be classified to determine legal liability for related subjects in the case of self-driving cars being circulated in Viet Nam. Accordingly, self-driving cars will be classified into 3 groups of vehicles: partially automated, highly automated, and wholly automated vehicles. According to SAE standards, vehicles with levels 0, 1 and 2 are classified as group partially automated vehicles and always require human intervention during movement. Vehicles with levels 3 and 4 are classified as group highly automated vehicles and the role of the operator is gradually being replaced by the support of the self-driving system. Finally, vehicles with level 5 are classified as a group of wholly automated vehicles. In this group of vehicles, people will become passengers on the vehicle and their control role is eliminated.

On the basis of grouping and understanding the characteristics of each group of vehicles, Vietnamese law needs to expand the subjects of driving tasks to motorized vehicles. In Law on Roadway Traffic in 2008, the regulation “driver means operator of a motor vehicle”² is no longer relevant when self-driving

¹ Voice of Vietnam, VOV. (June 14, 2021). “Self-driving cars cause accidents, who is responsible?”. VOV Traffic Radio. Retrieved from <https://vovgiaothong.vn/xe-tu-lai-gay-tai-nan-ai-chiu-trach-nhiem-d21073.html>.

² Section 24 Article 3 of the Law on Roadway Traffic in 2008.

cars are circulating in Vietnam. Accordingly, the “motor vehicle driver” does not stop at the subject being “human” but can also be the AI equipped in the vehicle’s self-driving system. Therefore, this regulation needs to be revised in the direction that the operation of a motorized vehicle includes both the driver’s driving and the self-driving system’s driving.

Regarding liability, it is necessary to modify and supplement a number of regulations to improve the legal framework to cover and adjust self-driving cars.

Firstly, regarding administrative liabilities, Decree 100/2019/ND-CP (amended and supplemented by Decree 123/2021/ND-CP) needs to add some relevant regulations in the context of self-driving cars circulation. It is necessary to stipulate more mandatory provisions for owners and drivers not to arbitrarily change and modify the self-driving system of the vehicle, focusing on technical standard regulations and administrative penalties.

In the context of the breakout self-driving cars, the role of driver is gradually replaced by self-driving systems. Therefore, in some cases, road traffic violations can be caused by AI errors or by hackers. In these cases, the person responsible for the violation should be the manufacturer and the hacker. The manufacturer is the one who programmed the self-driving system, so if the system fails, leading to a violation of traffic safety regulations, they must be indirectly responsible. Similarly, when hackers attack the self-driving system and take control, they are responsible for their action. However, in practice, imposing administrative liability on manufacturers or hackers is impossible because it will cause difficulties in the sanctioning process. Competent authorities should spend a lot of time investigating faulty goods of manufacturers and hackers. Therefore, in order to ensure fairness, the Law on Protection of Consumers’ Rights in 2010¹ needs to add the right to recourse the administrative fines of self-driving car drivers to manufacturers or hackers.

Secondly, regarding civil liabilities, when self-driving cars cause an accident that causes damage to life, health or property due to the fault of the self-driving system, the manufacturer must be responsible for indemnification for the damage. According to the Law on Protection of Consumers’ Rights in 2010, when self-driving cars cause an accident to a third-party, but the fault comes from the system, there is no basis to claim the manufacturer to compensate for third-party damage because the regulation only stops the manufacturer compensating its consumers.

Article 597 and 600 of the Civil Code in 2015 provide for compensation for damage caused by persons of legal entity, workers, or trainees, but there are no specific guidelines on the term “during the performance of duties” or “during the performance of the assigned duties”. This affects the determination of whether the manufacturer (legal entity) is responsible in case their person makes an error in the process of programming the self-driving system. Therefore, these terms need to be guided specifically according to the employee’s liabilities instead of being understood in terms of time. Specifically, persons of the legal entity, workers, or trainees must be careful in the process of performing their duties and if they are careless and causing damage, they can be used as a basis to prosecute manufacturer liability in the future.

Considering the problem that the self-driving system is compromised and causes an accident that causes damage to the health, life and property of others, Article 584 of the Civil Code can be used to prosecute the compensation liability of hackers. However, the law needs to stipulate what is the act of infiltrating the self-driving system to gain control, classify clearly between intentional and unintentional acts of taking control of a vehicle causing damage to others, etc to serve as a basis for claiming damages and make the application of the law faster and easier.

¹ The Law on Protection of Consumers’ Rights (Law No. 59/2010/QH12) dated November 17, 2010, was amended and supplemented by the Law amending and supplementing some articles of 37 Laws related to planning (Law No. 35/2018/QH14) dated November 20, 2018.

Finally, regarding criminal liability, the Criminal Code in 2015 needs to supplement a number of provisions related to the liabilities of manufacturers and hackers.

In Article 75 of the Criminal Code in 2015, a condition for taking the liability of a legal entity should be supplemented, specifically, “criminal acts are committed by an AI product programmed by a commercial legal entity”. Article 76, has more than 30 crimes that a legal entity can incur but none of which is related to the traffic sector; thus, it is necessary to expand the scope of liability of the commercial legal entity. Although there is no reason for the manufacturer to intentionally program the system to infringe on the life, health and property of others, it is undeniable that this does not happen at all. Therefore, Article 123 (stipulates the crime of intentional murder), Article 134 (stipulates the crime of intentionally causing injury or harm to the health of others) needs to consider that commercial legal entities can also be in charge of. Article 262 of the Criminal Code in 2015 stipulates the liability of individuals when allowing the use of motorized vehicles and special-use motorcycles that do not meet traffic technical safety standards. Regarding this crime, when self-driving cars are circulated, the manufacturer can still be prosecuted for liability. Therefore, this provision should expand the scope of responsible subjects to include legal entities. In the process of programming the self-driving support system, if the manufacturer programmed the system to handle the situation so that the risk is minimal, it is necessary to consider reducing sanctions for the manufacturer.

In addition to the manufacturer, the hacker should be considered for criminal liability when causing damage to the life, health, and property of others if the attack on the self-driving system fully meets the constitutive signs of crime and causes serious damage. For the act of attacking the system and intentionally causing an accident, the perpetrator is liable for intentional homicide (Article 123), the crime of intentionally causing injury (Article 134). Regarding the act of attacking the self-driving system and unintentionally causing an accident, it is necessary to add the crime of “attacking the self-driving system of an autonomous vehicle” in Section 1 Chapter XXI of the Criminal Code in 2015. This provides a more transparent framework for determining criminal liability and ensures that hackers are held accountable for their actions.

5. CONCLUSION

The study has concretized theoretical issues on self-driving vehicles by researching and presenting definitions, levels of autonomy according to SAE J3016, and liabilities in general and specifically for self-driving cars. Next, the study has analyzed the legal regulations of some typical countries in this field and provided some proposed regulations to improve the legal framework of Vietnam, preparing for the circulation of self-driving cars.

The study results set the premise for applying liability about self-driving cars in practice to ensure the interests of related subjects. In addition, the study is also the beginning of elementary research and serves as a reference source for students or researchers. The current study only focuses on legal issues of the most common self-driving vehicle in the world - the car. If the technology develops further and more legal issues arise about other vehicles, the study will play a useful legal background for future research about self-driving cars.

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LEGALITY OF NFT: INTERNATIONAL EXPERIENCE AND RECOMMENDATIONS FOR VIETNAM

**Author: Nguyen Pham Quynh Anh¹, Nguyen Thi Loan Anh², Le Phuong Thao², Le Hoang My²,
Vo Ngoc Bao Han²**

ABSTRACT: *The overall objective of this study is to provide an understanding of the basic concepts and theoretical issues related to qualitative NFTs and to determine their nature in relation to the concept of property under Vietnamese law. By synthesizing and analyzing global legislation on NFTs and NFT transactions, the study proposes an appropriate legal framework to recognize the legitimacy of NFTs, which Vietnam can refer to and implement in practice to support its development process and current state of science and technology. Based on this framework, the study aims to actively encourage the development of this investment activity and contribute to the strong growth of the economy.*

Keywords: *Non-Fungible Token; NFT; the legality of NFTs.*

1. INTRODUCTION

The world is witnessing a lot of competition in science and technology. The 4.0 technology revolution has been happening extremely quickly, with breakthrough advances in many fields. In particular, blockchain technology attracts attention, and one of its applications is the Non-fungible Token (NFT). In less than a decade, it has made a great impression in the digital world with hundreds of millions of dollars in transaction values.

In 2019, NFT began appearing in many applications, games, and especially the art market with an explosion in the number of participating artists and works. At that time, the total transaction value was recorded up to about 24.5 million USD.³

By about 2020–2021, the NFT market really sublimed with an impressive increase. At this stage, the number of buyers increased by nearly 50%, bringing the total value of NFT transactions globally to 17.6 billion USD in 2020 and approximately 25 billion USD in 2021.⁴

In Vietnam, more individuals and organizations are trading NFTs. NFT is a new wave creeping into many different fields, bringing efficiency to the digital economy and opening up thousands of attractive opportunities in Vietnam. According to a survey by Statista, in 2021, the Vietnamese market witnessed a strong development of the NFT market when it recorded more than two million users participating in NFT exchanges, accounting for 2.43% of the population. Total transaction revenue was recorded up to more than 14.6 million USD. In the field of painting, Phong Luong, and Tu Na, participated in the painting exhibition and earned more than 7,000 USD and 31,000 USD, respectively. The first NFT painting “Hoa mai may man” by Xeo Chu, was sold for 22,899 USD.⁵ In the game field, Axie Infinity has achieved much success when it becomes a globally famous NFT game with a revenue of billions of USD in 2021. It can be seen that the NFT market in Vietnam may become very bustling, promising to thrive in the near future.

Despite active activities, there is a problem that many countries, including Vietnam, have not recognized

¹ Corresponding author: Nguyen Pham Quynh Anh; Tel: +84 398950799; Email: anhnpq20501c@st.uel.edu.vn

² University of Economics and Law, Vietnam National University Ho Chi Minh City

³ Source: NonFungible.com

⁴ *Ibid.*

⁵ Hoai Phuong. (10/08/2021), “Teen artist Xeo Chu auctioned his works for nearly 23,000 USD in an auction on Binance NFT marketplace”, *Tuoi Tre News*. <<https://tuoitre.vn/hoa-si-nhi-xeo-chu-dau-gia-tranh-duoc-gan-23-000-usd-tu-san-giao-dich-nft-20210810145914897.htm>>

NFT as an asset or have a complete legal framework governing NFT activities. Vietnamese law currently does not have a specific legal definition for NFT, nor is it recognized as one of the four types of property under civil law. It is urgent to recognize the NFT and have a complete legal framework because it will create a safe legal corridor for related activities and promote more effective and equitable investment activities.

In order to build an appropriate legal framework for NFT and NFT related activities, especially the recognition of NFT's legitimacy in Vietnam, it is necessary to clarify the NFT's concept and related concepts. In this case, the concept of the token is an important object and it will serve as the basis for the analysis and evaluation of NFT. Currently, there are many different approaches to the concept of a token, but it is necessary to put those concepts in relation to the metaverse and blockchain technology. In that case, the token can be safely used as a store of value for internal and external transactions within a given ecosystem.¹ Thus, the token can be a representation of a digital asset encoded in a smart contract, where each token belongs to a blockchain address.

In essence, an NFT is a unique, indivisible, and irreplaceable token, established and stored on the blockchain platform through a smart contract. As a result, NFT can verify, store, record the existence and ownership, and even represent, the digital or physical assets it verifies and stores. These assets can include art (paintings, music, pictures, and videos); online games (items, characters, in-game assets, etc.); an item in the metaverse; or any asset that can exist in digital form, including a digital version of real-life assets.² Due to their irreplaceable characteristics and the ability to verify, store, and record the existence of assets, NFTs can be digital assets or a certificate of title in some cases.

2. LITERATURE REVIEW

2.1. History of formation

In 2012, before Ethereum³ the concept of “Colored Coins” was first mentioned by Meni Rosenfeld, chairman of the Israeli Bitcoin organization, in the book “An Overview of Colored Coins”. This is considered as a rudimentary version, laying the foundation for the development of NFTs later.⁴

In 2017, some projects were invested on a large scale such as CryptoPunks, Crypto Kitties. In particular, the game Crypto Kitties was considered a resounding success, recording a large number of players to the point of congesting the Ethereum network.

In 2021, the art market not only saw online auctions of artworks but also began to sell NFT artworks. By the end of 2021, when Facebook changed the company's name to Meta and began developing the Metaverse, the demand for NFTs, especially NFTs in the Metaverse, continued to increase. From this period to the present, blockchain technology and NFTs continue to be of public interest, promising to bring many new improvements in the field of cultural arts.

2.2. Research project

¹ Choudhary, V. V. (2022), “*Non Fungible Token (NFT): Delve Into the World of NFTs Crypto Collectibles and How It Might Change Everything?*” (Vol. 2), Vicky Choudhary.

² University of Economics Ho Chi Minh City. (25/11/2021), “*Research on NFT - Digital assets applying Blockchain technology*”, UEH. <<https://ueh.edu.vn/khoa-hoc/tim-hieu-ve-nft-tai-san-so-ung-dung-cong-nghe-blockchain-57881?app=true&app=true>>

³ Ethereum is a technology for building apps and organizations, holding assets, transacting and communicating without being controlled by a central authority. There is no need to hand over all your personal details to use Ethereum - you keep control of your own data and what is being shared. Ethereum has its own cryptocurrency, Ether, which is used to pay for certain activities on the Ethereum network.

Source: Ethereum.org

⁴ Rosenfeld, Meni. (2012), “*Overview of Colored Coins*”, *White paper; bitcoil. co. il*, 1-2

It can be seen that until 2021, the NFT ecosystem was still in a developmental stage and there were relatively few research works on NFTs in general and the legal framework of NFTs in particular. There are some research work:

Firstly, the article “Tokenized: The Law of Non-Fungible Tokens and Unique Digital Property” by Joshua A.T. Fairfield, published in the *Indiana Law Journal*: Vol. 97: Iss. 4, Article 4. This research proposed a clear direction for the development of the legal platform for NFTs through the argument that NFTs are personal property, not pure contracts or intellectual property licenses. Therefore, NFT transactions should be regarded as transactions of personal property. Finally, the article also pointed out that NFTs will be a basic and typical example of digital personal property, a form of legal ownership that is necessary and but not clearly established.

Secondly, the article “Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges” by authors Qin Wang, Rujia Li, Qi Wang, and Shiping Chen from Southern University of Science and Technology, Swinburne University of Technology, University of Birmingham, and the CSIRO Data61 data innovation group in Australia. In this article, the authors comprehensively studied NFT from a technical perspective, including technical components, models, and design characteristics. They made comments on the security development progress of current NFT systems and discussed the potential and opportunities for NFT applications in the future. This is a fairly comprehensive research work on NFT from a scientific and technical perspective.

In Vietnam, there is currently no comprehensive and specific reference book on NFT transactions. However, there are a few articles discussing NFT and the legal issues such as:

Firstly, the article “NFT from the perspective of copyright law” by Nguyen Ngoc Phuong Hong and Luu Minh Sang, published in the *Journal of Science and Technology of Vietnam*. The research provides a basic understanding of the definition of NFT and help to initially understand what NFT is and the characteristics that differentiate NFT from previous digital assets. However, the authors also clarify the legal issues from the perspective of copyright law, thereby highlighting the connection between NFT and the original work, the copyright issues that are still controversial, and the potential copyright violations related to NFT.

Secondly, the article “Overview on the legal position of cryptocurrency (Bitcoin) in some countries in the world - Orientation to build a legal framework for cryptocurrency in Vietnam” by Nguyen Thi Hong Nhung, Nguyen Thi My Hanh, published in the *Journal of Science and Technology Development - Economics - Law and Management*: Vol 3 No 2.

This article analyzes and comments on the legal nature of cryptocurrencies, especially Bitcoin, and the legal position of them in Vietnam compared to countries like France (Europe) and Thailand. After that, authors make the point of view: With current regulations, cryptocurrencies have been considered as a type of property right recorded in the 2015 Civil Code. At the same time, the author proposes not to use cryptocurrencies as a means of payment like fiat money, but the object of exchange and transaction activities can be viewed as a type of security following the model of Thailand. Although there are differences in terms of research subjects, in essence, NFTs and cryptocurrencies are both digital assets. Therefore, the arguments and views that the article gives are of great reference value for the team’s research paper.

3. RESEARCH METHOD

Analytical Methods: This method is used throughout the study, specifically research various documents, and sources of information and analyze them into components to gain a deeper understanding of NFT assets and the legal issues surrounding them.

Synthetic method: This method is used in the sections on the overview of the research problem to synthesize domestic and foreign research works, thereby linking the analyzed information to create an

assessment base price to make legal proposals and recommendations related to the legality of NFT

Systematization method: Using data and evidence by listing specific figures in the introduction section as well as providing practical evidence to highlight the actual situation of the NFT market in Viet Nam

Comparative jurisprudence: This is an important method used in the study, specifically in section 4. Vietnamese law has not recognized NFT as an asset, while some countries around the world are tending to accept NFT in its legal system. Therefore, the comparison of legal regulations regarding between countries is an important foundation. This comparison helps to evaluate and analyze the pros and cons of regulations in the world and conduct a review and select appropriate factors to apply to Vietnamese law. From the comparison of national laws, the authors can make some recommendations to improve some provisions of Vietnamese law to have a basis to recognize the legality of NFT.

Evaluation method: Based on arguments and information in the research, evaluating the applicability of current legal regulations and future potential of classifying NFT as an asset in accordance with Vietnamese law.

Historical Method: Each legal issue must be studied in the appropriate historical context. Previously, digital assets in general and crypto assets, in particular, were unfamiliar terms that had not appeared and existed in daily life; however, with the rapid development of activities in the field of science and technology, these terms have emerged and brought about legal issues. From the change of circumstances, the historical method will help the research team to assess legal issues in different historical contexts, thereby making appropriate evaluations and assessments.

4. RESULTS AND DISCUSSION

4.1. Foreign Legal Studies

4.1.1. United States

According to current US law, the classification of the nature of NFT assets can be approached from three perspectives, including: commodities, securities, or digital assets.

(i) Commodities

Section 1(a)(9) of the Commodity Exchange Act of 1936 (CEA) defines that “Commodity” includes some of the specific items listed and all services, rights, and interests (except motion picture box office receipts, or any index, measure, value, or data related to such receipts) in which contracts for future delivery are presently or in the future dealt in¹. Therefore, from this definition, along with the typical characteristic of NFT as a representation of a unique right and asset value, it can be inferred that if NFT is the subject of a future contract where the parties agree to transfer some or all of the rights to that NFT, and the transfer of NFT must be made at a specified time in the future, it can also be classified as a type of commodity.

(ii) Securities

Under current US law, when conducting NFT projects, it is necessary to consider whether such NFT meets the criteria to be classified as a security under securities laws. According to the definition

¹ The origin: “The term “commodity” means wheat, cotton, rice, corn, oats, barley, rye, flaxseed, grain sorghums, mill feeds, butter, eggs, *Solanum tuberosum* (Irish potatoes), wool, wool tops, fats and oils (including lard, tallow, cottonseed oil, peanut oil, soybean oil, and all other fats and oils), cottonseed meal, cottonseed, peanuts, soybeans, soybean meal, livestock, livestock products, and frozen concentrated orange juice, and all other goods and articles, except onions (as provided by section 13–1 of this title) and motion picture box office receipts (or any index, measure, value, or data related to such receipts), and all services, rights, and interests (except motion picture box office receipts, or any index, measure, value or data related to such receipts) in which contracts for future delivery are presently or in the future dealt in”. <<https://www.law.cornell.edu/uscode/text/7/1a>>

of securities is enumerated in Section 2(a)(1) of the Securities Act of 1933¹, tokens in general and NFTs in particular are not listed in the law. However, an NFT investment transaction can still be classified as an “investment contract” and be considered a security if it passes the Howey Test². If an NFT transaction fails the Howey Test, the US court will conclude that the transaction is purely commercial rather than an investment contract.

In fact, fractional ownership of NFTs (Fractional NFTs³) could be considered unregistered securities under certain circumstances because there’s a collective investment. Therefore, on a case-by-case basis, NFT may still be a security subject to the provisions of the Securities Act of 1933 and the Securities Exchange Act of 1934 of the United States.

(iii) Digital Assets

According to a draft of the Digital Asset Market Structure and Investor Protection Act⁴, digital assets will be under the same regulatory framework as traditional assets. The bill distinguishes “digital assets” and “digital asset security” according to certain attributes such as rights to equity or debt interest in the issuer, right to profits, interest dividend payments from the issuer or voting rights, and the method of initial public offering⁵. It proposed a definition of “digital asset” as “*an asset created electronically or digitally through software code and whose secure transaction history is recorded on distributed digital ledger or other digital data structure in which consensus is reached through a mathematically verifiable process*”⁶. This definition is broad enough to cover all types of NFTs and they are likely to be uniformly governed by commodity law. In addition, if an NFT project meets the criteria to become a digital asset security, the NFT may still be subject to regulation under US securities laws. Although this bill has not been officially approved, it also shows the views of US lawmakers in the classification and management of NFTs in particular and digital assets in general.

In particular, according to the IRS guidance on Digital Assets in the 2019 FAQ (last updated in March 2021)⁷. The IRS has officially defined that: “*Digital assets are broadly defined as any digital representation of value which is recorded on a cryptographically secure distributed ledger or any similar technology as specified by the Secretary.*” Digital assets are considered as one of the general asset classes, which include

¹ The origin: “*The term “security” means any note, stock, treasury stock, security future, security-based swap, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, collateral-trust, certificate, preorganization certificate or subscription, transferable share, investment contract, voting-trust, certificate, certificate of deposit for a security, fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option, or privilege on any security, certificate of deposit, or group or index of securities (including any interest therein or based on the value thereof), or any put, call, straddle, option, or privilege entered into on a national securities exchange relating to foreign currency, or, in general, any interest or instrument commonly known as a “security”, or any certificate of interest or participation in, temporary or interim certificate for, receipt for, guarantee of, or warrant or right to subscribe to or purchase, any of the foregoing*”.

² The Howey Test originates from the SEC v. W. J. Howey Co. case (1946) and is a test to determine whether a transaction can be classified as an “investment contract” or not. An “investment contract” is a transaction which has four elements: i) an investment of money; ii) in a common enterprise; iii) with the expectation of profits; iv) derived from the efforts of others.

³ Fractional NFT is a fully-fledged NFT that has been divided into smaller parts, allowing multiple different people to verify ownership rights to a portion of the same NFT. The NFT is fractionalized by using a smart contract to create a large number of tokens linked to the indivisible original. These token parts provide each owner a percentage of ownership rights to the NFT and can be bought, sold, or traded on secondary markets.

⁴ The bill was introduced to the US Congress in July 2021

⁵ Section 101, Draft of the Digital Asset Market Structure and Investor Protection Act

See more: <<https://www.congress.gov/bill/117th-congress/house-bill/4741/text>>

⁶ Section 101, Draft of the Digital Asset Market Structure and Investor Protection Act

⁷ See more: <<https://www.irs.gov/vi/businesses/small-businesses-self-employed/digital-assets>>

(but are not limited to): virtual currency, convertible cryptocurrency, stablecoin¹, and NFT.

Thus, with the current legal mechanism of the United States, depending on each specific case, NFTs can be defined as different types of assets. Even if the NFT is classified as a commodity and subject to commodity law, other classifications are not excluded. For example, NFTs can be classified as both commodity and security and are subject to securities laws.

4.1.2. Australia

According to ATO - Australian Taxation Office, NFT is a type of crypto asset. And also according to the definition of this agency, crypto assets are a digital representation of value that you can transfer, store, or trade electronically. Crypto assets are a subset of digital assets that use cryptography to protect digital data and distributed ledger technology to record transactions.² They may run on their own blockchain or use an existing platform such as Ethereum. And blockchain – the main technology to create NFT is a form of secure digital ledger used to store a record of crypto transactions. While NFT is different from other cryptocurrencies or tokens in its non-interchangeability, NFT is considered a different kind of crypto asset, so it has the characteristics of these assets. It generally operates independently of a central bank, authority, or government. As is the general trend in the world, Australia claimed that crypto assets are not a form of money³, the country instead treats crypto assets as an asset class and recognizes the legitimacy of the transactions involved.

In addition, Australia's tax rules for NFT can be relied on to see how the government recognizes the legality of the NFT. In this way, NFT can be in the form of (1) CGT (capital gain tax) assets or (2) personal use assets. In some cases, NFT may also be considered a trading stock of a company if the company holds and uses NFT in carrying on NFT business (including NFT trading, NFT mining).⁴

It can be concluded that Australia is one of the countries that has recognized the legality of NFT when considering this technology product as an asset, specifically a crypto asset that has been regulated in the legal system of this country.

4.2. The legal nature of NFT under the present Vietnamese legal framework

Based on studying the experiences of countries, within the scope of this section, the authors provide analysis and comment on practical legal norms to answer the following theoretical issue: “The legal nature of NFT under Vietnamese Civil Law”, thereby giving out a number of recommendations establishing the relevant legal framework.

(i) As property under the Civil Law

Pursuant to the Article 115 of the Civil Code 2015 regulated property rights is a right which can be evaluable in a sum of money. Common property rights in Vietnam are land use rights⁵, intellectual

¹ Stablecoins are cryptocurrencies developed on Blockchain. They have a mechanism to ensure the value is always in a stable state by pegged or tied their value to another currency, commodity, or financial instrument

² “What are crypto assets?” (19/8/2022), Australian Taxation Office. <<https://www.ato.gov.au/individuals/Investments-and-assets/crypto-asset-investments/what-are-crypto-assets/>>

³ *Ibid.*

⁴ “Non-fungible tokens”. (07/11/2022). Australian Taxation Office. <<https://www.ato.gov.au/Individuals/Investments-and-assets/Crypto-asset-investments/Transactions---acquiring-and-disposing-of-crypto-assets/Non-fungible-tokens/>>

⁵ Land use right is a property right given to people by the State through the form of land allocation or land lease because pursuant to the 2013 Constitution and the Law on Land 2013, amended and supplemented in 2018 regulated that the land is owned by the entire people. The Land Law 2013 also recognizes land use rights for stable land users and stipulates general rights and obligations of land users.

property rights¹, and other property rights such as the right to claim for payment of a debt²,... Property rights associated with personal identity are not transferable such as inheritance rights, alimony rights, and the right to claim compensation for health damage.

Drawing on the attributes of NFTs outlined in section 1, it can be seen that (i) NFT is a certificate of ownership; (ii) is a property that has non-physical assets; by NFT formed from tokens; (iii) evaluable in a sum of money and (iv) is transferable in a civil transaction. Moreover, NFT is a product of human creativity and is used to serve the needs of the subjects involved in the transaction.

Conclusion: The NFT can be considered as a form of property right recognized in the Civil Code of Vietnam in 2015, as it shares similarities with the terms mentioned in the provisions on property rights.

(ii) As property right under Law on Intellectual Property

According to the provisions of Article 4.2 of the Intellectual Property Law 2005, amended and supplemented in 2009, 2019 and 2022, copyright means rights of organizations and individuals to works they have created or own. Pursuant to Article 18 of this Law, copyright includes property rights and moral rights. Property rights include the right to make derivative works, the right to public performance, the right to distribute, etc.

Contrary to the practice of NFT-for-IP trading in the market, from the original work, the author can create and trade NFTs with the aim of transferring all or certain rights to one or more other entities. This will have two legal consequences for the buyer of the NFT: either they have only certain rights in the author's property, or they have full copyright over the NFT. Accordingly, in practice, NFT transactions to transfer part of the rights to the original work are more common. For example, Mintable, Hub Life or Foundation platforms have specific provisions in their smart contracts. They allow the buyer to have only a few rights such as the right to display and identify the subject to be accessed. It can be seen that this activity corresponds to the author's property rights transfer activities according to intellectual property law. Therefore, NFT can be considered as a property right in copyright under intellectual property law, which is essentially a special form of property right in Civil Law.

(iii) As a good under Commercial Law

In Marxist-Leninist political economy, in a narrow sense, a commodity is a substance that exists in a definite shape in space and can be exchanged, bought, and sold. In a broad sense, a commodity is anything that can be exchanged, bought, or sold, including immaterial states.

According to the 2012 Price Law, goods are assets that can be exchanged, bought, and sold on the market and are capable of satisfying human needs, including movables and real estate.

Article 3.2 of the Commercial Law 2005 defines goods as including all types of movable property, including movable property formed in the future and things attached to the land. And according to Article 107 of the Civil Code 2015, real estate includes land; houses and construction works attached to land; other properties attached to land, houses, and construction works; other property as prescribed by law; and movable property, which is the property that is not immovable.

Based on the aforementioned legal definitions, the research team concludes that the principle of determining circulating goods in legal relationships must be recognized as a form of property. As analyzed in section (i), NFT is sufficient to be considered as a type of property rights in the Vietnam Civil Code in 2015. Therefore, in this case, NFTs (excluding securities or payment instruments) can be considered a commodity.

Conclusion: If considering the definition of the term goods based on the regulations of the current Vietnamese law in a broad sense, in the case of NFTs (which are not securities or payment instruments) when entering into a transaction that is considered a commodity.

¹ See Article 4 of The Law on Intellectual Property 2005, amended and supplemented in 2009, 2019 and 2022

² See Article 450 of the Civil Code 2015

(iv) As securities under the Law on Securities

To be considered a security, an NFT must first be an asset and fall into one of the classes of securities listed in Article 4.1 of the Law on Securities 2019. In essence, an NFT does not belong to any type of securities, including shares, bonds, fund certificates, warrants, secured warrants, pull options, depository receipts, and derivatives.

However, in terms of characteristics, securities can be considered a legal instrument to recognize legitimate rights and interests between investors and issuers. In addition, securities also have the characteristics of circulation, high liquidity, and risk. Compare the above characteristics with the nature of NFT, it can be seen that, (i) NFT is essentially a certificate of ownership of the parties involved in NFT-related transactions; (ii) NFT can be circulated, i.e., NFT can participate in transactions of buying, selling, giving; (iii) NFTs can be exchanged for money through NFT-for-Eth transactions (and vice versa); (iv) NFT is high-risk. Thus, it can be seen that, if the analysis is based on characteristics, the NFT meets the conditions to be considered a type of “security”.

Conclusion: In fact, current Vietnamese law does not have regulations to recognize NFTs as securities. Therefore, the application of securities law to the NFT is not suitable.

(iv) As means of payment under the Law on Banking

According to the current legal regulations, NFTs are not prohibited from being exchanged, donated, ... and are only banned when they are circulated and traded as a means of payment (it is forbidden to treat NFT as fiat money). Pursuant to Article 4.6 of Decree 101/2012/ND-CP as amended and supplemented by Decree 80/2016/ND-CP Non-cash payments (abbreviated as “Decree 101/2012/ND-CP”) include: Cheques, payment orders, collection orders, bank cards and other payment instruments as prescribed by the State Bank (such as e-wallet services¹).

Article 4.7 of Decree 101/2012/ND-CP stipulates: “Illegal payment instruments are payment instruments not included in Clause 6 of this Article.” This means that the legal means of payment under Vietnamese law must be in the cases listed in Article 6 of Decree 101/2012/ND-CP.

Conclusion: In essence, NFT is a crypto asset, completely different from “virtual money”. Therefore, transactions related to NFT (in cases where NFT is not considered a means of payment) are not contrary to the provisions of current Vietnamese law.

SUMMARY: Based on the above legal grounds and arguments, the research team believes that, according to the provisions of the current Vietnamese legal system, NFT can satisfy the conditions to become:

- (i) Property rights
- (ii) Goods

5. PROPOSING DIRECTIONS FOR ESTABLISHING THE LEGAL FRAMEWORK TO RECOGNIZE NFTS AS PROPERTY UNDER VIETNAMESE LAW

5.1. The legal basis for the recognition of NFT as a property right under the current Vietnamese civil law

As mentioned, in the current Vietnamese law, the NFT may qualify to be regulated in certain areas. However, in order to be universal, the authors will focus on analyzing and evaluating the legal nature of

¹ According to Clause 8 Article 4 of Decree No. 101/2012/ND-CP “*Digital wallet service is the practice that a provider of payment intermediary services provides a customer with an nominal electric account on an information carrier (such as electronic chip, mobile phone sim, computer, etc.) that enables the customer to store a sum of money in the form of deposit equivalent to the sum of money transferred from the customer’s payment account at a bank to a secured payment account of the provider of digital wallet service with the ratio of 1:1.*” Money on an e-wallet is actually a cryptocurrency (not a digital asset, cryptocurrency or virtual currency) and can be used for payments.

NFT from the perspective of civil law, thereby giving out a number of recommendations establishing the relevant legal framework.

NFTs can be linked to many different types of assets and represent many rights and obligations, which makes them difficult to classify. However, the authors propose to consider the NFT as:

- (1) A type of property, namely a property right; or wider
- (2) Digital assets on a technology platform (Blockchain);
- (3) They are not used as a means of payment as legal money; and
- (4) Do not consider them virtual assets or virtual currency in online games.

For the following reasons:

Accordingly, NFT has fully satisfied the conditions to be listed in the group of “*other property rights*” under Vietnamese civil law. Specifically:

Firstly, Article 115 of the Civil Code 2015 does not clearly define property rights that can be considered the subject matter of a civil transaction or provide specific criteria.¹

As such, there are two issues that need to be clarified here:

- (1) Can all property rights become the subject of civil transactions?
- (2) Only the specific property rights specified in the Civil Code 2015 or in the guiding documents can be the subject of civil transactions?

It can be seen that, up to now, there is no clarity in the regulation of property rights as objects in civil transactions. And as a rule, subjects of civil law can do whatever the law does not prohibit. Accordingly, transactions related to NFT may meet the conditions to be performed in practice under current Vietnamese law, which means that NFT can be considered a property right subject to civil transactions.

Secondly, Considering the definition of property rights according to the 2015 Civil Code and assessing the recognized property rights (intellectual property rights, land use rights, etc.), property rights have two specific characteristics:

- (i) Intangibility
- (ii) Evaluable in a sum of money

Accordingly, the authors clearly analyze the legal nature of NFT through the above two criteria. Specifically:

For the criterion “intangibility”

In the Deluxe Black’s Law Dictionary, the property is interpreted as a word commonly used to refer to anything that is the subject of the title, tangible or intangible, or movable or immovable. Thus, from a jurisprudence point of view, the concept of property is seen in relation to ownership and is considered under diverse aspects such as tangible property, intangible property, movable and immovable.²

In the Vietnamese legal system, the concept of intangibles appeared along with the birth and development of company valuation theories.³ Pursuant to Article 2.2 of Circular No. 203/2009/TT-BTC

¹ Nguyen Hoang Long (2018), “*Property rights according to the 2015 Civil Code*”, *Electronic People’s Court Journal*. <<https://tapchitoaan.vn/quyen-tai-san-theo-quy-dinh-cua-bo-luat-dan-su-nam-2015>>

² Vu Thi Hong Yen (2015), “*The concept of property in the civil law and the proposal to amend the Civil Code 2005*”, *Journal of Legislative Studies*, 21(301). <http://laphap.vn/Pages/TinTuc/208513/Khai-niem-tai-san-trong-phap-luat-dan-su-va-kien-nghi-sua-doi-Bo-luat-Dan-su-nam-2005.html?fbclid=IwAR0eHSg34RYFPEwusNaJ_Cu8_Xn3cbs51dTEv9sWRoMXwiSbeXqXRSFVzmo>

³ Nguyen Ngoc Dien, “*Textbook of Law on property, property ownership and inheritance rights*”, page 22.

dated October 20, 2009 of the Ministry of Finance guiding the regime of management, use and depreciation of fixed assets, mention intangible fixed assets¹ and Article 2.1 of this Circular provides for tangible fixed assets².

In the current Vietnamese Civil Code, intangibles are expressed through a number of legal regulations (Article 115 of the Civil Code 2015 on property rights is a typical example of this type of property)³. It can be seen that intangibles have no physical nature, so their existence cannot be perceived thanks to the senses but can only be known through human awareness. In addition, intangibles in civil law are a type of property that is not only present in commercial business transactions but also in daily transactions, which means that intangibles may belong to those owned by an individual or organization.⁴

It can be seen that NFT exists in digital form and depends on the blockchain platform to operate. So NFT has no physical nature, which means in some cases, through human awareness, they can know the existence of NFT. In addition, considering the nature of intangible assets according to Vietnamese civil law, NFTs are also formed and owned by the individual or organization that created them.

So, based on the arguments mentioned, NFT satisfied the criteria of being an intangible asset - a type of intangible asset that is conditional on its existence in a special space, that is cyberspace.

For the criterion “evaluable in a sum of money”

On the basis of studying the regulations of civil law, it can be seen that the criterion “evaluable in a sum of money” is one of the features of legal characteristics when referring to the term “property”. Property is evaluable in terms of a sum of money, which is understood as property that has value and brings certain benefits to people.

Based on the criterion of “evaluable in a sum of money”, compared with NFT, the authors have the following two issues:

(i) In essence, an NFT is a unique, indivisible, and irreplaceable token, established and stored on the blockchain platform through a smart contract. As a result, NFT is a special token with unique economic value for its holders.

(ii) Property rights are a right that can be valuable in terms of money. According to the authors, to determine this, it can be based on two methods: the legal method or the agreement method.⁵

For the legal method, legislators give owners the right to enjoy material benefits from allowing others to exploit all or part of the rights in their property when participating in civil transactions whose transaction object is property rights. Thus, in the form of legalization, property rights have been clearly shown to be worth a sum of money.

¹ Intangible fixed assets are assets that have no physical form, represent an amount of invested value that meets the criteria of intangible fixed assets, and participate in many business cycles, such as: some costs directly related to the land used; costs of distribution rights, patents, copyrights, etc.

² Tangible fixed assets are the main labor materials with a physical form satisfying the standards of tangible fixed assets, participating in many business cycles while still keeping the original physical form such as buildings, structures, machinery, equipment, means of transport, etc.

³ Nguyen Hoang Long (2018), *ibid*.

⁴ For example Transferring land use rights between individuals, transactions related to the granting of intellectual property rights of authors to artworks,...

⁵ Nhung, N. T. H., & Hanh, N. T. M. (2019), “Overview on the legal position of cryptocurrency (Bitcoin) in some countries in the world - Orientation to build a legal framework for cryptocurrency in Vietnam”, *VNUHCM Journal of Economics, Business and Law*, 3(2), 119-125. <<https://doi.org/https://doi.org/10.32508/stdjelm.v3i2.549>>

As for the method of agreement, if the law has not yet specifically adjusted an intangible transaction object and this transaction does not violate the basic principles in Article 3 of the Civil Code 2015. If the parties to the transaction have agreed to exchange that intangible object by paying a corresponding amount, that transaction object can also be considered a kind of property right. As a result, the evaluable in a sum of money factor, in this case, is conventionally based on consensus among the parties involved. That means, the NFT is transferable in a civil transaction by agreement.

For example, by classifying NFTs according to the manifestation of the type of asset that the NFT represents, the NFT can be attached to the asset through a specific URL on the blockchain platform to perform the above function. At the same time, for each NFT that has been created on the platform, the holder of the NFT can exploit the platform to perform NFT transactions with the NFT itself (hereinafter referred to as “a”) with derivative NFT versions of “a” (could be a1, a2, a3,... depending on the terms of agreement for transactions between the owner of the NFT and another participating entity participating in NFT transactions). When a transaction arises between the owner of the NFT and another entity in need, it will clearly show the economic value.

Thus, with the two characteristics of intangibility and being evaluable in a sum of money, NFT fully satisfies the condition of a type of property (property rights) under Vietnamese law.

Thirdly, the nature of transactions involving NFT

As can be seen, the essence of NFT transactions¹ is that the holder of the NFT gives one or all sets of rights related to the NFT to other transaction parties and receives a corresponding benefit from them. Specifically, when buying NFT from the owner (understood as the creator of the NFT), they have ownership in the sense that it becomes their property, but they may not be able to own all of the property rights to the NFT. Because they have only those rights based on the share of rights conferred by the creator of the NFT. As a result, the NFT is a digital certificate of ownership representing the purchase of crypto assets.

Conclusion, from the analysis above, the authors conclude that they propose to consider NFT as a property right under the current Civil Code.

5.2. Mechanism to establish a legal framework to recognize NFTs as property under Vietnamese law

It can be confirmed that crypto assets are a product of modern technology, and in the current trend of existence and development, adapting and harmonizing crypto assets in the process of economic globalization is necessary. Before this fact, the study assimilated the opinions of experts and experiences in the world of issues related to crypto assets to have a more comprehensive and open view of the trend development of the global economy - finance, thereby improving the efficiency of state management in the field of science and technology. Therefore, it is necessary to set objective requirements to establish a legal framework to recognize NFTs as property under Vietnamese law.

As mentioned, the values of building a legal framework related to crypto assets of the United States, Australia, China, and Singapore are a good reference source for the process of forming the regulation of crypto assets-related institutions in the future of the Vietnamese legal system. However, each country in the world always has some specific characteristics, so the process of building and perfecting the legal framework for crypto assets in Vietnam needs to be carried out in specific stages under study, selection, and suitability for the Vietnamese market. For the above reasons, the authors propose some recommendations to establish a legal framework for recognizing NFTs as property under Vietnamese civil law, as follows:

Recommendation 1: Identification of the true nature of “new” asset classes to come up with appropriate terminology.

¹ NFT transactions include NFT-for-NFT, NFT-for-IP, and Eth-for-NFT (or vice versa).

Digital assets, non-physical assets, and crypto assets are terms that are easy to confuse for those who do not have in-depth knowledge in the field of science and technology. Up until now, mass media sites have been introducing concepts and using these terms mechanically, not in accordance with the nature of each type of above assets. This brings risks to investors when entering the market, as well as creating difficulties in accessing and managing transactions arising in fact. Therefore, the study of the nature and identification of each type of asset above will contribute to the convenience of management as well as making appropriate legal regulations.

Recommendation 2: Recognize NFT as an asset according to Vietnamese civil law and in sync with relevant legal provisions.

Through the process of studying the approaches of countries (the United States, Australia, China, and Singapore), it can be seen that countries have different reactions to the strong development of the NFT market. Specifically, most countries in the world are gradually accepting the existence of NFT and, based on each transaction of NFT, issuing guiding documents to adjust experimental legal frameworks for the appropriate application.

For Vietnam, on the basis of global development and integration, the reconciliation, adaptation, and gradual acceptance of NFTs and NFT-related transactions have been clearly demonstrated through the viewpoints and policies. of the state in recent times.

After the process of research, consultation from experts, and learning from experiences from many other countries around the world to clearly define the nature of crypto assets (namely NFT), Vietnamese law should proceed to recognize NFT as an asset according to Vietnamese civil law and in sync with relevant legal provisions. Accordingly, NFT fully meets the conditions to be considered property, namely property rights. This property right belongs to the group of movables because it is not attached to any real estate as prescribed in Article 107 of the Civil Code 2015. And this property right can be completely traded as a commodity under Article 3.2 of the Commercial Law 2005.

However, the recognition of the legal nature of the NFT as a property right should only be considered as an immediate solution. Based on the research results, the authors found that the laws of the United States¹ and Australia² recognize the legality of NFT as a type of digital asset. Accordingly, a digital asset is in the form of a token generated from distributed ledger technology (DLT), which asserts one or more rights of the owner to the digital asset on the blockchain system or to the issuer. Digital assets include crypto assets and other non-physical assets. Therefore, in the long term, the authors recommend building a definition of digital assets in specialized legal documents to ensure synchronization, and stability and possibly improve the predictability of regulations and laws in accordance with international standards.

6. CONCLUSION

NFT is a new type of crypto-asset with unique characteristics, so when it is the object of transactions, there are many urgent legal problems. From the theoretical and practical issues as well as the legal experience of countries, the following conclusions can be drawn:

¹ According to the IRS guidance on Digital Assets in the 2019 FAQ (last updated in March 2021), the IRS has officially affirmed that digital assets are defined that: “*Digital assets are broadly defined as any digital representation of value which is recorded on a cryptographically secure distributed ledger or any similar technology as specified by the Secretary.*” Digital assets are considered as one of the general asset classes, which include (but are not limited to): virtual currency, convertible cryptocurrency, stablecoin, NFT.

² According to ATO - Australian Taxation Office, NFT is a type of crypto assets. And also according to the definition of this agency, crypto assets are a digital representation of value that you can transfer, store, or trade electronically. crypto assets are a subset of digital assets that use cryptography to protect digital data and distributed ledger technology to record transactions.

1. NFT should be recognized in a specific way and true to its nature so that it can be adjusted appropriately by the laws of countries including Vietnam.

2. Currently, countries around the world still have different reactions to the recognition of the legality of the NFT. In which, the countries that have recognized the NFT all recognize it as a type of crypto-asset or digital asset as well as record its transaction and exchange as bartering activities.

3. It is recommended that Vietnamese law consider NFT as an asset class, namely property rights, so that it can become the subject of commodity transactions.

4. The legal recognition of NFT is closely related to the recognition of the legality of other types of crypto-assets, typically cryptocurrencies. The recognition of digital assets will become the basis for the recognition of NFTs as well as other types of crypto assets such as (bitcoin, ethereum, ...)

Although the current NFT market is still young and difficult to access for the entire society, NFT transactions have had some really explosive periods and posed many notable legal problems. And this can also be considered an opportunity to introduce legal frameworks that can cover new types of assets in the digital age and catch up with world market trends.

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OPTIMAL PUBLIC DEBT THRESHOLD. EMPIRICAL RESEARCH IN SOME ASEAN COUNTRIES AND POLICY IMPLICATIONS FOR VIETNAM

Author: Nguyen Thi Xuan¹, Tran Tien Bang², Dang Linh Nga², Trinh Anh Trung²

Mentor: Nguyen Thi Lan²

ABSTRACT: *Based on the theory of Laffer curve, the study establishes the general optimal public debt threshold for certain Southeast Asian nations including Vietnam. The study simultaneously uses both threshold regression and OLS regression model with the data collected from 8 countries in ASEAN region from the start of 2001 until the end of 2021. The results show that there is a non-linear relationship between public debt and economic growth with the optimal public debt threshold for some ASEAN countries is roughly 54%. In light of these findings, the authors propose several policy recommendations for the Government of Vietnam to build the debt ceiling, as well as facilitates the country's long-term socioeconomic development objectives.*

Keywords: *Public debt; Optimal public debt threshold; Southeast Asia*

1. INTRODUCTION

Public debt plays an important role for each country in promoting economic potential, developing infrastructure, and maintaining societal security. Public debt can, however, solely put pressure on monetary and sustainable fiscal policy if it is not used properly. (Kumar & Woo, 2010).

Economic of ASEAN countries has witnessed drastic and vigorous development in recent years, which is a bright spot in economic recovery and development. However, due to COVID-19 outbreak, huge expenditures on policies meant to support economic recovery have led to a state budget deficit and a sharp increase in public debt of countries in this region (OECD, 2022). Additionally, a rising trend in global interest rates has been pushing borrowing costs up, while a stronger US dollar exchange rate increases external debt pressure (EIU, 2022).

This raised an inquiry of whether the current public debt ceiling of Vietnam (at 60% of GDP) and other Southeast Asian nations actually reasonable and at a safe level. What adjustments should the Vietnamese government and other countries in the region make on the public debt ceiling and management when evidently in this volatile regional and global macroeconomic situation, it is crucial to establish an appropriate public debt threshold for Vietnam in particular and Southeast Asian countries in general. In order to find the answers to the concerns raised above, the authors conducted the study: “Optimal public debt threshold. Empirical research in some ASEAN countries and policy implications for Vietnam”.

2. THEORETICAL FRAMEWORK

2.1. Literature review

Related to the assessment of optimal public debt threshold, there have been numerous studies carried out, such as:

To evaluate the threshold effect and determine the ideal value of Vietnam's public debt threshold and to analyze the nonlinear link between public debt and economic growth in Vietnam, Su Dinh Thanh (2012) employed Hansen's threshold model from 2000 (the OLS estimation method). The result shows that

¹ Foreign Trade University; Email: k60.2114310114@ftu.edu.vn

² Foreign Trade University

Vietnam's public debt threshold is set at 75.8%. Thereby, the article has proposed some policy suggestions for making public debt policy. It further suggested that public debt levels should be kept below the threshold to prevent unexpected fluctuations.

Dao Van Hung (2016) used the threshold parameter regression method to determine the public debt ceiling and the public debt threshold in the period from 2016 to 2020 to ensure public debt in Vietnam. He found out that when the public debt-to-GDP ratio is less than or equal to 68%, public debt positively impacts economic growth and the sustainability of fiscal policy. Conversely, if this ratio is greater than 68%, public debt can have negative effects such as reducing the motivation for investment and development, inhibiting economic development, reducing debt repayment capacity and the level of public debt safety. The author then proposed that the optimal public debt threshold for the period 2014-2020 of Vietnam was about 68-70% of GDP, and about 63-77% of GDP if including the margin of error of 10%.

Vu Xuan Thuy and Nguyen Thi Trang (2010) used linear model regression (OLS) analysis to assess the impact of public debt on Vietnam's economic growth in the period 1999-2018. The outcome revealed that public debt variables: import-export, government spending had a negative and significant impact on economic growth. Meanwhile, investment variables and trade openness had a positive impact on annual GDP growth. In addition, factors such as public investment, import and export all had an impact on stimulating the economic growth in Vietnam. The analysis also discovered that raising government spending within the bounds of what the budget could support without increasing the level of public debt would boost economic growth.

Vo Thanh Hoa (2017) investigated the impact of public debt on economic growth in a sample of 8 ASEAN countries (excluding Myanmar and Brunei) and four Asian countries having strategic partnerships with ASEAN (including Japan, South Korea, China and India). According to the study, the growth of per capita GDP and state debt are inversely related. Specifically, as the government in the country borrowed more debt, the GDP per capita growth decreased. The countries in the sample were developing countries. Public investment mainly came from debt and the inefficient use of investment capital, all of which would lead to more difficult debt repayment. Inefficient use of capital would also adversely affect economic growth. Moreover, if the savings rate was higher, private capital and businesses would reduce investment in the economy, which would reduce the per capita GDP growth rate.

Empirical studies of Cristina Checherita and Philipp Rother (2010) in 12 eurozone nations had shown the average impact of government debt on per-capita GDP over a period of about 40 years, since 1970. The authors showed that there was a non-linear effect of debt on growth with a turning point (about 90 –100% of GDP) - beyond which the government debt-to-GDP ratio had an adverse effect on growth in the long run. The confidence interval for the debt turning point suggested that the consequences of excessive debt on growth might have already started at around 70-80% of GDP. From a policy perspective, the study also provided additional arguments for the debt reduction process to enhance prospects for long-term economic growth.

The team of Luiz Renato Lima, Wagner Piazza Gaglianone, and Raquel M.B. Sampaio (2008) employed a quantile autoregression model (VAR) to investigate the fiscal sustainability and public debt of Brazil. The team proposed a novel methodology to separate nonstationary periods from stationary ones, in order to identify different public debt trajectories compatible with fiscal sustainability. They used this trajectory to create a public debt ceiling, or the highest amount of public debt that would not endanger long-term fiscal viability. The researchers used data on Brazil's governmental debt to illustrate how the debt ceiling measurement may be applied.

The research of Noraznin Abu Bakar and Sallahuddin Hassan (2011), analyzed the impact of external debts on economic growth in Malaysia, using the data on the country's public debt situation. The analysis was conducted both at aggregate and disaggregate levels. Based on VAR estimations, the experimental findings examined the effects of GDP, external debt, capital accumulation, labor force, and human capital.

The estimated findings at the aggregate level indicated that total external debt had a positive impact on economic growth. Specifically, a 1% increase in total external debt would generate 1.29% of long-term economic growth. The study also revealed that Malaysia did not have an excessive debt burden that would have a negative impact on economic growth in the long run.

The research team including Mehmet Caner, Thomas Grennes and Fritzi Koehler-Geib (2010) pointed out the concern that the increase in public debt could cause negative effects on economic growth. If this threshold was exceeded, was there a point at which the burden of public debt became severe? The study used the threshold regression model following the approach of Hansen (1996, 2000). The authors also used pooled least squares regression to relate their findings to those of Reinhart and Rogoff (2010). The results of this analysis provided a foundation for the debt growth relationship by examining the existence of a threshold and estimating the threshold value while controlling for other important factors: variables affecting growth. The key findings were that the threshold level of the average long-term public debt to GDP ratio was 77% for the full sample and 64% for the developing country subsample. Exceeding the thresholds could be costly for countries, which should forgo GDP growth if debt exceeds the threshold for a long time.

2.2. Theoretical basis

2.2.1. Public debt

According to the International Monetary Fund (IMF) and the World Bank (WB), public debt is the entire debt repayment obligation of the public sector. In addition to government debt from central to local levels, public institutions such as the Central Bank, state depositors, financial and non-financial institutions (according to the IMF) are considered as constituting the total public debt of a country (IMF&WB, 2011).

In Vietnam, according to the provisions of Clause 2, Article 1 of the current Law on Public Debt Management (No. 20/2017/QH14), public debts include: (i) debts to the government arising from domestic and foreign loans, which are signed and issued in the name of the State, in the name of the Government; (ii) debts guaranteed by the Government are debts borrowed by enterprises and policy banks of the State guaranteed by the Government; and (iii) local government debts are debts incurred by provincial People's Committees.

It can be seen that Vietnam's view of public debt has a notable difference in determining the scope of public debt. According to the IMF and WB, public debt is the debt of the public sector, including the debt of the central bank to implement the monetary policy and the debt of the State-owned enterprise, while the public debt of Vietnam does not include the debt of the State Bank of Vietnam and the debt of the State-owned enterprise; thereby leading to differences in the calculation of public debt of Vietnam compared to the IMF and the WB.

2.2.2. Optimal public debt threshold

There are several different analyses and definitions of the conception: optimal public debt threshold. The hypotheses, generally, show an intimate relationship between the optimal public debt-to-GDP ratio and the economic incentives and social benefits. A debt-to-GDP threshold is optimal if economic development and social security achieve maximum efficiency without negatively affecting private investment or increasing the level of government credit risk or increasing total development costs (Alfaro & Kanczuk, 2018). Some other studies suggested that the optimal public debt threshold index will be determined through the point at which marginal profit equals marginal cost. In other words, a country's social security level is maximized (Rochet, 2011). It can be said that the "optimal public debt threshold" is an important indicator to manage and control public debt at the optimal level of the economy and a reference basis for calculating the national debt ceiling.

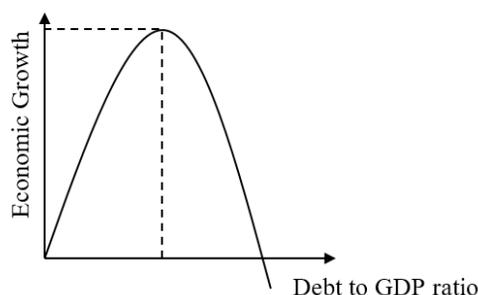
2.3. Analytical framework

The results of previous studies can be divided into 3 viewpoints on the impact of public debt on the economic development of a country: positive impact, negative impact and nonlinear impact, together with the existence of an optimal public debt threshold. These aforementioned effects are reasonably explained by the Laffer curve theory of debt.

Public debt has a positive impact on economic growth, helping to increase national economic resources, promoting infrastructure development, and labor productivity (Dar & Amirkhakhali, 2014). Public debt helps the Government mobilize capital both domestically and abroad, optimally utilize people's idle funds (Levin, 1970), and at the same time take advantage of support sources from financial institutions around the world. With regard of developing countries, where the private sector is not sufficiently large, the state economy plays the most important role. And in order to achieve rapid economic growth, the Government often applies an expansionary fiscal policy, increasing government spending, and lowering taxes. Tax cuts are offset by public debt, which stimulates aggregate demand, increases production, and fosters economic growth (Levin, 1970).

In the long term, the expansionary fiscal policy will increase the public debt burden; therefore, the Government will be forced to make new loans to pay the old debts. In the long run, total debt far exceeds budget revenues, leading to fiscal imbalances and the risk of government insolvency (Checherita & Rother, 2010). On the one hand, when the Government covers the budget deficit with domestic loans by issuing Government bonds; thus, it results in increasing the demand for credit, pushing up interest rates, and decreasing the investment demand of the economy, which causes the Crowding Out Effect (Kenton, 2023). On the other side, when the Government covers the budget deficit with foreign loans, it will affect the exchange rate. The government balancing foreign currency sources to repay the loan increases the demand for foreign currency; the domestic currency will depreciate, and import costs will increase. The high exchange rate also makes debt repayment costs higher, further reducing solvency, and increasing the State's risk of default (Ormaechea, 2020). Furthermore, the government borrowing money to finance budget expenditure increases the money supply in the economy, and this inevitably leads to inflation (Grigoli & Sandri, 2023).

The nonlinear relationship between public debt and economic growth supports the hypothesis: there exists an optimal public debt threshold, at which, the economy achieves maximum growth. This is further explained by the “debt overhang” theory (Krugman, 1988) or the debt Laffer curve. Built on the original Laffer curve of Arthur Betz Laffer (1974), the debt Laffer curve illustrates the relationship between economic growth and public debt. At low debt levels, economic growth grows in the same direction as debt levels. However, when a certain value is reached, when economic growth reaches the most optimal value, at this point debt begins to negatively affect growth and is called “critical value” (Caner, Grennes, & Koehler-Geib, 2010). After the critical value, the higher the debt level, the greater the pressure on the economy.



Picture 1: The debt Laffer curve

Source: Worthwhile Canada Initiative (2017)

Pham et al. (2016) determined the external debt threshold of Southeast Asian countries and Vietnam based on the application of the Laffer curve. Using the OLS estimation method with quadratic regression, the study arrived at the conclusion that the external debt threshold of 10 countries in ASEAN region in the period 2004 - 2016 is at 70.42%. The study also showed that there is a nonlinear relationship between the borrowing of countries and regional economic development, consistent with the interpretation of the Laffer curve. The study of Caner, Grennes, & Koehler-Geib (2010) also estimated the public debt threshold of 101 countries, but with Hansen’s (2000) approach using a threshold regression model. The study also proved the existence of a “threshold” point of public debt and the non-linear impact of public debt on economic development.

The research team will apply Laffer curve theory as a basis, and use previous research findings to establish the optimal public debt threshold for certain Southeast Asian countries.

3. RESEARCH DATA AND METHODS

3.1. Research Data

The study collects data from officially published and highly reliable information sources such as the World Bank (WB), International Monetary Fund (IMF data), CEIC data, Bulletin Public Debt of the Ministry of Finance of Vietnam, and others. Besides, the authors have eliminated countries and time periods with insufficient and inconsistent data in order to bring high accuracy of the study data used in the model.

The research data used is time-series data. The initial data sample collected was in the form of balanced panel data. However, the research team has averaged the values of the observations in an attempt to bring the data sample to the time-series form, which allows to use the threshold regression model and to show the trend and periodicity of public debt during the study period. The results of the data collection process include 84 observations and 6 variables: real GDP growth rate, debt-to-GDP ratio, economy’s openness, investment/GDP index, inflation rate and debt service coverage ratio.

3.2. Methodology

3.2.1. OLS regression model

Having collected a set of time-series data, this research utilizes quadratic OLS regression and its derivative in a bid to estimate an optimal public debt threshold for countries in Southeast Asian. In specific, the model illustrates the relationship between real economic growth of Southeast Asian countries and their public debt as well as other factors is as follow:

$$rGDP_t = \beta_0 + \beta_1 DEBT + \beta_2 DEBT^2 + \beta_3 \ln TRADE + \beta_4 \ln INVT + \beta_5 \ln INF + \beta_6 \ln DSCR + u_t \quad (1)$$

where, the symbol t stands for the survey period, from the first quarter of 2001 to the fourth of 2021. Besides, rGDP is the dependent variable presenting the average of real GDP growth rate of Southeast Asian countries over t. Independent variables in this research include: DEBT, lnTRADE, lnINV, lnINF and lnDSCR. In which, DEBT presents the average public debt to GDP ratios of the countries during the study period, lnTRADE represents the average openness and ln INV represents the average value of the investment rate to GDP of countries over the period. Additionally, lnINF represents the level of inflation of the region while lnDSCR shows the debt repayment capacity of the countries.

Table 1: Description of variables in the model

Variable	Symbol	Measurement	Expected sign	References
Dependent Variable	rGDP	Average real GDP growth rate	+	Pham, Hoang, Tran, & Van (2016); Caner, Grennes, & Koehler-Geib (2010); Omosho, Bawa, & Doguwa (2016); Dar & Amirhakhali (2014)

Independent Variable	DEBT	Average public debt to GDP ratio	+	Wright & Grenade (2013); Dao (2016); Caner, Grennes, & Koehler-Geib (2010)
	$DEBT^2$	Average public debt to GDP ratio squared	-	
	lnTRADE	Natural logarithm of average openness of the economy	+	Caner, Grennes, & Koehler-Geib (2010), Wright & Grenade (2013), Dao (2016)
	lnINVT	Natural logarithm of average investment rate to GDP	+	Dar & Amirkhakhali (2014); Pham et al. (2016); Hoang & Duong (2018)
	lnINF	Natural logarithm of average inflation	+/-	Caner, Grennes, & Koehler-Geib (2010); Hoang & Duong (2018)
	lnDSCR	Natural logarithm of average debt service ratio	-	Wright & Grenade (2013)

Source: Synthesis of the authors

In the aforementioned model, β_0 is the intercept coefficient which plays a role for predicting the regression results. The estimate coefficients representing the relationship of variables: DEBT, lnTRADE, lnINVT, lnINF and lnDSCR in the model, is illustrated as $\beta_1, \beta_3, \beta_4, \beta_5, \beta_6$ respectively while the coefficient β_2 of the quadratic variable $DEBT^2$ represents the nonlinear relationship between public debt and economic development. u_t in the model stands for the remaining factors that affect the dependent variable that have not been mentioned.

In an attempt to calculate the optimal public debt threshold for Southeast Asian countries, the research looks for a tipping point in which the derivative of (1) with respect to DEBT got the value as 0 (rGDP reach its maximum):

$$\frac{drGDP}{dDEBT} = \beta_1 + 2\beta_2 DEBT = 0$$

The result of the above equation, therefore, shows the greatest impact of DEBT variable on rGDP, which is the optimal threshold that the research endeavors to find.

3.2.2. Threshold regression model

Besides using the OLS regression model, the threshold regression model is an alternative estimation method that does wonders for determining the optimal public debt threshold for the Southeast Asian region. Drawing on the approach given by Hansen (2000), Caner et al (2010) and other related studies, the threshold regression model of this study can be written in two cases as follows:

If $DEBT \leq \lambda$, which means the public debt ratio of the region is either smaller or equal the optimal public debt threshold and has the positive impact to the economics ($\beta_{11} > 0$), the model is written as:

$$rGDP_{t1} = \beta_{01} + \beta_{11} DEBT + \beta_{21} \lnTRADE + \beta_{31} \lnINVT + u_{t1} \quad (2)$$

If $\lambda < DEBT$, which means the public debt of Southeast Asian economics is greater than their optimal threshold and it adversely affects the economics ($\beta_{12} < 0$), the model in such cases is:

$$rGDP_{t2} = \beta_{02} + \beta_{12} DEBT + \beta_{22} TRADE + \beta_{32} INVT + u_{t2} \quad (3)$$

According to Caner et al. (2010) approach, (2) and (3) equation can be merged as follow:

$$rGDP_t = \beta_{01}(DEBT \leq \lambda) + \beta_{02}(DEBT > \lambda) + \beta_{11}DEBT(DEBT \leq \lambda) + \beta_{12}DEBT(DEBT > \lambda) + \beta_{21}lnTRADE(DEBT \leq \lambda) + \beta_{22}lnTRADE(DEBT > \lambda) + \beta_{31}lnINVT(DEBT \leq \lambda) + \beta_{32}lnINVT(DEBT > \lambda) + u_{t1} + u_{t2}$$

The role of rGDP, ln TRADE, ln INVT and u_t in this threshold regression model stays unchanged compared to the previous. The symbol λ is used in search of the optimal public debt to GDP threshold and is expected to be equivalent to the threshold estimated from aforementioned OLS regression model. In this model, the variable DEBT not only shows the interaction between debt to GDP ratio and real GDP growth, but also plays a role of threshold variable used to find the optimal threshold. $\beta_{01}, \beta_{11}, \beta_{21}, \beta_{31}$, respectively, is the intercept and estimate coefficient of DEBT, lnTRADE, lnINVT regarding $DEBT \leq \lambda$ and $\beta_{02}, \beta_{12}, \beta_{22}, \beta_{32}$, on the other hand, is the intercept and estimate coefficient of such variables regarding $\lambda < DEBT$. The two values u_{t1} and u_{t2} still act as random errors in the two cases explained above.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The information obtained from the data is described statistically to initially provide the most general analysis, which is shown in the following table.

Table 2: Statistical description of variables

Variables	Number of observations	Mean value	Standard error	Minimum value	Maximum value
rGDP	84	4,924308	2,528319	-6,839	7,845375
DEBT	84	52,95492	5,832868	44,35625	64,9271
lnTRADE	84	4,945971	0,0647933	4,822997	5,090022
lnINVT	84	3,230339	0,0782439	2,990059	3,3301
lnINF	84	1,207063	0,6699799	-1,922438	2,571944
lnDSCR	84	2,548631	0,0703771	2,402431	2,714695

Source: Authors' calculations

The statistical table of 84 observations from eight Southeast Asian countries, namely: Vietnam, Laos, Indonesia, Thailand, Malaysia, Singapore, Cambodia, and the Philippines, provides general information about the mean and standard error of the sample, as well as the minimum and maximum values of each variable from the first quarter of 2001 to the end of 2021.

Despite much socio-economic volatility during this period, especially from the Covid-19 epidemic in 2019–2021, Southeast Asian countries had generally positive economic growth, with real GDP growth averaging at 4.924%. However, the standard error of rGDP reaching 2.528% indicates that there is quite a significant difference in the development level between these countries compared to the mean value of the region. Specifically, that difference can be determined by the minimum and maximum values of rGDP, with values reaching -6.839% (negative growth) and 7.85%, respectively.

The public debt/GDP ratio in the region falls on average to approximately 52.955%, with the highest standard error out of all variables at 5.833%. This figure shows that there is a disparity in the public debt/GDP ratio in the studied countries in ASEAN region. Part of the disparity can be explained by the general world economic situation, such as the 2008 economic crisis or the dependence of economic policy on Covid-19 prevention in each country.

The regional economic openness index, investment/GDP index, and debt serviceability index of eight Southeast Asian countries are factored into logarithmic functions, resulting in the mean values reaching approximately 4.95, 3.23, and 2.55 units, respectively. These figures are all positive with minor standard

error levels (less than 0.08 units), indicating that in each of the values, there is not much difference between these countries. This demonstrates that from 2001 to 2021, they consistently worked to open up the economy, stimulate investment, and actively repay debt. Putting the above indices into logarithmic form also greatly reduced the difference between the least and maximum values.

When examining the inflation index, the mean value of the region reaches 1,207 units after returning to the logarithmic function, the lowest level among the indexes. This index has the highest standard error at roughly 0.67 units when compared to the variables $\ln\text{TRADE}$, $\ln\text{INVT}$, and $\ln\text{DSCR}$, which are all converted to logarithmic form. This figure demonstrates that there is a large disparity in inflation among countries, with average regional inflation ranging from -1.92 to 2.57 units.

4.2. Covariance

Table 3: Covariance matrix

	rGDP	DEBT	lnTRADE	lnINVT	lnINF	lnDSCR
rGDP	1,0000					
DEBT	-0,3062	1,0000				
lnTRADE	0,4623	-0,0935	1,0000			
lnINVT	0,0317	-0,4097	-0,2913	1,0000		
lnINF	0,4814	-0,1290	0,6355	-0,1775	1,0000	
lnDSCR	-0,4318	0,6556	-0,4579	-0,0042	-0,3821	1,0000

Source: Authors' calculations

The real GDP growth rate of Southeast Asian is positively correlated with the openness of the economy and the index of investment and inflation. If the GDP growth rate increases, the openness of the economy and investment index, as well as inflation, will increase depending on the corresponding level. rGDP, representing real GDP growth, is moderately positively correlated with the openness of the economy ($\ln\text{TRADE}$) at 0.4623 and regional inflation ($\ln\text{INF}$) at 0.4814, but it is weakly correlated with the investment index INVT at 0.0317 units. This shows that there is minor interdependence between rGDP and $\ln\text{INVT}$. The correlation coefficient of -0.4318 between rGDP and $\ln\text{DSCR}$, on the other hand, shows that the two variables are negatively correlated with each other.

There is an adverse correlation at various levels between the public debt/GDP index and other variables such as $\ln\text{TRADE}$, $\ln\text{INVT}$, and $\ln\text{INF}$. While the correlation levels of the public debt level with $\ln\text{TRADE}$ integration openness and the $\ln\text{INF}$ inflation index are both very low, the Southeast Asian public debt/GDP index shows a moderately negative correlation, with the variable $\ln\text{INVT}$ representing the region's investment level at -0.4097 units. In the case of rGDP and DEBT, there is a relative negative correlation between real GDP growth and public debt of -0.3062 units.

In conclusion, there is a relative correlation between the variables used in the model, through which it can be seen that the independent variables and controlled variables both have explanatory significance for the dependent variable. In addition, there is no strong correlation between the variables, and a perfect correlation does not occur.

4.3. Estimation results and model testing

4.3.1. Ordinary least-squares (OLS) models

The authors conducted a regression using the Ordinary least-squares approach and a time series dataset to determine the non-linear relationship between the public debt variable and the real GDP growth index.

The authors provide the following table of OLS model results after calculating and correcting model faults with the Newey-West method as follows:

Table 4 : OLS regression result

```
. reg rGDP DEBT DEBTx2 TRADE INVT INF DSCR, vce(robust)
```

Linear regression

Number of obs	=	84
F(6, 77)	=	8.08
Prob > F	=	0.0000
R-squared	=	0.4125
Root MSE	=	2.012

rGDP	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
DEBT	2.747093	1.007985	2.73	0.008	.7399385	4.754247
DEBTx2	-.0255143	.009419	-2.71	0.008	-.0442699	-.0067586
TRADE	8.076932	4.943206	1.63	0.106	-1.766247	17.92011
INVT	.9541743	3.918477	0.24	0.808	-6.848511	8.756859
INF	1.488864	.4310637	3.45	0.001	.6305066	2.347222
DSCR	-5.231796	3.547417	-1.47	0.144	-12.29561	1.832015
_cons	-99.63619	39.50806	-2.52	0.014	-178.3068	-20.96559

Source: Extracted from STATA 17

The estimation results reveal that the model has a coefficient of determination R-squared of 0.4125 across all 84 observations. This means that the model’s independent and controlled variables can explain 41.25% of the variance in the value of the dependent variable, rGDP, as it fluctuates around its sample mean in the data. Other factors, such as the public debt/GDP ratio, the openness of the economy, the investment index, inflation, and the debt serviceability index, influence the region’s real GDP growth rate, as represented by the R-squared number.

The regression results can be rewritten using the results table as follows:

$$rGDP_t = -99,636 + 2,747DEBT - 0,0255DEBT^2 + 8,077TRADE + 0,954INVT + 1,489INF - 5,232DSCR + \hat{u}_t \quad (4)$$

When the p-value coefficient is equal to 0.014, the regression findings demonstrate that the estimate of the intercept $\hat{\beta}_0$ in the model’s result is statistically significant at the 5% level of significance. The coefficient estimate, on the other hand, is negative at -99,636 units. That is, if the region’s public debt/GDP ratio is zero and the region’s countries do not open up, develop, and so on, real GDP growth will be negative at -99.636%.

The model’s $\hat{\beta}_5$ estimation of 1,488 shows that if the region’s inflation rises to 1%, ceteris paribus, the average real GDP growth rate of Southeast Asian will increase to an average of 0.015 units. Contrarily, although the estimated result of the OLS regression model shows a positive relationship between two independent variables TRADE, INVT, and a negative relationship between DSCR and economic growth, the test of statistical significance indicates that these estimators are not statistically significant at all levels.

The values of the coefficients $\hat{\beta}_1 = 2,747$ and $\hat{\beta}_2 = -0,0255$ show that there is a non-linear relationship between DEBT and rGDP in the model. In other words, the excessive increase in public debt levels of countries in Southeast Asian will have a negative impact on the economic development of the

region. The p-values of these two values are at roughly 0.004, showing that the above estimate is statistically significant at the 1% level and can be applied to gauge the optimal threshold value.

The maximum value of rGDP, after being derived from model (4), must ensure:

$$\frac{drGDP}{dDEBT} = 2,747 - 0,051DEBT = 0 \Rightarrow DEBT = 53,9\%DEBT = 53,9\%$$

Deducting from model 4, the value for the optimal public debt threshold for countries in Southeast Asian is 53.9%.

4.3.2. OLS regress postestimation

Postestimation results of OLS regression in the research indicates that there are no existence of homoscedasticity, multicollinearity or omitted variables at the significance level of 5% but autocorrelation. Therefore, the research team uses Newey-West estimator in order to get rid of this defect and the result reveals that the initial estimate coefficient remained, which means the optimal threshold at 53,9% is still valid.

4.3.3. Threshold regression result

Similar to the OLS regression result, the threshold regression result of this research suggests that threshold exists in the relationship between average public debt and real GDP growth in Southeast Asia economics. According to the estimation result, the optimal public debt to GDP ratio of the region is in the vicinity of 54,1288%, generally is homogeneous as OLS regression result (at 53,9%), albeit negligible error.

Table 5: Threshold regression result

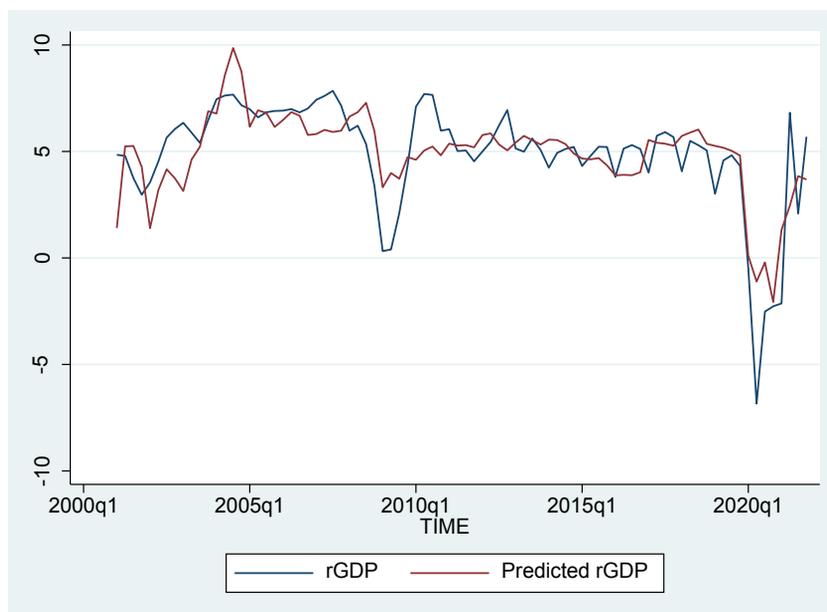
Order	Threshold	SSR
1	54.1288	224.1016

rGDP	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Region1						
TRADE	13.97516	3.607347	3.87	0.000	6.904892 21.04543	
INVT	6.601924	4.177037	1.58	0.114	-1.584917 14.78877	
_cons	-85.22344	27.3132	-3.12	0.002	-138.7563 -31.69055	
Region2						
TRADE	60.91414	7.35605	8.28	0.000	46.49654 75.33173	
INVT	-16.76147	4.560276	-3.68	0.000	-25.69944 -7.823491	
_cons	-244.6306	37.54553	-6.52	0.000	-318.2185 -171.0427	

Source: Extracted from STATA 17

This optimal value at 54,1288% implies that if the public debt to GDP ratio surpasses this level, each additional percentage point in the ratio of public debt to GDP will cost the economy a certain percentage points in real economic growth. Nonetheless, if ASEAN countries maintain their public debt under the optimal value, each addition in public debt may be in the positive proportion to economic development. To

ensure whether the obtained result is statistical significance or not, the team employs dynamic prediction and compares them with the actual values. The dynamic forecast does well track changes over the period.



Picture 2: Dynamic prediction result

Source: Extracted from STATA 17

4.3.4. Summary of research results

Taking two estimation results of OLS regression and threshold regression in consideration, there is overall an equivalent between the two values, despite negligible error. The optimal public debt threshold, therefore, can be registered at approximately 54%. Not only is the result in line with previous studies, but it also reinforces the theory of the existence of a nonlinear relationship between public debt and economic growth in countries demonstrated in the Laffer curve (Laffer, 2004) and Debt Overhang theory (Krugman, 1988).

5. POLICY IMPLICATIONS

5.1. Building public debt ceiling

When it comes to building a sensible public debt ceiling for Southeast Asia countries, the estimated optimal public debt threshold can act as a precursor to find such value. Regression results show that the optimal public debt threshold of Southeast Asia is in the vicinity of 54%, suggesting that countries in the research area in general, and Vietnam in particular should maintain a public debt level in this optimal range in the future, according to the theory of Laffer curve (Laffer, 2004). However, in order to reduce undesirable risks, as well as dispose of errors in estimation that may negatively affect policy implications, the study recommends that Vietnam’s public debt ceiling should be adjusted to about 5% higher than the estimated optimal threshold, at 60% of GDP. This value, furthermore, is in line with Vietnam’s current public debt ceiling set by the National Assembly of Vietnam, according to Resolution No. 23/2021/QH15 (2021).

5.2. Developing the domestic debt market

Because domestic capital is more secure, Vietnam has to improve and promote the growth of domestic debt markets in the coming years. Domestic capital mobilization reduces costs greatly when compared to foreign capital since it is not vulnerable to adverse external impacts such as interest rates, inflation, and

exchange rates. In addition, domestic government bonds must also be closely monitored and developed in the next few years in order to maintain the sustainability of public debt as well as the safety of debt repayment capabilities. Long-term capital mobilization will be aided by the development of the domestic bond market and risks associated with interest rates and exchange rates will also be reduced. However, this may contain a substantial possibility that Vietnam's public debt would exceed the ideal threshold of 54%.

5.3. Saving direction and cost reduction

Cutting government expenditure entails more than just making a specific cut to fit the anticipated ideal public debt threshold; it also entails learning how to correctly and effectively employ available resources and applying accomplishments to service and production. As a result, it makes little difference how much people save or cut back on spending and borrowing; the most essential thing is to deploy resources where they will be most effective and have the greatest impact on the socio-economic system. The government should prioritize investment in areas that are truly critical and necessary. The state must explicitly define which regions must be funded without exceeding the 60% public debt limit. Where the private sector can operate and develop more effectively, the government should allow private financial actors to promote and reduce spending in this area. Furthermore, spending cuts necessitate a shared understanding of the importance of working together to solve common challenges, regardless of industry or location.

5.4. Controlling inflation

Natural inflation (less than 10%) is the normal level of inflation experienced by an economy, particularly in developing Southeast Asian countries. A safe level of inflation also suggests that people are still willing to hold money in order to complete transactions and contracts in local currency, which is a motivator for countries to mobilize domestic capital from people in a more secure and effective manner. In the coming years, Vietnam must rigorously control its inflation rate, with an inflation target of no more than 5%. Managing inflation is compulsory since it impacts not just the economy but also other macroeconomic components and people's livelihood. The government should place a greater emphasis on managing inflation and not overlook viable policy options, while also calculating different instances that may occur.

6. CONCLUSION

In conclusion, the optimal public debt threshold for Southeast Asian countries is determined according to the OLS regression model is 53.9% and the threshold regression model is 54.128%. The results of these two models show that the optimal public debt threshold in Southeast Asia, approximately at 54%, is also consistent with few other studies. In addition, in the research process, the study has absorbed and used the theory of Laffer curve to overcome the research gaps in the model to find the general optimal public debt threshold for countries in Southeast Asia. At the same time, the empirical research demonstrates the existence of a non-linear relationship between public debt and Southeast Asian growth. Therefore, the authors set a reasonable public debt ceiling for Vietnam is about 60% of GDP and several of Vietnam's public debt management policies to ensure safe public debt and promote the economy in a sustainable way.

Although figuring out the common public debt threshold for Southeast Asia at 54% is the largest contribution of this study, limitations are undeniable. The fact that countries have different political institutions, with different definitions of debt and also depending on the views of policymakers and the economic characteristics of that country, the debt threshold set by the authors may not be really suitable for all countries in the region. However, the authors anticipate that through the above analysis and synthesis, the study will contribute to improving the theory of optimal public debt threshold and creating a scientific basis for public debt management policy to improve the sustainability of public debt in Vietnam in the years to come.

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IMPACT OF EXCISE TAX ON TOBACCO CONSUMPTION BEHAVIOR IN VIETNAM

Nguyen Thi Cam Giang¹, Ha Thi Hanh Hoa², Nguyen Thi Phuong Thao²,
Nguyen Quynh Chi³, Phan Thi Thuy Linh⁴, Pham Khanh Huyen⁵

ABSTRACT: *With rising tobacco consumption around the world, particularly in Vietnam. The essay examined and evaluated the excise duty on cigarettes in Vietnam. Moreover, the author developed a research model based on elements influencing tobacco consumption behavior, such as GDP per capita, population, inflation, excise tax rate, product price, and gender. Besides, the authors discovered shortcomings in the current Vietnamese tax system after reviewing documents and data, such as the tax rate being too low in comparison to people's income and the taxable price being currently factory pricing. As a result, the essay provides important ideas for pushing the reform of Vietnam's tobacco excise tax policy in the next few years.*

Keywords: *excise tax rate, tobacco consumption, Vietnam, behavior, recommendation.*

1. INTRODUCTION

Increasing tobacco taxes has been shown to be the most effective way to reduce consumption. The World Health Organization calculates in 2013, with data from 2012, that if all countries increased the excise tax charged on a pack of cigarettes by 50%, The number of smokers would be reduced to 49 million, which would prevent at least 11 million deaths from smoking (World Health, 2014). On average, raising tobacco taxes to increase the price of cigarettes by 10% would reduce tobacco use by 4% in high-income countries and by about 5% in low and middle-income countries. This pattern has been observed in many different regions. In it, WHO has shown that Europe is one of the global leaders in increasing tobacco taxes and has achieved many positive results in recent years (World Health, 2014).

According to many studies, less than 2% of women smoke in Vietnam, whereas nearly 50% of adult men smoke. Women and children are disproportionately exposed to secondhand smoke at home and in public places. In Vietnam, diseases linked to tobacco use are thought to cause 40,000 premature deaths annually (Marquez, 2019). In addition to taking lives, smoking-related illnesses also cost the nation millions of dollars in lost productivity and medical expenses. Especially when compared to neighboring nations like China (36%), Malaysia (47%), the Philippines (51%), and South Korea (64%), Vietnam's excise tax on cigarettes is only 28% of the cost of the most widely consumed brand. The WHO recommended a target of 70% of the cost of a pack of 20 cigarettes to have a positive impact on consumer behavior and the excise tax rate of Vietnam is much lower than this rate (Marquez, 2019). In 2008, tobacco sales grew to more than 1,000 billion VND after applying the new 65% tax rate, a rise of 10% from the tax rate of 55% in 2007, while consumption volume fell by 8% from 2007 to 2008. However, because the level of consumption continued to rise in the years that followed, the tax only went up that year and not in the years that followed, so it had little effect (Marquez, 2019).

A tax increase typically does not result in a significant increase in prices or a reduction in consumption in nations where taxes make up a very small portion of the final price of tobacco as Vietnam. However, it does result in an increase in revenue. Not only is raising the tobacco tax beneficial for public health, but it also increases the government's tobacco tax revenue. The overall objective of this study is to determine the impact of the excise tax rate on tobacco consumption behavior in Vietnam. As a result, the findings of this study, along with in-depth qualitative and quantitative research, will serve as a strong basis for developing future tobacco excise tax support strategies in Vietnam.

¹ Faculty of Finance - Banking Academy of Vietnam

² Banking Academy of Vietnam

2. THEORETICAL FRAMEWORK

GDP per capita, population, inflation, excise tax, product price, and gender are the six major factors influencing tobacco consumption behavior that have been determined and proposed. These findings are based on the research of Bauer et al (2007), Parks et al (2021), Dilley et al (2012), and related studies. The author sets forth the following pairs of hypotheses

The GDP per capita is one of the key factors influencing tobacco consumption in various nations. The study of Chauvin et al (2004) demonstrates that populations in high-GDP areas had greater rates of tobacco consumption than populations in low-GDP areas. Additionally, a meta-study of factors like household wealth and income reveals that people with high financial standing frequently find it more difficult to stop smoking than those without a job, including students and the jobless (Thompson et al, 2019). According to an evidence-based study by Jha (2020), smoking is the leading cause of death in high-income countries, accounting for 41 million deaths in the United States, United Kingdom, and Canada between 1960 and 2020. Besides, this study stated that while adult smoking rates in high-income countries have declined dramatically, smoking remains prevalent in these countries. In contrast to previous studies, Bauer et al (2007) claim that people with lower incomes are more likely to smoke than people with higher incomes, based on their research in Germany. This is due to the fact that people with higher incomes value their health more because they have a more productive time in the future when they are healthy. However, it's possible that those with higher incomes may have to work more frequently, which puts them under constant strain and promotes smoking.

H1: The GDP per capita has an impact on tobacco consumption behavior

Tobacco consumption was intimately related to population factors. Variations in demographics and population have also been demonstrated to have a considerable impact on the usage of cigarettes, cigars, and other medications (Ganz et al, 2022). Based on a study conducted by Dr. Mehrshad Abassi in 2007 with the Iranian population aged 15–64, the average daily smoking rate was 11.3% (5.6 million: 21.4% men and 1.4% women), with smokers accounting for 1.7 million or 3.4% of the Iranian population (Meysamie et al, 2010). According to prior research, smoking prevalence among young individuals aged 15 and older in Vietnam is 22.5% of the total population, 45.3% of men, and 1.1% of women, based on data collected by the GATS in 2015 (Hoang et al, 2017). The common thread running through the preceding data is that the proportion of adult men who smoke is much higher than that of women. Additionally, Corey et al (2017) stated that young and middle-aged people are more likely to smoke than the elderly. Moreover, the majority of countries with an elderly population have lower smoking rates than those with a young population (World Bank, 2020).

H2: The population has impact on tobacco consumption behavior

In fact, inflation has an impact on people's tobacco consumption behavior since it affects economic conditions and personal incomes. According to Dilley et al (2012), a rise in cigarette pricing in Washington may have no effect on smoking patterns because inflation lowers expenses while prices remain unchanged. In contrast, while the median price of a pack of cigarettes increased by 1.91 USD between 2000 and 2008, after accounting for inflation, the rise only reached 0.63 USD. Moreover, the research of Guindon et al (2017) in Argentina demonstrates that pricing has no effect on tobacco consumption behavior from times of high inflation to times of extremely high inflation. In this case, the price has no bearing at this time. Additionally, inflation-adjusted cigarette pricing and taxes diminish people's attraction to tobacco as well as the number of days they consume tobacco (Kierstead et al, 2023). This illustrates that in order to maintain the effect, the price of cigarettes must be increased on a regular basis to compensate for inflation. To reduce people's purchasing power, authorities must ensure that cigarette taxes are automatically adjusted to inflation variations, as in Korea and the Russian Federation (Dan, 2022; Marquez et al, 2018).

H3: Inflation has an impact on tobacco consumption behavior.

It can be seen that the excise tax rate is related to the consumption behavior of people in the countries. A study on the change in tobacco consumption behavior before and after the excise tax increase found that, in order to maintain the number of cigarettes smoked per day, consumers had to switch from smoking cigarettes premium leaves to normal tobacco (Chiou et al, 2014). Therefore, increasing excise tax will reduce people's ability to consume, in the long run, a strong tax increase on tobacco lines will limit the number of cigarettes consumed. According to a study conducted in Australia by Parks et al (2021), increasing tobacco pricing or taxes on tobacco is not only an effective tobacco control strategy for reducing smoking rates in the general population but it may also be utilized to eradicate smoking socioeconomic inequities. Moreover, this study discovered that smoking rates in Australia decreased from 28.2% to 19.7% while expenses increased from 3.39 USD to 11.60 USD between January 1991 and December 2006. Moreover, Jiménez-Ruiz et al (2008) discovered that price is a crucial determinant in household smoking and cigarette consumption choices. Increases in tobacco excise taxes result in higher prices, which contribute to a decrease in the percentage of smoking families. Many studies have also been conducted to investigate the impact of price fluctuations on tobacco product substitution, and it has been established that changes in tobacco pricing are significantly related to the excise tax rate.

H4: The excise tax rate has an impact on tobacco consumption behavior.

Product price increases are the most effective way to reduce smokers and tobacco usage (Phan, 2015). The higher the price of tobacco products, the more probable it is to deter nonsmokers from starting to smoke, aid in the prevention of addiction, and maybe encourage current smokers to quit or limit the amount they consume. The higher the product price, the more probable it is to keep those who have quit smoking from smoking again. After assessing the evidence in 1999, the World Bank concluded that a 10% average price increase would reduce demand for tobacco products by approximately 4% in high-income countries and approximately 8% in low- and middle-income countries (Fuchs et al, 2019). However, another study by Laxminarayan et al (2004), employing a sample of smokers and non-smokers, found that increases in drug pricing had no effect on the decision to start smoking. This study also investigates the potential impact of price changes on tobacco product substitution and discovered that changes in cigarette pricing had a proportional relationship and were strongly connected with the choice to convert among cigarettes.

H5: The product price has an impact on tobacco consumption behavior.

Tobacco consumption behavior is also influenced by gender factors. The factors influencing the smoking behavior of men and women are different, as do the ones influencing the decision to smoke or not and how much to smoke for both sexes (Kilic et al, 2014). According to Grunberg et al (1991), there are apparent gender differences in tobacco consumption behavior, with the general view being that men use tobacco products more than women. In another study in Puerto Rico by Latimer et al (2004), a survey examining the prevalence of substance use by gender among adolescents found that the female gender was associated with tobacco use, while the male gender was associated with marijuana use in high school. Besides, according to the study of gender differences in cigarette consumption in Turkey by Kilic et al (2014), Turkey has a significantly high smoking rate, and there is a significant gender difference in smoking. This study showed that almost a third of adults aged 15 years and over (47.7% of men and 14% of women) smoked in 2008. Moreover, smoking rates among Turkish women increased significantly from 1997 to 2009, from 10.9% to 15.2% (Kilic et al, 2014). However, Kong et al (2017) in the USA suggest that gender differences in e-cigarette use among adolescents are relatively unknown. Rates of e-cigarette use ranged from 1.6% to 16.2% in men and 0.6% to 16.8% in women (Kong et al, 2017).

H6: Gender has an impact on tobacco consumption behavior.

3. RESEARCH METHOD

3.1. Data collection method

It is feasible to evaluate the impacting tobacco consumption behavior in Vietnam based on independent variables such as GDP per capita, population, inflation, excise tax rate, product price, gender, and dependent variable tobacco consumption behavior. The researchers used panel data spanning 23 years from 2000 to 2022 including 9 countries with high smoking rates (Appendix A). Moreover, reliable sources such as the GSO, World Bank, OECD, Statista, and other esteemed journals were used to collect the data.

3.2. Research model

On the findings of the research, six hypotheses are proposed for the analysis. Customers’ consumption behavior is influenced by independent variables such as GDP per capita, population, inflation, excise tax rate, product price, and gender. Moreover, the dependent variable is tobacco consumption behavior since it is affected and clarified through the independent variables mentioned above. The investigators chose OLS, FEM, REM, and FGLS models on Stata software to clearly analyze the effects of the aforesaid independent factors on the dependent variable. Relying on the preceding analyses, the authors’ study model:

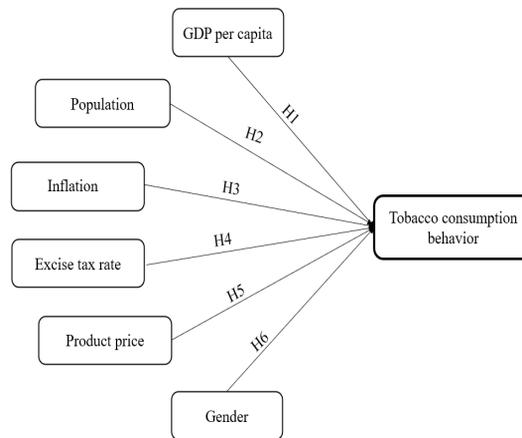


Figure 1: Model of factors affecting tobacco consumption behavior in Vietnam

To demonstrate in detail the influence of the variables, the investigators used panel data from 2000 to 2022 from 9 countries with high smoking rates. In addition, the information gathered relies on credible sources such as WHO, GSO, World Bank, OECD, Statista, and so on.

The equation of the model is described:

$$\text{LnTCB}_d = \text{LnGDP}_i + \text{Popul}_i + \text{Infl}_i + \text{Tax}_i + \text{Pric}_i + \text{Gen}_i (\text{dummy}) + \varepsilon$$

Note:

Name Variable	Meaning	Units	Examined hypothesizes	The expected result of Coefficient Bata	Source of data
LnTCB _d	Tobacco consumption behavior	Million packs of 20 cigarettes	Dependent variable		Statista, WHO, GSO, OECD.
LnGDP _i	GDP per capita	USD	H1: The GDP per capita has an impact on tobacco consumption behavior	+/-	World Bank

Name Variable	Meaning	Units	Examined hypothesizes	The expected result of Coefficient Bata	Source of data
Popul _i	Population	Million people	H2: The population has an impact on tobacco consumption behavior	+/-	World Bank
Infl _i	Inflation	%	H3: Inflation has impact on tobacco consumption behavior	+/-	World Bank
Tax _i	Excise tax rate	%	H4: The excise tax rate has an impact on tobacco consumption behavior	+/-	Statista, WHO, GSO, OECD.
Pric _i	Product price	VND	H5: The product price has an impact on tobacco consumption behavior	+/-	Statista, WHO, GSO, OECD.
Gen _i (dummy)	Gender *		H6: Gender has impact on tobacco consumption behavior	+/-	

* 0: Male smoking rate is higher than female

1: Female smoking rate is higher than male

4. RESULTS AND DISCUSSION

4.1. Results

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
LnTCB _d	207	7.732	0.669	5.991	8.612
LnGDP _i	207	9.185	1.322	5.977	10.966
Popul _i	207	88.887	62.84059	15.93	275.5
Infl _i	207	4.639	8.777	-1.7	80
Tax _i	207	61.091	17.484	25	90
Pric _i	207	76344.16	76831.1	1500	365690
Gen _i	207	0.0193	0.137	0	1

Source: Calculating result from Stata

Table 2: Correlation between variables

	LnGDP _i	Popul _i	Infl _i	Tax _i	Pric _i	Gen _i
LnGDP _i	1.0000					
Popul _i	-0.584	1.0000				
Infl _i	-0.187	0.048	1.0000			
Tax _i	0.150	-0.363	0.071	1.0000		
Pric _i	0.740	-0.389	-0.248	0.056	1.0000	
Gen _i	0.018	0.016	-0.026	-0.095	-0.030	1.0000

Source: Calculating result from Stata

As shown in the following Table 1, each variable has 207 observations collected. Table 2 demonstrates that when all variables are smaller than 0.8, the correlation between them is acceptable.

Table 3: OLS regression

LnTCB _{<i>t</i>}	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
LnGDP _{<i>t</i>}	0.141	0.049	2.85	0.005	0.043	0.240
Popul _{<i>t</i>}	0.0009	0.0008	1.18	0.240	-0.0006	0.002
Infl _{<i>t</i>}	0.017	0.004	3.80	0.000	0.008	0.026
Tax _{<i>t</i>}	-0.001	0.002	-0.44	0.659	-0.005	0.003
Pric _{<i>t</i>}	-5.34e-06	7.66e-07	-6.96	0.000	-6.85e-06	-3.82e-06
Gen _{<i>t</i>}	0.289	0.283	1.02	0.308	-0.269	0.848

Source: Calculating result from Stata

The author employed the OLS regression model to assess each association between the variable that is dependent and the independent variable. In this model, Prob > F = 0.0000, implying that the P-value is less than 0.05, and R-squared = 0.3283.

Table 4: VIF

Variable	VIF	1/VIF
LnGDP _{<i>t</i>}	2.89	0.346
Pric _{<i>t</i>}	2.31	0.433
Popul _{<i>t</i>}	1.73	0.578
Tax _{<i>t</i>}	1.18	0.846
Infl _{<i>t</i>}	1.08	0.928
Gen _{<i>t</i>}	1.02	0.983
Mean VIF	1.70	

Source: Calculating result from Stata

The researcher concludes from Table 4's results that there is no multicollinearity between the variables since their VIF are all less than 5. When the author checked for heteroscedasticity in the OLS model, the author discovered Prob > chi2 = 0.0000 < 0.05 (Appendix B), which indicates heteroscedasticity. As a result, the researcher believes that the OLS regression model is inappropriate for this investigation.

The researcher then implements the FEM and REM models to the research in order to determine each relationship between the variables. In addition, the researcher employed the Hausman technique to select the best model.

Table 5: Hausman technique

	fem	rem	Difference	Std. err.
LnGDP _{<i>t</i>}	0.042	0.107	-0.065	0.039
Popul _{<i>t</i>}	0.007	0.002	0.005	0.002
Infl _{<i>t</i>}	0.001	0.002	-0.0007	.
Tax _{<i>t</i>}	-0.001	-0.001	-0.0006	0.0009
Pric _{<i>t</i>}	-4.23e-06	-4.41e-06	1.79e-07	1.63e-07
Gen _{<i>t</i>}	0.009	-0.001	0.0103	.
Prob > chi2 = 0.4389				

Source: Calculating result from Stata

According to Table 5, the P-value (Prob>chi2 = 0.4389) is higher than 0.05, indicating that the REM

model is the most productive model. When the researcher performed additional tests, the author discovered that, while there was no autocorrelation ($\text{Prob}>F = 0.0564 > 0.05$) (Appendix E), heteroscedasticity showed up in the REM model ($\text{Prob}>\chi^2 = 0.0000 < 0.05$) (Appendix D). As a result, this model is similarly unsuitable for the investigation.

Lastly, to solve the shortcomings of the preceding models, the author employs FGLS regression.

Table 6: FGLS regression

LnTCB _d	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
LnGDP _i	0.260	0.034	7.63	0.000	0.193	0.327
Popul _i	-0.0002	0.0004	-0.52	0.601	-0.001	0.0005
Infl _i	0.015	0.003	4.62	0.000	0.008	0.021
Tax _i	-0.006	0.001	-3.84	0.000	-0.009	-0.002
Pric _i	-5.56e-06	6.31e-07	-8.82	0.000	-6.80e-06	-4.33e-06
Gen _i	-0.017	0.158	-0.11	0.910	-0.328	0.292

Source: Calculating result from Stata

Concluding that the FGLS model has solved the drawbacks of earlier models, with $\text{Prob}>\chi^2 = 0.000$ (Appendix H), indicating that this table will depict the relationship between the dependent and independent variables. Some key things that can be done are as follows:

- The association between GDP per capita and Vietnam’s tobacco consumption behavior is important and positive, as $P>|z| = 0.000 < 0.05$ and $\text{Coef} = 0.26 > 0$.
- The association between population and Vietnam’s tobacco consumption behavior is not significant and negative, as $P>|z| = 0.601 > 0.05$ and $\text{Coef} = -0.0002 < 0$.
- The association between inflation and Vietnam’s tobacco consumption behavior is important and positive, as $P>|z| = 0.000 < 0.05$ and $\text{Coef} = 0.015 > 0$.
- The association between the excise tax rate and Vietnam’s tobacco consumption behavior is important and negative, as $P>|z| = 0.000 < 0.05$ and $\text{Coef} = -0.006 < 0$.
- The association between product price and Vietnam’s tobacco consumption behavior is important and negative, as $P>|z| = 0.000 < 0.05$ and $\text{Coef} = -5.56 < 0$.
- The association between gender and Vietnam’s tobacco consumption behavior is not significant and negative, as $P>|z| = 0.910 > 0.05$ and $\text{Coef} = -0.017 < 0$.

4.2. Discussion

The findings of the FGLS regression model show that while inflation and GDP per capita has a positive impact on Vietnam’s tobacco consumption behavior, excise tax rate, and product price have a negative impact on it.

As a matter of fact, it can be observed that there is a convoluted relationship between tobacco consumption and GDP per capita. However, depending on the nation or from various perspectives, a high or low GDP per capita level will have varied implications (Brien, 2019). Nowadays, in countries with high GDP per capita, both the government and consumers prioritized health concerns. People with high-income levels frequently manage their spending sensibly, especially on necessities such as health items (Chauvin et al, 2004). For this reason, instead of smoking, they will be willing to spend money on services and goods that help them relieve their stress after work and safeguard their health. This is not consistent with the research model’s findings, because as GDP rises, so does the rate of cigarette consumption drop. Nevertheless,

several studies conducted in nations with high GDP levels demonstrate the contrary, that these individuals are frequently more likely than those with low incomes to be exposed to cigarette advertising (Black et al, 2012). On the other hand, the economies of these nations are developing swiftly, forcing people to work long hours continuously and turn to smoking as a quick stress reliever (Thompson et al, 2019). As a result of the tobacco industry's rapid expansion, high-end tobacco products like cigars also became popular. The tobacco manufacturers have targeted the high-income people's urge for self-expression by charging costs of up to 1 million VND for each cigarette or more in Vietnam. Besides, high-income countries consistently place a high priority on improving education, which contributes to the close association between GDP and education (Chauvin et al, 2004). There will be a low tobacco consumption rate here since people appreciate the value of health and live in a healthy environment. In addition, education receives less focus in nations with low GDP levels. Consequently, to increase their market reach and their target consumers, tobacco companies frequently capitalize on these cons (Jha, 2020). Given these points, it is clear that the GDP will have a variety of impacts on Vietnam's tobacco use behavior. The level of tobacco consumption will grow gradually due to the rapid GDP per capita growth rate and changes in the process of operating and creating tobacco products suitable for the market of tobacco enterprises.

The model's outcomes support the author's original claim that Vietnam's inflation impacted cigarette usage and have a positive impact. In fact, inflation is a factor that affects the cost of goods, including cigarettes. According to Dilley et al (2012), increasing the price of a product would not reduce cigarette usage when inflation significantly increases. Moreover, the price has become less critical in restricting tobacco use behavior during periods of high and super-high inflation (Guindon et al, 2017). These studies show that despite the price of cigarettes being expensive, they are only helpful in reducing tobacco use globally or in Vietnam precisely with adequate inflation adjustment. Additionally, Kierstead et al (2023) claim that a price increase that is, on average, more significant than the inflation rate might restrain a client's increase in tobacco usage.

The results of the model indicate that the coefficient for this connection is -0.006 when the excise tax rate in Vietnam is raised by 1 unit, resulting in a reduction in tobacco use behavior of roughly 0.006 units. Although it is possible that this coefficient is not large, it also suggests that increasing excise tax will limit tobacco consumption. In reality, one factor affecting Vietnam's high tobacco use is the country's Excise Tax Policy, which keeps cigarette costs low and does not keep up with inflation or people's income levels (Chaloupka et al, 2019). Adults of all socioeconomic and demographic backgrounds are more likely to limit their tobacco usage as cigarette excise tax rates rise (Parks et al, 2021). Jiménez-Ruiz et al (2008) also state that increasing the excise tax rate on tobacco is one of the most practical and effective measures to reduce yearly tobacco consumption. In this regard, Thailand has used the strategy to boost the excise tax rate 11 times, increasing taxes by a percentage ranging from 55% to 90%. Due to these changes, the percentage of Thai youth who smoke has declined from 32% in 1991 to 17.4% in 2021 (Le, 2023). This strategy also resulted in a 3.3% decline in cigarette sales in China, which increased tax revenue for the Chinese government by almost 11 billion USD (WHO, 2016). Consider the Philippines as an illustration, which increased its excise tax rate from four tax categories to a single rate of 30 Pesos per pack of cigarettes (Schafferer et al, 2018). According to the author, the increase in excise tax rates is a factor in the price increase of tobacco at retail, which reduces the likelihood that individuals will start using tobacco for the first time and prevents consumers from accessing these harmful items. As a result, limiting tobacco usage by raising the excise tax will both safeguard citizens' health and boost state revenue.

As the author's initial prediction, the product price has an impact on tobacco consumption behavior in Vietnam, and it has a negative effect, that is, when the price of a product increases, the number of cigarettes used will decrease. Similar studies have also suggested that when consumer products, especially tobacco, have high prices, it will limit the ability of people to start using tobacco or have a strong effect on making

these people choose to quit tobacco (Phan, 2015). This can be understood that not every individual can afford to pay a sizable income for tobacco use. In addition, when the price of tobacco increases, it will cause a hindrance when consumers will consider a high-priced item compared to what it brings them (Le, 2023). Fuchs et al (2019) argue that increasing tobacco prices is a necessity to limit the amount of cigarettes consumed each year. This study also shows that at current cigarette prices, a 10% increase in the price of cigarettes is needed to reduce the number of cigarettes sold each year at a time when GDP is higher and higher. Contrary to the results of this study, Laxminarayan et al (2004) showed that increasing the price of cigarettes has no effect on reducing smoking prevalence, but rather it stimulates the transition to other tobacco lines of consumers. In the author's view, raising the price of cigarettes will reduce tobacco consumption, but a direct increase in the price of the product will be difficult to achieve when it involves many other issues.

From the results obtained from the FGLS model and the above analysis, it can be seen that the excise tax rate and product price have a negative influence on tobacco consumption behavior in Vietnam. However, while the coefficient of product price is -5.56, the excise tax rate is only -0.006. This means that the current excise tax has a negligible impact on tobacco consumption. After analyzing the model and studying related documents, the author believes that the excise tax accounts for a very small proportion of the price of cigarettes, which makes the price of cigarettes increase, but not enough to affect tobacco consumption behavior. Besides, as explained above, during the period of high inflation and rapid GDP growth, the price of cigarettes increased, but it did not limit consumption, which was caused by the consumption tax policy. The special consumption of the ruler is not really reasonable. Therefore, the government needs to reform the tobacco excise tax policy to have an indirect impact on tobacco consumption behavior in Vietnam through the price of cigarettes, this should be considered both in periods of high inflation and rapid growth of GDP per capita.

Besides the factors affecting tobacco consumption, population and gender have no impact on tobacco consumption behavior in Vietnam.

Even though the model's calculations indicate that the population is not influenced smoking habits, most evidence indicates the opposite. As shown, age is the main demographic factor affecting tobacco use behavior. A European study found that older persons are more likely than younger people to struggle with quitting for many reasons, such as long-term smoking, weak quitting intentions, and so on (Easley et al, 2019). However, the number of young people smoking has rapidly grown in numerous countries due to the tobacco industry's fast expansion, notably the introduction of e-cigarettes. Cheung et al (2015) found that adults' growing brains make them particularly vulnerable to nicotine, which predisposes young people to dependence and tobacco use. The quality of e-cigarettes has improved, especially when the product offers a nicotine dosage that is more appealing to young people than regular cigarettes (Ganz et al, 2022). In fact, e-cigarette use is rising in popularity in Vietnam's major cities, especially among young people and those with high standards of living. The 2019 School Health Survey claims that up to 2.6% of pupils between 13 and 17 used e-cigarettes compared to 3.1% of teenagers between 15 and 17. Specifically, male students had a rate of 4.8%, and this percentage of female students was 1.4% among the ages of 15 and 17 (Vuong, 2021).

Contrary to the original hypothesis that the author put forward that gender has an effect on tobacco consumption behavior, the results of the research model suggest the opposite. However, in the past many studies have provided evidence that gender has an impact on consumption behavior. In general, between men and women there will be different expectations, desires and lifestyles that influence consumer behavior, for example, today men tend to use cigarettes or cigars while women increasingly prefer to use e-cigarettes (Chelladurai et al, 2023). Previously, it could be seen that tobacco use among women was very limited or almost non-existent. However, today with the development of the tobacco business, there are more and more product lines that attract the use of women, especially the introduction of e-cigarettes. Kilic et

al (2013) showed that in Turkey the prevalence of female tobacco use increased from 10.9% to 15.2% between 1997 and 2009. Pursuant to the World Bank (2019), men smoke more than women. One in 3 males who are men smoke. In contrast, only one in 16 women smoke. Even so, tobacco use has recently increased among women, especially young people, the elderly, and pregnant women (Corey et al, 2017).

5. CONCLUSION

The results of the study show that there are 4 factors affecting tobacco consumption behavior in Vietnam, including GDP per capita, inflation, excise tax rate, and product price, while the population and gender variables do not affect it. Several recommendations are made to improve tobacco consumption in Vietnam.

Firstly, change the tax base: given that tobacco prices are low in Vietnam, Vietnam should consider applying an excise tax rate such as China and the Philippines. In reality, cigarettes are inexpensive because the tobacco tax in Vietnam is based on the ex-factory price rather than the retail price. Nevertheless, the ex-factory price is so low that even if it is taxed, the retail price is unaffected. To have a significant impact on the value of a pack of cigarettes before reaching consumers, Vietnam should move from calculating ex-factory prices to taxing the retail price of cigarettes or raw materials used in tobacco production. In order to secure the management of people's buying power in the same manner as Korea achieved by using the mixed tax technique, the particular consumption levels of cigarettes must also be altered regularly by inflation and GDP.

Secondly, regarding taxable items: the National Assembly and the Government should have a list of commodities that are prohibited from being consumed must now also include pipe tobacco products, e-cigarettes, and the equipment, components, and oil-related to e-cigarettes. Besides, in order to further increase the excise tax's efficacy in reducing consumption and promoting public health, it is essential to raise the excise tax rate for the goods used as inputs to make the aforementioned products.

Thirdly, improving public knowledge and awareness of the unfavorable impact of tobacco: the National Assembly and the Government of Vietnam should provide focus on informing students about the harmful effects of tobacco smoking, organizing themed events, and running competitions about preventing and avoiding the negative consequences of tobacco, and so on. Thereby, it has aided in raising young people's awareness of their responsibility to adopt a healthy lifestyle and cooperate to prevent and manage tobacco's harmful effects.

Fourthly, in relation to tax disclosure and fraud prevention: the Tax Department should enhance inspection and examination in order to prevent tax loss and regulate the tax declaration, tax finalization, and tax reimbursement channels in order to combat tax fraud on tobacco items. Tax fraud and counterfeit goods related to tobacco tax administration must be investigated, verified, and dealt with. This requires prompt information exchange and close collaboration with agencies.

Fifthly, fight against tobacco smuggling: the government needs to cooperate with other countries to form an international chain of links and supervision, which will help operational agencies to capture accurate, timely information and prevent such incidents of smuggled shipments. Moreover, Vietnam needs to strengthen the control of smuggling at border gates and at tobacco retail points. In particular, to effectively control cigarette smuggling in Vietnam, the authorities should focus on provinces with high tobacco smuggling and provinces bordering other countries.

Finally, rationally allocate revenue from the excise tax on cigarettes: the state should support medical funding for passive smokers because even though they do not use them, they are still heavily affected by smoking medicine. Next, revenue from tobacco taxes should be allocated to educational activities that improve individuals' understanding of the harmful effects of tobacco. In addition, in order to continue to maintain profits and maximize profits, tobacco companies are always looking for ways to hinder, prevent or weaken measures to increase tobacco tax. Therefore, to limit this situation, the government also needs to have clear policies and regulations to support Vietnamese tobacco businesses, and the funding should be

from tobacco tax revenue. This is done with the goal of protecting the tobacco company against smuggled or counterfeit tobacco sources, contributing to protecting the health and interests of consumers.

6. APPENDIX

Appendix A: Selected countries for data collection

	1	2	3	4	5	6	7	8	9
Country	Vietnam	Indonesia	Thailand	Japan	Korea	Netherlands	France	England	Turkey

Appendix B: Hetest

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

Assumption: Normal error terms

Variable: Fitted values of lntcbd

H0: Constant variance

chi2(1) = 24.36

Prob > chi2 = 0.0000

Appendix C: Hausman

---- Coefficients ----				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fem	rem	Difference	Std. err.
lngdpi	.0427992	.1078278	-.0650286	.0398873
populi	.0077297	.0024165	.0053132	.0024258
infl	.0013813	.0021516	-.0007703	.
taxi	-.0019539	-.0013205	-.0006334	.000944
prici	-4.23e-06	-4.41e-06	1.79e-07	1.63e-07
geni	.0091775	-.0012223	.0103999	.

b = Consistent under H0 and Ha; obtained from xtreg.

B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(5) &= (b-B)' [(V_b-V_B)^{-1}] (b-B) \\ &= 4.81 \end{aligned}$$

Prob > chi2 = 0.4389

(V_b-V_B is not positive definite)

Appendix D: Xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

$$\text{lntcbd}[\text{country1}, t] = Xb + u[\text{country1}] + e[\text{country1}, t]$$

Estimated results:

	Var	SD = sqrt(Var)
lntcbd	.4476468	.6690641
e	.0400852	.2002128
u	.0733156	.2707686

Test: Var(u) = 0

chibar2(01) = 1517.81
Prob > chibar2 = 0.0000

Appendix E: Xtserial

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 8) = 4.965

Prob > F = 0.056

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FACTORS INFLUENCING THE QUALITY OF LOGISTICS SERVICES IN INTERNATIONAL FREIGHT FORWARDING COMPANIES IN HANOI

Author: Vu Ha Tuan Huy¹

Mentor: Assoc. Prof. Dr. Nguyen Thi Thuong Huyen¹

ABSTRACT: *Logistics is a vital sector supporting Vietnam's socio-economic development and competitiveness. The industry has experienced rapid growth since 1990, with over 3,100 domestic and 33 international logistics providers, including major players like DHL, FedEx, Maersk Logistics, and APL Logistics. While large companies exist, most are small and medium-sized enterprises offering 17 different logistics services, primarily transportation. However, challenges such as inadequate infrastructure, limited capital, management expertise, and high taxes and fees persist. Hanoi city is prioritizing logistics development, directly contributing to local GDP and employment, and indirectly enhancing competitiveness and supporting businesses. Many enterprises within industrial parks and clusters have their own logistics operations. Hanoi is taking measures to become a major logistics hub nationwide. However, challenges include inadequate infrastructure, limited capital scale, management expertise, and high taxes and fees. This study aims to investigate the factors influencing the quality of logistics services in international freight forwarding companies in Hanoi, recognizing the urgency and importance of this topic in both theoretical and practical contexts.*

Keywords: *Logistics services, Transportation companies, International freight forwarding companies, Service quality, Hanoi city, Logistics industry in Vietnam, Logistics infrastructure, Logistics management, Logistics sector growth*

1. INTRODUCTION

Logistics plays a crucial role in the economic development of countries, and Vietnam is no exception. Several studies have been conducted to understand the state of logistics in Vietnam and identify factors that contribute to its competitiveness and growth. This article will explore some prominent research conducted by both foreign and domestic authors to shed light on the logistics landscape in Vietnam.

Nomura Research Institute's study, published in 2002, is one of the most popular foreign-authored research papers on logistics in Vietnam. The study highlighted that the current logistics service providers in Vietnam only meet 25% of the primary demand in the market. It also emphasized that while Vietnam benefits from low-cost logistics services, the quality of these services is not assured.

Additionally, the underdevelopment of local freight forwarding companies poses significant challenges to the domestic logistics market. A study (Steven A. Samaras conducted, 2000) focused on improving and enhancing the competitiveness of inbound logistics services. The study surveyed 80 active logistics businesses and quantitatively demonstrated that cost, delivery speed, and customer advantage are closely related to the quality of logistics services. Specifically, 65 out of the 80 surveyed companies (81.25% of the sample) agreed that cost, delivery speed, and customer advantage influence the quality of logistics services, with cost differentiation accounting for 11%, customer advantage 4.81%, and delivery speed 4.42%. Blancas and colleagues concentrated their research on proposing five solution groups to improve the reliability and performance of transportation, warehousing, and overall supply chain operations in Vietnam, both domestically and internationally. The five solution groups encompassed: (1) parallel modernization with customs system synchronization, (2) efforts to enhance transparency, (3) strengthening planning, management, and implementation of multimodal transport corridors, (4) emphasizing the development of road transport infrastructure, and (5) exploring and creating conditions for integration with other countries and territories. Although these reports did not provide an in-depth analysis of the entire logistics system in Vietnam, they focused on assessing the situation of various

¹ Academy of Finance

transportation modes such as road, air, rail, and maritime. They also evaluated the infrastructure of transportation in Vietnam systematically. Using the SWOT analysis method, these reports presented valuable insights and specific recommendations to address the slow development of the logistics infrastructure in Vietnam. Zhang and Lu employed the SWOT, PEST, Analytic Hierarchy Process (AHP), and functional models to examine and analyze the strengths and limitations of logistics capabilities in different regional countries. They proposed 12 criteria to evaluate the competitive capacity of the logistics industry in each country. These criteria consisted of seven fundamental factors, including geographical location, resource allocation, population distribution, legal system, human resources and education, infrastructure, climate and weather, and five advanced factors related to logistics service demand, the impact of logistics services on the economy, logistics services, service improvement capability, and future development potential.

Dinh Le Hai Ha (2013) employed a dialectical materialist and historical materialist approach, combined with desk and field research methods, to analyze and evaluate the development of the logistics system in Vietnam from 1986 to 2013. The analysis focused on mechanisms such as logistics policies and regulations, logistics infrastructure, and competitive environment. Logistics, a complex chain of activities involved in transferring of goods and information from producers to end-users, is influenced by various international regulations, practices, commitments, and national legal frameworks. These factors encompass international laws, regulations, customs, WTO commitments, bilateral agreements concerning logistics services, and national laws related to logistics services and operations. Bui Duy Linh (2018) surveyed 423 logistics companies operating in Vietnam to identify the factors impacting the competitive capacity of the country's logistics service industry. The research revealed six groups of factors influencing the competitive capacity of Vietnam's logistics service industry, including: (1) infrastructure development, (2) institutional framework, legal regulations, and logistics operations management, (3) quality of human resources in the logistics sector, (4) logistics costs, (5) efficiency of processes, procedures, and capabilities of logistics service providers, and (6) demand and development potential of logistics services. The study also emphasized the strong influence of human resource quality and the legal policy system on the competitive capacity of Vietnam's logistics industry in the context of deepening integration into the global economy.

Additionally, the research indicated that logistics costs and service quality factors had a relatively low level of impact. Nguyen Thi Tuyet Nga (2019) conducted a quantitative study using factor analysis and multiple regression analysis to examine the factors influencing the development of logistics companies in the Mekong Delta region. The survey data collected from 331 logistics companies operating in the region identified four factors impacting these businesses' development. These factors included: (1) local policy factors, (2) business environment factors, (3) capital factors, and (4) internal capacity factors. The quantitative analysis results indicated that the business environment and local policy factors significantly influenced the development potential of logistics companies. Internal capacity factors and capital were ranked third and fourth, respectively, in terms of their impact.

While the studies mentioned above provide valuable insights into the development and competitive capacity of Vietnam's logistics sector, there is a research gap regarding the specific topic of "factors influencing the quality of logistics services" in transportation companies within Hanoi city. The research topic "Factors influencing the Quality of Logistics Services in Transportation Companies in Hanoi" is distinct from the previously conducted studies and aims to build upon the existing research findings.

2. THEORETICAL FRAMEWORK

2.1. Theoretical basis of logistics service quality

2.1.1. Concept of service

There are different definitions of services, but overall they agree that a service is the "product of labor, not existing in intangible form, with simultaneous production and consumption to meet the needs of production and consumption." According to Philip Kotler, a service is "any action or result that one

party can provide to another and is mainly tangible, not leading to ownership rights. Its product may or may not be associated with a physical product.” In summary, a service is “products similar to goods but intangible. From an economic perspective, the essence of a service is the supply to meet needs, such as tourism services, fashion services, healthcare services... and to generate profits.”

2.1.2. Concepts and characteristics of logistics services

Logistics, a business concept that emerged in the 1950s, primarily stems from the increasing supply and transportation needs in a globalized world, requiring specialized professionals in this field. Logistics is “a part of the supply chain, encompassing all good-related activities, including packaging, transportation, warehousing, preservation, until the goods are delivered to the final consumer. Logistics is one of the post-production services, understood as the process of preparing goods, arranging, packaging, labeling, and preserving goods, transporting goods to ports, and handling customs procedures for exports or imports.”(Tao Thi Hai, 2020)

In 2005, during the 7th session of the 11th National Assembly of the Socialist Republic of Vietnam, the Commercial Law 2005 was passed, which provided specific provisions for the concept of logistics services: “Logistics services are commercial activities in which traders organize and perform one or more stages, including receiving goods, transportation, storage, warehousing, customs clearance procedures, other document procedures, customer consultation, packaging, labeling, delivery, or other related services related to goods, as agreed with customers for remuneration.”

A narrower definition group believes that “logistics services mainly focus on services related to goods. The concepts within this group all agree that the essence of logistics services is the collection of supporting factors for the transportation process of products from the place of production to the ultimate consumer. The most typical is the logistics concepts mentioned in Commercial Law 2005. However, the definition in Commercial Law 2005 is still open-ended. Specifically, in addition to systematically listing the aspects of the logistics concept, the Law still leaves open the possibility of including other services related to goods for future management purposes. The narrower definition group emphasizes the interconnectedness of various elements such as transportation, warehousing, storage, etc. Furthermore, logistics service providers do not differ significantly from multi-modal transportation service providers.”

2.1.3. Quality of logistics services

There are multiple perspectives on quality in different fields and for different purposes. However, an internationally recognized definition of quality is provided by the International Organization for Standardization (ISO). Quality is the degree to which a set of inherent characteristics fulfills requirements.

Service quality is a broad concept with various definitions depending on the type of service, but it is generally considered to be what customers perceive. Customers have different perceptions and individual needs, so their perception of service quality also varies.

According to Zeithaml & Bitner (2000), service is “actions, processes, or performances that produce desired outcomes for customers, satisfying their needs and expectations.” According to Kotler & Armstrong (2004), service is “activities or benefits that one party can offer to another, which are essentially intangible and do not result in ownership. Its production may or may not be tied to a physical product.” Thus, service quality is defined in various ways depending on the focus of the study. Understanding service quality is fundamental to implementing measures for improving the service quality of a logistics company. In the broadest sense, service quality is the level of customer satisfaction in the process of experiencing the service, encompassing the overall service provided by a business that brings a chain of benefits and fulfills the customers’ expected value in the activities of production, supply, and distribution of services.

2.2. Factors affecting the quality of logistics services

2.2.1. Subjective factors

a, The Price factor

Price is the factor that has the most influence on logistics service activities. Especially for customers using logistics services, the price is the basis for deciding whether to buy a product or not, should buy this product or another product. Compare prices on the comparison web for customers to see, and show the company's outstanding strengths compared to other companies in the same industry. In short, the company with good warranty policies, and high prices are still preferred by customers. The more competitive the price, the higher the quality of logistics services is appreciated. This price is formed based on: (1) Transportation cost: a cost that accounts for a large proportion from 1/3 to 2/3 of the total cost of circulation and distribution. Measures to reduce transportation costs include increasing the usability of means of transport by optimal design of products, and packaging of goods, initially increase the weight of the goods on the means of transport. (2) Opportunity cost of capital: the minimum rate of return that a business earns when capital is not invested in inventory but in other activities. The opportunity cost of capital depends on the interest rate payable on the loan, the amount of inventory, and the capital norm per unit of product. (3) Cost of goods preservation: Cost of goods preservation includes costs of warehouse rent, preservation, import and export of goods in and out of the warehouse, compensation for damaged goods, insurance costs for goods. (4) Estimated profit of the business.

b, The Time factor

Along with increasingly modern technology, time is becoming more and more important, requiring accurate time needs not only for any industry. Especially for logistics services - transportation and forwarding services, delivery time is also one of the factors that customers consider when choosing a shipping company to use the service. Order shipping time will include related issues such as: (1) Delivery on time as promised; (2) delivery on demand, or (3) timed delivery. Delivery time is fulfilled as committed if and only if the shipping unit has a quality transportation process. The stages are done together in a methodical way, closely linked, and problems that may arise are handled quickly and promptly.

c, The Safety factor of goods

Cargo safety is the ability to ensure the delivery of goods to the destination intact. A reputable shipping service always prioritizes the safety of your goods. At the same time, reputable logistics companies will have to have insurance contracts with strict terms to protect the interests of customers in case the goods are damaged in transit, except in the case of factors such as: objective as natural disasters. Therefore, the higher the safety of goods, the more customers appreciate that logistics service.

d, Elements of facilities

To develop a logistics business, companies need to ensure that the system of facilities is qualified to preserve goods in good quantity and quality. Develop a variety of facilities to meet the diverse import and export needs of customers. Transport company facilities may include: seaports, ICD ports, international container ships, inland vessels, warehouse systems, and trucks. In addition, there are management software systems and business processes.

e, The Customer care factor

To create a company with a foothold in the market, consulting customers is an important key, it is not only pre-programmed methods but also needs to be flexible and very ingenious and delicate in each situation. different cases. Therefore, in the process of exchanging information with customers, employees must always keep a positive attitude, guide and answer customers' questions quickly. Customer care service is all the care and support activities that businesses provide to customers before, during and after the

purchase process. The ultimate goal is to bring the best shopping experience to all customers regardless of gender or age. In fact, this is a special service aimed at all audiences from those who have, are or have never used the products and services of the transport company. Customer services in logistics is the additional service activities and actions that are provided, playing the role of added value. Therefore, the more attentive the customer services of the transport company, the more customers appreciate that logistics service.

f, Reliability factor

In the process of companies providing services to customers, major partners have created an impression of the brand's reputation by introducing VIP customers of the company to prove their prestige and quality and product availability. Owning famous and reputable customers will create a sense of peace of mind for new and regular customers in general. The supplier's reputation, reliability and professionalism is assessed through the company's capacity profile, clear and complete legal information and especially the services performed in accordance with commitments to customers. At the same time, the reviews of old customers also show the reputation of a freight transport unit that customers refer to before choosing. Therefore, the higher the reliability of logistics services, the more customers appreciate that logistics service.

g, Brand image element

The brand best represents all the achievements of the business. When businesses build a brand, it means creating a position in the hearts of customers. Customers know the brand and the business. Therefore, the brand is also the property of the business. Brand equity includes the values that the brand brings to customers, the community and society... Elements such as logos, slogans and logos of businesses, products/services also contribute to creating a brand. brand plays a significant role in the success of every business. Because these are factors that directly reach customers. The administrative customer is the one who identifies these values through their experiences with the brand. When a brand gives customers a positive experience, and the brand's recognition is large, the value of that brand is "positive". On the contrary, when customers have a bad experience when using the service, brand awareness is poor, which means that the brand's value is "negative".

2.2.2. The objective factors in Vietnam

Several objective factors in Vietnam impact the quality of logistics services. Firstly, the diverse geographical conditions pose challenges for transportation, with high mountains, the Mekong Delta, coastal areas, and islands. This necessitates appropriate transport solutions to ensure the smooth flow of goods and maintain the quality of logistics services.

Secondly, the legal environment plays a crucial role in logistics operations. Vietnam has customs clearance, transportation, safety, and environmental protection regulations. Complying with these regulations and legal standards is vital for providing high-quality logistics services.

Thirdly, the development of multimodal transport systems is a significant factor. Vietnam is actively working on enhancing infrastructure and expanding multimodal transportation, including rail, air, and sea. This development opens up new opportunities and improves the capacity for transporting goods.

Fourthly, the improvement of transport infrastructure is essential. Investments are being made to upgrade and build seaports, airports, roads, and railways. This infrastructure development ensures efficient cargo handling and reduces delivery times.

Lastly, information technology and telecommunications advancements are instrumental in managing and tracking freight. Utilizing logistics management information systems, tracking systems, and effective communication among stakeholders can significantly enhance the quality and efficiency of logistics services in Vietnam.

3. RESEARCH METHOD

3.1. Research model and research process

3.1.1. Research model

In the Company's Logistics service, customer satisfaction is an influencing factor in evaluating quality. From the analysis of the advantages and disadvantages of the models, as well as the quality of Logistics services of the Company, the author finds that Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021) are "models". The model is the most comprehensive and appropriate, the model has been analyzed to determine the service quality, the variables affecting the service provided by the company and the service factors related to the customer".



Figure 1. Research model

Source: Author's compilation

3.1.2. Research process

The research process goes through the following steps: Collecting and synthesizing research theories. With the collected data, the author will analyze and draw conclusions as well as propose appropriate solutions. Detailed process explanation:

Step 1: Identify the problem to research

Step 2: Identify information that needs to be collected: collect primary data through qualitative and quantitative research.

Step 3: Conduct qualitative research through in-depth interviews with experimental design, sample size $n = 15$ subjects.

Step 4: Based on the results of the above qualitative research, begin the quantitative research process by designing the questionnaire and the survey sample.

Step 5: Conduct preliminary quantitative research with sample size $n = 15$ subjects.

Step 6: Analyze preliminary data, edit the questionnaire.

Step 7: Conduct formal research by completing a questionnaire with samples size $n = 200$ subjects.

Step 8: Process and analyze data, draw cognitive maps

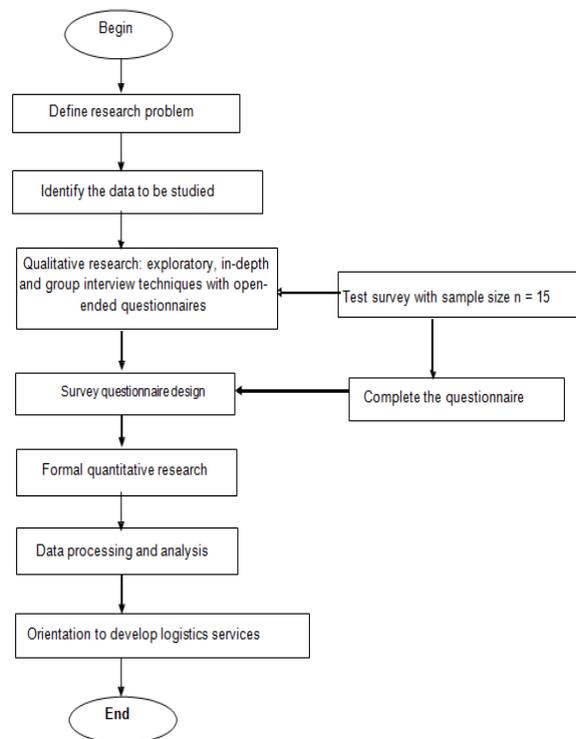


Figure 2. Research process

Source: Author's recommendation

3.2. Hypotheses

H1: The more competitive the price of logistics services, the higher the quality of logistics services is appreciated.

H2: The faster the delivery time, the higher the quality of logistics services is appreciated by customers.

H3: The higher the safety of goods, the higher the quality of logistics services is appreciated by customers.

H4: The better the customer services of the transport company, the better the quality of logistics services is appreciated by customers.

H5: The better the facilities of the transport company, the better the quality of logistics services is appreciated by customers.

H6: The higher the reliability for logistics services, the higher the quality of logistics services is appreciated by customers.

H7: The better the brand image of the transport company, the better the quality of logistics services is appreciated by customers.

3.3. Qualitative research and scale building

Qualitative research: From the research objective, the topic synthesizes relevant theoretical bases (background theory, research concepts and previous studies). On that basis, draft scales are the research model, hypotheses and observed variables measuring the research concept at this stage. The initial scales in the research model include the following:

- Price of logistics services;
- Delivery time;

- Safety of goods;
- Infrastructure of transportation company;
- Customer services;
- Reliability for logistics services;
- The Brand image of the transport company.

Concretize by 28 observed variables and 3 observed variables for the service quality scale of logistics companies. The author conducts qualitative research by designing a preliminary questionnaire, then conducting a direct survey of 15 experts. The research topic used secondary data which is the data in annual reports on business activities and personnel of commercial enterprises, manufacturing enterprises and forwarder companies operating in Hanoi.

3.4. Quantitative research

In this study, the sample is selected by convenience method, one of the non-probability sampling forms. According to the convenient sampling method, the subjects were selected with accessible elements (research subjects).

According to Hair et al. (1998), “To perform EFA factor analysis, the sample size applied in the study must be at least 5 times the total number of observed variables. For multivariable regression analysis: the minimum sample size to be obtained is calculated by the formula $50 + 8 * m$ (m is the number of independent variables)” (Tabachnick and Fidell, 1996). This study has 7 independent variables, so the minimum number of customers to conduct the survey is 106 votes. To ensure the level of representation, the author surveyed 230 votes. Due to the effectiveness of the online survey, the author will conduct an online survey, with 215 valid votes collected. Survey sample size for research: In order to ensure high feasibility in the survey, the selected sample will follow the convenient sampling method including 230 survey questionnaires conducted on individual customer groups, commercial enterprises, production enterprises and forwarder companies have been working, as well as using the services of companies in Hanoi. With the above procedure, this study completely meets the requirement of sample size for factor analysis.

The research questionnaire is designed in the form of a structured questionnaire. Criteria for the questionnaire: designed with a clear structure, correct spelling, grammar, concise sentences, easy to understand, and easy to answer (Nguyen Dinh Tho, 2011).

The main content of the questionnaire includes demographic information and variables measuring the following factors: Prices of logistics services; Delivery time; Safety of goods; Transport company facilities; Customer care; Reliability for logistics services; Transport company brand image.

3.5. Methods of data processing and analysis

Collected data are processed and analyzed by methods of synthesis, analysis, and comparison... on MS Excel and SPSS including Cronbach’s Alpha test, Exploratory Factor Analysis (EFA), % cumulative variance, and regression equation.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Reliability testing using Cronbach’s Alpha coefficient for the scales

Research results according to the results of testing the reliability of the scale, Cronbach’s Alpha coefficient of the factors: Price; Delivery time; Safety of goods; Infrastructure; Customer services; Reliability; Brand image is respectively: 0.875; 0.872; 0.948; 0.937; 0.948; 0.821; 0.915. Accordingly, all

have coefficients greater than 0.6; There are even factors with coefficients higher than 0.9, so these factors achieve high reliability, proving that these are good scales that can be used to assess the quality of logistics services in transportation service companies in Hanoi.

Table 1: Summary of the analysis results of reliability testing using Cronbach's Alpha coefficient

Ký hiệu	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
<i>Cronbach's Alpha Price of logistics services = 0,875</i>		
PL1	0,812	0,808
PL2	0,629	0,881
PL3	0,805	0,814
PL4	0,695	0,856
<i>Cronbach's Alpha Delivery time = 0,872</i>		
DT1	0,648	0,860
DT2	0,771	0,827
DT3	0,776	0,826
DT4	0,645	0,858
DT5	0,669	0,853
<i>Cronbach's Alpha Safety of goods = 0,948</i>		
SG1	0,870	0,932
SG2	0,865	0,934
SG3	0,884	0,928
SG4	0,875	0,931
<i>Cronbach's Alpha Infrastructure of transportation company = 0,937</i>		
IF1	0,820	0,924
IF2	0,808	0,927
IF3	0,807	0,927
IF4	0,828	0,923
IF5	0,892	0,911
<i>Cronbach's Alpha Customer services = 0,948</i>		
CS1	0,860	0,936
CS2	0,835	0,940
CS3	0,850	0,938
CS4	0,852	0,937
CS5	0,894	0,930
<i>Cronbach's Alpha Reliability of logistics services = 0,821</i>		
RL1	0,680	0,750
RL2	0,726	0,701
RL3	0,625	0,804
<i>Cronbach's Alpha Brand image of transportation company = 0,915</i>		

B11	0,844	.
B12	0,844	.

4.1.2. Exploratory Factor Analysis (EFA)

The KMO coefficient (Kaiser-Meyer-Olkin) of the group of independent variables is $0.810 > 0.5$. Therefore, a large KMO coefficient that is significant for factor analysis is appropriate.

Table 2: KMO and Bartlett's Test for Independent Variables

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.810
Bartlett's Test of Sphericity	Approx. Chi-Square	5578.904
	df	378
	Sig.	0.000

Source: SPSS

Besides, Bartlett test has statistical significance (Sig.) is 0 less than 0.05 to ensure the hypothesis that the variables are correlated with each other in the population;

Factor loading of all variables is greater than 0.5 to ensure that the values of observations have practical value in the study.

The cumulative variance percentage reached 80.479%, which is greater than 50%, indicating that the EFA model is appropriate. The Total Square Test reveals that the Component value stops at 7. This indicates that dividing the variables into groups is completely suitable. After conducting tests, it is observed that the component variables are similar within each group, and dividing them into 7 independent variables is reasonable. Therefore, we can proceed with the research without adjusting the model.

In conclusion, the exploratory factor analysis (EFA) conducted shows that all variables in the model meet the required standards and conditions for practical research.

4.1.3. Hypothesis testing

After running the model, the variables PL, DT, SG, CS, IF, RL, BI have Prob values of 0.000, 0.048, 0.000, 0.008, 0.178, 0.000, and 0.147 respectively. These Sig values are smaller than 0.05, indicating that at a significance level of 5%, the alternative hypotheses H1, H2, H3, H4, and H6 are accepted. This means there is sufficient evidence to conclude that Price of Logistics service, Delivery time, Safety of goods, Customer services, and Reliability of Logistics service have a positive impact on Service quality in logistics.

Discovered from the study, we see that only 1 group has a positive effect on the dependent variable.

4.1.3. Regression equation

The Coefficients table provides us with the results of the t-test to evaluate the significance of regression coefficients, the VIF (Variance Inflation Factor) index to assess multicollinearity, and the regression coefficients themselves. Based on the evaluation results, we can observe that all variables in the model have sig values for the T-test less than 0.05. This implies that at a significance level of 5%, the null hypothesis (Ho) for these hypotheses is rejected, and the alternative hypothesis (H1) is accepted.

The intercept coefficient (C) having a negative value indicates that there is always a constant (random factor) with a negative effect on the Quality of logistics services in transportation companies in Hanoi, regardless of the variations in the studied factors.

Table 3: Summarize regression coefficients of coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.230	.302		-.762	.447		
PL	.377	.046	.421	8.194	.000	.765	1.307
DT	.150	.075	.102	1.989	.048	.759	1.317
SG	.307	.046	.325	6.688	.000	.853	1.172
CS	.112	.042	.126	2.688	.008	.919	1.088
IF	.055	.041	.063	1.351	.178	.933	1.072
RL	.223	.049	.244	4.579	.000	.712	1.405
BI	-.058	.040	-.073	-1.457	.147	.806	1.240

Source: SPSS

Adjusted R Square are used to evaluate the goodness-of-fit of a regression model. The model summary table provides these values to assess the model’s appropriateness. In this case, the Adjusted R Square value of 0.569 indicates that the independent variables included in the regression analysis account for 56.9% of the variance in the dependent variable. The remaining 43.1% is attributed to factors outside the model and random error.

Table 4: Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate
.583	.569	.5335258

Source: SPSS

The model explains 56.9% of the impact of the variable “Quality of logistics services” in transportation companies in Hanoi. According to the author’s evaluation, this is a relatively high percentage in experimental research.

From the regression coefficients, constructing the equation:

$$QL = 0,421 * PL + 0,102 * DT + 0,325 * SG + 0,126 * CS + 0,244 * RL + \epsilon$$

Table 5: Summary of influencing factors

Factors	Impact coefficient (Beta coefficient)	Impact
Positive influence		
Price of Logistics service	0,421	The greatest impact
Safety of goods	0,325	The second greatest impact
Reliability of Logistics service	0,244	The third greatest impact
Customer services	0,126	The fourth greatest impact
Delivery time	0,102	The least great impact

Source: Author’s compilation

4.1.4. Violations of assumptions in regression analysis testing

The standardized residual histogram is used to test the assumption of normality in the distribution of residuals. $Mean = -2,9$, $E - S = -2,9$, $SD = 0,984$, the mean value is close to 0, and the standard deviation is approximately 0.984, which is close to 1. Therefore, it can be concluded that the distribution of residuals approximates a normal distribution, and the assumption of normality is not violated for the residuals.

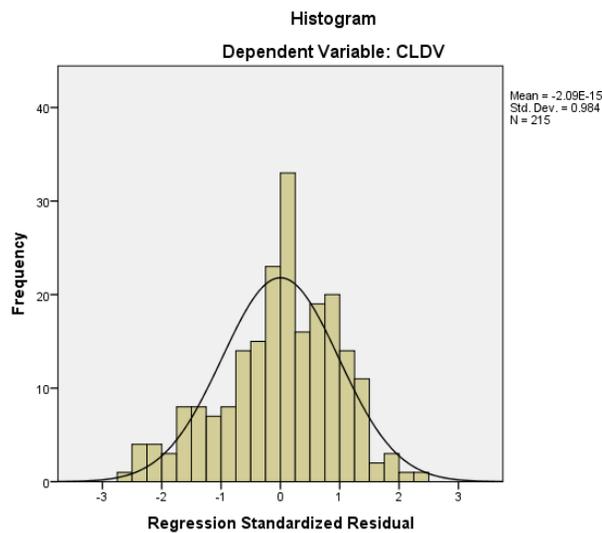


Table 6: Normalized Residual Frequency Test Histogram

Source: SPSS

4.2. Discussing research results

Research has identified the factors influencing the quality of logistics services in transportation companies in Hanoi, including: the price of logistics services, the safety of goods, the reliability of logistics services, customer services, and delivery time.

4.2.1. Price of logistics services

Price is the “most influential factor in logistics service operations. Price stimulates consumer purchasing desires. Comparing prices with other businesses in the same industry shows customers the outstanding strengths of the company compared to other companies in the sector. Even with higher prices, customers still prioritize companies with good warranty policies.”

4.2.2. Safety of goods

Ensuring the safety of goods during transportation is crucial for logistics service providers. Establishing a reputation by showcasing important customers and demonstrating credibility, quality, and the ability to supply products contributes to building trust among customers, both new and existing.

4.2.3. Reliability of Logistics services

In terms of reliability, during the process of providing services to customers, large partners have “created an impression of brand reputation by introducing important customers of the company to demonstrate credibility, quality, and the ability to supply products. Owning reputable and trustworthy customers will provide a sense of security for both new and existing customers.”

4.2.4. Customer services

Regarding customer services, building “a team of experienced and enthusiastic staff who can address customer inquiries, ensure customer information security, and provide timely updates on transportation progress and specific shipment schedules through 4.0 technology software.”

4.2.5. Delivery

Ensuring the timely delivery of goods is crucial for logistics service providers. Having a wide range of well-equipped warehouses that can store goods in sufficient quantity and quality is important. Developing diverse types of warehouses allows for meeting the diverse import-export demands of customers.

A brand can maintain a lasting impression in customers' minds when it is associated with good service quality. Service quality is the most important factor in ensuring brand credibility. To achieve this, companies need to recruit highly skilled personnel, regularly organize professional training sessions to improve expertise, update the latest documents, and address issues with customs and customers. To develop logistics business operations, companies need to "ensure a wide range of warehouses with sufficient conditions for good storage in terms of quantity and quality. Develop various types of warehouses to meet the diverse import-export needs of customers."

In summary, the logistics business system in Hanoi has made positive contributions to economic development, with a rapid increase in the number and business capacity of logistics companies. The human resources of these companies have gradually improved over time. However, there are still limitations and challenges faced by logistics companies in Hanoi. These include small-scale operations, limited capital, technology, and human resources. These companies often play a role as simple satellite service providers, focusing on tasks such as customs procedures, vehicle rentals, and storage facilities, with limited value-added activities. They engage in minimal value-added activities at warehouses, primarily involved in buying and selling freight charges for sea and air transport, acting as customs declaration agents, and providing trucking services. The underlying reasons for these limitations can be attributed to various factors. There is still limited awareness of logistics in Vietnam, both at the central and local government levels, as well as within industries and businesses. The capacity of logistics companies in Vietnam lags many other countries in the region. Furthermore, there is insufficient emphasis on training and developing human resources to serve logistics companies.

5. CONCLUSION

Research has identified factors that influence the quality of logistics services in transportation companies in Hanoi, including: the price of logistics services, the safety of goods, the reliability of logistics services, customer services and delivery time.

5.1. Summary of research results

In summary, the logistics business system in Hanoi has made positive contributions to economic development, with logistics companies rapidly increasing in number and business capacity, and the workforce in logistics enterprises gradually improving. However, there are still limitations of logistics companies in Hanoi, such as small scale, limited capital, technology, and human resources. These companies often play the role of simple service providers, such as customs procedures, vehicle rental, and warehousing, with limited value-added activities at the warehouse, primarily focusing on buying and selling shipping and airfreight rates, customs brokerage, and trucking services. The underlying causes can be attributed to the following factors: limited awareness of logistics in Vietnam, from central to local government agencies and within industries and businesses; the capabilities of logistics companies in Vietnam are still significantly lower compared to many countries in the region; insufficient emphasis on training and developing human resources to serve in logistics companies.

5.2. Limitations and Future Research

5.2.1. Limitations

Research has made significant positive contributions to companies in understanding customers and identifying factors that impact the quality of logistics services. However, it is important to note the limitations

of the research in terms of time, budget, human resources, and supporting tools. The sampling method used in the study was convenient, which may affect the representativeness of the sample in the overall population.

Furthermore, the identified factors influencing the quality of logistics services may only apply to small-scale enterprise contexts. The research has primarily focused on internal factors that influence the quality of logistics services within the company. Moreover, the research project employed measurement scales and validated the research model using techniques such as reliability analysis, exploratory factor analysis, and multiple linear regression analysis.

It is essential to acknowledge these limitations and consider them when interpreting the findings and applying them to practical scenarios. Future research should aim to address these limitations by utilizing more robust sampling methods, expanding the scope to include larger companies, exploring external factors, and employing a wider range of statistical techniques for analysis.

5.2.2. Future Research

Despite the significant contributions of the study and its important findings, given the limitations of the study, the authors suggest several future research:

Firstly, the study will strive to achieve a larger sample size by surveying all customers currently utilizing the company's services. By including a more extensive range of participants, the research intends to enhance the representativeness of the findings and improve the generalizability of the results.

Secondly, the research will adopt a holistic approach, focusing on studying the overall landscape of logistics businesses. Instead of solely examining small-scale enterprises, the study will encompass companies of varying sizes. This broader perspective will provide a more comprehensive understanding of the factors influencing the quality of logistics services within the industry.

Thirdly, the research will expand its scope by incorporating additional external environmental factors that impact the quality of logistics services in the company. These factors may include market conditions, regulatory frameworks, competitive dynamics, technological advancements, and customer expectations. By considering these external elements, the study aims to provide a more comprehensive analysis of the determinants of logistics service quality.

Lastly, the research will utilize Structural Equation Modeling (SEM) as a statistical tool to examine the research model and derive more nuanced results. SEM offers a comprehensive framework for evaluating the relationships between variables and enables a deeper understanding of the interdependencies among different factors influencing logistics service quality. By employing SEM, the researcher aims to assess both direct and indirect effects and gain a more comprehensive understanding of the complex dynamics within the model.

6. APPENDIX

Table: Scales of research

	Scale of research	Source
	Price of Logistics services (PL)	
PL1	Competitive price: The logistics service prices of the company are competitive compared to the market.	Irene Gil Saura, David Servera Frances, Gloria Berenguer Contri and Maria Fuentes Blasco (2008); Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
PL2	Flexible pricing: The logistics service prices of the company are adjusted flexibly according to the fluctuations in the economy and the industry.	
PL3	Price information is constantly updated: The company always updates and provides comprehensive and timely information about the prices of logistics services.	
PL4	Specific prices, a clear and detailed listing of services: The company provides clear and detailed information about the specific prices of different types of services.	
	Delivery time (DT)	

DT1	Fast delivery time	Irene Gil Saura, David Servera Frances, Gloria Berenguer Contri and Maria Fuentes Blasco (2008); Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
DT2	Always deliver on time	
DT3	Commitment in delivery	
DT4	Handling goods to arrive at the fastest destination	
DT5	Resolve quickly on delivery time	
	Safety of goods (SG)	
SG1	When a loss occurs, companies immediately notify customers of the situation.	Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
SG2	Ensure compliance with packing and shipping regulations.	
SG3	Good preservation of goods in the process of loading and unloading, moving must be gentle, avoiding collisions, breakage, distortion of cartons.	
SG4	Advice on buying insurance for goods during transportation.	
	Customer services (CS)	
CS1	Strong staff with experience and enthusiasm.	Irene Gil Saura, David Servera Frances, Gloria Berenguer Contri and Maria Fuentes Blasco (2008); Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
CS2	The staff is flexible and very skillful, delicate in each different case.	
CS3	Staff need to explain more details about import and export procedures	
CS4	Create close relationships with customers. There are preferential policies for customers. The policy of giving gifts on holidays, birthdays, to improve relationships.	
CS5	Build a customer information base.	
	The Infrastructure of transportation company (IF)	
IF1	Large warehouse system, warehouses are qualified to preserve goods in good quantity and quality.	Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
IF2	Companies have their own restrooms for customers while waiting for procedures from the company.	
IF3	The company has forklifts, new trucks and containers to ensure the safety of goods	
IF4	The company has advanced and modern electronic equipment to meet the development speed of Logistics services	
IF5	Using ERP software in delivery management - freight forwarding, data standardization	
	Reliability for Logistics services (RL)	
RL1	The companies give the best advice to customers to go the fast and economical way.	Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
RL2	Guarantee for the products and services provided by the company will not encounter errors, damage or problems during use.	
RL3	Companies must control and minimize risks during cooperation.	
	Brand image of transportation company (BI)	
BI1	The promotion strategy is suitable for each time and at a cost appropriate to the company's capacity.	Nguyen Thanh Binh, Le Cong Doan, Mai Thanh Hung (2021)
BI2	Logo stands out and makes a great impression on customers' eyes.	
	Quality of Logistics services (QL)	
QL1	Are you satisfied with the service quality of the logistics company?	
QL2	Continue to use logistics company services	
QL3	Introduce friends, relatives	

Source: Author's compilation

Descriptive statistics analysis

Name of category	Items	Frequency (number of people)	Percentage(%)
Gender	Male	140	65.12
	Female	75	34.88

Age group	22 -> 30 years old	50	23.26
	30 -> 40 years old	115	53.49
	40 -> 50 years old	45	20.93
	Over 50 years old	5	2.33
Academic level	Under the university	15	6.98
	University	160	74.42
	Graduate	40	18.6
Work experience	0 -> 3 years	30	3,306
	3 -> 10 years	105	48.84
	10 -> 20 years	70	32.56
	20 years or more	10	4.65

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.383	22.797	22.797	6.383	22.797	22.797
2	4.169	14.888	37.685	4.169	14.888	37.685
3	3.723	13.298	50.983	3.723	13.298	50.983
4	2.839	10.138	61.121	2.839	10.138	61.121
5	2.43	8.678	69.799	2.43	8.678	69.799
6	1.836	6.557	76.355	1.836	6.557	76.355
7	1.155	4.124	80.479	1.155	4.124	80.479
8	0.879	3.139	83.618			
9	0.514	1.837	85.455			
10	0.458	1.636	87.091			
11	0.407	1.455	88.545			
12	0.342	1.222	89.767			
13	0.312	1.113	90.88			
14	0.285	1.016	91.896			
15	0.259	0.924	92.821			
16	0.249	0.889	93.71			
17	0.23	0.822	94.531			
18	0.219	0.783	95.314			
19	0.193	0.689	96.003			
20	0.187	0.669	96.672			
21	0.168	0.601	97.272			
22	0.152	0.541	97.814			
23	0.141	0.502	98.316			
24	0.135	0.482	98.798			
25	0.125	0.447	99.245			
26	0.113	0.405	99.65			
27	0.093	0.333	99.983			
28	0.005	0.017	100			

	Rotated Component Matrix						
	1	2	3	4	5	6	7
CS5	0,932						
CS4	0,903						
CS1	0,899						
CS3	0,894						
CS2	0,882						
IF5		0,928					
IF4		0,888					
IF1		0,880					
IF2		0,873					
IF3		0,865					
SG4			0,918				
SG2			0,908				
SG1			0,907				
SG3			0,903				
DT3				0,899			
DT2				0,896			
DT5				0,740			
DT4				0,723			
DT1				0,608			
PL4					0,874		
PL3					0,866		
PL1					0,845		
PL2					0,704		
RL2						0,883	
RL3						0,771	
RL1						0,748	
BI1							0,921
BI2							0,913

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ASYMMETRIC INFORMATION AND HERDING BEHAVIOR: AN EMPIRICAL ANALYSIS FROM VIETNAM

Author: Chau Thuan Phat¹, Tran Mai Linh, Vy Gia Huy², Nguyen Pham Ngoc Dung²

Mentor: Nguyen Thu Hang², Nguyen Thi Nhu Hao²

ABSTRACT: This research examines the impact of information asymmetry on herding behavior among investors in the Vietnamese stock market. We investigate this relationship at three levels: aggregate market level, investor level, and firm level. First, at the aggregate market level, our evidence suggests that decrease of asymmetric information resulting from the issuance of a new regulation - Circular 155/2015/TT-BTC can reduce the intensity of herding due to a decrease in non-information-based intentional herding and the losing popularity of momentum trading. Second, at the investor level, the study finds evidence of asymmetric herding between arbitrageurs and noise traders. Herding among arbitrageurs and noise traders is also found to significantly decrease following the issuance of the new regulation. Finally, at the firm level, herding intensity is higher between stocks with higher levels of information asymmetry, such as those with lower market capitalization, heavier tails in their return distribution, and higher idiosyncratic risk variance ratios.

Keywords: stock market, herding behavior, Circular 155/2015/TT-BTC, information environment, asymmetric information, regulation.

SENTIMENT ANALYSIS ON VIETNAMESE CONSUMER REVIEWS OF ONLINE FASHION PRODUCTS USING NEURAL NETWORK

Author: Mai Nu Song Ngan³, Nguyen Thanh Tam⁴, Hoang Nu Thanh Tuyen⁴

Mentor: Vuong Thi Thao Binh⁴

ABSTRACT: The application of artificial intelligence (AI) in business operations is an inevitable trend in the current industrial revolution era. Online ratings and reviews provided by customers can offer valuable insights to businesses about how their products are being received in the market. For online fashion products, there are thousands of customer reviews, so it is necessary to use advanced methods to classify customer sentiments. However, research on applying machine learning (ML) models to classify customer reviews has mostly focused on English e-commerce platforms. This study aims to apply machine learning models to a Vietnamese e-commerce platform. The study applied three models: Multilayer Perceptron (MLP), Long Short-Term Memory Recurrent Neural Network (LSTM-RNN), and Convolutional Neural Network (CNN) to classify opinions and online comments into positive and negative categories. The research results showed that all three models performed well in analyzing online consumer sentiments with relatively high accuracy rates: 88.49%, 87.87%, and 87.74% respectively. Additionally, the study focused on natural language processing (NLP) methods, including data cleaning, preprocessing, and language representation. This process is considered challenging, particularly for the complex grammar of the Vietnamese language.

Keywords: Sentiment analysis; neural network; natural language processing; Vietnamese language, multilayer perceptron, long short-term memory recurrent neural network, convolution neural network.

¹ Foreign Trade University; Email: k60.2113343022@ftu.edu.vn

² Foreign Trade University

³ Foreign Trade University; Email: mnsongngan@gmail.com

⁴ Foreign Trade University

EMPLOYEE WELFARE AND STOCK PRICE CRASH RISK: AN EMPIRICAL EVIDENCE FROM VIETNAM

**Author: Nguyen Phan Hoang Minh¹, Tran Gia Bao, Pham Hoang Duy²,
Vo Pham Anh Khoa², Nguyen Khoa Nguyen²
Mentor: Nguyen Thu Hang², Le Thi Thu²**

ABSTRACT: *This research aims to analyze employee welfare's impact on the future stock price crash risk of listed firms on HOSE in Vietnam. Drawing on the stakeholder, resource-based, and agency theories, our findings indicate that firms which prioritize employee welfare are associated with a lower risk of stock price crashes, potentially due to the improved reputation they gain by enhancing their employees' well-being and reducing the potential for internal dissent or organized protests. Furthermore, employee-friendly firms with transparency in information disclosure provide value addition from the stakeholder's point of view.*

Keywords: *employee welfare, stock price crash risk, Vietnam.*

1. INTRODUCTION

The current economic landscape has witnessed considerable ups and downs over the past decade, marked by significant fluctuations such as the 2008 financial crisis, the 2020 COVID-19 pandemic-induced crash, and the 2023 Silicon Valley Bank's bankruptcy. Vietnam, in recent years, has also experienced some major stock market crashes connected to the activities of FLC Group and Novaland Group. These unfavorable events not only lead to an immediate loss of investors' wealth and reduce their willingness to invest, but also pose a threat to the sustainable and healthy growth of the real economy (L. Wang et al., 2021). Past research has pinned down two major causes of stock price crash risk. Using the framework of agency theory, researchers have explained stock price crash risk as due to poor corporate governance, incentivizing bad news hoarding (Jin and Myers, 2006; Kothari et al., 2009; Hutton et al., 2009). Alternatively, other scholars, such as Hong and Stein (2003) have linked stock price crash risk to factors such as investor heterogeneity and short-sale constraints. Another branch of studies on the causes of stock price crash risk, receiving less attention than others, though arguably being just as important, is the employee welfare of the company.

Employees are considered one of the most valuable strategic assets of organizations (Gabčanová, 2011), simultaneously serving as the backbone of a company, and generating value for firms. Prior research has yielded contradictory results with regard to how employee welfare can influence the risk of a stock price crash. According to the stakeholder and resource-based theories, companies that disclose their employee-related practices are fulfilling the expectations of their stakeholders by demonstrating their commitment to achieving sustainable outcomes in the short and long term. As a result, stakeholder trust increases, which ultimately leads to stock price stability and reduced risk of stock price crashes. On the other hand, the agency theory contends that a heightened level of employee welfare may be an outcome of the agency problem and exacerbate crash risk. Specifically, expectation to maintain a firm's reputation as well as concerns about their future prospects can cause managers to misuse employee welfare to hide and hoard bad news. When the accumulated detrimental information reaches a particular threshold, bad news finds its way to the general market which results in a crash in stock price. Given the lack of consensus in the

¹ Foreign Trade University; Email: k60.2112343046@ftu.edu.vn

² Foreign Trade University

literature regarding the relationship between employee welfare and stock price crash risk, we aim to fill this gap within the context of the Vietnamese stock market.

The Vietnamese stock market emerges to be an ideal destination to explore the relationship between employee welfare disclosure and stock price crash risk. First, the stock market in Vietnam has been highly volatile over the past few years, stemming from investors' cautious sentiment in the face of uncertainties and a less positive outlook for the country's institutional quality. Specifically, the weak institutional framework in emerging markets like Vietnam is an important factor which induces higher stock price crash risk (Vo, 2020). A prominent research by Morck et al. (2000) states that low institutional quality and weak property protection environment deter informed trading and hence avert firm-specific information from being integrated into stock prices and delivered to public investors (Chan and Hameed, 2006). **Second**, many Vietnamese businesses do not yet view the implementation of welfare policies as a crucial aspect of their responsibility towards their workers. Despite numerous state directives from the Party and State aimed at improving the welfare of workers and members, such as the 2016 Resolution No.7c on "The quality of meal for shift workers", "Tet get-together", a considerable number of enterprises still neglect their obligation to ensure the well-being of their employees (Vu Hong Quang, 2019)¹. If a current employer fails to check the boxes their employees are looking for, they run the risk of people leaving for better working situations as well as more progressive companies. **Third**, at present, there exists large differences in the degree of information disclosure among listed firms, with varying levels between large and small firms. Despite the implementation of Circular 155/2015, which prescribes the content of information disclosure on the stock market, many enterprises still have not dutifully carried out the disclosure of information. Notably, this inconsistency in information disclosure is evident in areas that concern labor-related issues, where many small firms deliberately withhold or inadequately report information about employee welfare due to their apprehension towards potential negative reactions from investors, which could lead to a detrimental impact on their stock prices.

In this paper, we examine the relationship between employee welfare disclosure and stock price crash risk of Vietnamese listed firms. We find that firms with better employee welfare disclosures have lower stock price crash risk. Specifically, among the variables representing employee welfare, the variable LABORPOLICY describing disclosure of policies ensuring employees' health, safety and welfare statistically and economically indicate that disclosure of employee welfare policies reduce stock price crash risk.

2. THEORETICAL FRAMEWORK

2.1. Definition of crash risk

Over the years, the definition of stock crash risk has evolved, with different viewpoints arising. In 2001, Chen et al. publicized a well-known description of crash risk as the negative conditional skewness of the return distribution for individual stocks. Acknowledging the significance of crash risk in financial markets, especially after recent fluctuations in the world, numerous researchers have attempted to forecast it using many explanatory variables and theories. The two most popular ways to interpret crash risk are investors' heterogeneity by Hong and Stein (2003) and the agency theory framework by Jin and Myers (2006).

Hong and Stein (2003)'s study proposes that investors' heterogeneity with short-sale constraint policy can cause a stock crash. The result reveals that when there are short-sale constraints in the market, which prohibit investors from holding short positions and could only hold long stock positions, different investor opinions can cause the stock to crash. Jin and Myers (2006) states that managers of companies tend to hide bad news from the market for an extended period to pursue their agenda. This behavior involves

¹ Yên T. (2019, January 26). Thước đo năng suất lao động - Báo Đại biểu Nhân dân. Báo Đại Biểu Nhân Dân.

covering up the company's intrinsic value by intentionally using vague, ambiguous, or unclear information in financial statements and using opaque reporting systems (Kothari et al., 2009).

Hutton et al. (2009) and Kothari et al. (2009) point out that when the manager successfully blocks negative information from releasing into the market can lead to asymmetry distribution of stock return. When the accumulated destructive information reaches a particular threshold, and the manager cannot hold it anymore, bad news finds its way to the market which results in a significant crash in stock price.

2.2. Hypothesis development

2.2.1. *Why employee welfare might decrease stock price crash risk*

According to the stakeholder theory, a firm should make decisions that serve the interests of all its stakeholders, not just its shareholders (Preston and Sapienza, 1990). In business, a stakeholder is considered as a group or individual who can significantly influence or can be influenced by a firm's objectives (Freeman, 2010). A firm's employees, instrumental in increasing the level of customer satisfaction and loyalty, are seen as one of six "primary stakeholder" groups that the firm depends on for their survival and continued success (Krekel, Ward and De Neve, 2019). As a stakeholder group, employees and how they are treated can also influence firm performance. Firms investing in employee-friendly practices can benefit from higher stock market performance (Goetzel et al., 2016) and lower stock price crash risk (Xixiong et al., 2022).

Meanwhile, the resource-based theory is a management theory that suggests that a company's resources are the key to achieving a sustainable competitive advantage (Barney, 1991). Two key concepts of the resource-based theory are resource and capability. A resource or capability must be scarce, valuable and cannot be imitated, acquired or replaced by rival companies in order to be able to generate competitive advantages. The competitive advantage could rapidly disappear when another enterprise owns or develops those strategic resources (Olalla, 1999). Considering the resource-based theory, it is clear that employees - scarce, valuable, hard to imitate and non-replaceable - are valuable resources that can create a competitive advantage for a company.

Both the stakeholder and resource-based theory show that firms have motivation to improve employee welfare. In the context of the stakeholder theory, firms tend to improve employee welfare to maximize the utility for all its stakeholders. Meanwhile, the resource-based theory states that as employees are an important strategic resource, firms are likely to commit to improving employee welfare to create capabilities that lead to competitive advantage. Adopting these strategies result in the following benefits for the firm:

First, employee welfare reflects the efforts that a firm is willing to go to for the betterment of its labor force's well-being and job satisfaction. Firms that look out for the needs of its employees can be seen by stockholders as well-managed and may enjoy better reputation from both within the company and outside perspective (Ben-Nasr and Ghouma, 2018). Second, it is also a widely accepted belief that higher employee satisfaction reduces the chance of organized protests happening and internal dissent. Disgruntled employees might be compelled to organize strikes resulting in firms having to increase their employees' salaries in addition to paying the shutdown and upkeep costs incurred during strikes (Lee, 2017). Mitigating any possible strike will result in more stable stock prices and lower crash risks, therefore it is favorable for managers to enact welfare programs to satisfy employees' needs (Ben-Nasr and Ghouma, 2018). Third, it can be argued that employee-friendly firms with transparency in terms of information disclosure provide value addition from the stakeholder's point of view. Managers are thus incentivized to develop effective mechanisms for stakeholders' engagement to enhance their firm's value and curb bad news hoarding activities (Li and Zhang, 2020). Using the stakeholder theory framework, improving stakeholders' relations through the implementation of employee-friendly practices might help reduce stock price crash risk (Xixiong et al., 2022). The implementation of such practices as well as the disclosure of relevant information is beneficial because they serve as indicators of good faith towards its stakeholders.

Based on the above analysis, we propose the following hypothesis:

H1: Firms with higher levels of employee welfare tend to have lower stock price crash risk.

2.2.2. Why employee welfare might increase stock price crash risk

In corporate finance, the agency dilemma states that there are conflicts of interests between the principal stakeholders and their agents. Agents are hired by the principals to execute transactions on their behalf and to maximize their profits. However, due to the information asymmetry between the outside investors and the inside managers, agents tend to further their own agendas at the expense of their principals' interests (Ben-Nasr and Ghouma, 2018).

To resolve the agency problem, stakeholders may utilize additional internal incentives offered to any manager acting in a way that aligns with their goals. One such incentive is to link the managers with the principals' financial performance through profit-sharing. A consequence of this method however, is that it incentivizes managers to hide any bad news that might adversely affect their clients' stock price and, by extension, their compensation. To achieve this, agents engage in "hidden actions" (activities not valued by the principal) using deceptive maneuvers, one of which is through generous employee welfare (Friedman, 2007). Another proposed solution is more disclosure of information to reduce information asymmetry. With the growing link between CSR and stock price crash risk (Kim et al., 2014), stakeholders might require reports relating to employee treatment in addition to traditional financial statements. However, without sufficient transparency and corporate governance, even such reports might be manipulated by managers to divert shareholders' attention and sustain their bad news hoarding activities (K. T. Wang et al., 2021). This corporate misbehavior is detrimental to firm performance as research into crash risk has reached the consensus that, using the agency theory framework, bad news hoarding activities are linked to a higher probability of crash risk (Li and Zhang, 2020). When the managers can no longer hide the stockpiled bad news, the firm's accumulated negative information is released to the public, which causes a stock price crash.

Despite the problem posed by their actions, there are many reasons that encourage managers to hide bad news as long as possible. One of which is the cash flow they obtain is reduced for any bad news received by investors (Jin and Myers, 2006) which leads to uncertainties about their income and career opportunities. Another reason why managers delay bad news is that managers gamble on subsequent corporate events to materialize, one of which might improve the firm's status and allow them to either "bury" the bad news indefinitely or to reveal the bad news at a better time (Kothari et al., 2009). Furthermore, expectation from both the public and stakeholders might also affect a manager's decision to hoard bad news. Under pressure to maintain the firm's reputation, managers attempt to actively manipulate CSR information to meet the public's expectations (Dai et al., 2019).

It is for all the reasons mentioned above that higher levels of employee wellbeing do not necessarily translate to better firm performance. Bowen et al. (2010) find that employees who receive better incentives are less likely to report any financial wrongdoing in their firms to the public. Therefore, it is in the managers' interests to provide their staff with generous welfare programs in order to curtail the likelihood of their employees reporting their misconduct. Similarly, in the hands of a nefarious manager, CSR can also be exploited to divert shareholder scrutiny. For the furtherment of their careers, managers may even adopt socially responsible measures to cover up corporate misbehavior (Kim et al., 2014) or to fulfill their personal agendas (Hemingway and Maclagan, 2004). A high level of transparency in information disclosure helps reduce stock price crash risk, but intentional opaqueness in CSR reports can be used as a self-interested tool for managers to mask their unethical behavior (Dai et al., 2019).

Based on the above analysis, we propose the following hypothesis:

H2: Firms with higher levels of employee welfare tend to have higher stock price crash risk.

3. RESEARCH METHOD

3.1. Model specification

To test our hypothesis, we use the following model:

$$CRASHRISK_{t+1,i} = \beta_0 + \beta_1 EMWELFARE_{t,i} + \beta_2 CRASHRISK_{t,i} + \sum_c \beta_c CONTROL_{t,i}^c + \varepsilon_{t,i} \quad (1)$$

The regression model utilizes subscripts *i* and *t* to refer to stock *i* and year *t*, respectively. Following Chen et al. (2001), we measure the dependent variable $CRASHRISK_{t+1,i}$, which represents the price crash risk of stock *i* in year *t*+1 through two variables $NCSKEW_{t+1,i}$ and $DUVOL_{t+1,i}$. $EMWELFARE_{t,i}$ is shown using two proxy variables EMSCORE and DEMP.

In terms of control variables, in order to measure the effect of the stock price crash on the previous year on this year's crash, we utilize lagged variables of the dependent variable $CRASHRISK_t$ based on two variables $NCSKEW_{t,i}$ and $DUVOL_{t,i}$. Those lagged variables help us evaluate the impact of the previous year's price crash risk on the current year's price crash risk. Additionally, $CONTROL_{t,i}$ comprises a set of control variables on prior studies by Hutton et al. (2009) and Kim et al. (2014); the number of control variables used in the model is denoted by *c*.

3.1.1. Measures of stock price crash risk

To assess firm-specific crash risk, we follow the study of Chen et al. (2001), which measures firm-specific weekly return as the residuals from the market model; this helps us to separate the crash risk that is affected by firm-specific factors from the broad market movement. We estimate firm-specific weekly returns based on the following equation:

$$r_{j,t} = \alpha_1 + \beta_{1,j} r_{m,t-2} + \beta_{2,j} r_{m,t-1} + \beta_{3,j} r_{m,t} + \beta_{4,j} r_{m,t+1} + \beta_{5,j} r_{m,t+2} + \varepsilon_{j,t} \quad (2)$$

Where $r_{j,t}$ is the stock return on firm *j* at week *t*, and $r_{m,t}$ is the return on the value-weighted market index at week *t*, and $\varepsilon_{j,t}$ is an error term. Regarding non-synchronous trading, we included the lag and lead terms for the market index return. After that, we calculate firm-specific weekly returns for firm *j* in week *t* as the natural logarithm of one plus the residual from the equation above.

We measure two stock price crash risk proxies for empirical analysis: (1) NCSKEW, the negative conditional skewness; and (2) DUVOL, the down-to-up volatility. NCSKEW is calculated by taking the negative of the third moment of firm-specific weekly returns for each year and normalizing it by the standard deviation of firm-specific weekly returns raised to the third power. Specifically, for each firm *j* in year *t*, NCSKEW is calculated as shown in equation (3):

$$NCSKEW_{j,t} = -[n(n-1)^{\frac{3}{2}} \sum W_{j,t}^3] / [(n-1)(n-2)(\sum W_{j,t}^2)^{3/2}] \quad (3)$$

Where $W_{j,t}$ is firm-specific weekly return as defined above, and *n* is the number of weekly returns during year *t*. A negative sign is put in front of the third moment such that a higher value of NCSKEW indicates higher crash risk.

Our second measure of crash risk is the down-to-up volatility measure (DUVOL), measuring the likelihood of a crash shown in. Before calculating DUVOL for each firm *j* over a fiscal-year period *t*, we separate the firm-specific weekly returns into two groups: 'down' weeks when the returns are below the annual mean and 'up' weeks when the returns are above the annual mean. We separately calculate the standard deviation of firm-specific weekly returns based on these two groups. DUVOL is depicted as the natural logarithm of the ratio of the standard deviation in the "down" weeks to the standard deviation in the "up" weeks.

$$DUVOL_{j,t} = \log ((n_u - 1) \sum_{DOWN} W_{j,t}^2 / (n_d - 1) \sum_{UP} W_{j,t}^2) \quad (4)$$

Where n_u and n_d are the number of up and down weeks in year t , respectively. A higher value of DUVOL implies greater crash risk.

3.1.2. Independent variables

We use the information disclosure approach to measure the employees' well-being in the company. First, we manually collected employee-related information from the company's annual report and sustainability reports. After that, we create a checklist of employee-related information that must be disclosed following Circular No. 155/TT-BTC/2015, a guideline from the Ministry of Finance for information disclosure on the stock market. We employ the binary method; when companies deliver the required information, they will be assigned a score of 1 and a score of 0 if they do not disclose the information required. The maximum point is 5, corresponding to 5 categories in the checklist.

Table 1. Categorization of employee welfare

No.	Variable	Category
1	NUMEMPLOYEE	Number of employees.
2	AVGWAGE	Average wages of workers.
3	LABORPOLICY	Labor policies to ensure health, safety and welfare of workers.
4	AVGTRAINING	The average number of training hours per year, according to the staff and classified staff.
5	CAREERPROGRAM	The skills development and continuous learning program to support workers employment and career development.

After acquiring the mentioned data, we compute the company's employee welfare disclosure score (Score) as the fraction of its disclosure score to the maximum possible points. Subsequently, we transform the welfare disclosure score (Score) to get our first proxy variable, EMSCORE, calculated as the natural logarithm of (1+Score). The second proxy variable DEMP is a dummy variable that takes the value of 1 when a company discloses employee welfare information (Score>0) and 0 (Score=0) otherwise. This variable classifies companies without employee welfare disclosure and those that have disclosed.

We also include five variables NUMEMPLOYEE, AVGWAGE, LABORPOLICY, AVGTRAINING, and CAREERPROGRAM; these variables are dummy variables and take the value of 1 when a company discloses the information related to the five categories in Table 1, respectively; otherwise, these five variables take the value of 0.

3.1.3. Control variables

To account for potential factors that may affect stock price crash risk, we have integrated a comprehensive set of control variables in line with previous literature (e.g., Hutton et al., 2009; Ben-Nasr and Ghouma, 2018; Kim et al., 2011). SIZE is calculated as the natural logarithm of market capitalization in VND, to control for firm size; LEV represents the ratio of total liabilities to total assets. Return on assets (ROA) is calculated as the ratio of net income over total assets, to control for profitability. DTURN is the difference between the average monthly share turnover for the fiscal year and the previous fiscal year's average monthly share turnover, in which the monthly share turnover is the monthly trading volume deflated by the total number of outstanding shares in that month. Stocks with high DTURN are more prone to crashes (Chen et al., 2001), which is the intuition behind introducing this variable. RTN reflects stock return performance as the average of firm-specific return in the year. SIGMA measures stock volatility, which is the standard deviation of firm-specific return. BTM is calculated as the ratio of equity over the market value of equity. ABACC, calculated as the absolute value of abnormal accruals following the modified Jones model by Dechow and Dichev (2002), represents the opaqueness of financial statements and control for earnings management.

Table 2. Variable description

Variable	Description	Expected Sign
Dependent variables		
NCSKEW	The negative conditional skewness	
DUVOL	Down-to-up volatility	
Independent variables		
EMSCORE	The natural logarithm of (1 + Score)	+/-
DEMP	DEMP= 1 if Score>0 DEMP= 0 if Score=0	+/-
NUMEMPLOYEE	= 1 if company discloses the information about the number of employees, otherwise = 0	-
AVGWAGE	= 1 if company discloses the information about the average wages of workers, otherwise = 0	+
LABORPOLICY	= 1 if company discloses the information about the labor policies to ensure health, safety and welfare of workers, otherwise = 0	-
AVGTRAINING	= 1 if company discloses the information about the average number of training hours per year, according to the staff and classified staff, otherwise = 0	
CAREERPROGRAM	= 1 if company discloses the information about the skills development and continuous learning program to support workers employment and career development, otherwise = 0	
Control variables		
SIZE	The natural logarithm of the firm's market capitalization	+/-
LEV	The ratio of total liabilities over total assets	+/-
BTM	The market to book ratio calculated as the ratio of equity over market value of equity	+/-
ROA	The ratio of net income over total assets	+/-
SIGMA	Standard deviation of weekly firm-specific return	+
DTURN	The average monthly share turnover for the fiscal year minus the average monthly share turnover for the previous fiscal year	+/-
ABACC	The absolute value of the estimated residuals from the adjusted-Jones model	+
RTN	Average of weekly firm specific return in the year	+

3.2. Sample selection

To investigate the effect of employee welfare on stock price crash risk, we collect data on all listed companies in the Ho Chi Minh City Stock Exchange from 2017 to 2021. The data on price, trading and financial statements are retrieved from FiinPro, whereas the information on employee welfare is manually gathered from companies' annual reports or sustainability reports.

We exclude observations with missing information, stocks with less than 26 weeks of trading in a year, and financial firms from. The final dataset consists of 1,123 observations of 235 firms from 2017 to 2021.

4. RESULTS AND DISCUSSION

4.1. Summary statistics

Table 3. Summary statistics

Variables	No. of obs.	Mean	Median	Std. Dev.	Min	Max
NCSKEW _{t+1}	1,123	-0.281	-0.269	0.812	-2.403	2.439
DUVOL _{t+1}	1,123	-0.209	-0.207	0.704	-2.26	2.453

Variables	No. of obs.	Mean	Median	Std. Dev.	Min	Max
Score _t	1,123	0.656	0.800	0.264	0	1
SIZE _t	1,123	27.471	27.277	1.571	24.198	33.344
LEV _t	1,123	0.46	0.470	0.21	0.003	0.990
ROA _t	1,123	0.074	0.057	0.083	-0.297	0.552
BTM _t	1,123	1.215	0.954	0.94	0.167	5.504
SIGMA _t	1,123	0.046	0.041	0.021	0.013	0.152
DTURN _t	1,123	0.002	-0.000	0.062	-0.341	0.363
ABACC _t	1,123	0.084	0.062	0.081	0.001	0.542
RTN _t	1,123	-0.002	-0.001	0.006	-0.072	0.024

Our sample includes observations spanning over five years from 2017 to 2021 after accounting for missing data. Table 3 illustrates the summary statistics of the variables. The mean values of NCSKEW and DUVOL are -0.281 and -0.209, and their standard deviations are 0.812 and 0.704, respectively. These figures are broadly comparable with those reported by Dai et al. (2019) and K. T. Wang et al. (2021). The high standard deviation values of NCSKEW and DUVOL indicate that during our sampling period, the variation of stock price crash risk among Vietnamese firms is significant. Furthermore, the variable Score, with an average value of 0.656, indicates that on average 65.6% of firm-years disclosed their employee welfare information. Finally, the mean values of ROA and LEV are 7.4 percent and 46 percent, respectively.

4.2. Regression results

Table 4. Regression results

VARIABLES	NCSKEW _{t+1}	DUVOL _{t+1}	NCSKEW _{t+1}	DUVOL _{t+1}
NCSKEW _t	-0.00279	0.00951	-0.00457	0.00821
	(-0.08)	(0.32)	(-0.13)	(0.28)
EMSCORE _t	-0.284**	-0.222**		
	(-2.28)	(-2.03)		
DEMP _t			-0.248***	-0.185**
			(-2.86)	(-2.22)
SIZE _t	0.0104	0.00907	0.0117	0.00999
	(0.58)	(0.62)	(0.65)	(0.68)
LEV _t	-0.363***	-0.340***	-0.346***	-0.327***
	(-2.99)	(-3.76)	(-2.84)	(-3.58)
ROA _t	-0.147	-0.352	-0.133	-0.341
	(-0.37)	(-1.12)	(-0.32)	(-1.07)
BTM _t	-0.240***	-0.234***	-0.240***	-0.234***
	(-7.10)	(-8.12)	(-7.08)	(-8.24)
SIGMA _t	6.827***	6.049***	6.893***	6.104***
	(5.12)	(5.17)	(5.25)	(5.25)
DTURN _t	1.661***	1.288***	1.606***	1.247***
	(4.00)	(3.72)	(3.91)	(3.64)
ABACC _t	0.109	0.305	0.100	0.300
	(0.40)	(1.25)	(0.37)	(1.23)

RTN _t	26.51***	25.59***	26.65***	25.69***
	(4.54)	(4.99)	(4.58)	(5.02)
Constant	-0.0974	0.0262	-0.0446	0.0617
	(-0.18)	(0.06)	(-0.08)	(0.14)
Observations	1,123	1,123	1,123	1,123
R-squared	0.206	0.226	0.207	0.227
Robust t-statistics in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.				

The results in Table 4 support Hypothesis 1 that firms with better employee welfare are less likely to experience stock price crashes. The negative and significant coefficients on the employee welfare proxies, DEMP and EMSCORE, suggest that good employee welfare practices may help firms mitigate the risk of stock price crashes. The coefficient for EMSCORE is also economically significant, indicating that a one-standard-deviation increase in the employee welfare proxy is associated with a 35.5% (26.7%) decrease measured in NCSKEW (DUVOL)¹. This finding is consistent with prior research by Kim et al. (2014), which highlights the role of social responsibility and employee-friendly practices in reducing the likelihood of bad news hoarding and increasing transparency.

However, our findings are in contrast to those of Ben-Nasr and Ghouma (2018), who found support for the agency theory hypothesis instead. Ben-Nasr and Ghouma (2018) used a global dataset that included firms generally larger than those in Vietnam, which could explain this difference. Overall, our results support the stakeholder and resource-based theories, which emphasizes the importance of employee welfare practices in enhancing firm performance and consequently reducing crash risk.

We also observe several significant relationships between firm-level determinants and stock price crash risk. High book-to-market and leverage ratios are negatively correlated with the likelihood of stock price crashes, at the 1% significance level. This is consistent with Kim et al. (2014); Dai et al. (2019) and Wang et al. (2015). A possible explanation is because these variables are proxies for financial strength and stability, which are factors that enable firms to better handle crashes.

In addition, we find that past firm-specific returns (RTN) and return volatility (SIGMA) are highly correlated with stock price crash risk, at the 1% level. Firms with large past returns and more volatile returns are more likely to experience crashes, which is consistent with prior research (Chen et al., 2001, Kim et al., 2011). This could be because investors tend to extrapolate past returns and volatility into the future, leading to overoptimistic expectations.

Finally, changes in trading volume (DTURN) are also a significant predictor of stock price crashes. Firms experiencing large changes in trading volume may be more susceptible to stock price crashes, as their stock prices may be more sensitive to changes in investor sentiment, which is consistent with Chen et al. (2001).

Furthermore, to determine which employee-friendly practices influence stock price crash risk the most, we re-estimate our model where the variables DEMP and EMSCORE are replaced with five indicators of employee welfare - NUMEMPLOYEE, AVGWAGE, LABORPOLICY, AVGTRAINING, CAREERPROGRAM. The results are shown in Table 5 below. All five variables returned negative coefficients, however, LABORPOLICY is the only one statistically significant at the level of 1%, which is the indicator that a firm has employed “labor policies that ensure the health, safety and welfare of employees. Consistent with the result from Table 4, firms that employ and disclose LABORPOLICY benefit from lower levels of stock price crash risk. The coefficient on NUMEMPLOYEE is negative and marginally significant

¹ A one standard-deviation increase in EMSCORE is associated with a 35.5% (26.7%) decrease in NCSKEW ((-0.284*0.264)/-0.281=-0.355) and (DUVOL ((-0.222*0.264)/-0.209=-0.267).

in column (1). The significance of other determinants remains qualitatively unchanged.

In the context of the Vietnamese work culture, this discovery can be explained by the fact that even if the salary is not satisfactory, many employees still stick around thanks to the company's performance-based compensation and complementary benefits (Tuan and Thanh, 2023). The reward, in turn, provides positive psychology to employees, empowering them to communicate more and provide feedback about alterations to a business that can mitigate operational crises (Ngoc Su et al., 2021). Furthermore, employee welfare's contribution to job satisfaction also leads to a significant increase in work performance and a reduction in inconsistency in the workplace (Ngo, 2021). The concept of benefits as a motivating factor is also a novel concept in Vietnam that, if utilized and understood properly, can improve both employee satisfaction and work performance.

While the working hours in Vietnam is on par with the global average, overtime is often encouraged and required among industrial workers which contribute to higher levels of stress and health problems (Tran et al., 2019). Consequences of working overtime also leads to employees turning to smoking and drinking as coping mechanisms, further attributing to their issues. Therefore, labor policies that enforce employee health and welfare, such as work safety requirements, increase the workers' mental and physical condition as well as overall workplace satisfaction. Health insurance policies are also considered to be a key non-monetary benefit that promotes employee psychology and have been found to lower costs (Ngoc Su et al., 2021).

Finally, in accordance with both the stakeholder and resource-based theories, implementing labor legislations increases a firm's reputation and stakeholder confidence. The existence of such practices in a company's report may reveal that the company is willing to go above and beyond in order to keep its employees satisfied, which instills trust in stakeholders. This outcome is similar to research done by Ben-Nasr and Ghouma (2018). Another important factor is the disclosure of relevant information which also attracts stakeholders (Freeman, 2010). All those factors combined lead to stability in the stock market, enhanced firm value and reduced stock price crash risk (Li and Zhang, 2020; Xixiong et al., 2022).

NUMEMPLOYEE, the indicator signifying that a firm disclosed its employee headcount, has an inverse relationship with stock price crash risk but only at the 10% significance level and for the NCSKEW measure. A possible explanation is that a firm disclosing its number of personnel each year means that the firm is at least partially transparent in its turnover rate, a factor that does lead to employee dissatisfaction (Flanagan and O'Shaughnessy, 2005). While significant decrease in headcount may discredit the firm's image, being transparent does curb bad news hoarding activities and reduce stock price crash risk. A firm merely revealing its number of employees is not as economically significant as it implementing employee-friendly practices, but this finding does add to the validity of the stakeholder theory.

An indicator that we expect to be statistically significant, but was not, is AVGWAGE. According to informal corporate theories, disclosing wages is actually detrimental to employee welfare. While wage transparency does lead to more equal pay among employees, it also has an unintended consequence of causing wages overall to fall as workers lose their individual bargaining power and create public scrutiny (Cullen and Pakzad-Hurson, 2021). Empirically similar is the research done by Perez-Truglia (2020), finding that low-paid employees experience negative well-being, reduce their effort or even quit upon learning that their average co-worker makes more money than them. Due to those reasons, disclosing the average wage may decrease financial performance and should consequently cause the stock price crash risk to increase. Our results however show that this indicator is not economically significant in the context of Vietnamese listed firms. A possible explanation for this outcome is that the notion only loosely aligns with the pre-established agency theory, therefore it does not affect bad news hoarding activities and consequently stock price crash risk.

Table 5. Sub-sample results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	NCSKEW _{t+1}	DUVOL _{t+1}	NCSKEW _{t+1}	DUVOL _{t+1}	NCSKEW _{t+1}	DUVOL _{t+1}	NCSKEW _{t+1}	DUVOL _{t+1}	NCSKEW _{t+1}	DUVOL _{t+1}	NCSKEW _{t+1}	DUVOL _{t+1}
NUMEMPLOYEE _t	-0.127* (-1.79)	-0.0642 (-1.02)									-0.0638 (-0.79)	0.00634 (0.09)
AVGWAGE _t			-0.0446 (-0.91)	-0.0216 (-0.54)							0.00766 (0.14)	0.0257 (0.59)
LABORPOLICY _t					-0.177*** (-2.84)	-0.182*** (-3.25)					-0.184** (-2.27)	-0.229*** (-3.29)
AVGTRAINING _t							-0.0619 (-1.09)	-0.0719 (-1.57)			-0.0547 (-0.96)	-0.0723 (-1.57)
CAREERPROGRAM _t									-0.0278 (-0.54)	-0.0139 (-0.32)	0.0591 (0.97)	0.0745 (1.53)
NCSKEW _t	-0.00411 (-0.12)	0.00907 (0.31)	-0.00104 (-0.03)	0.0106 (0.36)	-0.00435 (-0.13)	0.00771 (0.26)	-0.00268 (-0.08)	0.00932 (0.32)	-0.00184 (-0.05)	0.0102 (0.35)	-0.00658 (-0.19)	0.00548 (0.19)
SIZE _t	0.00901 (0.50)	0.00799 (0.54)	0.00471 (0.25)	0.00590 (0.39)	0.0122 (0.68)	0.0113 (0.77)	0.0114 (0.63)	0.0108 (0.73)	0.0108 (0.59)	0.00886 (0.59)	0.0114 (0.58)	0.0126 (0.79)
LEV _t	-0.348*** (-2.84)	-0.333*** (-3.64)	-0.371*** (-3.04)	-0.344*** (-3.76)	-0.380*** (-3.11)	-0.356*** (-3.89)	-0.364*** (-2.95)	-0.339*** (-3.73)	-0.365*** (-2.96)	-0.341*** (-3.74)	-0.372*** (-3.01)	-0.360*** (-3.84)
ROA _t	-0.128 (-0.32)	-0.342 (-1.07)	-0.142 (-0.35)	-0.349 (-1.10)	-0.228 (-0.57)	-0.435 (-1.41)	-0.127 (-0.32)	-0.329 (-1.05)	-0.145 (-0.36)	-0.351 (-1.10)	-0.207 (-0.52)	-0.439 (-1.42)
BTM _t	-0.235*** (-6.96)	-0.230*** (-7.90)	-0.236*** (-6.90)	-0.230*** (-7.68)	-0.240*** (-7.06)	-0.236*** (-8.19)	-0.232*** (-6.81)	-0.228*** (-7.67)	-0.232*** (-6.86)	-0.228*** (-7.68)	-0.241*** (-6.95)	-0.235*** (-7.93)
SIGMA _t	6.854*** (5.17)	6.109*** (5.23)	6.933*** (5.21)	6.151*** (5.25)	6.808*** (5.14)	5.989*** (5.14)	7.011*** (5.24)	6.200*** (5.25)	6.962*** (5.23)	6.164*** (5.26)	6.825*** (5.09)	6.088*** (5.18)
DTURN _t	1.620*** (3.94)	1.263*** (3.68)	1.662*** (4.00)	1.283*** (3.72)	1.659*** (3.95)	1.291*** (3.68)	1.651*** (3.98)	1.284*** (3.72)	1.645*** (3.96)	1.275*** (3.69)	1.647*** (3.91)	1.289*** (3.66)
ABACC _t	0.130 (0.48)	0.321 (1.31)	0.123 (0.45)	0.318 (1.29)	0.102 (0.38)	0.294 (1.21)	0.117 (0.43)	0.307 (1.26)	0.126 (0.46)	0.319 (1.30)	0.0967 (0.36)	0.281 (1.17)
RTN _t	26.38*** (4.52)	25.49*** (4.95)	26.50*** (4.51)	25.54*** (4.94)	26.60*** (4.56)	25.72*** (5.03)	26.30*** (4.48)	25.40*** (4.91)	26.37*** (4.50)	25.49*** (4.93)	26.53*** (4.53)	25.62*** (4.97)
Constant	-0.0912 (-0.17)	-0.00129 (-0.00)	-0.0566 (-0.10)	0.0131 (0.03)	-0.114 (-0.21)	0.0359 (0.08)	-0.269 (-0.49)	-0.131 (-0.30)	-0.237 (-0.43)	-0.0749 (-0.17)	-0.0694 (-0.12)	-0.0245 (-0.05)
Observations	1,123	1,123	1,123	1,123	1,123	1,123	1,123	1,123	1,123	1,123	1,123	1,123
R-squared	0.205	0.224	0.203	0.223	0.208	0.231	0.203	0.225	0.203	0.223	0.209	0.233

Robust t-statistics in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

4. CONCLUSION

The results from this study indicate that higher employee welfare disclosure leads to lower crash risk, specifically, it is policies ensuring employee welfare that shows high significant levels. This can be explained under the stakeholder theory as the firm showing willingness to cater for employee well-being, fostering loyalty and establishing a positive reputation, as well as providing value for investors. Furthermore, in the context of Vietnam-specific work culture, non-monetary compensations can facilitate better communication, implementing practices that increase employee welfare, decrease turnover and improve employee attachment to the company. The findings put forward some recommendations for related parties: lawmakers, firms, and

investors. Lawmakers should continue to develop a legal framework to monitor companies and promote stock market growth. Firms should invest in employee wellness, provide comprehensive benefits and pay special attention to public disclosure of information. Investors should perform their due diligence in researching companies before investing, as well as prioritize those with good employee compensations.

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THE IMPACT OF LEADERS' EMOTIONAL INTELLIGENCE ON EMPLOYEES' JOB SATISFACTION IN BANKING: THE MEDIATING ROLE OF TRANSFORMATIONAL LEADERSHIP

Author: Dang Duong Huy Chuong¹, Nguyen Ba Phong², Le Phuong Linh²

Mentor: Duong Thi Hoai Nhung², Le Thai Phong²

ABSTRACT

Research purpose: The study investigated the relationships of Emotional Intelligence and Transformational leadership of leaders to their employees' job performance in the banking industry.

Research motivation: This research explores how leaders with high emotional intelligence and a transformational style can create a positive work environment, increase employee motivation and satisfaction, and contribute to the success of complex jobs in the banking industry.

Research design, approach and method: Collected data were analyzed using descriptive statistics, a two-stage higher-order latent variable embedding technique, structural equation modeling (SEM), and bootstrap.

Main findings: The results showed a positive correlation between emotional intelligence and job satisfaction, which was partially mediated by transformational leadership. SmartPLS software will be applied to analyze the collected data.

Practical/managerial implications: The study highlights the significance of Emotional Intelligence (EI) and Transformational leadership (TF) in shaping work environments. To enhance the EI and TF of leaders within an organization, several recommendations have been proposed, including a systematic and consistent approach for individuals to develop and improve their emotional intelligence to attain high job satisfaction and gain a competitive advantage. In addition, organizations should introduce training programs to boost EI and TF of leaders. It is critical for organizations to acknowledge the importance of these traits in strengthening human capital, which leads to higher employee job satisfaction and overall success.

Keywords: Emotional intelligence; Transformational leadership; Job satisfaction; Banking

THE SHADOW ECONOMY: DOES THE REGULATORY QUALITY MATTER?

Author: Nguyen Duc Thao³, Nguyen Dieu Quynh⁴, Le Thao Linh⁴, Dang Thu Phuong⁴

Mentor: Dr. Vu Thi Phuong Mai⁴

ABSTRACT:

Purpose: In the current context of constant social unrest, identifying how regulatory weaknesses contribute to corruption and the expansion of the shadow economy is of utmost importance as it can inform anti-corruption measures and strengthen institutions. This research aims to comprehensively investigate the impact of regulatory quality and other macroeconomic factors on the shadow economy in 132 countries over the world from 1996-2018.

Data/Methodology: We use a panel dataset comprising of 5 explanatory variables, 2 dummy variables, and a dependent variable representing 132 countries from the years 1996 to 2018. the data is gathered from reputable websites like the Worldbank and Worldwide Governance Indicators (WGI) and so on. We first employ the Ordinary Least Squares (OLS) approach as the baseline model and include control variables for country- and year-fixed effect. The two-step D-GMM technique is then applied to address the endogeneity and non-stationarity. Finally, we use the simultaneous quantile regression technique to test the model's robustness.

Findings: We discovered negative correlation between the informal economy and GDP per capita, tax revenue rate, unemployment rate, and regulatory quality. In particular, tax enforcement increases illegal trading and tax evasion in the shadow economy in nations with poor regulatory standards. However, in nations with strict government laws, enterprises have more incentives to join the shadow economy in order to evade taxes.

Contributions: By investigating determinants from all three prominent categories: economic, institutional, and socio-cultural factors, our research represents the most thorough examination to date in the literature, including a wide variety of nations and numerous time periods. We also offer a comparative analysis of sub-samples based on the variable regulatory quality in order to comprehend how institutional regulation capability influences the shadow economy in different national contexts.

Keywords: shadow economy, macroeconomic determinants, regulatory quality.

¹ Foreign Trade University; Email: dangduonghuychuong201115081@ftu.edu.vn

² Foreign Trade University

³ Foreign Trade University; Email: thaond.ftuforum@gmail.com

⁴ Foreign Trade University

THE IMPACT OF THE EUROPEAN UNION EMISSIONS TRADING SYSTEM (EU ETS) ON THE PERFORMANCE OF EU AIRLINES

Author: Nguyen Minh Thanh¹, Pham Hien Phuong², Nguyen Y Nhi²,
Nguyen Ngoc Lan Nhi², Luong Quang Minh²
Mentor: Mai Thu Hien²

ABSTRACT: The aviation industry is experiencing rapid growth and is expected to continue its expansion. However, it is also known for being one of the largest contributors to emissions. In 2012, the European Union Emission Trading Scheme (EU ETS) included aviation transport and granted each airline free emissions allowances. This raised concerns about the overall development of the European aviation industry and its impact on Europe's economic performance. To assess the effects of EU ETS on airlines, this study examines the profitability of airlines and their emissions reduction. Using a panel OLS regression model, the study analyzes the performance of major European airlines from 2012 to 2019. The findings reveal that while economic and financial factors negatively affect the profitability of EU airlines, the EU ETS appears to have a positive influence on their environmental performance. Understanding the key factors that influence airline profitability can guide the government in formulating effective policies and initiatives.

Keywords: airlines, aviation industry, economic performance, environmental performance, EU ETS

THE IMPACT OF INFORMATION – COMMUNICATION TECHNOLOGY (ICT) ON ECONOMIC GROWTH: CONVERGENCE CLUBS ANALYSIS IN DEVELOPING COUNTRIES

Authors: Doan Manh Duc³, Nguyen Yen Nhi⁴,
Bui Thi Minh Thuong⁴, Luu Thi Thuy Dung⁴, Phung Minh Khoi⁴
Mentor: Luong Thi Ngoc Oanh⁴

ABSTRACT: This research examines the impact of information and communication technology (ICT) on different economic convergence clubs in developing countries between 1990-2021. Using the convergence club method proposed by Phillips & Sul (2007), the research divided 106 developing countries into 04 clubs of economic convergence with different growth levels: high, medium+, medium- and low. Moreover, ICT development index is built from three indicators: Fixed telephone subscriptions, Mobile cellular subscriptions and Individuals using the Internet by principal component analysis. Finally, using an ordered logit model, the research demonstrates that the lower the ICT development index, the higher the probability that a country belongs to the lower growth convergence club. In addition, the research also found that the higher the labor force participation rate, the higher the probability that a country belongs to the lower growth club, and vice versa for the gross capital formation per GDP. In other words, ICT and capital investment are displacing low-skilled labor in these countries in contributing to economic growth. In terms of policy, the research implies that policy makers should promote further ICT education and training and improve the quality of the workforce to adapt to the strong development of ICT in the current context.

Keywords: ICT, economic convergence club, ordered logit model, developing countries

¹ Foreign Trade University, Hanoi; Email: minhthanh1392002@gmail.com

² Foreign Trade University, Hanoi

³ Foreign Trade University: k60.2111410032@ftu.edu.vn

⁴ Foreign Trade University

AN EXPLORATORY STUDY AMONG GRADUATES AND UNDERGRADUATES FROM THE FOREIGN TRADE UNIVERSITY IN HANOI ANALYZED THE INTERMEDIARY IMPACT OF ONLINE COURSE QUALITY ON THE RELATIONSHIP BETWEEN DIGITAL COMPETENCE AND EMPLOYABILITY

Nguyen Van Long¹, Nguyen Mai Hoa², Đinh Phương Thảo², Le Huy Hoang², Nguyen Khanh Van²
Mentor: Pham Thi My Dung²

ABSTRACT: The economy is undergoing a rapid digital transition as a result of the use of digital technology, which has raised the bar for individuals' digital competence in terms of both quality and proficiency. People must consistently advance and polish their digital capabilities and talents in addition to their specific knowledge in order to land desired professions. As a result, all levels of educational institutions now have to constantly improve the training materials for their students that relate to digital proficiency. Online course quality, hence, becomes one of the alternative solutions, which educators think, can stimulate both digital competence and employability. The study conducted a survey to evaluate the level of digital skills of undergraduate and graduate students at the Foreign Trade University in Hanoi with the goal of understanding and comparing the relationship between their digital competence and employability, simultaneously, whether online course quality mediates the influence of digital competence on employability or not. According to the findings, young people with strong digital abilities have a higher chance of landing the jobs they want, and the results also indicate the significant impact of online course quality on these two variables. Additionally, the research identified particular digital competency domains that are advantageous for students and offered suggestions for the more balanced development of digital competency among young people as well as empathizing on the importance of new innovation in designing online courses by integrating a quantification validation model with the theoretical framework of the Digcomp 2.1 digital competency framework.

Keywords: Digital competence, employability, online course quality, undergraduate, graduate, Foreign Trade University.

APPLYING AN EXTENDED MODEL OF GOAL-DIRECTED BEHAVIOR TO EXAMINING STAYCATION INTENTION TOWARDS THE NEW NORMALITY IN VIETNAM

Authors: Tran Luu Thanh Thao³, Nguyen Khanh Nguyen Thao⁴,
Hoang Le Phuong Thao⁴, Huynh Thi Nhu Quynh⁴, Nguyen Thi Ngoc Yen⁴
Instructor: Vu Thi Dan Tra⁴

ABSTRACT: Staycation is a combination of 'stay' and 'vacation'. During the COVID-19 epidemic, this form gained popularity. However, past research has primarily focused on assessing the factors influencing staycation intention during the pandemic, with few studies in the post-pandemic recovery phase. This research aims to analyze multiple factors determining the staycation intention in the new normal using an extended model of goal-directed behavior that incorporates motivation, perception of health risk and risk tolerance to explain an individual's intention to staycation. The data was collected through an online survey with a sample size of 466 valid respondents with age over 18 and residing in Vietnam, then was analyzed using PLS-SEM. Positive attitudes, subjective norms, positive anticipated emotions and perceived health risks influence the desire to staycation. Desire, followed by perceived behavioral control and perception of health risk positively affect staycation intention. Additionally, the role of motivation is significant in influencing Vietnamese's attitude toward staycation. However, there is no relationship between the intention to staycation and frequency of past behavior. Risk tolerance also plays no role in moderating between intention to staycation and perception of health risk. This rejected hypothesis of the moderating effect of risk tolerance further confirms the important role of health perception in the new normal. In addition, the research contributes the instrument used to measure perceptions of health risk was related to the post-pandemic context, whereas previous research has only evaluated this variable during COVID-19 pandemic.

Keywords: Staycation, Behavioral intention, Perception of health risk, Risk tolerance, Motivation

¹ Foreign Trade University; Email: K59.2014210088@ftu.edu.vn

² Foreign Trade University

³ Foreign Trade University; Email: tranluuthanhthao20111156096@ftu.edu.vn

⁴ Foreign Trade University

REVISITING INCOME SATISFACTION OF VIETNAMESE ALUMNI AS BENEFICIARIES OF HIGHER EDUCATION LOAN PROGRAM

Authors: Vu Minh Trang¹, Thieu Thi Cam Van², Pham Ngoc Khanh²

Mentor: Dr. Hoang Huong Giang²

ABSTRACT: The student credit program under Decision 157/2007/QĐ-TTg has been evaluated as a good opportunity for financially disadvantaged students to get access to preferential loan sources, which enable them to pursue their study and have a better future. As a result, over 3.6 million students have accessed the credit, accounting for about 10% to 15% of the annual enrollment, with the disbursement of 66.011 billion VND by the end of 2020. It is very urgent for the government and policy makers to have a comprehensive assessment on the policy effectiveness on alumni's income with the aim of policy adjustments more effectively because it has been implemented for 15 years. However, there has not been any investigation into the effect of the program on beneficiaries' outcomes after graduation such as their income and job status. Therefore, this research conducted surveys and semi-structured interviews to gather information to evaluate the satisfaction of beneficiaries about their employment status and salary level after obtaining college degree, thus providing implications on the effectiveness of the loan program in improving the alumni's prospects of income improvement. Finally, implications to the program are subsequently proposed to optimize the extent of assistance to the financially vulnerable students.

Keywords: student credit program, income satisfaction, poverty, Decision 157/2007/QĐ-TTg.

THE IMPACT OF GAMIFICATION ON IN-APP PURCHASE INTENTION IN THE MOBILE APPLICATIONS INDUSTRY AMONG GEN-Z BUYERS

Author: Le Thi Ngoc Khanh³, Nguyen Tung Duong⁴, Nguyen Ngoc Tu⁴

Mentor: PhD. Nguyen Hong Hanh⁴

ABSTRACT: The mobile application industry has undergone substantial growth, prompting the adoption of gamification as a prominent strategy to augment user engagement and motivation with Generation Z (Gen Z) emerging as a significant consumer segment. In this context, understanding the factors that influence Gen Z's in-app purchase intention is crucial for app developers and marketers. Despite its widespread use, a dearth of empirical evidence exists regarding the impact of gamification on in-app purchase intention within the Gen Z buyer segment of the mobile applications industry. Consequently, this study aims to address this research gap by investigating the influence of gamification on in-app purchase intention among Gen Z buyers, thereby contributing to the existing body of knowledge. This research points out the influence of gamification on in-app purchase intention and exploring the mediating factors of perceived usefulness, perceived social influence, perceived enjoyment, satisfaction, usefulness, and trust using a sample of urban Gen Z buyers with a model comprising these variables to examine this relationships. The findings of this study highlight the crucial role of perceived usefulness, enjoyment, trust, and satisfaction in shaping in-app purchase intention among Gen Z buyers in the mobile applications industry, and at the same time, emphasize the positive or negative impact of each factor on this matter. This includes perceived usefulness has a significant positive impact on satisfaction, indicating that users are more likely to make in-app purchases when they find the application useful while enjoyment also contributes to satisfaction but has a weaker influence compared to usefulness, especially for Gen Z users; perceived social influence does not significantly affect satisfaction, while trust emerges as the most crucial factor influencing in-app purchases. And finally, usefulness indirectly influences purchase behavior through its impact on satisfaction. Understanding the underlying mechanisms influencing purchase intention can guide app developers and marketers in designing and optimizing their strategies to better cater to the preferences and behaviors of Gen Z consumers in the mobile applications industry.

Keywords: Gamification, in-app purchase, in-app purchase intention, mobile application, Gen Z

¹ Foreign Trade University; Email: minhtrangvu4620@gmail.com

² Foreign Trade University

³ Foreign Trade University; Email: khanhngocle.by@gmail.com

⁴ Foreign Trade University

A STUDY ON THE EFFECT OF CULTURAL INTELLIGENCE ON ENTREPRENEURIAL INTENTION-THE MEDIATING ROLE OF CREATIVITY

Author: Dang Nguyen Hien Mai¹, Nguyen Dao Tra My²

Mentor: Huynh Thi My Hanh³, PhD; Nguyen Ngoc Uyen Phuong

ABSTRACT: *The paper aims to examine the effect of cultural intelligence on entrepreneurial intention by applying the Theory of Planned Behavior and evaluating the mediating role of creativity in this relation. By using Partial Least Square – Structural Equation Modelling, the proposed structural model was tested with a sample of 115 people in entrepreneurship. The results of this study pointed out that all four constructs of cultural intelligence show significant effect to entrepreneurial intention while just two of three constructs in TPB directly affected it. Also, this study indicates creativity, along with entrepreneurial attitude, acts as a mediator in the relationship between cultural intelligence and entrepreneurial intention. These findings contribute to a better understanding of entrepreneurial intention in the field of entrepreneurship in the context of Vietnam. Policy makers, business managers and universities benefit from the study findings, and several directions for future research are provided.*

Key Words: *cultural intelligence; entrepreneurial intention; creativity; TPB, PLS-SEM.*

1. INTRODUCTION

Entrepreneurship was defined as the process of determining the opportunities, distributing the resources to pursue these objectives, enhance as well as make full advantages of these opportunities in the long run ^[1]. Altinay et al., (2021) and McMullan & Long (1987) ^{[2][3]} also emphasized the necessity of entrepreneurship and claimed that it was one of the fundamental engines that propels global business growth. It is becoming more and more important for developing countries (in case of Vietnam) in which economies and entrepreneurial ecosystems have not offered much favourable conditions for entrepreneurs ^[4]. In recent years, Vietnam has been recognized as a promising market for entrepreneurship, with a vibrant ecosystem that is attracting not only local but also international entrepreneurs.

Entrepreneurial intention is believed to be the main element to affect the decision to start up a new firm ^{[5][6]}. According to Boyd & Vozikis (1994) ^[7], entrepreneurial intention is the state of mind that directs and steers the entrepreneur's efforts toward the development and implementation of a business concept. When studying prior studies about entrepreneurial intentionality, Franco et al (2010)^[8] has concluded that the scientific literature has focused on two key areas of study, namely cognitive (or personal traits) and contextual factors (or demographic profiles and so on). About the latter one, as can be observed, various external factors, such as course of study, demographic and national or inter-regional characteristics, and so on, have influenced the intention to set up a new venture ^[8]. With respect to cognitive perspective on entrepreneurship, it requires a variety of factors, sometimes considered as distinct features that can be isolated and identified ^{[7] [9]}. Creativity was considered as a crucial antecedent of entrepreneurship and also proposed as a predictor of entrepreneurial intention ^{[10] [11]}. Entrepreneurship often involves identifying and exploiting new opportunities, and entrepreneurs who have creativity easily come up with unique and innovative solutions to problems ^[12]. Having creativity could help entrepreneurs to develop and refine their products or services, and to differentiate themselves from competitors, sometimes it is associated with the identification of opportunities, which leads to new enterprises (and, in some circumstances, new industries)

¹ University of Economics - The University of Danang; Email: 191121302528@due.edu.vn

² University of Economics - The University of Danang.

³ University of Economics - The University of Danang; Email: Hanhhtm@due.edu.vn

[13]. As a result, creativity can play a significant role in shaping entrepreneurial intention, which is an individual's willingness and motivation to pursue entrepreneurship. In previous studies, researchers have a tendency to focus on the Big Five Personality Traits as a predictor of creativity. However, entrepreneurs nowadays must face cross-cultural challenges in both domestic and international contexts. Domestic situations refer to a variety of indigenous cultures and regional culture while international contexts mention differences in international, ethnic backgrounds and religious beliefs [2]. From this perspective, cultural intelligence emerges as an important predictor of creativity and in entrepreneurial processes [2].

Altınay et al., (2021) [2] indicated four dimensions of cultural intelligence (CI) including metacognitive CI, cognitive CI, motivational CI and behavioral CI and studied their effects on creativity. However, he just studied two mental aspects of CI out of four dimensions as he claimed that very few research that investigate the impact of CI on other outcomes encompassing creativity and innovation among entrepreneurs. Yet, he did not investigate motivational CI and behavioral CI to creativity, also, studies conducted thoroughly the influence of all four dimensions of CI on creativity are limited, which exposed the first gap that need addressing. As a result, the initial goal of this study is to examine the interaction between four mental elements of cultural intelligence (metacognitive CI, cognitive CI, motivational CI and behavioral CI) on self-creativity. When considering the effect of cultural intelligence, Kromidha et al., (2022), Dheer RJ and Lenartowicz T, (2018), Ang S, Van Dyne L, Koh C, et al., (2007) [14] [15] [16] confirm that cultural intelligence is linked to entrepreneurial intention positively, and cultural intelligence have a direct effect on entrepreneurial intention. However, the indirect relationships of these both constructs have not been studied yet, indicating a second gap for this paper to fill in.

By understanding identified research gaps, this study aims to examine the direct and indirect relationships between cultural intelligence and entrepreneurial intention with mediating effect of creativity as well as examine the direct and indirect relationships between cultural intelligence and entrepreneurial intention with mediating effect of entrepreneurial attitude by applying the Theory of planned behaviour (TPB).

2. LITERATURE REVIEW

2.1. Theory of reasoned action (TRA) and Theory of planned behaviour (TPB)

The original definition of Theory of reasoned action (TRA) was given in the field of social psychological science [17]. It was a model used for predicting behavioral intention and understanding corresponding behaviors [18][19]. They believed that the intention to do an action under volitional control predicted it, while the attitude toward the behavior and the subjective norm concerning the behavior both had an additive effect on intentions. Therefore, TRA suggested that attitude, subjective norm all affect intention. Also, Glanz et al., (2015) [20] has mentioned TRA as theoretical constructs related to personal motivational factors as predictors of likelihood to engage in particular behaviors. For a number of years before being presented by M. E. Fishbein, (1967) [21], very few studies had hardly shown any relevance between attitudes and behaviors, about three studies were found [22][23]. Thus, the TRA model [21] was created with respect to better understanding the elements including attitude toward behavior, subjective norm and behavioral intention (which are considered to be the direct antecedents to behavior [24]. The three subjects are considerably related to beliefs. Ajzen (1991) [25] explained types of beliefs related to attitude and subjective norms. These are behavioral beliefs, which are believed to influence attitudes toward the behavior, and normative beliefs, which is posited as the underlying determinants of subjective norms. In this model, people's behavior is predicted by three basic variables in question: attitude toward behavior, subjective norm and intention. TRA has been used as a theoretical model by researchers from numerous academic areas as shown in Table below. The original approach, however, is limited in how it addresses actions for which people have incomplete

volitional control. As a result, Ajzen (1980) and M. Fishbein et al., (1975) ^{[26][27]} added perceived control as an addition, which led to a new model called TPB, which is better studied in entrepreneurial context.

According to Crawley & Coe (1990) ^[28], attitude toward the behavior, considered the personal component, captures a person's perception of their liking or disliking toward a particular behavior. A person will have a positive or negative opinion of a certain behavior if they believe that it will produce more or less favorable outcomes. As mentioned by Al-Mamary & Alraja (2022) ^[29], a favorable attitude toward students' entrepreneurship has a positive impact on entrepreneurial intention. Ajzen (1991), (2001) ^{[25] [30]} claimed that behavioral beliefs are the antecedents of attitudes, and attitudes would explain intention and/or behavioral intention. Subjective norms refer to the people's perceptions of the behavioral standards which others, such as family, friends, and teachers, expect them to indulge in or refrain from performing behaviors ^[29] According to Kashima et al. (1993) ^[31], the subjective norm is determined by the total of products of normative beliefs (i.e. whether different significant others believe the decision maker should execute the behavior) and motivation to comply (i.e. how much the decision maker is willing to comply with each significant other's wants). Normative beliefs are considered the antecedents of subjective norms, and subjective norms, along with attitudes, would explain intention and/or behavioral intention. Ajzen (1985) ^[32] defined intention as the choice to engage in or refrain from engaging in an action. According to Ajzen (1991) ^[25], behavioral intentions are an additive function of attitudes, social norms, and perceived behavioral control. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, or how much of an effort they are planning to exert, in order to perform the behavior ^[25]. Entrepreneurial intention refers to the effort a person will put forth to engage in that entrepreneurial activity. And so, it captures the three motivational factors, or antecedents, influencing behavior ^{[2][33]}. Besides, the intention of carrying out entrepreneurial behaviors may be affected by several factors, such as needs, values, wants, habits, and beliefs ^[25].

The theory of planned behavior is an extension of the theory of reasoned action ^{[26][27]} made necessary by the limitations of the original model in addressing behaviors over which people have incomplete volitional control. Ajzen (1991) ^[25] emphasized, there are three different kinds of beliefs that are connected to the three predictors of intention: behavioral beliefs, which are thought to affect attitudes toward behavior, normative beliefs, which act as the determinants of subjective norms, and control beliefs, which form the foundation of perceptions of behavioral control. According to Krueger Jr et al. (2000) ^[6], the TPB offers a coherent, parsimonious, and highly-generalizable framework for understanding and forecasting behavioral intentions of various kinds, which makes it a good choice when studying antecedents of behavioral intentions in the context of entrepreneurship. The idea of planned behavior places a lot of importance on perceived behavioral control. In actuality, the addition of perceived behavioral control sets the theory of planned behavior apart from the theory of reasoned action. Ajzen first introduced the perceived behavioral control concept, which was later defined as a "person's perception of the ease or difficulty of performing the behavior of interest." ^[25] Following the theory of planned behavior, perceived behavioral control, together with behavioral intention, can be used directly to predict behavioral achievement. Besides, perceived behavioral control, according to Ajzen (2015) ^[34], can prevent individuals from executing a behavior or make it easier for them to perform a behavior when obstacles or resources are present. In start-up context, perceived behavioral control (PC) is defined as the perception of the ease or difficulty of becoming an entrepreneur (Liñán & Chen, 2009) ^[35].

2.2. Cultural Intelligence

The cultural intelligence theory has been conceptualized in two different ways –the first one introduced by Earley & Ang, (2003) ^[36] and the other by Earley & Ang, 2003; Thomas, 2008 ^{[36] [37]}. Earley & Ang, (2003) ^[36] defined cultural intelligence (CI) as an individual's capability to function and manage effectively

in culturally diverse settings. According to Brislin et al., (2006)^[38], CI denoted the ability of an individual to thrive in a multicultural environment by demonstrating recognition of cultural differences and respecting and finding a common ground with those differences. Then, CI referred to “a system of interacting knowledge and skills.....that allows people to adapt to, select, and shape the cultural aspects of the environment”^[37]. According to Rockstuhl et al. (2011)^[39], CI is an extremely valuable leadership quality in today’s interconnected society. In fact, Westby (2007)^[40] contends that in the context of an interconnected world, CI is applicable to everyone and goes far beyond multicultural circumstances. According to Brislin et al. (2006)^[38], CI can refer to displaying intelligent behavior inside one’s own culture, as well as to adaptation and discovering points of commonality with other cultures. Theoretically, CI consists of four dimensions: metacognition, cognition, motivation, and behavior^[40]. The first is cognitive CI, which entails learning new information and developing the skills necessary to comprehend models of cultural norms^{[41][42]}. The second is metacognitive CI, which is concerned with having understanding of the social, economic, and legal systems that are common in various cultures^[43]. The ability to manage one’s own resources and energy to deal with cross-cultural contingencies is motivational CI, the third dimension^[44]. The fourth factor, behavioral CI, refers to a person’s capacity to modify both verbal and nonverbal behaviors in order to conform to cultural norms^[45]. In brief, cultural intelligence (CI) refers to the ability to understand, appreciate, and effectively work with individuals from different cultural backgrounds, even in a complex cultural domestic workplace^{[45][46]} or multinational workplace^{[45][47]}. In the business fields, CI is typically linked to leadership and internationalization^{[43][48]}. According to Stuetzer et al (2016)^[49], entrepreneurial activity frequently results from environmental factors such as institutional influences, beliefs, and failure-related fear. These factors vary among countries and locations.

2.3. Creativity

It was not until the year 1950 when J.P. Guilford first presented his creativity address to the American Psychological Association that much research done on creativity grew considerably^[50]. Creativity is defined as the ability to generate new and valuable ideas by recombining and matching information and knowledge^[51]. The “four P’s,” or process, product, person, and place, are the primary influences on creativity according to creativity theory^[52]. Researchers focused particularly on the process of creativity and attempted to explain the technology and mechanism of creative thought using the cognitive method. Torrance (1966)^[53], for instance, described creativity as a process in which a person first becomes aware of problems, flaws, and disagreements that are challenging to identify, after which it is necessary to come up with solutions and hypotheses, and finally to test and modify these hypotheses in order to produce a successful result. Creativity enables the organization to capitalize on opportunities that arise as a result of changing environmental conditions^[54]. Many researchers relate creativity with entrepreneurship since creativity is especially important for entrepreneurial activities, and entrepreneurship itself is a creative activity. From the standpoint of entrepreneurship, creativity is expressed in the process of producing novel and useful ideas to launch new businesses or initiatives, followed by the development of novel goods or services^[55].

2.4. Conceptual framework and hypotheses development

As mentioned in the literature review, cultural intelligence (CI) comprises four dimensions: metacognitive, cognitive, motivational, and behavioral. The results of Yunlu et al (2017)^[56] supports the utility of CI as a generative process tool in influencing creativity. Metacognitive CI, cognitive CI, and motivational CI were positively associated with creativity. High levels of these sorts of CI make people more likely to collect and look for pertinent information in order to generate ideas with a variety of creative possibilities. Moreover, Hu, N., Wu, J., & Gu, J (2019)^[51] proposes and determines that cultural intelligence is positively associated with employees’ creative performance. Besides, a variety of information can inspire

creativity, and innovation at work can be risky. Madjar, N (2008)^[57] mentioned that cultural intelligence enhances employee creativity through effective and informational support in inter-organizational teams. As a result, putting the following hypothesis:

H1: Cultural intelligence has a significant direct influence on Creativity

There were few results that discuss the relationship between cultural intelligence and entrepreneurial attitude. Baltaci, A., (2017)^[58] showed that cultural intelligence is positively associated with both prejudice and level of entrepreneurship. The research of Etemad & Wright (2003)^[59] in the field of education found that school principals' entrepreneurial experiences and their knowledge of foreign languages play an important role in international projects and other entrepreneurial pursuits. Thus, it is hypothesized that:

H2: Cultural intelligence has a significant direct influence on Entrepreneurial attitude

Even though CI and entrepreneurial intention (EnI) are conceptually and practically related, only limited research has been conducted on their relationship. The entrepreneurship literature^{[15][60][62]} says that cognition plays a very important role in the formation of EnI and is positively related to EnI^[15]. Besides, individuals with high behavioral CI can better adjust to intercultural elements^[16], in which they can thus recognize entrepreneurial opportunities. Moreover, the research of Kromidha et al., 2022^[14] contributes to entrepreneurship research by remarking the roles played by CI, as personal ability, and by perceptions of the institutional element in enhancing individual intentions to engage in entrepreneurship. Therefore, we present the following hypothesis:

H3: Cultural intelligence has a significant direct influence on Entrepreneurial intention

Harris, R (1998)^[63] wrote about the common linkage between creativity and attitude. He claimed that "creativity is an attitude: the ability to accept change and newness, a willingness to play with ideas and possibilities, a flexibility of outlook, the habit of enjoying the good while looking for ways to improve it." In connection to the specific setting of our investigation, other studies showed a favorable correlation between imaginative thinking and entrepreneurial attitudes among university students around the globe. Zampetakis et al. (2011)^[11] studied how creative thinking affected students' entrepreneurial attitudes and intentions in England. The findings demonstrated that creative students had stronger entrepreneurial attitudes and intentions than non-creative pupils. Another study in Sweden found that students who achieved high marks on a test related to creative thinking had positive attitudes toward entrepreneurship^[64]. Accordingly, the following hypothesis is formulated:

H4: Creativity has a significant direct influence on Entrepreneurial attitude

The theory of Planned Behaviour states that attitude is one of the intention predictors^{[25][65]}. Some earlier researchers have looked into what motivates or influences someone to establish a business. According to Luthje, C., & Franke, N (2003)^[66], they assert that the entrepreneurial attitude affects strongly and significantly toward entrepreneurial intention and entrepreneurial attitude is affected by one's risk-taking propensity and internal locus of control. Furthermore, Kusmintarti, A., Thoyib, A., Ashar, K., & Maskie, G (2014)^[67] suggest that an entrepreneurial attitude affects positively and significantly their entrepreneurial intentions. Meanwhile, Baron^[68] stated that entrepreneurial attitude acts as a reinforcing entrepreneurial characteristic to influence entrepreneurial intention. Luthje, C., & Franke, N (2003)^[66] claims that internal locus of control and willingness to take risks has a positive and important influence on entrepreneurial attitude and has a positive and significant influence on entrepreneurial intention. Therefore, presenting the following hypothesis:

H5: Entrepreneurial Attitude has a significant direct influence on Entrepreneurial intention

Perceived behavioral control (PC) is influenced by beliefs about control, understood as assessing one's abilities in overcoming specific obstacles that may arise while setting up or driving companies. According

to Kobylińska, U. (2022)^[69], the strongest positive relationships were observed for the influence of the PC variable on intention. Moreover, in this result, high responder ratings for the measure “Perceived control” imply that students believe they are adequately prepared to assume the position of an entrepreneur, which may be a benefit of an effective education system in this field. According to Liñán, F., & Fayolle, A. (2015)^[70], The literature generally agrees that the perception of being in control is positively related to the intention to become an entrepreneur. In this context, the following hypothesis was put forward:

H6: Perceived behavioral control has a significant direct influence on Entrepreneurial intention

In the research about student entrepreneurial intention, Wijayati, D. T., Fazlurrahman, H., Hadi, H. K., & Arifah, I. D. C. (2021)^[71] introduced the subjective norms of students that have a positive influence on student entrepreneurial intention. Moreover, Heuer, A., & Liñán, F (2013)^[72] also found that the subjective norm has a positive effect not only directly on entrepreneurial intention but also on Perceived behavioral control and personal attitude toward venture creation. In studies using simplified items, the subjective norm tends to be nonsignificant, while those applying the more complex measure “subjective norms x motivations to comply” confirmed that the subjective norm significantly explains venturing intention^[72]. Furthermore, the literature on social capital stresses the role of networks in transmitting values and norms which would affect motivations^[73]. In this context, the following hypothesis was put forward:

H7: Subjective Norm has a significant direct influence on Entrepreneurial Intention

Creativity is the ability to generate concepts that are both original and practical, whether in the immediate or distant future^[74]. Creativity is also seen as significant to entrepreneurial intent or behavior, since it is linked with identification of chances that lead to the foundation of new firms^{[13][75][76]}. Moreover, according to Sternberg, R. J. and T. I. Lubart, (1996)^[77] introduction, entrepreneurship is somewhat a result of creativity, because often new businesses are original and useful. Feldman, D. C., and M. C. Bolino (2000)^[78] related creativity to self-employment motivation in their study on career anchors, contending that people with high perceived creativity are likely to be drawn to an entrepreneurial career path. Another study explored a model of improvisation that has been found to influence the establishment of entrepreneurial intentions^[79]. Zampetakis et al (2011)^[11] examined how various forms of creativity influence those who have not yet started their own businesses. As a result, they discovered that people’s perceptions of creativity are likely to motivate them to take risks. In this context, the following hypothesis was put forward:

H8: Creativity has a significant direct influence on Entrepreneurial Intention

Mediating effects:

As we have mentioned before, previous research showed that Cultural Intelligence has a significant direct impact on Entrepreneurial Attitude^{[58][66]}. Besides, According to Luthje, C., & Franke, N. (2003)^[66], entrepreneurial attitude has a positive influence on entrepreneurial intention, and the other authors like Kusmintarti, A., Thoyib, A., Ashar, K., & Maskie, G. (2014)^[67] also supported this hypothesis. Therefore, we put forward the hypothesis about the relationship between cultural intelligence and entrepreneurial intention with the mediating role of Entrepreneurial Attitude, by following hypothesis:

H9: Attitude mediates the relationship between cultural intelligence and entrepreneurial intention

Hamidi, D. Y., Wennberg, K., & Berglund, H. (2008); Harris, R. (1998); Zampetakis et al., (2011)^{[11][63]}^[64] claimed that creativity has a strong direct impact on entrepreneurial attitude. Moreover, the relationship between entrepreneurial attitude and entrepreneurial intention is also confirmed by previous research such as Kusmintarti, A., Thoyib, A., Ashar, K., & Maskie, G. (2014)^[67]. From this perspective, we propose the following hypothesis:

H10: Attitude mediates the relationship between creativity and entrepreneurial intention

Hu, N., Wu, J., & Gu, J. (2019)^[51] proposes and determines that cultural intelligence is positively

associated with employees' creative performance. Furthermore, Zampetakis et al., (2011) ^[11] also studied how creative thinking affected students' entrepreneurial attitudes and intentions in England and found that creative students had stronger entrepreneurial attitudes. Therefore, the following hypothesis was put forward:

H11: Creativity mediates the relationship between CI and EA

As mentioned in hypothesis 1, we suggested that cultural intelligence has a significant direct influence on creativity. Besides, many researchers ^{[12] [75] [76] [78]} also claimed the relationship between creativity and entrepreneurial intention. Therefore, suggesting a hypothesis:

H12: Creativity mediates the relationship between cultural intelligence and entrepreneurial intention

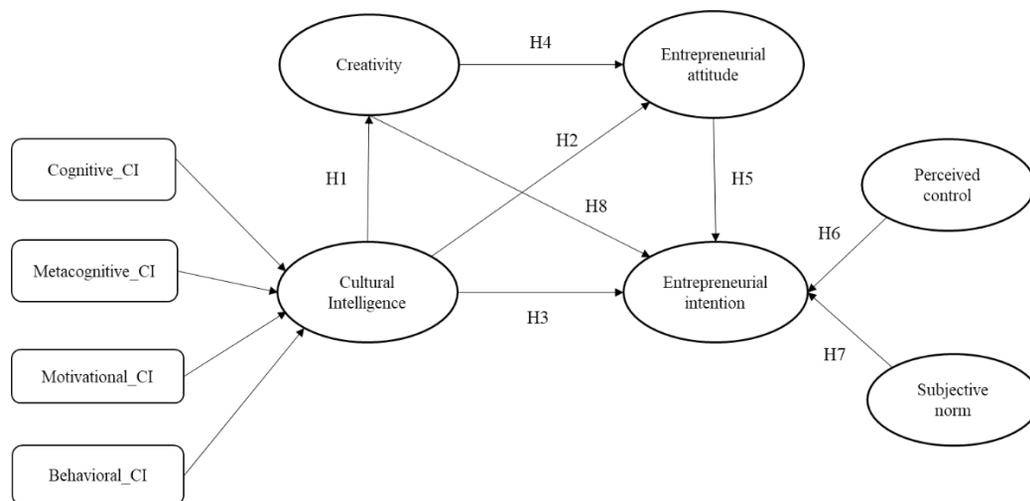


Figure 1. The conceptual framework of the study

3. RESEARCH METHODOLOGY

3.1. Measurement instrument development

Measurement scales were adapted from existing scales found in previous research, including cultural intelligence (CI), creativity (Crea), self-efficacy (SE), entrepreneur intention (EnI), entrepreneurial attitude (EA). In particular, cultural intelligence is composed by four dimensions that will be measured by their own observed items ^[16] namely metacognitive cultural intelligence (MCQ) with four items, cognitive cultural intelligence (CQ) with six items, motivational cultural intelligence (MoCQ) with five items; and behavioral cultural intelligence (BCQ) with five items. Also, creativity is observed by five items adopted from ^{[80] [81] [82] [83] [11]}. By applying the theory of planned behavior (TBP), six items measuring perceived behavioral control (PC), five items measuring subjective norm (SN) and five items entrepreneurial attitude (EA) affecting directly on entrepreneurial intention (EnI) with six items were developed. Additionally, all survey questions obtained from relevant prior studies were modified to be used in the context of entrepreneurship and globalization. All 47 items were measured using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree)

3.2. Method of collecting and analysing data

The target population for this study is all entrepreneurs and those who have taken the course of entrepreneurship. A nonprobability sampling technique, particularly convenience sampling was employed in the study. In this way, all members of the prospective groups were invited to participate in this research. The survey was conducted from March 2023 to May 2023 via online survey. The study used Partial Least Squares

- Structural Equation Modeling (PLS-SEM) as the primary approach to data analysis. The analysis process is divided into five steps adapted from F. Hair Jr et al., (2014)^[84]. Data collection issues must be addressed by the data examination process with four main steps, including identification of missing values, assessment of suspicious patterns (straight lining or inconsistent answer), examinations of outliers, and verification of data distribution. Then, we evaluated first-order and second-order measurement models. In this study, first-order measurement models are applied for the construct of cultural intelligence (CI). For second-order measurement models, CI was proposed as a reflective-formative second-order construct. Therefore, a two-stage approach was applied for the evaluation of the two hierarchical component models (HCMs) in this study. The next stage will address the assessment of the structural model result to know how well empirical data support the proposed theory or concept of the path model^[84] by investigating collinearity, the significance and relevance of the structural model relationships, the level of R², the f² effect size, the predictive relevance and the q² effect size. Finally, we analyze the mediating effects existing in the model.

4. RESEARCH FINDING

4.1. Demographic profile of respondents

Participants' demographic information, including gender, age group, living area, level of education, major subject, marital status. Among 115 participants, the number of female participants is twice that of male participants (66.1% compared to 33.9%). People aged 15 to 24 years old accounts for over half of respondents with 60.9% of the total, followed by the group from 25 to 34 years old and 35 to 44 years old (32.2% and 6.1%). By contrast, the age groups of 55–64 years old contribute 0.9%. In addition, no one from 45 to 54 years old and over the age of 65 participates in the survey. This indicates that there were more young respondents than middle-aged and elderly respondents in this study. About the education level in the sample, 78.4% of the respondents have a bachelor's degree, 5.4% have an intermediate or junior college degree, 14.4% have a postgraduate degree, 1.8% have completed high school, and 0% has other degrees. This shows that respondents who participated in the survey achieve elevated levels of education. Additionally, 33.5% of participants have a background in business administration, and one-third have backgrounds in other fields, including economics (24.5%), engineering (7%), pedagogy (3.5%) and other majors (31.5%). Most respondents are from the central region, making up 77.4%, the other areas of Vietnam accounted for an equal number of people, 10.4%. Besides, 95 of 115 participants report that they are still alone, accounting for the highest rate with approximately 82.7%. The remaining participants were married, including 5.2% without children, and 12.1% with children.

4.2. The evaluation of measurement models

4.2.1. First-order measurement model evaluation

The result was concluded based on the criteria set for reflective measurement that comprises internal consistency reliability, convergent validity, and discriminant validity. The results shows that all the criteria were accepted, including the outer loadings (>0.708), the average variance extracted ($AVE \geq 0.5$), composite reliability ($CR > 0.7$) and HTMT criterion ($HTMT < 0.9$)^[84].

4.2.2. Second-order measurement model evaluation

We are going to analyse the significance of outer weights of first-order constructs (MCQ, CQ, MoCQ, BCQ) for assessing their relative contribution to the second-order construct, CI. The results revealed that just two dimensions, MoCQ had p-values above the critical t-value of 2.57 at significant level of 1, indicating the significance of their path weights ($p < 0.01$) and BCQ exhibited p-values greater than the essential t-value of 1.96 at a significant level of 5, indicating that their path weights were significant ($p < 0.05$)^[84]. On the

contrary, with respect to the last two dimensions MCQ and CQ, their p-value results indicate that they have no significance. However, we are not in a rush to remove these two variables and will continue to monitor the outer loading index. The result indicates that all variables accepted; therefore, preserve four dimensions as formative variables of CI. As a result, the significance and relevance of the four dimensions represent their formative push factors construct, CI.

Table 1. First-order measurement model result

	Outerloading	CR		AVE	HTMT			
		Rho_a	Rho_c		BCQ	CQ	MCQ	MoCQ
BCQ		0.918	0.938	0.751				
BCQ_1	0.857							
BCQ_2	0.867							
BCQ_3	0.874							
BCQ_4	0.912							
BCQ_5	0.822							
CQ		0.912	0.929	0.686	0.682			
CQ_1	0.796							
CQ_2	0.79							
CQ_3	0.863							
CQ_4	0.838							
CQ_5	0.834							
CQ_6	0.846							
MCQ		0.911	0.937	0.789	0.744	0.642		
MCQ_1	0.888							
MCQ_2	0.89							
MCQ_3	0.921							
MCQ_4	0.852							
MoCQ		0.911	0.933	0.736	0.797	0.635	0.631	
MoCQ_1	0.843							
MoCQ_2	0.861							
MoCQ_3	0.845							
MoCQ_4	0.886							
MoCQ_5	0.854							

4.3. The evaluation of structural model

The Bootstrapping routine with 5000 samples was implemented to evaluate the path coefficients (β). In terms of direct relationships, results revealed that t-values above crucial t-value 2.57 at a significant level of 1 supported four of eight hypotheses, and t-values above 1.96 at a significant level of 5^[84] confirmed two of eight hypotheses. Particularly, cultural intelligence impacted the model's proposed constructs, including creativity and entrepreneurial intelligence. However, the direct relationship between cultural intelligence and entrepreneurial intention was rejected ($t=0.795$, $p>0.1$). By contrast, the perceived creativity was a significant determinant of entrepreneurial attitude ($t = 2.544$, $p < 0.05$), but it did not affect entrepreneurial intention ($t = 0.251$, $p > 0.1$). Additionally, two of three subjects of the theory of planned behavior were discovered to be determinants of entrepreneurial intention, namely entrepreneurial attitude and perceived behavioral control. Subjective norm, however, does not show any direct influence on entrepreneurial intention ($t = 1.412$, $p > 0.1$).

In terms of indirect effect, the findings depicted that cultural intelligence had a significant positive indirect impact on entrepreneurial attitude through creativity with t-values greater than 1.96 at the significant

level of 5% [84]. Also, the results showed that entrepreneurial attitude had a positive mediating influence on the relationship between creativity and entrepreneurial intention with t-value higher than 1.96 at the significant level of 5% [84]. Cultural intelligence significantly indirectly affected entrepreneurial intention through entrepreneurial attitude with t-values greater than 2.65 at the significant level of 1%. As a result, cultural intelligence had no indirect impact on entrepreneurial intention via creativity.

Table 2. Results of path significance of structural model

Path relation (Hypothesis)	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Result
H1: CI → Crea	0.699	0.705	0.061	11.47***	0.000	Supported
H2: CI → EnI	0.401	0.417	0.11	3.644***	0.000	Supported
H3: CI → EI	0.101	0.099	0.127	0.795 ^{ns}	0.427	Rejected
H4: Crea → EA	0.319	0.307	0.125	2.544**	0.011	Supported
H5: EA → EI	0.476	0.473	0.088	5.397***	0.000	Supported
H6: PBC → EI	0.227	0.228	0.079	2.864**	0.004	Supported
H7: SN → EI	0.113	0.12	0.08	1.412 ^{ns}	0.158	Rejected
H8: Crea → EI	0.027	0.025	0.108	0.251 ^{ns}	0.802	Rejected
Result of indirect effects						
Crea → EA → EnI	0.152	0.146	0.068	2.245	0.025	Supported
CI → Crea → EA → EnI	0.106	0.103	0.049	2.161	0.031	Supported
CI → EA → EnI	0.191	0.197	0.064	2.996	0.003	Supported
CI → Crea → EnI	0.019	0.019	0.078	0.245	0.806	Rejected
CI → Crea → EA	0.223	0.216	0.091	2.443	0.015	Supported

Note: ^{ns}non-significant, ***p<0.01, **p<0.05

5. DISCUSSION AND CONCLUSIONS

5.1. Theoretical contributions

Despite The TPB model is suitable in the Vietnamese context and the theoretical importance of subjective norms (e.g. Ajzen, 1991^[25]), our research and past meta-analytic research also found subjective norms to be least closely associated with entrepreneurial intentions (e.g. Krithika, J., & Venkatachalam, B. (2014)^[85]. Younger people may focus their decisions about their entrepreneurial careers more on personal factors such as attitude, which could account for the generally limited influence of societal norms on entrepreneurial inclinations ^{[85][86]}. Besides, another reason is that entrepreneurial intentions require improvement and this improvement is not easy to share with others so the SN has little impact on entrepreneurial intentions. That being said, sharing ideas and business plans is crucial for developing businesses and creating new opportunities. Entrepreneurs can seek support and guidance from experts, investors, and experienced colleagues to refine their plans and make informed decisions. This study has shown the impact of cultural intelligence, via all of four dimensions: metacognition CI, cognition CI, motivational CI, and behavioral CI on creativity and entrepreneurial attitude as previous studies were only interested in two variables. In our research, creativity acts as a mediator. We found that cultural intelligence has a significant indirect influence on entrepreneurial attitude via creativity. Furthermore, we claimed that entrepreneurial attitude as a mediator in the relationship between cultural intelligence and entrepreneurial intention.

5.2. Practical implications

Creativity is potentially most useful within the enterprise as a way of overcoming barriers to cultural intelligence resources and in terms of deriving alternative and lower-cost solutions to solving problems. As research results have shown the influence of Creativity on entrepreneurship attitudes, businesses, schools and society should have programs and methods to enhance creativity and innovation, bring more meaningful entrepreneurial ideas for society. For schools, especially teenagers and university students, it is recommended to integrate subjects related to entrepreneurship and innovation to stimulate spirit and attitude. Moreover, schools should provide more practical extracurricular sessions on the formation and development of entrepreneurship in the region to draw lessons on entrepreneurship and innovation. Besides, there needs to be a combination of games and subjects that require high creativity. For each individual, businesses need to have appropriate training programs for employees to promote the spirit of innovation and propose appropriate recommendations for the sustainable development of the company. The government also needs to promote innovative entrepreneurship related programs to increase the number of creative proposals for the sustainable development of individuals and countries. In the development of today's globalized industry, when emotional intelligence (EQ) is increasingly appreciated by young people, businesses are gradually paying more attention to a new type of intelligence that is cultural intelligence. Increasing cultural intelligence helps team members to be more understanding and sensitive to different opinions and perceptions. As colleagues adapt and integrate into each other's cultures, they can develop a shared culture where there is harmony, making work run more smoothly and efficiently. Besides, leaders with high cultural intelligence will easily build strong cohesive relationships in the group. Team building activities can encourage members to understand more about each other's strengths and weaknesses and allow them to solve problems together. It can be seen that cultural intelligence requires people to always try to learn and absorb more of those unique cultural quintessence values.

5.3. Limitations and future research

Although the research findings provide meaningful implications, this study also has several limitations. First, just very few entrepreneurs (who had already set up their own firm) was taken part in the survey, and almost every participation is student who has studied entrepreneurship in univeristy. Thus, additional entrepreneurs should be added to this study to boost the model's explanatory capacity. Second, the current study used a convenience sampling method through online surveys. Due to the limitation of geographical location, the participants in the survey mainly come from Danang. In addition, respondents were mainly from the young and unmarried groups. As a result, diverse samples with married groups having children or having no children should be collected more in further research. In addition, samples from the business service sector were much more focused along with the lack of the other fields such as manufacturing and industry make the research results limited. Future research should for better cross-industry comparison of cultural intelligence. Therefore, further research should expand the sample size and collect multi-disciplinary data to have a comparison between job status.

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THE ROLE OF GAMIFICATION IN DRIVING USER STICKINESS AND POSITIVE WORD-OF-MOUTH IN APP-BASED LANGUAGE LEARNING – AN S-O-R APPROACH

Academic advisor: MBA. Chu My Giang¹

Students: Le Viet Bao Hung¹, Thai Bao Chau¹

ABSTRACT: Mobile app developers have been adopting gamification as a relatively novel mechanism, believing that it will help engage app users and facilitate customer value creation. Therefore, this research is conducted to confirm if gamification can make users stay longer in the app and give positive comments about the app. The study examines the effects of the app's gamification features on user stickiness and positive word-of-mouth via a new conceptual model following the Stimulus-Organism-Response structure. With such findings, marketing practitioners can develop unique strategies to upgrade user experiences, thus enhancing overall marketing performance.

Keywords: gamification; stickiness; word-of-mouth; perceived value; user engagement.

ANALYSIS OF FACTORS AFFECTING THE ADOPTION OF SUSTAINABLE FARMING PRACTICES BY FARMERS IN VIETNAM: THE ROLE OF BEHAVIORAL FACTOR.

Thao Nguyen-Phuong², Phong Nguyen-The², Thu Pham-Anh², Hieu Lai-Minh²

Abstract: Over the past few decades, people's living standards have improved, and their demand for healthier lifestyles and better food sources has also increased. There needs to be a suitable method in the future to meet the needs of both quantity and quality of the people. Understanding behavioral and non-behavioral factors will be a step forward in promoting decisions to adopt sustainable practices, creating a balance between economic development and environmental protection. In this research, we use NEP to represent social factors, at the same time, based on the theoretical diagram of a sustainable livelihood framework built by DFID with 5 types of livelihood capital: (1) human capital; (2) natural capital; (3) financial capital; (4) physical capital, and (5) social capital, our framework further develops non-behavioral factors to consider the impact of these factors. With the proposed research framework to integrate behavioral factors with non-behavioral factors affecting sustainable farming decisions of Vietnamese farmers, our study uses survey data of 303 farmers across large rural areas of Vietnam to check the validity of the proposed research framework through two models - SEM and Binary logit. The results suggest that farmers who tend to risk tolerance and have concerns about food safety and environmental concerns tend to adopt organic farming practices. Eight propositions in NEP are considered to be meaningful to farmers' decision to apply organic farming. Farmers' financial perceptions, particularly changes in the costs of adopting organic farming, discourage farmers from choosing sustainable farming practices. Our research results also show that, after the age of 60, farmers are no longer willing to participate in this farming method. The association between farmers and the local government system significantly impacts farmers' decisions to practice sustainable agriculture. The green nearby and farm size are the factors that influence farmers' decision to adopt sustainable agriculture in several ways.

Keywords: Sustainable agriculture, organic farming, behavioral factors, non-behavioral factors, Vietnam

1 University of Economics – The University of Danang

2 Faculty of Political Economy, VNU University of Economics and Business

ON THE LIQUIDITY CONNECTEDNESS BETWEEN CRYPTOCURRENCIES AND OTHER FINANCIAL ASSETS

Phuong Ha Bui^{1*}, Thai Hong Le²

Abstract: This paper aims to examine the liquidity connectedness between major asset classes, including cryptocurrencies, oil, gold, stocks, and bonds, over the period from September 2014 to November 2022. Results from the time-varying parameter vector autoregression (TVP-VAR) show that the liquidity connectedness between the examined asset classes is generally low, with Bitcoin being the main transmitter of liquidity shocks while oil and bonds act as net receivers. Next, we employ the biwavelet analysis to investigate the co-movement between the liquidity connectedness index (TCI) and various uncertainty factors. Our findings suggest a weak correlation between the TCI index and uncertainty factors, and especially no significant correlation between the TCI index and geopolitical risk. However, some notable correlation still appears during the 2014-2015 and 2018-2021 periods. During the former period, the TCI index plays the leading role, whereas during the latter period it is affected by various risk factors.

Key words: liquidity connectedness, TVP-VAR, biwavelet analysis, uncertainties, cryptocurrencies

JEL codes: C32, E02, G10, G11

THE IMPACT OF EMISSION TRADING SCHEME ON CORPORATE CAPITAL STRUCTURE: EVIDENCE FROM A QUASI-NATURAL EXPERIMENT FROM CHINA

Nguyen Hanh Luu³, Hiep Ngoc Luu⁴, Uyen Ngoc Phung³,
Trang Thi Mai Nguyen³, My Thi Tra Nguyen³

Abstract: This paper examines the impact of environmental regulation on corporate capital structure decisions. Based on data from 3,410 listed companies in China from 2006 to 2021, we apply a staggered differences-in-differences method in a quasi-natural experimental environment. Our results indicate that the emission trading scheme significantly associates with corporate capital structure decisions and leads to decreasing leverage in Chinese firms through using several robustness tests, falsification tests, and dynamic timing effects. This policy might increase firms' default risk and further cause challenges for firms to access external capital markets. Our findings also provide a reference for policymakers about the relationship between the ETS program and corporate capital structure decisions, and implementing the Emission Trading Scheme affects carbon-intensive sectors.

Keywords: Environmental Regulations; Emission Trading Scheme (ETS); Capital Structure; China; Difference-in-Difference.

JEL classification: Q58, Q51, G32, D81.

¹ VNU University of Economics and Business, Ha Noi, Viet Nam; Email: haphuong.rces@gmail.com.

² VNU University of Economics and Business, Ha Noi, Viet Nam

³ VNU University of Economics and Business, Vietnam National University, Hanoi, Vietnam

⁴ University of St-Andrews, St Andrews, United Kingdom; Email: hiepln@vnu.edu.vn

DETERMINANTS OF THE AGRI-TOURISM DEVELOPMENT IN THE TAN CUONG GREEN TEA FARMING AREAS (THAI NGUYEN): A HYBRID APPROACH BASED ON THE COMBINATION OF THE DIFFUSION OF INNOVATION (DOI) THEORY AND THE PLS-SEM

An Thinh Nguyen¹, Nhung P.T. Nguyen², Thuy Hang Nguyen¹, Ngoc Tran¹, Tung Lam Nguyen¹

Abstract: Agri-tourism is known as a means of identification and realization of various on-farm and off-farm attractions existing in rural destinations. This study aims to analyze the factors affecting the development of agri-tourism in Thai Nguyen province including Green Productivity (GP), Digital Transformation (DX), and Stakeholder Engagement (SE). Five innovative attributes of DOI theory: Relative advantage, Compatibility, Complexity, Trialability, and Observability are applied. Questionnaires were distributed to 350 residents of green tea farmers' cooperatives in Thai Nguyen. The collected data were analyzed using partial least squares structural equation modeling (PLS-SEM). The findings reveal that (1) Compatibility, Trialability, and Observability factors explain 35.8% of local's perception of Green Productivity ($R^2 = 0.358$); (2) Compatibility, Complexity, and Observability factors explain 30.6% of local's perception of Stakeholder engagement ($R^2 = 0.306$); (3) Relative Advantage, Complexity, Trialability, and Observability factors explain 34.6% of local's perception on Digital Transformation ($R^2 = 0.346$); and (4) Green Productivity, Stakeholder engagement, Digital Transformation explain 55.1% of Development of Agri-tourism ($R^2 = 0.551$). The findings reveal that the 5 innovation attributes of DOI are good predictors of the application of green productivity, stakeholder engagement, and digital transformation in agri-tourism. The results also show that GP, SE, and DX contribute positively to the development of agri-tourism. The policy recommendations of the study are also discussed.

Keywords: Agri-tourism, Green Productivity, Stakeholder Engagement, Digital Transformation, PLS-SEM, Diffusion of Innovations (DOI), Thai Nguyen, Vietnam.

THE IMPACT OF SOCIAL CAPITAL ON ENTREPRENEURIAL INTENTION AMONG HANOI STUDENTS

Le Thi Quynh Trang³, Nguyen Hai Anh⁴, Nguyen Van Hung³

Abstract: Social capital has been a foundation of Vietnamese unity for thousands of years, allowing the nation to overcome hostile forces throughout its history. However, this capital has not been used to promote entrepreneurship, particularly among young and creative students. To address this issue, the authors evaluated the influence of social capital on students' entrepreneurial intentions in Hanoi. The research uses qualitative and quantitative research methods to identify and test the influencing factors of social capital on students' entrepreneurial intentions. The results from a survey of 367 students at eight universities in the city of Hanoi show that there are 5 factors that positively affect the students' intention to start up a business, including (1) social network, (2) trust, (3) social interaction, (4) perceived desirability, (5) perceived feasibility. In addition, by findings from data processing using SPSS 20 software demonstrate, the authors show that perceived desirability plays the most important role in entrepreneurial intention. Based on these results, the group of authors has made recommendations for universities and colleges in the process of training and supporting students to start up a successful business. This study has significant implications for theory, practice, and politics.

Key words: Entrepreneurial intention, students, social capital, perceived desirability.

¹ University Economics and Business, Vietnam National University

² University Economics and Business, Vietnam National University; East Asia University of Technology, Hanoi, Vietnam

³ VNU University of Economics and Business, 144 Xuan Thuy, Cau Giay, Hanoi, Vietnam

⁴ VNU University of Economics and Business, 144 Xuan Thuy, Cau Giay, Hanoi, Vietnam; Email: 20050201@vnu.edu.vn

FACTORS AFFECTING CUSTOMER'S INTENTION TO PURCHASE ORGANIC COSMETICS IN HANOI

Anh Hoang Minh¹, Thuong Tran Dieu², My Do Thi Ha¹, Quoc Nguyen Anh¹

Abstract: As human life continues to advance and improve, there is an increasing interest and utilization of organic, natural, and health-safe products, among which organic cosmetics stand out. However, this consumption trend is relatively novel to Vietnamese citizens, making it challenging for businesses to grasp consumer intentions toward these products. Therefore, the research team conducted a study on the factors influencing consumers' intention to purchase organic cosmetics in Hanoi City by expanding the Theory of Planned Behavior (TPB) model. Regression analysis results from 146 participants revealed that attitude, subjective norms, perceived behavioral control, and brand positively impacted purchase intentions. Conversely, perceived price had an inverse effect, while environmental concern did not affect the intention to purchase organic cosmetics. Consequently, the study proposed solutions for businesses to stimulate consumer intentions to purchase organic cosmetics.

Keywords: Customers' Behaviour, Organic cosmetic, purchasing intention, TPB, Sustainable consumption.

THE INFLUENCE OF FACTORS OF ENTERPRISE CHARACTERISTICS ON THE APPLICATION OF IFRS OF LISTED COMPANIES IN VIETNAM

Pham Le Hong Chau³, Nguyen Thu Thao⁴, Tran Thi Thang⁴, Do Thi Vui⁴

Abstract: In the trend of global economic integration, the application of international financial reporting standards (IFRS) is a solution for Vietnamese businesses to increase transparency, comparability of financial reporting information, while reducing capital costs and increasing competitiveness for businesses. The objective of the research is to identify and measure the extent of the influence of factors on business characteristics on the application of IFRS by listed companies in Vietnam. The research uses descriptive statistics, correlation coefficient analysis and binary logistic regression analysis to process data collected from 400 companies listed on HNX and HOSE in the period 2019 - 2021. The results of the research show that there are 4 factors affecting IFRS application of listed companies in Vietnam: Audit quality, Firm size, Foreign investment and Number of Supervisory Board Members. Thereby, the research proposes a number of recommendations for businesses as well as stakeholders to strengthen and accelerate the application of IFRS in Vietnam.

Keyword: International financial reporting standards, factors on business characteristics, listed companies in Vietnam, foreign investment, audit quality.

¹ School of Business Administration, VNU University of Economics and Business, No. 144 Xuan Thuy Road, Cau Giay District, Hanoi, Vietnam

² School of Business Administration, VNU University of Economics and Business, No. 144 Xuan Thuy Road, Cau Giay District, Hanoi, Vietnam; Email : 20050364@vnu.edu.vn

³ VNU University of Economics and Business; Email: hongchau.phamle02@gmail.com;

⁴ VNU University of Economics and Business

THE MEDIATING ROLE OF MENTAL ACCOUNTING ON INVESTMENT DECISION: THE CASE OF BEGINNER INVESTORS IN VIETNAM

Phuong Thu Nguyen¹, Phuong Thao Bui¹

Abstract: The study investigates the impact of Mental Accounting on investment decisions of new individual investors in Vietnam as an intermediate variable. This study uses quantitative and qualitative methods to analyze data collected from 215 investors in Vietnam through questionnaires. Results show that 3 factors: Investment Time, Investor's Analysis, Stock Type has a positive influence on Mental Accounting. Stock Type factors have the strongest impact on Mental Accounting, followed by Investment Time and Investor's Analysis. However, Demographic factors (Age, Gender, Training Field, Annual Income, Academic Level) witnesses no influence on Mental Accounting, which reflects the characteristics of Vietnam's stock market. From the analysis, it is evident that investors do not always make objective investment decisions. We also make some recommendations to improve the quality of beginner Vietnamese investors.

Keywords: mental accounting, investment decisions, beginner investors.

THE IMPACT OF E-LOGISTICS ON THE BUSINESS EFFECTIVENESS OF ENTERPRISES AND SELLERS ON E-COMMERCE PLATFORMS: EVIDENCE FROM VIETNAM

Nguyen Thanh Phuong², Phan Thi Minh², Tran Cong Thang²

Abstract: E-Logistics service was created and developed to assist businesses in resolving complex issues including output, input, and optimizing the cycle of transportation of products and services. However, in terms of technical infrastructure, delivery schedule, and accuracy, E-Logistics likewise has a difficult time securing investment resources. As a result, the research team conducted a survey with a valid response number of 182 votes on the factors of E-Logistics affecting business effectiveness of enterprises and sellers on the e-commerce platforms in Vietnam. The research findings from data processing using SPSS 20 software demonstrate that five aspects of E-Logistics services, including technology and security, payment system electronic accounting, last mile delivery, legal system, organization, management, and risk handling, have an impact on business effectiveness of enterprises. The SWOT matrix was finally combined by the research team to make some recommendations to improve the business effectiveness of enterprises and sellers.

Keywords: E-Logistics, Business effectiveness, Enterprises, Sellers, E-Commerce Platforms.

EVALUATING THE IMPACT OF DIGITAL TRANSFORMATION ON ATTRACTING FDI TO VIETNAM

Tran Thi Hong Gam³, Pham Khanh Linh¹, Bui Phuong Thao¹, Nguyen Thi Hai Anh¹, Vu Thi Lam¹

Abstract: The ongoing global phenomenon of digital transformation is also prevalent in Vietnam, significantly influencing all sectors of the economy and playing a crucial role in attracting foreign direct investment (FDI) to the nation. The study evaluates the impact of digital transformation on attracting FDI in Vietnam across three dimensions: digital government, digital economy, and digital society by two models constructed based on Eclectic theory and panel data analysis. Using data from 23 countries investing in Vietnam during the period of 2010-2021, the study demonstrates that digital transformation has a positive impact on FDI attraction in Vietnam, with the digital economy showing a significant positive influence while digital government and digital society have not yet reached statistical significance. This implies that Vietnam's digital transformation plays an important role in attracting FDI, but the level of transformation is not uniform across all sectors. Based on the model results, the study proposes solutions to leverage the positive impact of digital transformation on FDI attraction in Vietnam, especially in the area of digital transformation.

Keywords: FDI, Digital transformation, Vietnam.

¹ VNU University of Economics and Business, 144 Xuan Thuy, Cau Giay, Hanoi, Vietnam

² VNU University of Economics and Business, 144 Xuan Thuy Road, Cau Giay District, Hanoi, Vietnam

³ Faculty of International Business and Economics, VNU University of Economics and Business

THE MECHANISMS UNDERLYING HOUSEHOLDS' DECISION TO USE SMART HEALTHCARE DEVICES: EVIDENCE FROM VIETNAM

Nguyen Thi Phuong Anh¹, Nguyen Lam My Anh¹, Bui Hieu Ly¹
Nguyen Thi Phuong Thao¹, Nguyen Thi Thanh Tam¹, Dinh Thi Trang¹

Abstract: Health and well-being are crucial aspects of sustainable development goals, emphasizing the need for a healthy society. However, people often struggle to prioritize their health due to busy lifestyles, making it essential to provide convenient and effective healthcare services. The COVID-19 pandemic has further emphasized the importance of health protection and the demand for intelligent healthcare products. Smart healthcare devices have gained popularity, offering efficient health monitoring and resource optimization. While the market for these devices is predominantly concentrated in developed countries, the industry in Vietnam shows promise, driven by economic growth and increasing demand. To understand the factors influencing households' decisions to use smart healthcare devices in Vietnam, this study develops a research model, constructs a questionnaire, and analyzes the data. The findings contribute to bridging the gap between consumer intention and actual usage of these devices and provide valuable insights for stakeholders to promote market development. Additionally, the study has implications for sustainable economic practices by proposing solutions to optimize policy programs and encourage consumers to adopt smart healthcare devices. By prioritizing actual behavior over mere intentions, this research fosters a favorable environment for smart healthcare device usage and supports the goals of sustainable economic development.

Keyword: smart healthcare device, Vietnam, decision, consumer behavior, SEM

A MACHINE LEARNING ALGORITHM TO EXPLORE THE IMPACT OF AGRICULTURAL LAND USED TYPES (LUTS) ON CO₂ EMISSIONS IN VIETNAM IN THE PERIOD 1990 - 2019

Nguyen Tuong Anh², Tran The Hoang², Doan Xuan Truc²,
Supervisors: Assoc. Prof. Dr. Nguyen An Thinh² and Ms. Dang Trung Chinh²

Abstract: This study aims to apply machine learning algorithms to explore the impact of agricultural land use types on CO₂ emissions in Vietnam from 1990 to 2019. Research using 4-layer artificial neural networks (ANNs) to analyze the relationship between agricultural land use types (LUTs) and CO₂ emissions. A total of 21 LUTs are selected to run the ANN model of this research method, including agricultural products such as crops, meat, vegetables. The results show that most of the increase in agricultural LUT correlated positively with CO₂ emissions (those are bananas; beans, dry; cabbages; cashew nuts, in shell; cassava, fresh; jute, raw or retted; cauliflowers and broccoli; chillies and peppers, dry, raw; cinnamon and cinnamon-tree flowers, raw; coconuts, in shell; coffee, green; groundnuts, excluding shelled; hen eggs in shell, fresh; watermelons; tea leaves; sweet potatoes), whereas others has a negative effect on CO₂ emissions (horse meat, fresh or chilled; unmanufactured tobacco; soya beans; sesame seed; rice). The findings of this study can be served as a scientific basis for policymakers promote effective strategies for reducing greenhouse gas (GHG) emissions from agricultural production into the atmosphere.

Keywords: Agricultural land used type; Co₂ in atmosphere; Environmental policy; Machine learning; Artificial Neural Network

¹ VNU-University of Economics and Business

² University of Economics and Business, Vietnam National University, Hanoi, Vietnam

EFFECTS OF PERCEIVED VALUE, SWITCHING COSTS ON RELATIONSHIP QUALITY AND FASHION BRAND ENGAGEMENT OF CUSTOMER IN HANOI: A RESEARCH FOR FASHION PRODUCTS

Cao Thi Ha Linh¹, Tran Thuy Linh¹, Tran Thi Thu Ha¹

Abstract: *This study analyzes the impact of perceived value, switching costs on relationship quality and fashion brand engagement of customers in Hanoi. Through data obtained from 188 customers who have bought fashion products, the PLS-SEM method with SmartPLS 4.0 software was used to test the metrological and structural models. The results show that perceived value has a positive impact on the quality of the relationship between the customer and the fashion brand, and the quality of the relationship has a positive impact on the customer engagement to the fashion brand. And perceived value has an indirect impact on brand engagement through relationship quality. Since then, the study has proposed some recommendations to businesses about fashion products. Specifically, fashion product brand managers need to: (i) Strengthen relationships with customers to achieve engagement; (ii) Improving customer care activities, improving product quality; (iii) Fashion brands can segment customers based on their level of engagement; (iv) Customer relationship quality will determine their engagement.*

Keywords: *Perceived value, switching costs, relationship quality, brand engagement, fashion industry.*

¹ Department of Business Administration, VNU University of Economics and Business, Hanoi, Vietnam.

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