# KỶ YẾU

## HỘI THẢO QUỐC TẾ DÀNH CHO CÁC NHÀ KHOA HỌC TRẺ KHỐI TRƯỜNG KINH TẾ VÀ KINH DOANH NĂM 2021

## PROCEEDINGS

## INTERNATIONAL CONFERENCE FOR YOUNG RESEARCHERS IN ECONOMICS AND BUSINESS

## ICYREB 2021

**Volume 4**

# HỌC VIỆN NGÂN HÀNG
## *BANKING ACADEMY OF VIETNAM*

NGÂN HÀNG NHÀ NƯỚC VIỆT NAM

**HỌC VIỆN NGÂN HÀNG**

# KỶ YẾU HỘI THẢO QUỐC TẾ

DÀNH CHO CÁC NHÀ KHOA HỌC TRẺ

KHỐI TRƯỜNG KINH TẾ VÀ KINH DOANH NĂM 2021

*INTERNATIONAL CONFERENCE FOR*

*YOUNG RESEARCHERS IN ECONOMICS AND BUSINESS*

## ICYREB 2021

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# BUSINESS ADMINISTRATION AND INNOVATIVE START-UP

# THE IMPACT OF INFLUENCER MARKETING ON CONSUMERS' BRAND ADMIRATION AND PURCHASE INTENTIONS

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## Abstract

*This research focuses on cosmetic products and observes the impact of celebrities and expert influencers on consumers' brand admiration and purchase intentions. The mediating role played by brand admiration and brand attitude between influencer marketing and purchase intentions are tested. The survey method was employed to conduct this research, and data were collected from 522 respondents. The proposed hypotheses were tested using Cronbach's Alpha coefficient and SEM structural models. The results submit that both celebrities and expert influencers have positive impact on consumers' brand attitude. The mediating role of brand attitude and brand admiration is empirically evident. This is a new discovery of the topic compared to previous studies of Influencer Marketing in the beauty industry. Finally, this research also indicates that using Influencer Marketing in the beauty industry on Facebook and Instagram is more effective in Vietnam than that on YouTube and Tik Tok, respectively.*

*Keywords: Brand Admiration, Brand Attitude, Influencer Marketing, Purchase Intention, Young Consumers.*

## 1. Introduction

One of the indispensable human needs is to beautify themselves. Daily socio-economic development and life quality improvement are accompanied by a change in the perception of beauty over time and space. At the same time, there is a growing demand for beauty care not only among women. Consumers aged 18 - 30 pay much attention to cosmetic products and their share in the total consumption is also high. In Vietnam, according to statistics published by Influencer Marketing Platform 7SAT (2020), approximately 90% of consumers trust influencer recommendations and the revenue of an effective Influencer Marketing campaign is 6.5 times higher than its expenses on average. Thus, it can be seen that Influencer Marketing is growing fast in Vietnam.

The number of studies conducted referring to influencer marketing is not small both domestically and internationally. These studies have shown the influence of influencer marketing on a number of factors such as customer attitudes towards the brand (brand attitudes), purchasing intentions and demographic factors such as gender. However, each study focused on influencer marketing's impact on one or two factors, so there was no comparison between the above factors. Therefore, the authors will synthesize and continue to

study more in-depth about all the above-mentioned impacts as well as exploitation, add new elements to perfect the scale such as brand admiration. The synthesis, evaluation and comparison of many influencing factors at the same time will enhance the comprehensiveness of the study. Based on a planned behavioral theory model and a rational model of action theory, the authors developed a model of research. In addition, the influence of influencer marketing through previous studies usually focuses only on relationship research on brand attitudes and consumer purchasing intentions. We found that there are other aspects such as brand admiration including brand love, brand trust, and brand respect have not been done research for beauty products.

Moreover, in practice, there is no national research study on the impact of Influencer Marketing on three factors: Brand Attitude, Brand Admiration and Purchase Intentions toward cosmetic products. Therefore, the research team chose the topic "*The Impact of Influencer Marketing on Consumers' Brand Admiration and Purchase Intentions*". Data were collected from labours aged 18 - 30 in Hanoi and the paper focuses on cosmetic products in order to give recommendations to brands for the purpose of maximizing the effectiveness of Influencer Marketing.

## 2. Literature review

### *2.1. International studies*

#### *2.1.1. Studies on the impact of Influencer Marketing on brand attitude and purchase intentions*

According to Mehdi Abzari et al. (2014), traditional advertising and social media have a significant effect on brand attitude. Besides, the effect of traditional media on brand attitude is stronger than social media, and customer attitude towards a brand has a significant effect on purchase intention.

According to Xin Jean Lim (2017), Influencer Marketing has an insignificant relationship with attitude and purchase intention. The main reason is that influencers' inadequate expertise knowledge about endorsed products. In addition, consumer attitude has a positive effect on purchase intention.

According to Spears, N., and Singh, S. N. (2004), attitude toward the ad (positive feelings, negative feelings, evaluations) has an indirect effect on purchase intention through attitude toward the brand.

#### *2.1.2. Studies on the impact of Influencer Marketing on brand admiration and purchase intention*

Jay Trivedi and Ramzan Sama's study (2019) focused on consumer electronics products and observes the comparative effect of celebrity vis-à-vis expert influencers on Gen Y (born after 1981) s' online purchase intentions. Expert influencers and attractive celebrity influencers exhibit an indirect effect on purchase intentions through message process involvement, attitude toward brand and brand admiration. As for electronics products, the effect of expert influencers is stronger.

Angela Mariska, Harry Soesan and Mahfudz's study (2019) analyzed the influence of product reliability, brands admiration and prices on brand reputation and its influence on purchasing decisions. From the results of research, brand admiration has a positive effect on brand reputation and brand reputation has a positive effect on purchasing decisions.

*2.1.3. Studies on the impact of Influencer Marketing on purchase intention*

Saima, and Khan, M. A. 's study (2020) was an attempt to identify the effect of various attributes of social media influencers on their credibility and eventually on purchase intention of consumers. The findings reveal that trustworthiness, information quality and entertainment value have significant direct effects on the credibility of influencers as well as significant indirect effects on the purchase intention of consumers. Also, the purchase intention of consumers is directly affected by an influencer's trustworthiness and credibility.

Trivedi, J. P. 's study (2018) pointed out that gen Z have a stronger relationship with social media and celebrities. As for the fashion and lifestyle industry, the effectiveness of attractive celebrity influencers is higher than expert influencers.

Azka Faranisa Ananda and Harimukti Wandebori's study (2016) determined the impact of drugstore makeup product reviews by beauty vloggers on YouTube towards purchase intention by undergraduate students in Indonesia. There is an impact from consumer attitude towards purchase intention, which is determined through the following factors: trustworthiness, expertise, attractiveness, and quantity of review. From the result of this research, trustworthiness of beauty vlogger, expertise of beauty vlogger and quantity of product review are parts that construct consumer attitude that influences purchase intention while attractiveness of beauty vlogger is not proven as part that constructs consumer attitude that influences purchase intention.

Atika Hermanda, Ujang Sumarwan and Netti Tinaprillia's research (2019) discovered how influencers influence the brand image and the purchase intention of cosmetic consumers. The research implements the purchase intention as the endogenous variable and influencers as the exogenous variable, as well as brand image as the intervening variable. The research results in the significant negative influence of influencer towards the purchase intention, in contrast with the brand image which had a significant positive effect.

*2.2. National studies*

Huynh Vy's thesis (2020) explored the role of social media influencers (SMIs) during the consumer decision-making process in the context of the Vietnamese beauty and cosmetic market. The results suggest that SMIs are influential throughout the three first stages of the consumer decision-making process (problem recognition, information search, and evaluation of alternatives) through creating helpful contents and staying relevant to consumers. However, as SMIs grow in size and attract more sponsorship offers, the authenticity of their product recommendations becomes questionable.

Research conducted by Pham Thi Minh Ly and Nguyen Thuy Vy (2015) aimed to assess consumers' evaluations of influencer's impact on attitude toward advertisements and

brands. The results show that relevant factors, negative information, and appearance have the strongest impact on consumers' attitude. Likability is the fourth strongest factor while trustworthiness and expertise are not highly demanded because the study was limited to common products.

## 3. Theoretical basis

### 3.1. Concepts

#### 3.1.1. Concept of Influencers

Through previous studies by Kartajay, Kotler and Setiawan (2017), Törhönen, Sjöblom, Hassan, and Hamari (2019), Lin, Bruning and Swarna (2018), Chaffey and Ellis-Chadwick (2016), Górecka-Butora, Strykowski and Biegun (2019) and Cotter (2019), it can be understood that an Influencer is an individual who has the ability to influence the purchasing decisions of others due to factors that they themselves own or are perceived by the community as power, knowledge, status, or relationship. In the context of social media, an Influencer is a person who has a large following, uses one or more social networking platforms such as Facebook, Instagram, Youtube, Tiktok, etc. to spread information to people, gain knowledge. knowledge of a particular field or ability to persuade a certain audience. This is also the approach that the research team chooses in this topic.

#### 3.1.2. Influencers Classification

According to 7SAT - an advertising service provider through Influencer/KOL, the Influencer network in Vietnam consists of 5 groups.

i) Vip/Celebrity: A group of celebrities with a large number of followers on social networks such as

ii) Professional Influencer: includes experts, people with high expertise and influence in a certain field.

iii) Citizen Influencer: Ordinary people who have more than 500 followers and their posts are always warmly received and interacted with by viewers.

iv) Community Fanpage: community fan pages with a huge number of followers on social networks

v) Fictional Character Fanpage: are fan pages of fictional characters with certain influence in the community.

In this study, the research team will mainly focus on Influencer i and ii. Hereafter, the research team called Expert Influencer (EI) and Attractive Celebrity Influencer (ACI) - celebrities with charisma and influence (Jay Trivedi and Ramzan Sama, 2019).

#### 3.1.3. Concept of Influencer Marketing

From previous studies, it is possible to define influencer marketing as a form of marketing by using influencers in society to convey the message of the business to the target audience. Instead of advertising directly to a group of customers, the business will partner and

pay influencers to spread the message through their social media channels. The message may be written by the influencers themselves or it can be complied by the business. This is also the approach that the authors choose in this topic.

### *3.2. Original theory*

According to the theory of planned behaviour, behavioural intentions are determined by three factors: (i) attitude toward the behaviour, (ii) subjective norm, and (iii) perceived behavioural control. According to the theory of reasoned action, limitations of attitude and subjective norm in practice are pointed out. If individuals lack behavioural control, intentions do not determine the performance of behaviours. Therefore, to overcome these limitations, Ajzen proposed the theory of planned bahaviour by introducing perceived behavioural control into it. He extended the theory of reasoned action wwith irrational factors to increase accuracy of beahvioural prediction model.

This research draws on the theory of planned behaviour because it describes the relationship between attitude and behaviour. In this study, the researchers aim to draw the relationship between brand attitude and purchase intentions toward cosmetic products. Brand attitude is proposed to be formed from the effect of an attractive celebrity or expert influencer.

### 4. Methodology

The research used two methods including qualitative and quantitative.

In the qualitative dimension of the research, in-depth interview method was utilized by getting information from marketing experts, economic experts, and certain Vietnamese consumers. The results of the interviews with experts and consumers show that nowadays consumers are easily influenced on their lifestyle, brand attitudes and purchase intentions by celebrities and influential experts on the internet. social networking forums like Facebook, Instagram, Youtube, Tik Tok,...

In the quantitative dimension of the research, data were collected from 522 consumers with Google Forms. The data collected is used to estimate SEM structural models with the support of SPSS 20.0 and AMOS 20.0 software. The research team chooses this method to study the impact of independent variables on dependent variables; in particular, the impact of influencers' characteristics on brand attitude, the impact of brand attitude on brand admiration (including brand trust, brand love and brand respect) and the impact of brand admiration on purchase intentions.

From literature review and theoretical basis, the research team hypothesizes:

- H1a: Expert influencers (EI)' characteristics including (EIE) expert influencers' expertise and (EIC) expert influencers' credibility exhibits positive effects on brand attitude (AB).

- H1b: Attractive celebrity influencers (ACI)' characteristics include: (ACIS) similarity to attractive celebrity influencers, (ACIA) attractive celebrity influencers' attraction, (ACIL) attractive celebrity influencers' likability, (ACIF) attractive celebrity influencers' familarity exhibit positive effects on brand attitude (AB).

- H2a: Brand attitude (AB) exhibits a positive effect on brand trust (BT).

- H2b: Brand attitude (AB) exhibits a positive effect on brand love (BL).

- H2c: Brand attitude (AB) exhibits a positive effect on brand respect (BR).

- H3a: Brand trust (BT) exhibits a positive effect on purchase intentions (PI).

- H3b: Brand love (BL) exhibits a positive effect on purchase intentions (PI).

- H3c: Brand respect (BR) exhibits a positive effect on purchase intentions (PI).

**Figure 1. SEM Research framework**
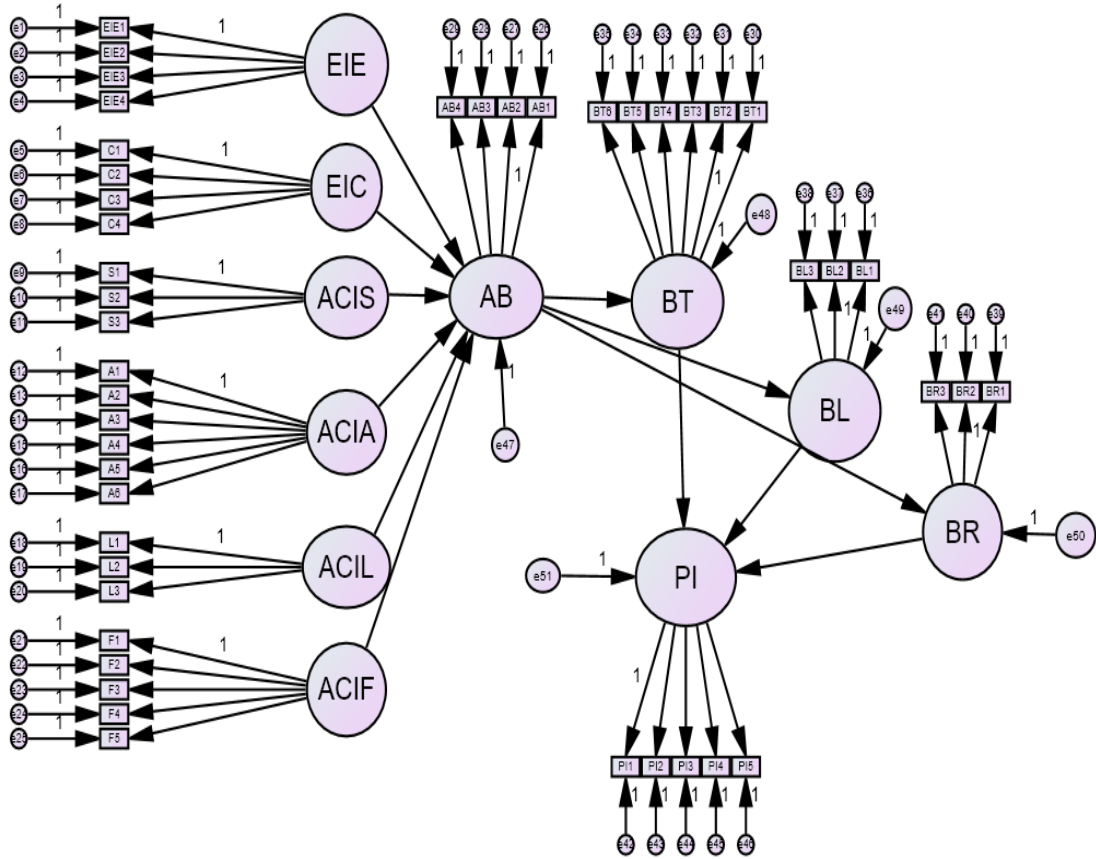


*Source: The team synthesized and built from AMOS 20.0 software*

**Table 1. Summarize the expected effects of the variables**

| Independent Variables | Dependent Variables | Source | Expected impact |
|---|---|---|---|
| EIE | | Ohanian (1990) | |
| EIC | | Ohanian (1990) | |
| ACIS | | Chun Cui Shan and Lim Wai Meng and Tan Ree Wen and Teh Ee Wen (2018) | |
| ACIA | AB | Ohanian (1990) | Positive impact |
| ACIL | | Chun Cui Shan and Lim Wai Meng and Tan Ree Wen and Teh Ee Wen (2018) | |
| ACIF | | Chun Cui Shan and Lim Wai Meng and | |

| | | | |
|---|---|---|---|
| AB | | Tan Ree Wen and Teh Ee Wen (2018) | |
| | BT | Mehdi Abzari, Reza Abachian Ghassemi, Leila Nasrolahi Vosta, (2014); Trivedi, Jay P. (2018) | |
| | BL | | |
| | BR | | |
| BT | PI | Karjaluoto, H., Munnukka, J., & Kiuru, K. (2016); Syed Hasnain Alam Kazmi1 and Muhammad Khalique, (2019) | |
| BL | | Syed Hasnain Alam Kazmi1 and Muhammad Khalique, (2019) | |
| BR | | Frei and Shaver (2002) | |

*Source: Synthesized and proposed by the research team*

## 5. Results and discussion

Data were collected through online surveys carried out in Hanoi. In total, there are 522 cases of analyzable samples. The findings approve that consumers stay connected with influencers the most through two social media platforms, namely Facebook and Instagram.

### 5.1. Results of KMO (Kaiser-Meyer-Olkin)

The KMO (Kaiser-Meyer-Olkin) values more than 0,5 ($0,5 \leq KMO \leq 1$), showing that exploratory factors analysis are appropriate.

### 5.2. Results of SEM model

**Table 2. Regression Weights**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| AB | <--- | EIE | -.163 | .025 | -6.629 | *** | |
| AB | <--- | EIC | .231 | .028 | 8.176 | *** | |
| AB | <--- | ACIS | .003 | .027 | .111 | .912 | |
| AB | <--- | ACIA | .064 | .031 | 2.043 | .041 | |
| AB | <--- | ACIL | .185 | .035 | 5.325 | *** | |
| AB | <--- | ACIF | .078 | .034 | 2.337 | .019 | |
| BT | <--- | AB | .589 | .050 | 11.759 | *** | |
| BL | <--- | AB | .255 | .054 | 4.691 | *** | |
| BR | <--- | AB | .638 | .059 | 10.814 | *** | |
| PI | <--- | BT | .248 | .052 | 4.729 | *** | |
| PI | <--- | BL | .149 | .030 | 5.045 | *** | |
| PI | <--- | BR | .098 | .036 | 2.752 | .006 | |

*Source: Calculated by the authors using AMOS*

With the 95% confidence interval, Sig (P) of ACIS on AB is 0.912>0.05, so variable ACIS exhibits no effect on variable AB. The remaining variables have Sig<0.5, so these

relationships are significant. From here, the research team removed variable ACIS from the research model.

**Table 3. Standardized Regression Weights**

|  |  |  | Estimate |
|---|---|---|---|
| AB | <--- | EIE | -.303 |
| AB | <--- | EIC | .397 |
| AB | <--- | ACIS | .005 |
| AB | <--- | ACIA | .090 |
| AB | <--- | ACIL | .247 |
| AB | <--- | ACIF | .103 |
| BT | <--- | AB | .819 |
| BL | <--- | AB | .248 |
| BR | <--- | AB | .658 |
| PI | <--- | BT | .330 |
| PI | <--- | BL | .285 |
| PI | <--- | BR | .177 |

*Source: Calculated by the authors using AMOS*

The estimated regression coefficient in Table 6.2 shows the effect of the independent variables on the dependent variable.

The regression coefficient of EIE is -0.303<0.00, showing the negative effect of EIE variable on AB. The regression coefficients of the remaining variables are >0.00, so they have the positive effect on the dependent variable.

Among the independent variables that have positive effects on AB (Brand attitude), the variables presented in order of decreasing effect are EIC (Expert influencers' credibility), ACIL (Attractive celebrity influencers' likability), ACIF (attractive celebrity influencers' familarity), ACIA (Attractive celebrity influencers' attraction), ACIS (Similarity to attractive celebrity influencers).

As for the effect of AB (Brand attitude) on Brand admiration (BA - including BT, BL, BR), the variables presented in order of decreasing effect are BT (Brand trust) brand), BR (Brand respect), BL (Brand love).

As for the effect of Brand admiration (BA - including BT, BL, BR) on PI (Purchase intention), the variables presented in order of decreasing effect are BT (Brand trust) brand), BL (Brand love), BR (Brand respect).

**Table 4. Squared Multiple Correlations ($R^2$)**

|     | Estimate |
| --- | --- |
| AB  | .329 |
| BR  | .433 |
| BL  | .061 |
| BT  | .671 |
| PI  | .339 |

*Source: Calculated by the authors using AMOS*

The Estimate coefficient in table 6.3 represents the R squared value of the impact of the independent variables on the dependent variable.

The variables of influencers' characteristics explain 32.9% of the change in AB (Brand attitude). Variable AB explains 43.3% of the change in BR (Brand respect), 6.1% of the change in BL (Brand love), 67.1% of the change in BT (Brand trust)). Variables BT, BL, BR explained 33.9% of the change in PI (Purchase intention).

**Table 5. Hypotheses tested with the SEM model**

| | **Hypothesis** | **Test Results** |
| --- | --- | --- |
| H1a | Expert Influencers exhibits a positive effect on Brand Attitude. | Partially accepted |
| H1b | Attractive Celebrity Influencers exhibits a positive effect on Brand Attitude. | Accepted |
| H2a | Brand Attitude exhibits a positive effect on Brand Trust | Accepted |
| H2b | Brand Attitude exhibits a positive effect on Brand Love | Accepted |
| H2c | Brand Attitude exhibits a positive effect on Brand Resrpect | Accepted |
| H3a | Brand Trust exhibits a positive effect on Purchase Intention | Accepted |
| H3b | Brand Love exhibits a positive effect on Purchase Intention | Accepted |
| H3c | Brand Respect exhibits a positive effect on Purchase Intention | Accepted |

*Source: Calculated by the authors*

### 5.3. Discussion

It can be seen that Influencers and Celebrities with charisma and influence have a significant and positive impact on Consumer Attitudes. The results can be explained by when Influencer has high credibility, attractiveness, likability, familiarity and similarity with consumers, it will build sympathy and attract the following of consumers. From there,

consumers will easily receive product marketing information from Influencer, have a positive attitude towards Influencer and products and brands associated with Influencer. Besides, this result is completely reasonable with the context of the Vietnamese market, especially Hanoi city with its economic and social development and Influencer Marketing.

The results indicate that the Consumer Attitude towards the brand has a significant and positive impact on the Brand Admiration. This result is consistent with the conclusion of Jay Trivedi and Ramzan Sama (2019) showing that Brand Attitude will build a positive relationship with Brand Admiration. When consumers have a good attitude towards the brand, they will form brand trust, love and respect for the brand. Conversely, when consumers have a negative attitude towards the brand, it will affect their trust, love and respect for that brand.

The results also show a significant and positive impact of Brand Admiration on Consumer Purchase Intent. This result is completely consistent with the conclusion of Jay Trivedi and Ramzan Sama (2019); Angela Mariska, Harry Soesan and Mahfudz (2019) show that when a brand builds trust, love and respect for the brand with consumers, purchase intention will also be formed.

## 6. Recommendations

### 6.1. Recommendatios for brands

*Firstly*, as for customers aged 18 – 30 in Hanoi, brands and influencers should boost marketing communication on two social media platforms Facebook and Instagram. *Secondly*, firms should choose celebrity influencers having a pure life, a lovely personality, honesty, and sincerity. *Thirdly*, firms should choose stars or influencers with far – reaching impact and most followed accounts. *Fourthly*, choosing influencers have characteristics, hobbies, and lifestyles similar to customers. *Fifthly*, brands should choose influencers having expert knowledge of health and credibility to introduce about products. To raise the effectiveness of Influencer Marketing as well as Influencers on brand admiration and purchase intentions toward cosmetic products, brands should choose suitable social media platforms.

### 6.2. Recommendatios for influencers: character traits influencers should develop to promote their attraction and positive consumers' brand attitude

*Firstly*, as for expert influencers, to build long-term relationships with their customers, they should improve their expertise and maintain their credibility, thereby increasing consumer evaluations of products endorsed. *Secondly*, as for attractive celebrity influencers, similarity, attraction, likability and familarity improve customer interaction, customer reach and brand recognition. *Thirdly*, expert influencers should develop attractive celebrity influencers' character traits and vice versa to gain the outstanding effects. When suitability, accuracy and attraction in their information, more customer bases will be reached, and the effectiveness of Influencer Marketing will rise.

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# THE IMPACT OF ELECTRIC WORD OF MOUTH THROUGH SOCIAL NETWORKING PLATFORMS ON PURCHASE INTENTION OF VIETNAMESE CUSTOMERS IN COSMETICS INDUSTRY

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## Abstract

*The purpose of this study is to investigate the impact of Electronic word of mouth through social networking platforms on purchase intention of Vietnamese customers in cosmetics field. To conduct the study, the author built up five hypotheses based on the previous studies about EWOM. The outcomes obtained from the data analysis have made the picture clearer when among different factors of eWOM, the quality of eWOM information, the attitude of eWOM information regarding cosmetics have positive impact on cosmetic purchase intention of Vietnamese customers. Therefore, it is necessary for cosmetic Vietnamese enterprises to focus on improving the quality of cosmetic sources of content they provide to online customers as well as guarantee the sufficient number of cosmetic content for customers, especially for the target group of customers. Other factors of eWOM like subjective standards towards cosmetic eWOM information is siginificantly postitive on purchase intention of Vietnamese customers in cosmetics field.*

*Keywords: Electric word of mouth; Social networking platforms; Purchase intention; Cosmetics industry; Vietnam.*

## 1. Introduction

The explosion of information technology in 4.0 Industrial Revolution changes the way customers search information, express their views about specific products or services. According to InternetWorldStats[1], there are over 4 billions of people using the Internet in 2018 and this number continues to increase significantly each year (by 7%). Internet in general and social media platforms in particular allow customers to express and share their point of view about products with the others. Pitta & Fowler (2005) believe that due to powerful advance of the internet, consumers are nowadays used to finding opinions and comments made by previous consumers at the aim of looking for necessary information before making decision on buying items or not. According to Hennig-Thurau (2004), Internet development raises possibility of customer to express their unbiased views on products. The growth of the Internet facilitates the chance for millions of people to share and spread their views and opinions (Dellarocas, 2003). Besides, Kozinets (2010) pointed out that the scope

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[1] InternetWorldStats, 2018. Available at: https://www.internetworldstats.com/stats.htm . Access on 05-03-2019

and ability of easy access to the Internet allow marketers to handle and follow up word of mouth (WOM).

WOM is an oral communication in which the receiver accepts an uncommercialized message in relation to the brand, product or service from the sender (Arndt, 1967). In other words, WOM happens between a conversation of two people where the sender gives an information about a product, service or even about a company to the receiver. Word of mouth (WOM) is considered to be an important source of information affecting consumer behavior (Chevalier & Mayzlin, 2006). Opinions, comments from consumers are considered to contain more updated, interesting and reliable information than marketing information from the product suppliers themselves. Today, the development of the Internet and information technology, especially social networking sites, has created a new environment that allows information exchange to be done more easily and frequently, which created a new term called "Electronic word of mouth" (eWOM).

The huge number of social networking platforms such as facebook, WhatsApp, Pinterest, Instagram, Twitter…attract billions of customers to join, creating such a powerful environment for eWOM to develop, in which Facebook becomes the most popular one with over 2 billions of active users (Smart Insights, 2018). This huge number of users proves that social media platforms have a huge attraction towards users, enabling them to connect more, share more, and of course, express their opinions about any issues arising or any product/service they purchase. EWOM, therefore, become more and more popular among online customers. EWOM through social media platforms is getting considerable attention of researchers and marketers in terms of its effects on customer behaviors.

Therefore, it is important to do the research about the effects of electronic word of mouth on purchase decision in the context of social media platforms to provide understandings. Hennig-Thurau (2004) believed that it is important for marketing officials to take eWOM into consideration, as views shown on social media platforms are nearly available to millions of individuals within a long period of time. According to Dellarocas (2003), since social media platforms are able to access to a wide range of customers at low cost, eWOM becomes very widespread, therefore, eWOM can be a strong tool to make a product popular in bigger market. Thus, it is important for marketers and enterprises to understand deeply and handle communication issues in every field of businesses, especially in fast-consuming goods industries in general and cosmetics industry in particular.

With general research above about the trend of using social networking sites and word of mouth tool online for cosmetic purchase of Vietnamese customers, it is necessary to conduct deeper study about the impact of electronic word of mouth through social networking platforms on purchase intention of Vietnamese customers in cosmetic industry. Recognizing the lack of studies on eWOM as well as its impact on customer purchase intention in cosmetic field in Vietnamese market, the study was conducted with the aim of understanding the

factors of eWOM information through social networking platforms which affect purchase intention of Vietnamese customers in cosmetic market.

The main objective is to help marketers and cosmetic businesses to have a detailed view about the impact of each specific factor of electronic word of mouth on purchase intention of cosmetic Vietnamese customers. We all know that the strong development of eWOM via social networks significantly affects cosmetic purchase intention. However, we do not know which detailed aspects of eWOM influence buying intention of cosmetic Vietnamese customers and the extent of impact in each factor of eWOM yet. Therefore, the study aims at figuring out factors of eWOM which affect cosmetic purchase intention in Vietnam as well as their impact level on buying intention.

This study is essential for cosmetic Vietnamese enterprises because at present, there is no research about eWOM in cosmetic field for Vietnamese market. It is clear that there is a knowledge gap needed to be fulfilled here. When in literature of this research, eWOM topic has been mentioned and studied by various scholars, typically Alboqami (2015) with his research "eWOM in social media" or Cheung, Lee et.al. (2008) with their study "the impact of eWOM'. But for Vietnamese market, it seems that the topic has been studied at a scarce scale. Especially, there is no research about eWOM for cosmetic industry. The author did the searching before starting the research to make sure this topic has been still the knowledge gap needed to be closed by this research. And the result for this searching was that there were some outstanding studies about eWOM such as Thao (2018); Ha & Thu (2020). Because of the knowledge gap in eWOM and purchase intention for cosmetic field, it makes the author have more motivation to start and complete this research. The research focuses on the impact of electronic word of mouth through social networking platforms on purchase intention of cosmetic Vietnamese customers, therefore, the central research question will be How does eWOM through social networking platforms influence customer purchase intention of Vietnamese customers in cosmetic field?"

The rest of this paper is organised as follows. First, we provide the research introduction. We then introduce the theoretical model and hypotheses, and explain the research design, before presenting the results. Finally, we discuss the study's theoretical and practical implications, along with some suggestions for future research.

## 2. Literature Review

### 2.1. Electronic word of mouth and Social networking platforms

Word of mouth is believed to be an important factor in affecting attitudes, behavior and intentions of customers (Sen & Lerman, 2007). Word of mouth is a talk or discuss about a specific product/service among those who are independent in companies supplying the products or those who are consumers of the products (Silverman, 2001). According to Riegner (2007), the second influential source affecting buying behaviors of customers comes from suggestions and clues of their close folks, which is called word of mouth. With the advancement of technology, it has led people to communicate through the internet,

specifically with social media. This development has brought a new outlook to WOM, consequently modifying its term to "electronic word of mouth (eWOM)" (Erkan & Evans, 2014). Goldsmith et al. (2008) characterize eWOM as all communication, relating to the detail knowledge of the product, services or the sellers thereof, informally done through the Internet, which are then forwarded to the consumers.

Electronic word of mouth is affirmations made by customers, both present ones and potential one about a particular product or service, the opinions are present in online forums, social platforms on the Internet (Hennig & Thurau, 2004). Doh & Hwang (2009), and Zhang (2010) identified that EWOM has regarded as an effective marketing tool in difference kind of dimensions such as customers count on eWOM such as opinions, reviews, comments about products before buying them. EWOM in these industries include unofficial talks, chat among consumers or between consumers and sellers on the base of social networking platforms about their usage or character of specific goods and services.

Keenan & Shiri (2009) identify that social networking platforms try to appeal more and more people, making every advantages and favourable conditions for participants to communicate on those platforms. The internet establishes a wide range of effective platforms to eWOM development such as blogs, forums, social networking sites (Cantallops & Salvi, 2014). The study of Ho & See (2014) shows that eWOM from those platforms has influence on purchase intentions. Chu & Kim (2011) argue that social networking platforms in general have been making significant changes in eWOM forms. Because they enable users to communicate with each other, users are able to share their views and comments about a specific product and service with their close folks such as their friends, relatives. For example, a policy of Facebook in 2011, which is the most world popular social networking site, was applied to make users use their real names. This is believed to help users access to more effective and reliable eWOM sources (Chu & Choi, 2011). According to Wolny & Mueller (2013) pointed out that most of dialogues among users on social networking platforms mentions or discusses brands, issues related to products.

According to Erkan (2016), social networking platforms are regarded as suitable platforms for eWOM, which is provding an excellent environmemnt for consumers are able to express their points of view about product/service/brand by various ways such as posting photos, updating statues, commenting. Barreda (2015) emphasizes that a large number of online customers are using social networking platforms to get advice from their close folks about product/service they intent to buy. Alboqami et al., (2015) points out that eWOM on social networking platforms is expressed in various means. More specifically, online customers have already known about the product or service after they consume those items and then share their experience and reviews for other users by pressing "Like" button, sharing an article about the product, commenting about quality of the product.

## 2.2. EWOM adoption

Previous studies about eWOM can be divided into two groups: population aspect and individual aspect. The former mainly focuses on the relationship between eWOM and product sales based on panel data collected from electronic commerce websites (Cheung et al., 2011). The latter treats eWOM as an interactive process between consumers. The communication between the senders and receivers of eWOM finally influences the decision of receivers (Park & Kim, 2008). Our research focuses on the adoption of eWOM during a consumer's decision-making process.

There have been numerous studies about the factors that may impact the adoption of eWOM. Consumers make decisions based on eWOM because of its informative and persuasive nature (Park & Kim, 2008). According to the theory of reasoned action (TRA) and the technology acceptance model (TAM), usefulness is one of the key factors that impact the acceptance of certain technology or behavior. Sussman & Siegal (2003) extended the research about usefulness to the field of information adoption. They addressed usefulness as a key antecedent factor of the acceptance of information. Cheung et al. (2009) proved that the usefulness significantly affects the adoption of eWOM. Cheung et al. (2008) also pointed out the usefulness of eWOM is affected by its relevance, timeliness, accuracy and integrity.

## 2.3. The relationship of eWOM and Purchase Intention

Intention element is used to evaluate the possibility of future behavior, according to Blackwell (2001). Meanwhile, Ajzen (1991) stated that intention is a motivating element, which plays the role of motivating an individual to be willing to perform a specific behavior. Contributing to this idea, Delafrooz et al. (2011) believed that online purchase intention is the certainty of an individual to make purchases on the Internet.

According to Bemmaor (1995), customer purchase intention has been evaluated thoroughly in marketing studies and this factor is regarded as a means to measure the amount of sales of a product. Consumer purchase intention is affected by close folks' recommendations and reviews including those of friends, relatives… (Price & Feick, 1984). This means that WOM has certain impact on customer purchase intention. In the scenario of powerful development of social networking platforms, the impact of EWOM on purchase intention has been shown more clearly.

With the growing trend of social media, researchers argue that eWOM has a significant impact on consumers' purchase intentions (Kim & Park, 2008). Kim & Park (2016) supports Ghosh's statement by stating that an individual's action or behavior can be forecasted and predicted by their intentions. Also, due to the enhancement in the convenience of eWOM communication, consumers can eliminate doubts about their decisions quickly and easily (Erkan & Evans, 2014). Similarly, Chatterjee (2001) argues that due to the eWOM messages, consumers are able to minimize risks which affects their decision process. Consequently, by looking at the amount of negative and positive eWOM information, consumers may think of the product as favorable or unfavorable (Han et al., 2008). Because

of this, it has become important for marketers to know the concept of eWOM for better communication with their customers and to better understand the factors affecting the buying intentions of consumers.

Many previous researchers have examined the purchase intention in relation to the various research contexts like the environment, firm behavior and so on. For example, Thamizhvanan & Xavier (2013) analyzed the factors of customers' purchase intention in the online environment, while Tian et al. (2020) identified the determinants of purchase intentions in the real estate industry. However, in the eWOM context, Dwivedi et al. (2020) stipulate that the impact of consumers' buying intention may depend on the message, receiver, and the source of eWOM. Furthermore, Erkan & Evans (2016) assert that both the characteristics of the eWOM message and the reactions to the message of a consumer reflects the impact of eWOM to the buying intention of consumers. Specifically looking through the characteristics of an eWOM information, several determinants were found from previous researchers such as the information quality (Gunawan & Huarng, 2015), credibility (Chih et al., 2013). Hence, the study would like to focus on these traits of eWOM message from the persecptive of quality and attitude toward information and its impact on the purchase intention of consumers.

### 2.4. Conceptual framework and hypothesis development

This study supports the point of view that both characteristics of E-WOM and customer attitude and behavior toward E-WOM information should be considered in term of their influence on customer purchase intention. Therefore, in this study, the model proposed is a combination of IAM from **Figure 1** (Sussman and Siegal, 2003) and the model TRA from **Figure 2** (Fishbein and Ajzen, 1975). From the theorical perspective, IAM discusses the nature of information eWOM, and TRA demonstrate consumer behavior and attitude toward E-WOM information. Thus, the combination allows the proposed research model to evaluate the link among variables as following: EWOM quality, attitude towards EWOM, subjective norm for EWOM, EWOM adoption and customer purchase intention.

**Figure 1: Information Adoption Model (Sussman and Siegal, 2003)**
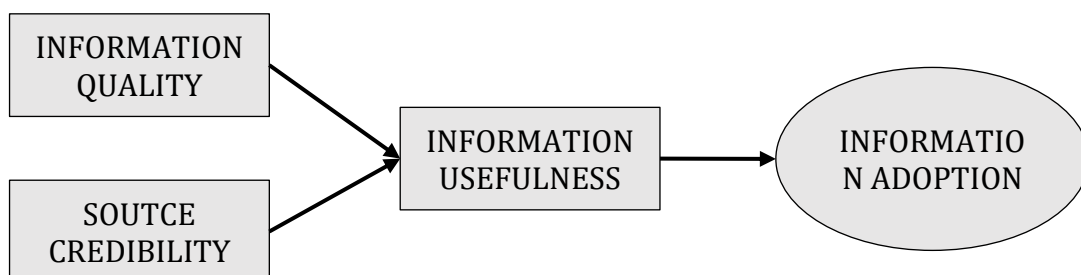
**Figure 2: Theory of reasoned action (Fishbein & Ajzen, 1975)**
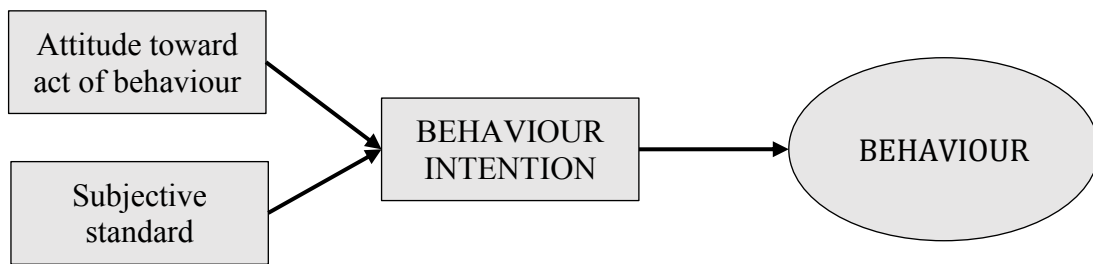


From the analysis and hypotheses, the conceptual research model is proposed as following:

**Figure 3: Conceptual research model for the thesis**
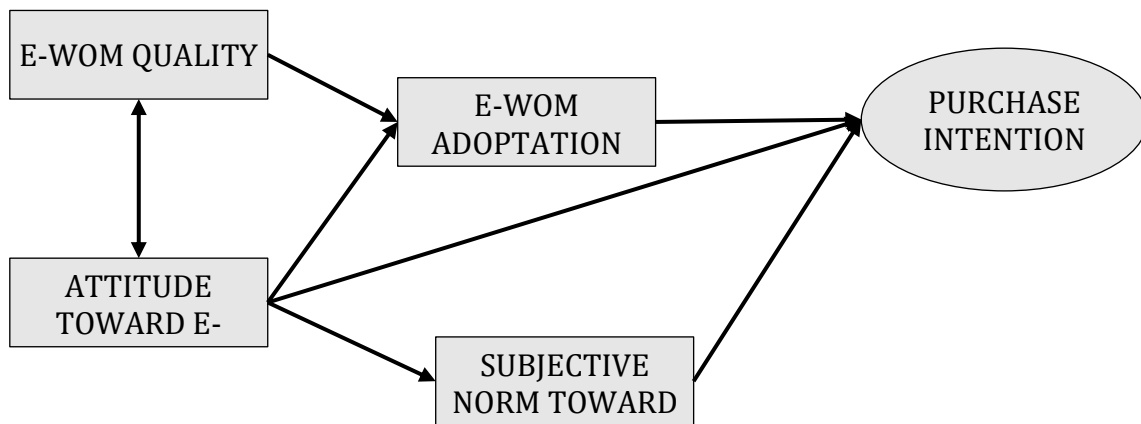


*2.4.1. eWOM adoption related hypotheses*

E-WOM may be created by most social network users; thus, quality of EWOM is increasingly paid attention (Xu, 2014). Actually, Park (2007) reveal that the quality of virtual comments has a positive impact on consumer purchase intentions. Thus, it can be believed that quality of E-WOM on social networking sites (SNSs) is among essential criteria to consumer buying intention. Wathen & Burkell (2002) identified that reliability of information (or information credibility) is a prerequisite criterion in a process of persuading an individual to pay attention on their buying. Thus, with the model IAM, this study sets expectations that EWOM credibility is positively related to EWOM usefulness and lead to EWOM adoption and purchase intention. Thus, this study proposes the following two hypotheses:

H1: EWOM quality about cosmetic products positively impacts the eWOM adoption.

*2.4.2. E-WOM Attitudes towards information related hypotheses*

Attitude and subjective norm toward information are recommended in the TRA model of Fishbein and Ajzen (1975). Customer attitudes involved to eWOM were done by some scholars in the previous researches, however subjective norms are not almost evaluated yet (Prendergast et al., 2010). Hansen, Jensen & Solgaard (2004) identify subjective standards as a factor that has a special influence on the countries with the community culture like Vietnam.

Therefore, the write suggests to put subjective norm in the suggested research model besides customer's attitude toward E-WOM with hypotheses as following:

H2: Attitude towards cosmetic eWOM information positively impact the E-WOM adoption.

H3: Attitude towards cosmetic eWOM information positively impact purchase intention.

*2.4.3. Customer purchase intention related hypotheses*

According to Ho and See (2014), people who use social networking platforms whether intentionally or not make various information on social networking platforms and the previous studies point out that eWOM influences buying intention. Yang (2012) argues that the acceptance of E-WOM sources on social networking platforms affects purchase intention and the impact level is different. This research proposes hypothesis that high rate of eWOM adoption leads to high rate of purchase intention. Thus, this study proposes the following two hypotheses:

H4: eWOM adoption about cosmetic products has a positive effect on cosmetic purchase intention of Vietnamese customers

H5: Subject norms towards cosmetic eWOM information positively effect on cosmetic purchase intention of Vietnamese customers

## 3. Research methodology

### 3.1. Data collection

In order to achieve research goal, we employed a quantitative study based on an online questionnaire in the Vietnamese context. The survey was aimed at internet users who had previously made an online comestics purchase. In the questionnaire, they were asked to think about an online vendor they had made a purchase from and where they had read online reviews published on the own vendor's EWOM platform (e.g. facebook.com). Thus, the questionnaire was completed with consideration of their previous experience with the website. The survey was disseminated through social networking sites such as Facebook. We used a nonrandom sampling approach and collected our data at a national level through a self-administered and voluntary survey. A link to the survey was provided to participants, who were then able to answer it directly and anonymously. Finally, 309 valid questionnaires were completed.

Accordingly, the author decides to choose a group of social networking users on Facebook as respondents for the sample because this channel of social networks is the most popular one for cosmetic shopping in Vietnam. Accordingly, the survey was conducted online by sending out questionnaire link to 350 Vietnamese people, but only 309 responses are valid and complete.

Quantitative method is used as the central methodology to solve the main research question for this research. To apply this method smoothly through the whole thesis, the author started with collecting data from survey and questionnaire method. The survey was conducted with the Vietnamese respondents who have an social network account like Facebook, Twitter,

Instagram…These respondents answers questions about their behaviors before making cosmetic purchase. The step of building up the questionnaire for the survey was so important that the author spent much time on selecting the suitable scale for each variable, which made favourable conditions for latter step of data analysis.

In data analysis, quantitative method supply the author a lot of reliable tools, including the scale reliability Cronbach's Alpha, the Exploratory Factor analysis EFA, the Confirmatory Factor analysis CFA. Furthermore, structural equation modeling (SEM) was also used to check the model fitness, so that AMOS software was applied for this purpose. In fact, the conduction of exploratory factor analysis (EFA) provides an evident path that demonstrates how items are precisely loadedbased on their respective factors (Hair et al., 2010). According to Netemeyer et al. (2003), the individual items' factors loadings must be greater than 0.4 in EFA. Furthermore, the Kaiser-Meyer-Olkin (KMO) and Bartlett's values should be greater than 0.6 (Tabachnick & Fidell, 2001). EFA was performed by using principal axis factoring and eigenvalues greater than 1 (McKnight & Chervany, 2002). The individual items loadings greater than 0.4 reveal that the values were in the acceptable range and all the items loaded on their respective factors. Furthermore, The overall fit of the measurement and structural models were assessed using a combination of absolute and relative indexes: normed chi-square (CMIN/DF), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). For both the measurement and structural models to have sufficiently good fit, these measures needed to be $<3, \geq 0.8, \geq 0.95$, and $\leq 0.7$ respectively (Hair et al., 2010). With those tools, the author can obtain the results related to EWOM factors that affect purchase intention of Vietnamese customers in cosmetic field.

### 3.2. Measurement of variables

The variables of the study were measured using items adapted from previous research. The various scales applied in this research to study variables and their hypotheses are built up based on the Likert scale with five levels, including "strongly disagree", "disagree", "neutral", "agree" and "strongly agree". The Likert scale may differ a little bit in different researches, but basically there are always five rating degrees to classify difference among subjects. The scale is designed with a group of questions which were previously used and referenced by other researchers. The reason the scales are used in this research is for making the survey reliable and more accurate. Among them, the scales of "cosmetic EWOM information quality" and "attitudes towards cosmetic EWOM information" are applied to the research based on the previous scales used by Park et al. (2007). The study of Cheung et at. (2009) provide the scales for "cosmetic EWOM information adoption" variable in this research. With the variable "subjective norms towards cosmetic EWOM information", the author uses the scales of Fishbein & Ajzen (1975). Finally, the scales of the dependent variable "cosmetic purchase intention" are based on the study of Coyle & Thorson (2001). The constructs and items are presented in **Table 1**.

**Table 1: Specification of the construct domain and measurement items**

| Construct | Items | Measurement items sources |
|---|---|---|
| *EWOM information quality* | - Easily understood<br>- Clear, accurate<br>- High-quality | Park et al. (2007) |
| *EWOM information attitude* | - Useful for me to make purchase decision<br>- Makes me feel confident in purchasing | Park et al. (2007) |
| *EWOM information adoption* | - Make me feel easier to buy a specific cosmetic product<br>- Helps me buy cosmetic products efficiently | Cheung et at. (2009) |
| *Subjective norm* | - My respected & beloved ones advice me to consult cosmetic information on SNPs<br>- People like me regularly read cosmetic information on SNPs | Fishbein & Ajzen (1975) |
| *Cosmetic purchase intention* | - High possibility for me to buy after I read reviews or posts on SNPs<br>- More likely purchase the item someday when I need it after reading reviews or posts on SNPs<br>- After reading reviews or posts on SNPs, I surely purchase the cosmetic product<br>- I will recommend the product read from a review or post on SNPs to my friends | Coyle & Thorson (2001) |

## 4. Result

### 4.1. Respondents' demographic

The respondents' demographic are presenrted in **Table 2**. A total of 309 responses was employed for the analysis phase. Out of that, we found 26.54 percent of them were male, 73.46 percent of them are from the age above 18 years old. The majority of participants in this research have a minimum of a high school and below's degree. Approximately 58.90 percent of participants have the bachelor degree, and only 29.45 percent got the master degree and 6.47 percent got the Ph.D degree.

**Table 2: Demographic characteristics of the samples**

| | | Frequency | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 82 | 26.54 |
| | Female | 227 | 73.46 |
| **Age** | 18-20 | 19 | 6.15 |
| | 21-25 | 225 | 72.82 |
| | 26-30 | 40 | 12.94 |
| | More than 30 | 25 | 8.09 |

| Education | | High school, below | 16 | 5.18 |
| | | Bachelor degree | 182 | 58.90 |
| | | Masters | 91 | 29.45 |
| | | Ph.D | 20 | 6.47 |
| **Online shopping experience** | | Less than 1 year | 19 | 6.15 |
| | | 1-3 years | 103 | 33.33 |
| | | 4-5 years | 118 | 38.19 |
| | | 6-7 years | 36 | 11.65 |
| | | More than 7 years | 33 | 10.68 |
| **Online shopping in a month (on average)?** | | 1-4 times | 17 | 5.50 |
| | | 5-8 times | 97 | 31.39 |
| | | 9-12 times | 135 | 43.69 |
| | | More than 12 times | 60 | 19.42 |
| **Have you shopped online cosmetic products?** | | Yes | 217 | 70.23 |
| | | No | 92 | 29.77 |
| **Read reviews/comments before purchase?** | | Yes | 280 | 90.61 |
| | | No | 29 | 9.39 |

The result of our survey illustrates that all of the respondents have read and experienced eWOM including online customer reviews, blogs, web boards, and social media posts before they make a purchase. Respondents' information search for products shows that 38.19 percent respondents used the internet from four-five years, and 94.5 percent respondents were those who shopped online more than 5 times per month (on average). Also, 90.61% respondents preferred to read reviews or comments, posted by different cosmetic products customers before purchase.

### 4.2. Validity and reliability analysis

To ensure the quality of the construct measurement, we conducted the reliability test examining the internal consistency of construct measurement. Factor loadings and Cronbach's alpha values are used for this purpose (Hair et al., 2010). They claim that the lowest acceptable value is 0.6, and the value of higher than 0.8 indicates a strong coherence of the measurement items. The results show an acceptable level of reliability, as Cronbach's alpha values ranging from 0.808 to 0.867, are higher than the shreshold value of 0.7 (Hair et al., 2010). Hence, the results of the current study show an acceptable level of reliability for all our constructs (as shown in **Table 3**).

**Table 3: Validity and reliability analysis**

| Construct | Item | Factor loading | Item-total correlation (>0.5) | Cronbach's Alpha (>0.7) | AVE (>0.5) |
|---|---|---|---|---|---|
| **EWOM information quality** | | | | 0.848 | 0.644 |
| | Inqua1 | 0.797 | 0.701 | | |
| | Inqua2 | 0.780 | 0.750 | | |
| | Inqua3 | 0.626 | 0.730 | | |

| | | | | | |
|---|---|---|---|---|---|
| **EWOM information attitude** | | | | 0.812 | 0.591 |
| | Att1 | 0.714 | 0.687 | | |
| | Att2 | 0.714 | 0.652 | | |
| | Att3 | 0.703 | 0.646 | | |
| **EWOM information adoption** | | | | 0.808 | 0.679 |
| | Adop1 | 0.823 | 0.679 | | |
| | Adop2 | 0.821 | 0.678 | | |
| **Subjective norm** | | | | 0.840 | 0.641 |
| | Sn1 | 0.822 | 0.723 | | |
| | Sn2 | 0.851 | 0.740 | | |
| | Sn3 | 0.726 | 0.658 | | |
| **Cosmetic purchase intention** | | | | 0.867 | 0.603 |
| | Int1 | 0.782 | 0.711 | | |
| | Int2 | 0.842 | 0.764 | | |
| | Int3 | 0.767 | 0.701 | | |
| | Int4 | 0.766 | 0.703 | | |

Convergent validity examines whether measured items of the same construct are correlated, which can be assessed through factor loading, average variance extracted (AVE), and reliability (Hair et al., 2010). **Table 3** summarises the results of the convergent validity testing of all constructs. Composite reliability (CR) values of all constructs were above the 0.7 threshold. AVE values of all constructs were greater than 0.5 (Hair et al., 2010). Hence, all constructs had acceptable reliability and convergent validity.

### 4.3. Structural equation model and model fit index

Structural equation modeling (SEM) used by many of researchers researchers for the evaluating their theories. For this study, the value of $\chi^2$/df is 1.432 which mean accepted. The ranges of AGFI (Adjusted goodness offit index), TLI (Tucker-Lewis Coefficient) and CFI (Comparative fit index), and GFI (Goodness of a fit index) are 0-1, and closely 1 recommends to perfect fit. The values of AGFI, GFI, CFI, and TLI are 0.929, 0.951, 0.989, and 0.986 which are perfect fit. The benchmark value of RMSEA (Root mean square of approximation) is slightly less 0.08 indicates good fit (Bollen & Long, 1993), this study's benchmark mark value is 0.037 which means considerably acceptable (see **Figure 2**).

### 4.4. Regression coefficients

As per conceptual framework, the structural model presented above in **Figure 2** shows the relationships between variables. Estimation of regression weights determined in **Table 4** indicated that eWOM quality information and eWOM attitude have a positive effect on eWOM adoption with value ranges 0.198 and 0.745, resprectively. We also find that eWOM adoption has a positive relation to purchase intention with values of 0.447. Furthermore, eWOM attitude has also positively affected the SN, their respected values is 0.939. However, we can not find the relationship between purchase intention and subjective norm, as well as purchase intention and EWOM information attitude.

**Figure 2: Structural equation model fitness**
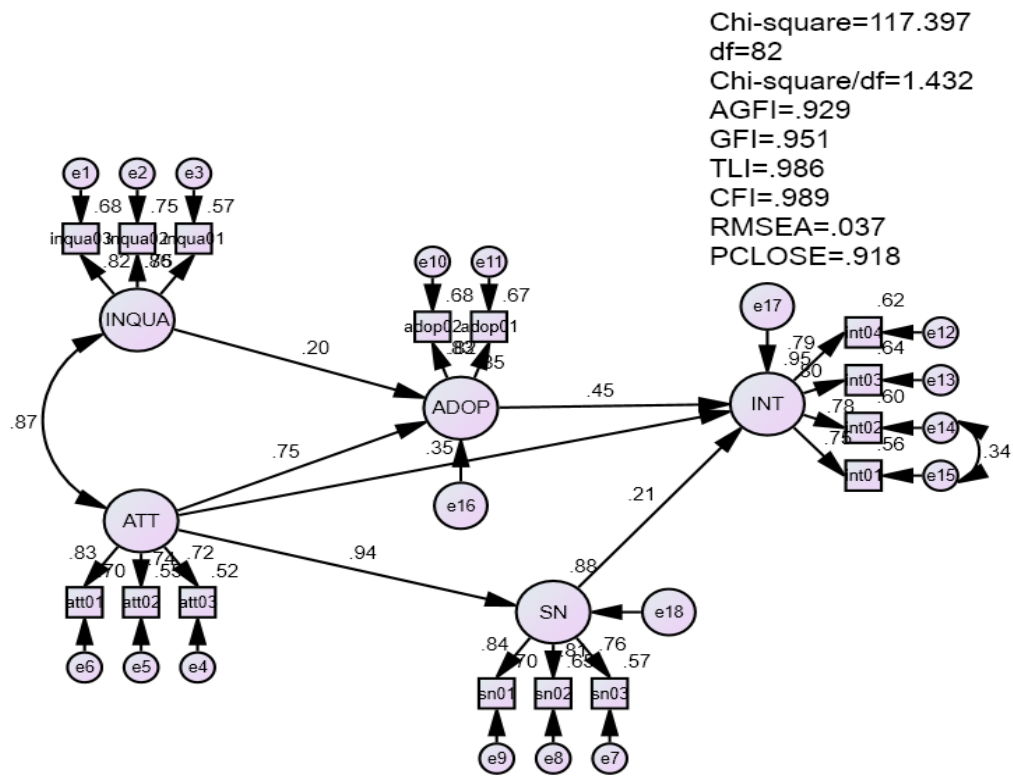


Note: INQUA: EWOM information quality; ATT: EWOM information attitude; ADOP: EWOM information adoption; INT: Cosmetic purchase intention; SN: Subjective norm.

**Table 4: Regression weights**

| Casual paths | Estimate | S.E. | C.R. | P | Results |
|---|---|---|---|---|---|
| ADOP ← INQUA | 0.198 | 0.093 | 1.753 | 0.080 | supported |
| ADOP ← ATT | 0.745 | 0.129 | 6.126 | *** | Supported |
| INT ← ADOP | 0.447 | 0.158 | 2.691 | *** | Supported |
| INT ← SN | 0.211 | 0.198 | 1.146 | 0.252 | Not supported |
| INT ← ATT | 0.347 | 0.280 | 1.253 | 0.210 | Not supported |
| SN ← ATT | 0.939 | 0.073 | 12.135 | *** | Supported |

Note: ***p values ≤ 0.01; INQUA: EWOM information quality; ATT: EWOM information attitude; ADOP: EWOM information adoption; INT: Cosmetic purchase intention; SN: Subjective norm.

## 5. Discussion

Compared to the studies and hypotheses suggested in the literature review, the outcomes from the data analysis shown above give some new viewpoints about the study of EWOM's impact on cosmetic purchase intention of Vietnamese people, which will be discussed as follows: In the literature review part, the statement of Park (2007) about EWOM quality was supported. He believed that quality of virtual comments or reviews has positive impact on purchase intention. And the hypothesis about EWOM quality and its positive

impact on purchase intention of cosmetic Vietnamese customers were supposed. It means that the quality of cosmetic EWOM informations on SNSs make Vietnamese customers intend to buy the cosmetic product. This means that cosmetic Vietnamese customers focus on the quality of EWOM when they consider buying cosmetics.

According to Erkan (2016), people have demand of seeking information on social media will tend to search for more helpful information sources, thus, adopt information at higher level, which can affect purchase intention. This point of view is true in case of cosmetic Vietnamese market. Based on the outcome obtained in the data analysis part, it is clear that the more cosmetic EWOM information Vietnamese customers require, the higher cosmetic purchase intention they have.

Hansen, Jensen & Solgaard (2004) identify subjective standards as a factor that has a special influence on the countries with the community culture like Vietnam. Thus, the study supposed that "subjective standards towards cosmetic EWOM information" has positive impact on cosmetic purchase intention of Vietnamese customers. From the results, we find that the factor "subjective standards" of Vietnamese people increase the possibility of purchase intention in term of cosmetics This result suggest that Vietnamese customers tend to follow advices of others who have close relationship with them.

The variable "attitude towards cosmetic EWOM information" was supposed to have a positive impact on cosmetic purchase intention of Vietnamese customers, based on viewpoint of Hansen (2004). On the other hand, "cosmetic EWOM information adoption" has positive impact on "cosmetic purchase intention" of Vietnamese customers. The outcomes from the data analysis shows that those hypotheses are true to cosmetic Vietnamese customers. It is when they regard "cosmetic EWOM" as an usefulness source and accept it, they have higher intention of buying cosmetics.

At this point, it is important to answer the central research question for the study "How does E-WOM through social networking platforms influence customer purchase intention of Vietnamese customers in cosmetic field?". Based on outcomes obtained from the data analysis and what are discussed above, it is clear that among seven factors of Electronic word of mouth studied in this research (including "cosmetic EWOM information quality", "attitude towards cosmetic EWOM information", "subjective standards towards cosmetic EWOM information", "cosmetic EWOM information adoption), those all have significantly positive impact on cosmetic purchase intention of Vietnamese customers. In fact, within the cosmetic EWOM information quality results, if a consumer deems a post or review to be strong, relevant, and objective, it can be expected that the information received is of good quality. Moreover, it can be viewed to further affect the buying intention of the consumer. This research also supports the effect of attitude towards cosmetic eWOM information on the eWOM adoption. Consequently, individuals who have higher eWOM adoption tend to increase their purchase intention when buying a cosmetic product.

From this analysis result, it is believed that if cosmetic businesses want to increase their sales (which means boost customer purchase intention), it is their task to find out which groups of customer segment that is really in need of cosmetic information. From that, they can focus on building up the marketing and cosmetic products content and provide plentiful cosmetic information sources for the targeted customer segment. Besides, it is important for businesses and marketers to know that when Vietnamese customers need EWOM, they are actually consulting someone about cosmetic product information. Therefore, establishing a good customer service team is essential to quickly respond any question, opinion of customers about cosmetic products. Quick and effective online react of cosmetic business for customers will help customers to satisfy their EWOM demand, which results in increase purchase intention then boost sales. In addition, based on the data analysis, it is obvious that Vietnamese customers are really concerned about original, accurate and reliable online sources and information about cosmetic products. Thus, the essential responsibility of businesses and marketers is that responding and providing reliable and original cosmetic information for customers besides meeting their demand for sufficient cosmetic updates.

## 6. Conclusion

Although EWOM concept has been studied by various previous scholars, this marketing tool for cosmetic Vietnamese market has not been discussed carefully. This research, therefore, contributed to marketers' understanding about EWOM in cosmetic field by studying the combination model of both EWOM characteristics and customer behavior factors. With the specific outcomes obtained, the study pointed out that the quality of cosmetic information are really important for marketers and businesses to take into account when it comes to applying EWOM marketing tool to businesses. In the end, the study expects to help cosmetic businesses and marketers to have a deeper view and knowledge about different aspects of EWOM, then help them to apply it effectively to marketing activities to boost purchase intention rate of cosmetic customers and cosmetic sales.

In sum, the study obtained the research objective which is to understand the role of specific EWOM factors in the cosmetic purchase intention of Vietnamese customers. In addition, it is important to keep in mind that EWOM will be more useful as it is applied together with other marketing tools such as guerrilla marketing, viral marketing. With this article, the author hopes that more EWOM strategies will be applied in the future, especially in the small and medium-sized business community and start-ups.

Limitations of the present study are that we only focused on cosmetic products customers of Vietnamese, used one single questionnaire with small sample size, a research model is intentionally simplified. However, it can be implemented on other goods and, in other countries as well with the enhancement of large sample size and model. In addition, the sampling technique used in this research is convenience sampling method, this is a non-probability sampling method, which leads to some limitations in term of generalizing the results (Nayeen Showkat, 2017). Lacking generalizability makes it impossible to widen the

scope of the obtain discovery beyond the selected sample Further study can be focused to explore other factors such as customers' perceived risk, trust, persuasion, effectiveness and cultural difference concerning the adoption of information. The further studies will also conducted for reasons behind the engagement of Vietnamese customers in EWOM on social networking platforms, which leads to some certain impacts on purchase intention.

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# WHICH FACTOR MAKES THE CRISIS TIMING STRATEGY MORE EFFECTIVE? INVESTIGATING THE CONCEPT OF INVOLVEMENT

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## Abstract

*An organization has different ways to cope with a crisis. These ways include both the choice of the content of messages and the timing of information release. This study seeks to examine (1) the impact of crisis timing strategies (stealing thunder and thunder) on responsibility and (2) explore the role of involvement in the crisis communication field. The experiment employs a between-subjects design and utilizes a fictitious crisis scenario to collect data from 300 participants. The results show that the use of stealing thunder to mitigate crisis damage is much more beneficial to organizations than thunder. In addition, the experimental result also reveals that crisis involvement has a moderating impact on the efficacy of crisis timing strategy toward organizational responsibility. Theoretically and pragmatically, key implications of this study suggest to the organization that the involvement of stakeholders takes a role as a shield to protect it during a crisis and should be proactive disclosure of crisis information as quickly as possible. It is necessary to make a more complex SCCT model by adding some variables such as involvement level, crisis timing strategies.*

*Keywords: Crisis timing strategies; involvement; responsibility; stealing thunder; thunder.*

## 1. Introduction

Crisis communication research produced many guidelines to cope with an unexpected crisis in the organization. In most cases, two types of crisis communication strategies are utilized to protect an organization including crisis response strategy and crisis timing strategy. The crisis response strategy focuses on the explanations for the crisis based on the Situational Crisis communication theory (Coombs, 2004) and Image restoration strategies (Benoit, 1997) while the crisis timing strategy is the timing self-disclosure of the crisis information. The literature on crisis communication paid more attention to what the organization says than the timing of response. It motivates to explore how about the effect of crisis timing strategy on handling crises.

Recently, a rising number of researchers have examined consumer variables (e.g., emotion, intension behavior,…). The role of involvement, as well as the influence of it on the perceptions of stakeholders toward the crisis event and organization, in crisis communication, was pointed out in some research (Arpan & Roskos- Ewoldsen, 2005; Choi & Lin, 2009b; Coombs & Holladay, 2005). Some experts took crisis involvement as a potential moderating

variable that affects the relationship between crisis response strategies and crisis types in reducing the crisis damage. Choi and Lin (2009a) investigated the differences in stakeholders' perceptions of crisis via two kinds of media such as online platforms and newspapers under the moderating effect of crisis involvement. Their finding is that different media channels give different perceptions of the public about crisis and depend on the involvement of stakeholders. Choi and Chung (2013) demonstrated that crisis involvement is a worthy variable to consider the effectiveness of crisis response strategies in any crisis. The reason why involvement becomes more important to study is that if crisis response strategies directly reach the target stakeholder, they will gain the desired impact (Coombs, 2006, 2007b; Gurau & Serban, 2005). Researchers, hence, took notice of the issues- relevant audience. When crisis managers select an effective crisis communication strategy, they should consider the involvement of stakeholders in the organization. Furthermore, Coombs and Holladay (2005) suggested that taking into account the involvement role in the crisis communication model is indispensable. Although crisis involvement determines significantly crisis outcomes, little research has examined it. To enrich the guidelines of the SCCT, this study attempts to debate the moderating role of crisis involvement impacting the relationship between crisis strategy and crisis communication outcome.

Therefore, mindful of those research gaps, this study uses a crisis event caused by corruption in university as a crisis scenario to test the effect of crisis timing strategies (e.g., stealing thunder, thunder) on crisis responsibility. Additionally, this study adds value by investigating the moderating role of crisis involvement on the interaction between crisis communication timing strategy and crisis responsibility.

## 2. Literature review

### *2.1. Crisis timing strategy*

Stealing thunder in the crisis communication field is defined that "the organization breaks the news about its own crisis before the crisis is discovered by the media or other interested parties" (Arpan and Roskos- Ewoldsen (2005, p.425). It means that stealing thunder strategy is the quick and proactive way to respond to a crisis. In most aspects, the proactive spread of crisis information is an admission of a mistake, or a weakness while most organizations always attempt to conceal, and evade it.

Stealing thunder is a good way to cope with the crisis because providing accurate crisis information as quickly as possible to all stakeholders can help the organization avoid the negative media coverage (Lyon & Cameron, 1998) and the attack of its opponents with twice as much impact (Mauet, 2007). Stealing thunder strategy, herein, is the quick and proactive way to communicate with the stakeholders while thunder strategy is the slow and passive one.

According to inoculation theory, stealing thunder is a vehicle to warn stakeholders about coming attackers (Williams et al., 1993), as well as an indication of concern and commitment to consumers (Schultz, et al., 2011). On the other hand, the "rapid and proactive"

self-disclosure strategy is an effective strategy regarding creating trustworthiness on stakeholders' perceptions (Arpan & Pompper, 2003; Arpan & Roskos-Ewoldsen, 2005). They noted that the credibility rating results are higher in stealing thunder rather than negative information which is spread by other parties. Obviously, stealing thunder leads to more trustworthiness on stakeholder's perceptions and improves the organizational credibility than thunder condition (Arpan & Pompper, 2003; Arpan & Roskos-Ewoldsen, 2005; Wigley, 2011; Williams et al, 1993).

It cannot be denied that a crisis timing strategy is an effective crisis communication strategy. SCCT suggested that organizations should use a strategy to be full of responsibility for the preventable crisis (Coombs, 2007). Stealing thunder has seemed like a strategy which an organization can take a large amount of crisis responsibility. To be specific, stealing thunder can downplay crisis severity to the organization, lessen the organizational responsibility toward crisis events by framing the crisis in the organization's own terms (William et al., 1993). An organization can frame the crisis to the positive aims such as that this crisis event is not important and serious. In this way, it allows the organization to adjust the meaning of crisis to reduce the degree of crisis severity, and organizational responsibility (Williams et al., 1993).

Based on these assumptions, this study will elaborate on finding the different effects of those crisis strategies on crisis responsibility with the following hypothesis:

H1: When an organization steals thunder, it leads to a more positive effect on responsibility than when it does not steal thunder

## 2.2. Moderating influence of involvement

The concept of involvement has attracted many researchers who attempt to investigate the important role of involvement in different academic fields (Chaffee & Roser, 1986; Grunig, 1992, 1997; Health & Douglas, 1990, 1991). According to Day (1970), involvement is defined as "the general level of interest in the object, or the centrality of the object to the person's ego-structure" (p.45). Another involvement definition is that involvement is seemed as "intrinsic importance, personal meaning, and consequences" (Petty and Cacioppo, 1986) or involvement is as a perception of consumers toward products based on their personal values, needs, and interests (Wells & Prensk, 1996; De Wulf, Odekerken- Schroder& Lacobucci, 2001; Bian & Luiz, 2011). This study uses the definition of involvement like "a person's perceived relevance of the object based on the inherent needs, values, and interests" (Zaichkowsky, 1985, p.342).

As an application of the involvement concept in the crisis communication field, some researchers focused on the importance of involvement to the organization or organization's product during a crisis period (Choi & Lin, 2009b; McDonald et al., 2010; McDonald & Hartel, 2000). In crisis situations, involvement has a crucial role to affect the perceptions of stakeholders toward crises such as crisis severity, organizational responsibility, purchase intentions (Arpan & Roskos-Ewoldsen, 2005; Choi & Lin, 2009a). In fact, consumer's

attitudes or one's perceptions about different communication features depend on their level of involvement (Petty et al., 1983). Generally, individual with high involvement is more interested in acquiring information about product (Zaichkowsky, 1985), and more motivated to comprehend the relevant messages (Greenwald & Leavitt, 1984) than one with low involvement. A high felt involvement consumer creates more complex and counterarguments (Wright, 1974; Celsi & Olson, 1988), focus on more detailed issues (Chaiken, 1980). On the other hand, the high involved individual tends to pay more attention to the content of messages compared with the low involved individual (MacInnis, Rao, & Weiss, 2002). People with high involvement put little effort to consider the issue-relevant information (i.e., crisis response strategies) (Petty et al,. 1983). Minimally involved individual concentrates on non-content messages (Petty et al., 1983; Yoo & MacInnis, 2005). To shape the attitudes to product, stakeholders with highly involvement will consider the relevant information of issue which motivates people to engage in (Petty et al., 1983). However, some previous studies suggested that the more involved people are, the more actively thinking about the relevant issues, and this is contradictory with less involved people (Petty & Cacioppo, 1979; Petty & Cacioppo, 1983; Zaichkowsky, 1985).

A previous study investigated the relationship between the organization and stakeholders as well as the attitude of people. They claimed that if people have positive predispositions to organization and more interest about its information, they will be more likely to continue to express favorably toward that organization even if they know about crisis event which related to that organization (Arpan, 2005; Coombs & Holladay, 2011; Lyon & Cameron, 1998). Claeys and Cauberghe (2014) gave a prediction that the highly-involved people might have the motivation to be interesting in the event when the information is exposed. In addition, according to involvement literature, crisis involvement can act as a moderator variable that influences the relationship between crisis communication strategies and crisis responsibility. Therefore, the hypothesis about this issue are proposed:

H2: The crisis involvement moderates the relationship between crisis timing strategy and responsibility.

## 3. Research method

### 3.1. Design and materials

The experiment employed a between-subjects design with two research conditions: stealing thunder versus thunder. We constructed two mock newspaper articles which included information about the bribe action between teacher and student. A newspaper was disclosed negative news by an organization in stealing thunder condition while the other one was from the press agency in thunder condition. According to SCCT, crisis history has affected the perception of participants toward the current crisis (Coombs, 2004). People tend to take into account a crisis basing on a previous crisis. Therefore, this study used a fictitious scenario to exclude the crisis history factor which can influence the results of research.

Each participant read one of two strategies. In stealing thunder condition, the university had quick and active responses toward the crisis situation to solve the problem while a slow and passive response was shown in thunder condition. For example, the sentence in stealing thunder condition read "Immediately, the headmaster was proactive to solve the issue by verifying the accuracy of the information related to accepting bribe which the student reflected above. Simultaneously, an emergency meeting was quickly arranged with the attendance of all students and all teachers in XYZ University…" and in the thunder condition "… Despite the widespread on Facebook, the headmaster did not proactively provide its stakeholders with information until he was invited to join in an interview about information related to taking bribes by the journalist…"

### 3.2. Participants and procedure

The participants for this study were 300 respondents who were contacted through email, Facebook, or Zalo and were invited to join in the survey of this study by following a link to the online questionnaire. To begin with, the participants were explained the study purpose, guarantees of confidentiality, voluntary participation, and benefits of the study. After that, if participants agreed to join the survey, they suffered two research sessions. In the first session, we showed a randomly assigned screenshot containing the news scenario and one crisis timing strategy. The convenient participants were required to read the whole crisis story describing the crisis context, timing of disclosure. After attending session 1, participants turned to session 2 to complete the brief questionnaire containing responsibility and involvement measures and some demographic information such as gender, anger, and living region.

Among 300 respondents, males accounted for 47% while females were 53%. The age of the participants was divided into six groups with 9.6% participants were less than 20 years old; the highest percentage was the age group from 20 to 29 (32.3%); the age group from 30-39 was 17.2 %; the age group from 40 to 49 made up 9.6%; 16.7% was the percentage of 50–59 age group, lastly, over 60-yea-olds accounted for 14.6%.

### 3.3. Measures

A four-item seven-point Likert scale ranging from one (strongly disagree) to seven (strongly agree) based on the work of Coombs (1998) that was adapted from Griffin, Babin, and Darden (1992) measures crisis responsibility. This scale consists of four items (e.g., "Circumstances, not the university, are responsible for this problem").

To examine the crisis involvement, five items based on Kopalle and Lehmann (2001), Mc Quarrie and Munson's (1992) were created. Respondents selected one of the seven-point Likert scales ranging from one "strongly disagree" to seven "strongly disagree" to answer all questions regarding crisis involvement (e.g., "The bribing action matters a great deal to me, The bribing action means nothing to me,…").

*3.4. Data analysis*

Statistical Program for the Social Sciences 20 is utilized to analyze the data collected from the survey. All statistic tests are required to be significant at the alpha level of less than 0.05.

The Independent Samples T-test is used to compare the means of two independent groups to determine whether there is statistical evidence that the associated population means are significantly different (Bryman, A., & Cramer, D., 2005). In this study, to check the different effects of stealing thunder and thunder on crisis responsibility, an independent sample T-test is conducted.

To confirm a third variable making a moderation effect on the relationship of the two variables, we must show that the nature of this relationship changes as the values of the moderating variable change. This is in turn done by including an interaction effect in the model and checking to see if indeed such an interaction is significant and helps explain the variation in the response variable better than before. Using the regular linear regression menu item in SPSS, moderating effect is tested.

# 4. Results

## *4.1. Reliability test*

To ensure the quality of findings, reliability has been assessed. Cronbach's alpha was used to assess the internal consistency of the multi-item scales used to measure the variables of interest (Cronbach's, 1951). Scales that demonstrated internal consistency were collapsed to create composite measures for hypothesis testing. A validity test was adopted to support this purpose.

This study used the principle of Georhe and Mallery (2003) about the alpha score. According to them, the scale will be acceptable when the alpha score is more than 0.7. Basing on this standard, the scale of involvement, of responsibility had acceptable reliability scores in this study with .887, .876  respectively.

## *4.2. Impact of crisis timing strategies, involvement on responsibility*

To test hypothesis 1, the analysis of independent samples T-test was employed. The results showed that the main effect of crisis timing on responsibility was significant (t= -2.079, df=196, p=.039< .05). Participants in stealing thunder (M= 3.62, SD= 1.83) had a lower score on the responsibility of organization toward crisis than in thunder condition (M= 4.20, SD= 2.07), confirming hypothesis 1.

To test the moderation Hypotheses 2, linear regression analyses were conducted. In the first step, two variables were included: crisis timing strategy and involvement to test the effect of those variables on the dependent variable. The main effect of crisis timing and involvement level on responsibility was significant with p< .05, <.01 respectively. In the next step, to avoid potentially problematic high multicollinearity with the interaction term, the predictor variables were centered (Aiken & West, 1991) and an interaction centered-term between crisis timing strategy and involvement was created. The results indicated the

significant interaction effect of involvement and crisis timing strategy on responsibility ($\beta$= .308, p< .001), hence Hypothesis 2 was supported.

## 5. Conclusions and discussion

This study elicited several key findings of value to the crisis communication field by examining experimentally the effects of crisis timing strategies and crisis involvement on responsibility.

The results of the study also showed that stealing thunder had a more positive effect on crisis responsibility than thunder. Whenever a serious and unexpected event emerges, people are likely to focus on the reason why the issue occurs (Coombs, 2007a). They will make attribution about crisis causes and then access the crisis responsibility to the organization. The stronger the attributions of organizational responsibility are, the more likely it is that the negative aspects of the crisis will damage the organization. Using proactive and addressing the issue in advance can help the organization gain the degree of control and shape a more favorable representation to the public, express the indication of concern and commitment to consumers. In doing so, the organization appears more trustworthy, honest, reducing the negative reactions from attackers. As a result, the organization is attributed to be less responsible with the respect to causing the crisis, the negative impact on the organization's reputation will lessen. This finding offers experimental support to the proposition made by William et al. (1993) that stealing thunder can reduce the crisis responsibility to the organization by adjusting the meaning of the crisis event. Additionally, according to Arpan and Roskos-Ewoldsen (2005), when an organization stole thunder, it would be perceived as more credible than it did not steal thunder. The research of Arpan and Pompper (2003) also indicated that stealing thunder enhanced the credibility ratings of the organization, the stakeholder to be easily acceptance of the message, and have the gentle reaction of the organization. In light of these findings, proactive self-disclosure of crisis information is not only an effective but also necessary crisis communication strategy.

Crisis responsibility is one of three factors to shape the threat of reputation to the organization, however, former findings of the effect of timing strategy were mainly found for organization credibility, organization reputation. Perception of crisis responsibility can be related to stakeholder response to crisis messages, organizational reputation rating, product purchase intent, and other emotions such as anger, fear, or disgust,…, this finding is very important.

Examination of whether involvement moderates the relationship between crisis timing strategy and dependent variable showed that crisis involvement generated an enhancing the effect of crisis timing strategy on responsibility. Involvement is a motivation state, then, affects attribution, elaboration, the emotion of stakeholders to the crisis. The organization's use of timing strategy will affect the public's perception of crisis responsibility differently depending on the level of involvement. Therefore, to give an effective strategy the organization need to adjust to target highly involved people or lowly involved people. This

finding is worthy because if the organization ignores the role of felt involvement in the cognitive process, it can waste more effort and financial to cope with a crisis. The result of this finding is consistent with the previous literature about involvement and crisis timing strategy. The perceptions of stakeholders toward the crisis events depended on their involved-crisis issue (Petty et al., 1983; Petty & Cacippo, 1986a) because the minimally involved individual is interested in the non-content of an organizational communication response (i.e., crisis timing strategy) more than highly involved one (MacInnis, Rao, & Weiss, 2002; Zaichokowsky, 1985). This finding also confirms the research of Choi and Lin (2009a) which shows the moderating effect of crisis involvement on stakeholders' perceptions toward organization during a crisis.

## 6. Limitations and implications

Some limitations of the current study provide suggestions for further research. Firstly, the use of a fictitious scenario may also be seen as a limitation of this study. The participants were not familiar with the organization, thus their judgments may not truly represent their responses in a real scenario. Future research should think about using a real organization and crisis to improve the results of the study. Secondly, Easley, Bearden, and Teel (1995) suggested that stealing thunder works the most efficiently when it is followed by an attack from a third party. This study only offered the primary attack. Thus, future research might explore further the effectiveness of crisis timing strategy by building the subsequent attack. Lastly, this study just focused on the effect of crisis involvement, ignored the level of involvement. Future research should investigate further how differences between low and high involvement are.

The results have theoretical implications. It is necessary to extend classical crisis communication like SCCT by taking into account crisis involvement and crisis timing strategy. The effectiveness of crisis strategy on crisis communication outcomes depends on crisis involvement (Choi and Chung, 2013; Claeys and Cauberghe, 2014). On the other hand, the timely strategy should be paid attention to because it plays the predictor of responsibility role.

The current study provides two practical implications for organizations facing crises. Firstly, the organizations should disclose the information about their crisis, rather than waiting to respond to inquiries from other attackers. Secondly, crisis communication managers should pay attention to crisis involvement's stakeholders in order to give effective strategies.

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# APPLICATION OF MEANS-END CHAIN THEORY IN EXPLORING CONSUMERS' MOTIVATION TOWARDS ORGANIC FOOD

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## Abstract

*The study aims to explore the motivation of organic food consumption among consumers in Hue city. The authors applied means-end chain theory in 77 samples. The results showed health and happiness are drivers for organic food purchase. The organic product attributes as means to achieve consumption goals are "no chemicals", "food safety", "better sensory", "nutritious value", and "producers/ origin". Basing on the results, the research figured out some implications for organic food stores to motivate organic food purchase.*

***Keywords:*** *organic food, motivation, means-end chain.*

## 1. Introduction

Global organic food and drink sales had a remarkable development during just under 20 years, increased from 15.1 billion euros in 2000 to 96.7 billion euros in 2018. The average growth of the period 2000- 2018 is 27%. This product type has become popular in North America and EU countries with high income and living standards. The United States is the leading nation in sales with 40.6 billion euros, followed by Germany (10.9 billion euros) and France (9.1 billion euros) (Willer & Klicher, 2020). In response to the organic food trend, Vietnam had 2.2% agricultural land for organic agriculture and attracted 17,169 producers in 2018. Vietnamese organic food retail sale was about 18 million euros (Willer & Klicher, 2020).

The means-end chain (MEC) theory was proposed by Gutman (1982) to uncover how customers' perception of choice links to basic values. MEC forms the motivation hierarchically by characterizing the attributes of products or services as the means and desired values as the ends toward which consumers are striving (Gutman,1982). Laddering interview is usually applied in MEC to explore consumers' motivation towards a specific product.

Hue city is a small city in the central of Vietnam with about 350 thousand people. In recent years, organic food has been more available in organic food stores or supermarkets such as Que Lam Organic, Hue Viet Organic, Big C, and Co.opmart. However, the market growth is still slower than in other cities such as Hanoi, Ho Chi Minh City, and Da Nang. Thus, it is necessary to have consumer insights to know what drives the consumers to buy organic foods. In addition, most of the studies in organic foods in Vietnam were conducted in those big cities and focused on purchase intention or segmentation (Nguyen et al., 2019; Van

et al., 2019). In the context of organic food, this research uses the MEC theory to gain an insight into drivers for organic food purchases among Hue consumers.

## 2. Liturature review

### 2.1. Organic agriculture and organic food

European Union stated that organic farming is an agricultural method that aims to produce food using natural substances and processes. In other words, organic farming encourages the responsibility in using energy and natural resources; biodiversity, ecology balance and water quality maintenance; soil enrichment; widely- applied high animal welfare standards (Council of the European Union, 2007). Organic productions control inputs strictly such as water, soil, air sources, fertilizers and exclude the use of GMOs and products produced from or by GMOs. Organic foods are products originating from agriculture, including aquaculture, where such products are placed on the market or are intended to be placed on the market (Council of the European Union, 2007). They can be live or unprocessed agricultural products; processed agricultural products for use as food; feed; vegetative propagating material, and seeds for cultivation. The products of hunting and fishing of wild animals shall not be considered organic production (Council of the European Union, 2007). In the organic background, the USA also launched organic regulations and standards to provide a clear structure for organic goods production and satisfy consumer demand for trustworthy organic products while providing a fair marketplace for producers, distributors, and marketers. According to the United States Department of Agriculture (USDA), organic is a labeling term that indicates that the food or other agricultural products are produced through approved methods (USDA, 2015). EU Organic and USDA Organic are labeled on the product containing at least 95% organic ingredients (Council of the European Union, 2007; USDA, 2015).

### 2.2. Values and Vietnamese values

#### 2.2.1. Values

Rokeach (1973) defined values as "enduring organisation of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative preferable". Values direct the choice of human behaviour (Schwartz & Bilsky, 1987). According to Rokeach (1973), due to the connection between personal values and an individual's cognitive system, they are usually considered more stable and roots of human motivations. Human values are rooted in culture, society and personality (Rokeach, 1973). People tend to agree upon the shared values prioritites in their nations than across countries (Baker et al., 2004). According to Schwartz & Sagiv (1995), there are 10 basic human values including universalism, benevolence, tradition, conformity, security, power, achievement, hedonism, stimulation, and self-direction. The value theory was applied in several studies in order to get better understanding about the motivation towards foods produced by organic farming systems (Zanoli & Naspetti, 2002; Costa et al., 2004; Baker, 2004; Barrena & Sánchez, 2010; Zagata, 2014; Kim, 2014; Tlies, 2019).

*2.2.2. Vietnamese values*

Vietnam is a typical collectivistic society (Hofstede, 1991), where close long-term commitment to their group is highlighted. In a survey conducted by Tran Ngoc Them (2015), the four most important values to Vietnamese were "happiness in family life", "stable employment", "justice in society", and "wealth". Moreover, a study applying Schwartz value found that Vietnamese were less concerned with gratification of self-oriented needs and desires (self-direction, hedonism) and with productive or innovative task performance (achievement-power, stimulation). On the other hand, they paid much attention to maintaining primary relations through cooperation and support, following tradition (security-conformity-tradition), and helping members of their close groups (benevolence) but less concerned with the welfare of strangers (universalism) (Różycka-Tran, Truong, Cieciuch & Schwartz, 2017).

## 2.3 Means-end chain (MEC) theory

*2.3.1. Means-end chain introduction*

Perception is a process by which people select, organize and interpret information to form a meaningful picture of the world (Kotler et al., 2017, 174). Perception plays an important role in creating an attitude, belief, action, buying habits, and decision-making. Perception is impacted by stimuli and consumers' characteristics. Product is anything that can be offered to a market for attention, acquisition, usage or consumption that might satisfy a want or need (Kotler et al., 2017, 250). When receiving stimuli from products such as information or package, a relationship among those stimuli, consumer self-knowledge, and his memory is set up (Zanoli & Naspetti, 2002). The structural linkage among perceived product attributes, benefits, and values is performed through MEC (Gutman, 1982; Olson & Reynolds, 2001).

MEC theory considers the customers' decision-making as a process to solve problems, in which product attributes are tools to achieve personal values. In MEC, means are referred products or personal activities, and value (end) are values of happiness (Gutman, 1982). Attributes (A) are at the lowest level of the hierarchy, connect consequences (C) and values (V) are at the highest level.

Attributes (A) represent the observable or perceived characteristics of a product (Zanoli & Naspetti, 2002). Concrete attributes reflect the physical features of the product such as flavor while abstract attributes are multidimensional, for example, country origin or the brand name (Kim, 2014). Consequences are still more abstract, reflecting the outcomes of what customers experience with product characteristics. According to Olson & Reynolds (1983), the consequences are sub-divided into two types; functional consequences including direct and tangible derived from consumption, and psychological consequences regarding intangible, personal, and indirect outcomes. In organic food consumption, functional consequences might be benefits such as individuals' health or the environmental protections whereas psychological consequences would involve consumers' mental health, food enjoyment. Both kinds of consequences are connected to values. Personal values are highly

abstract central held and defined as an enduring belief that people seek to achieve through behavior (Rokeach, 1973).

*2.3.2. Laddering*

Laddering technique is an in-depth interview widely used in MEC. This method is useful for researchers to gain an understanding of how consumers perceive the attributes of products/services to achieve higher-order values in their life (Gutman, 1992). The continuously repetitive question is "Why is it important to you?" to build a connection A-C-V. There are two types of laddering methods including soft laddering and hard laddering (Grunert & Grunert, 1995; Zanoli & Naspetti, 2002). Soft laddering is based on unstructured in-deep interviews by consecutively asking "why" questions so that it can provide deeper consumers insights. However, soft laddering is costly, time-consuming in collecting data, training interviewers, and analyzing (Hofstede et al., 1998). Hard laddering provides interviewees a standardized questions and answers requiring them to answer to find out abstract levels. Hard laddering method may solve some disadvantages of soft laddering (Zanoli & Naspetti, 2002). There are several types of hard laddering such as paper-and-pencil (Zanoli & Naspetti, 2002), card sorting technique (Valette-Florence & Rapacchi, 1991), and association pattern technique (ATP) (ter Hofstede et al., 1998).

MEC is measured through 3 steps (Reynolds & Gutman, 1988): (1) eliciting of product/ service attributes that are most relevant to the consumer; (2) conducting an in-depth interview to reveal how the consumer connect product attributes to consequences and values; (3) building a hierarchical value maps (HVM) to describe the association networks of attributes, consequences, and values.

## 2.4. Values as drivers for organic food purchase

MEC theory has been widely applied in consumer motivation studies (Zanoli & Naspetti, 2002; Baker, 2004; Barrena & Sánchez, 2010; Zagata, 2014; Kim, 2014; Tlies, 2019). The most frequently found values are security, universalism, hedonism, and power.

Security is defined as safety, harmony and stability of relationships and of oneself (family security, national security, social order, clean, reciprocation of favors) (Schwartz & Sagiv, 1995). Several researches proved that health linking to security value is an important motive for organic food consumption (Schifferstein et al., 1998; Chen, 2009; Zepeda et al., 2012; Hansen et al., 2018; Nguyen et al., 2019; Kautish et al., 2019). Indeed, consumers have health consciousness when they face poor hygiene, chemical residues in foods. In comparision with organic food, the risk for contamination with detectable pesticide residues in conventional food was 30% higher (Smith-Spangler et al., 2012). Hence, organic foods are beneficial to human health due to their frehness, nutrition and safe (Boobalan & Nachimuthu, 2020). Studies applying MEC confirmed that the main value driving preferences for organic food was health in the connection to family well-being such as "a healthy and long life" (Zanoli & Naspetti, 2002), "well-being and health" (Baker et al., 2004), "quality of life and

security" (Barrena & Sánchez, 2010), "living a good quality lifestyle" (Zagata, 2014), "family is procted" (Tleis et al., 2019).

Universalism is referred as understanding, appreciation, tolerance and protection for the welfare of all people and for nature (broadminded, wisdom, social justice, equality, a world at peace, a world of beauty, unity with nature, protecting the environment) (Schwartz & Sagiv, 1995). Environmental issues such as natural disasters, climate change and pollution attracted attention and concerns of the public (Mishal et al., 2017). Studies proved that conventional agriculture damaged the environment much than the organic. In conventional farming system, the risk of pesticides pollution of water bodies is higher (Reganold & Wachter, 2016). The amount of nitrate leaching, nitrous oxide emissions, ammonia emissions per unit of field area and energy consumption per-hectare in organic farms are lower than the figures of convensional farms (Tuomisto et al., 2012; Gattinger et al., 2012). People holding concerns more about the environment often consider the result of their behaviour in the environment. Moreover, Thøgersen & Olander (2003) found that environment-friendly behaviour arises from more universalism than any other value. "Responsibility for other creatures", "living in accordance with nature" are found in MEC researches in Germany and the Czech Republic " (Baker et al., 2004; Zagata, 2014). In addition, animal welfare closely relating universalism value significantly motivates consumers to choose organic food in a MEC study in Germany (Baker et al., 2004).

Hedonism is known as pleasure and sensuous gratification for oneself (pleasure, enjoying life, self-indulgence) (Schwartz & Sagiv, 1995). Consumer's belief about organic food being healthy make them feel better with a feeling of having healthy nutrients. It brings satisfaction among them for their healthy choices which leads to their emotional well-being (Apaolaza et al., 2018). A study in Brazil proved that "sensory appeal" impacted organic food intention among Brazilian consumers (Curvelo, Watanabe & Alfinito, 2019). MEC studies showed that one of the basic values for organic food motivation was pleasure, for example, "well-being, happiness, inner harmony" (Zanoli & Naspetti, 2002), "enjoyment" (Baker et al., 2004), "pleasure and enjoyment" (Barrena & Sánchez, 2010), "pleasure" (Kim, 2014).

Power is defined as social status and prestige, control or dominance over people and resources (social power, authority, wealth, preserving my public image) (Schwartz & Sagiv, 1995). Product is also useful for people to show their social class that they belong. Costa, Zepeda & Sirieix (2014) found that the social value of consumers was shown by organic food. The social value is up to the types of the purchase place and the additional green behaviors of consumers or producers. "Give me a sense of social belonging" linking to power value was among the three crucial values driving selections to organic food conducted by a MEC research in Spain (Barrena & Sánchez, 2010).

## 3. Methods

The study uses both qualitative and quantitative methods. In qualitative, soft laddering was applied on six organic consumers. After the research review, the list of attributes was

established in the elicitation stage. Participants were required to identify which attributes were the most relevant to them when purchasing organic food. To avoid the response bias, respondents were allowed to add attributes that were crucial to them personally. After that, they were asked, "Why is it important to you?". The laddering process repeated with why question after each answer. The answer usually starts with attributes and comes to consequences and values of the interviewee and ends when there is no more answer from him (Reynolds & Gutman, 1988). Through the in-depth interviews, we finally selected thirteen attributes, fourteen consequences, and eight values in which there are two new consequences.

**Table 1: The list of attributes, consequences and values**

| Code | Description | Suggested |
|---|---|---|
| **Attributes** | | |
| A1 | Certified | Zanoli & Naspetti (2002), Barrena & Sánchez (2010), Kim (2014) |
| A2 | Food safety | Zanoli & Naspetti (2002) |
| A3 | Natural product | Zanoli & Naspetti (2002), Kim (2014), Tleis et al (2019) |
| A4 | Animal welfare | Baker et al (2004) |
| A5 | Nutritional value | Zanoli & Naspetti (2002), Barrena & Sánchez (2010), Kim (2014), Tleis et al (2019) |
| A6 | No chemincals | Baker (2004), Zanoli & Naspetti (2002), Kim (2014), Zagata (2014), Tleis (2019) |
| A7 | Better sensory | Baker (2004), Zanoli & Naspetti (2002), Barrena & Sánchez (2010), Zagata (2014), Kim (2014), |
| A8 | Safety of agricultural workers | Baker (2004) |
| A9 | No genetically modified | Baker (2004), Kim (2014) |
| A10 | Producer, origin | Kim (2014) |
| A11 | Trust | Tleis et al (2019) |
| A12 | Price | Barrena & Sánchez (2010) |
| A13 | Information label | Barrena & Sánchez (2010) |
| **Consequences** | | |
| C1 | Wholesomeness & physical well- being | Zanoli & Naspetti (2002) |
| C2 | Enjoy eating | Baker et al (2004), Zanoli & Naspetti (2002) |
| C3 | Lower environmental impact | Baker et al (2004), Zanoli & Naspetti (2002), Barrena & Sánchez (2010) |
| C4 | Healthy eating habits | Zanoli & Naspetti (2002), Barrena & Sánchez (2010), Kim (2014) |

| C5 | Easy to get information and identify the product | Zanoli & Naspetti (2002) |
|---|---|---|
| C6 | Good value for money | Barrena & Sánchez (2010) |
| C7 | Bring back memories | Barrena & Sánchez (2010), Tleis et al (2019) |
| C8 | Feel traditional and familiar | Barrena & Sánchez (2010) |
| C9 | Ensure my family's health and my own | Barrena & Sánchez (2010) |
| C10 | Increasing energy and relaxion | Kim (2014) |
| C11 | Avoid health risk | Barrena & Sánchez (2010) |
| C12 | My children stay healthy | Tlies et al (2019) |
| C13 | Foods stay fresh/good longer | Qualitative research |
| C14 | Well- absorbed | Qualitative research |
| **Values** | | |
| V1 | A healthy and long life | Baker (2004), Zanoli & Naspetti (2002) |
| V2 | Well- being, happiness, inner harmony | Baker (2004), Zanoli & Naspetti (2002), Barrena & Sánchez (2010), Tleis et al (2019) |
| V3 | Personal achievement | Baker (2002) |
| V4 | Altruism and relationship with others | Zanoli & Naspetti (2002) |
| V5 | Sense of doing right things | Barrena & Sánchez (2010) |
| V6 | Satisfaction | Barrena & Sánchez (2010), Kim (2014), Tleis et al (2019) |
| V7 | Life quality | Baker & cộng sự (2004), Zagata (2014), Tleis et al (2019) |
| V8 | Family is protected | Barrena & Sánchez (2010) |

Continuously, a questionnaire for hard laddering was conducted with 2 parts. The first part included questions aims to screen the organic food consumers, followed by socio-demographic characteristics. In the second part, attributes, consequences, and values in Table 1 were arranged in the APT format: attribute- consequence (A-C) matrix and consequence-value (C-V) matrix. Two matrixes have the linkage through C. According to ter Hofstede et al (1998), in the A-C matrix, the columns and rows are filled by attributes and consequences respectively and the cell was the knot between attribute and consequence. C-V matrix was formed by consequences in the horizontal axis and values in the vertical axis. The respondents checked the cells to find out the strongest linkages that they believed.

**Figure 1: A- C implication matrix**        **Figure 2: C-V implication matrix**

|  |  | Attributes (A) |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  | A1 | A2 | A3 | A... | An |
| Consequences (C) | C 1 |  | x | x |  |  |
|  | C 2 |  |  |  |  | x |
|  | C 3 |  | x | x | x |  |
|  | C... |  |  |  |  | x |
|  | C n |  |  | x |  |  |

|  |  | Values (V) |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  | V1 | V2 | V3 | V... | Vn |
| Consequences (C) | C 1 |  | x | x |  |  |
|  | C 2 |  |  |  |  | x |
|  | C 3 |  | x | x | x |  |
|  | C... |  |  |  |  | x |
|  | C n |  |  | x |  |  |

The study surveyed consumers coming to organic food stores in Hue city. According to Costa et al. (2004), the sample size for hard laddering is at least 50. Therefore, the number of participants is 77 with the convenient sampling. The collected data were checked and then analyzed by descriptive statistics. A study using APT needs to identify important linkages whose frequency exceeds a certain threshold (cut-off) based on the total responses (Kang, 2013). The cut-off value can change depending on the sample size, linkage numbers, etc (Russella et al., 2004). The chain A-C-V is the connection between A-C and C-V through C. Therefore, the cut-off of the A-C matrix was the top 5% rank of the cell values, then the cut-off value of the C-V matrix was determined to make the number of C from three to five on the HVM (Kang, 2013). With this method, we can get a reasonable number of chains A-C-V.

## 4. Results and discussion

### 4.1. Sample description

Most participants are female with 87.0%, high education (>80% having college degree and above). The people aged from 35 to 60 are just under 70%. Personal income under 10 million dong occupies 35% while the higher income over 10 million is 65%. 80% people have children (baby or grandkid) in family.

**Table 2: Sample description**

| Social demographic characteristics | | Frequency (people) | Percentage (%) |
|---|---|---|---|
| **Sex** | Male | 10 | 13.0 |
|  | Female | 67 | 87.0 |
| **Education** | High school degree | 13 | 16.9 |
|  | College degree | 21 | 27.3 |
|  | University degree/ Ms./ Ph.D | 43 | 55.8 |
| **Age** | 18-34 | 19 | 24.6 |
|  | 35-44 | 24 | 31.2 |
|  | 45-60 | 28 | 36.4 |
|  | > 60 | 6 | 7.8 |

| Personal income | < 10 million dong | 27 | 35.1 |
|---|---|---|---|
| | 10-15 million dong | 31 | 40.3 |
| | >15 million dong | 19 | 24.6 |
| Children in family | Yes | 15 | 19.4 |
| | No | 62 | 80.6 |

## 4.2. Means-end chain analysis

### 4.2.1. Attribute- Consequence and Consequence- Value implication matrixes

According to Table 3 and Table 4, the value in each cell in both matrixes refers to the frequency of each linkage A-C or C-V. The bigger value is, the stronger connection is. By following the top 5 % rank rule, we need to select 9 cells in Table 3 (5% of 182 cells). However, 11 bold and underlined cells in Table 3 were chosen because 4 cells contained frequency values equal (30). Then, the cut-off is 30. A-C linkages having a frequency lower than 30 were not kept in the next stage. 11 important linkages are A2-C1 (Food safety- Wholesomeness and physical well-being), A2-C11 (Food safety- Avoid health risk), A5- C1 (Nutritious value- Wholesomeness and physical well-being), A5-C12 (Nutritional value- My children stay healthy), A6-C1 (No chemicals- Wholesomeness and physical well-being), A6-C2 (No chemicals- Enjoy eating), A6-C11 (No chemicals- Avoid health risk), A6-C12 (No chemicals- My children stay healthy), A6-C13 (No chemicals- Food stay fresh/good longer), A7- C2 (Better sensory- Enjoy Eating), A10- C5 (Producer, origin- Easy to get information and identify products).

**Table 3: Attribute-consequence implication matrix**

| | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | A12 | A13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | 0 | **35** | 15 | 0 | **30** | **38** | 20 | 0 | 10 | 0 | 0 | 0 | 0 |
| C2 | 3 | 25 | 15 | 0 | 27 | **30** | **49** | 0 | 10 | 17 | 22 | 0 | 5 |
| C3 | 0 | 0 | 21 | 0 | 0 | 27 | 0 | 0 | 10 | 0 | 0 | 0 | 0 |
| C4 | 0 | 13 | 13 | 0 | 20 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| C5 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **37** | 25 | 0 | 27 |
| C6 | 15 | 17 | 5 | 0 | 20 | 5 | 28 | 0 | 0 | 15 | 25 | 27 | 0 |
| C7 | 0 | 0 | 17 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C8 | 0 | 0 | 17 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| C9 | 23 | 23 | 19 | 0 | 23 | 29 | 28 | 0 | 10 | 15 | 27 | 0 | 19 |
| C10 | 0 | 23 | 5 | 0 | 27 | 17 | 28 | 0 | 0 | 0 | 2 | 0 | 0 |
| C11 | 17 | **45** | 20 | 20 | 23 | **55** | 20 | 0 | 12 | 0 | 17 | 0 | 0 |

|      | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | A12 | A13 |
|------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| C12  | 15 | 28 | 22 | 20 | **30** | **30** | 20 | 0 | 20 | 0 | 19 | 0 | 0 |
| C13  | 0  | 0  | 17 | 0  | 0  | **41** | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| C14  | 0  | 19 | 15 | 0  | 29 | 25 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |

In the next stage, 6 consequences selected in the A-C implication matrix would be considered in the C-V implication matrix. To keep 3-5 consequences in HVM, the cut-off of the C-V matrix was 45. Hence, there are 5 connections kept including C1-V1 (Wholesomenss & physical well-being- A long and healthy life), C2-V2 (Enjoy eating- Well-being, happiness, inner harmony), C5-V6 (Easy to get information & identify products- Satisfaction), C11-V1 (Avoid health risk- A long and healthy life), C12-V2 (My children stay healthy- Well-being, happiness, inner harmony). Then, A-C-V chains for HVM were established: A2-C1-V1, A6-C1-V1, A5-C1-V1, A6-C2-V2, A7-C2-V2, A10-C5-V6, A2-C11-V1, A6-C11-V1, A5-C12-V2, A10-C12-V2.

**Table 4: Consequence-value implication matrix**

|      | V1 | V2 | V3 | V4 | V5 | V6 | V7 | V8 |
|------|----|----|----|----|----|----|----|----|
| C1   | **55** | 43 | 35 | 5  | 0  | 35 | 35 | 30 |
| C2   | 37 | **45** | 0  | 0  | 0  | 45 | 37 | 0 |
| C3   | 20 | 21 | 10 | 7  | 30 | 7  | 25 | 25 |
| C4   | 28 | 30 | 0  | 0  | 0  | 28 | 30 | 8 |
| C5   | 0  | 32 | 15 | 25 | 4  | **51** | 25 | 17 |
| C6   | 0  | 0  | 0  | 0  | 0  | 0  | 4  | 0 |
| C7   | 0  | 17 | 5  | 5  | 0  | 17 | 0  | 0 |
| C8   | 0  | 25 | 3  | 0  | 0  | 18 | 18 | 0 |
| C9   | 30 | 40 | 35 | 30 | 28 | 35 | 33 | 47 |
| C10  | 34 | 34 | 36 | 0  | 0  | 30 | 29 | 5 |
| C11  | **50** | 40 | 28 | 3  | 0  | 35 | 37 | 37 |
| C12  | 38 | **46** | 30 | 25 | 40 | 37 | 36 | 45 |
| C13  | 0  | 5  | 0  | 0  | 0  | 37 | 35 | 7 |
| C14  | 25 | 30 | 3  | 0  | 0  | 28 | 31 | 0 |

To understand the HVM it needs to begin from a specific attribute, then follow the arrow to go to the next stage (consequences), and to the highest level (values) (Kang, 2013). With that instruction, HVM about the motivations for organic food purchases was figured out.

The most important ladder in HVM leads from the attributes "no chemicals" (A6) and "food safety" (A2) via the consequence "avoid health risk" (C11) and "wholesomeness & physical well-being" (C1) to value "a healthy and long life" (V1). The second value chain leading to "satisfaction" (V6) is "producers, origin" (A10) mediated by "easy to get information and identify products". The final perceptual orientation was showed through the chain "nutritious value" (A5) and "no chemicals" (A6) → "my children stay healthy" (C12)→ "well-being, happiness and inner harmony", additionally supported by the chain "better sensory" (A7) and "no chemicals" (A6) → "enjoy eating" → "well-being, happiness and inner harmony" (V2), additionally supported by → "my children stay healthy" (C12).

**Figure 3: Hiearchical value map with cut-off**
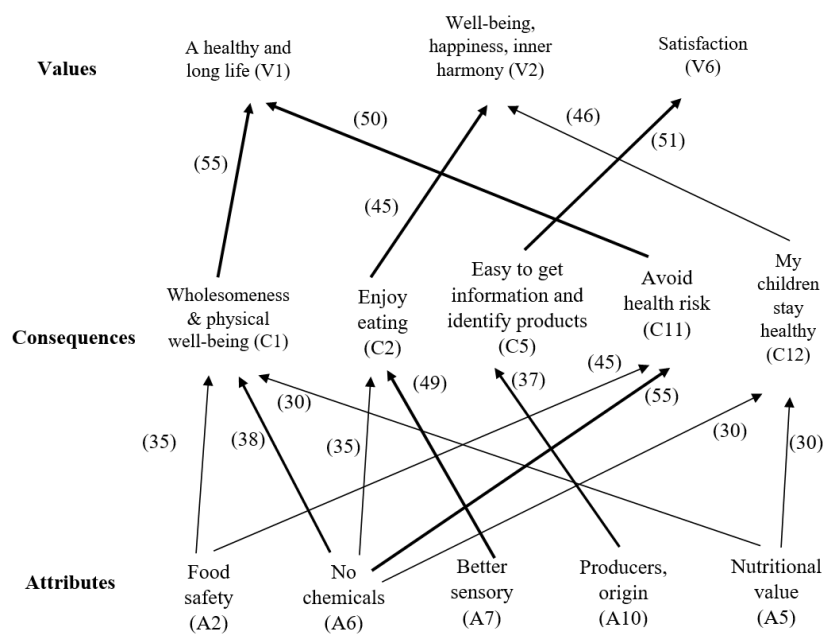


### 4.2.2. Discussion and implication

#### Discussion

The HVMs revealed that security was the value driving organic food consumption. Security is considered as personal health or family well-being. This result is supported by the study of Różycka-Tran, Truong, Cieciuch & Schwartz (2017) when Vietnamese have a highlight on security value. Since consumers have health consciousness, they have a tendency to adopt "health behaviour" by purchasing products which are beneficial for health and improving their lifestyle (Rana & Paul, 2020). Furthermore, health motivation was found in both developed and developing countries such as Italy, Germany, UK, Spain, the Czech Republic, China and Lebanon (Zanoli & Naspetti; 2002, Baker et al., 2004; Barrena & Sánchez, 2010; Zagata, 2014; Thøgersen, Zhou, & Huang, 2016; Tleis et al., 2019).

This research found that hedonism as pleasure, enjoying life, self-indulgence was related to organic food purchase. Hedonism value results from not only the feeling of "my children are protected" but also "eating enjoyment". In a study about Vietnamese values of

Tran Ngoc Them (2015), "happiness in family life" closely connected to "children protection" is one of the most important values. It is undeniable that several women buy organic food for children (Tlies et al., 2019). Especially, children in modern society are easy to get obese or early puberty due to chemicals or growth hormones. As a result, organic foods are chosen for babies with the hope to stay healthy, and also this buying decision gives parents happiness or inner harmony when they can do the best things for new generations. Hedonism can relate to the finding that emotional well-being is originated from the satisfaction of selecting organic food as a healthy choice (Apaolaza et al., 2018). Moreover, the information about producers and origin is useful to get information and identify products and this consequence makes consumers' satisfaction. The reason why consumers in Hue city select organic food is that producers/ origin information is clearer in comparison with that of conventional foods in wet/ traditional markets. In addition, consumers believe that if they know about producers to ask someone or organizations to be responsible for unexpected cases after consumption, they will be satisfied. Therefore, hedonism among Hue consumers is a combination of personal pleasures and the feeling of doing meaningful things for relatives. Hedonism was found in a wide range of researches of Zanoli & Naspetti (2002), Baker et al. (2004), Barrena & Sánchez (2010), Kim (2014).

Previous studies proved that the value as a motivator for organic food purchase was "universalism" value (Baker et al., 2004; Thøgersen, 2007a; Zagata, 2014). However, among consumers in Hue city, universalism was found not to be a priority value in organic food motivation. Moreover, as a typically collectivistic nation, Vietnam shows benevolence value much than universalism (Różycka-Tran, Truong, Cieciuch & Schwartz, 2017). In other words, Vietnamese cares about members in their close group instead of strangers or the society overall. Therefore, this study results confirmed the idea that organic food consumption in developing countries is closely related to personality than to society (Thøgersen, Zhou, & Huang, 2016; Tlies et al., 2019).

*Theoretical implications*

Since organic food introduction into the market, researchers and business managers have focused on what can motivate customers to purchase organic products. This research sheds new light on the motivations toward organic food consumption among consumers in Hue city, Vietnam. The value theory of Schwartz (1995), MEC theory (Gutman, 1982), and Vietnamese values (Różycka-Tran, Truong, Cieciuch & Schwartz, 2017; Tran Ngoc Them (2015) were proposed to figure out the drivers for organic food purchase. Our findings suggest that security (health) and hedonism (pleasure) are priority values driving the preference for organic foods. The market for organic food has a rapid growth because the type of food is viewed as healthy products that bring health benefits for consumers (Suciu, Ferrari & Trevisan, 2019). Additionally, eating organic food was found to generate good moods (Apaolaza et al., 2018) or bring happiness or inner harmony (Baker, 2004; Zanoli & Naspetti, 2002; Barrena & Sánchez; 2010; Tleis et al., 2019). Therefore, the findings of this study

enrich empirical evidences on consumer motivation towards organic food in a collectivistic society such as Vietnam.

*Practical implications*

This study also provides some practical implications for organic stores. Firstly, stores need to emphasize also benefits and values that satisfy consumers during purchase. Making a connection between a new food product in the market and crucial values is an effective marketing (Shree, Gupta, & Sagar, 2017). Hence, the finding revealed by this study is useful for sellers to design and imply marketing and communication strategies to promote organic food consumption as a way that brings "health" and "happiness" for consumers and their beloved people. Secondly, producers should pay attention to key attributes of organic goods in the product design process namely "better sensory", "no chemicals", "food safety", "producers, origin" and "nutritious value". In detail, in production, manufacturers or farmers should obey the organic regulations such as no chemical usage, no GMOs, no synthetic fertilizer, etc. As a result, the products may meet the organic standards, then, contain those attributes that are proved as high quality in comparision with conventional foods in previous studies (Lairon, 2011; Brandt, 2011; Palupi et al., 2011; Smith-Spangler et al., 2012; Srednicka-Tober et al., 2016). Furthermore, the attributes should be combined with the consequences such as "avoid the health risk", "eating enjoyment", "children stay healthy", "wholesomeness and physical well-being", and "product origin identification" to convince consumers to purchase.

## 5. Conclusion

Organic food is a sustainable consumption trend in the modern society. The purpose of the study was to enhance the understanding of what drives organic food consumption practice in Hue city, Vietnam based on the value theory and MEC theory. The findings confirmed that health (security) and happiness (hedonism) were the main values motivating organic food purchase among Hue customers. Consumers considered organic products' attributes namely "no chemicals", "better sensory", "food safety", "producers, origin" and "nutritious value" to achieve their goals. However, this research has some limitations. The first is the small convenience sample including early adopters purchasing organic food in stores. It means that it is low representative. Thus, future studies should apply key results to larger and more widespread samples. Secondly, there was not notions about the differences among segmentations. Motivation is considered a valuable means to segment markets. Hence, researches in the future should cluster the motivations and make a comparison among groups about values, consequences and attributes so that suggested marketing plans for each segmentations will work effectively. The last is the process of building the list of attribute, consequence and value elements for APT approach. Six organic consumers participated in in-depth discussions to refine the elements in the eliciation stage. Future researchers should invite experts on organic food such as marketers, farmers, food manufacturers, policymakers to get more reliable results.

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# STRATEGIC MARKET MANAGEMENT OF COMMERCIAL BUSINESSES: A CASE STUDY AT HAPROMART CHAIN

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## Abstract

*The market and the business environment are witnessing rapid changes in the constituent variables. This has led businesses in general and commercial enterprises in particular to have new and more effective methods of market management. Strategic market management is a modern business management model that allows enterprises to adapt and predict well the changes of the business environment, the potential for market development, and the diversity of customers' needs. Based on previous theoretical studies, the article has analyzed and evaluated the current situation of market management of Hapromart, one of the first supermarket chains in the Hanoi market. From there, the article proposes some solutions to improve Hapromart's strategic market management, which focus on issues such as improving the analysis of the overall market situation, perfecting the strategic market planning, strengthening the business plan's implement in the strategic market, and securing the resources for implementation in the strategic market.*

***Keywords:*** *strategic market management, commercial enterprises, Hapromart*

## 1. Introduction

The current environment with many rapid changes has strongly influenced the structure of competition in the industry and the market in terms of customer demand, competitive pressure on prices, technological advancements and product innovation… It has changed the method in market management of the enterprises. They need to keep a close eye on market developments to identify, adapt and respond to market requirements and business environment. Accordingly, strategic market management is considered a more scientific business management model, allowing businesses to choose and focus on operating business activities in markets. Most businesses today operate in many different markets, with each market playing a different role in the overall development. Some of these markets play a strategic role, having an important position in the market structure of the business. To create and strengthen a competitive position in the strategic market, enterprises need to apply the principles of strategic market management to their business practices. With these principles, corporate-level managers, business-level managers (how to compete in the market) and function-level managers (marketing, manufacturing, human resources, supply chain…) will

increase the level of integration of action programs to optimally support the enterprise's market strategy, thereby achieving the target market.

Within the last five years, Vietnam's trade and service field has changed rapidly and strongly. Positive market growth, increased competition, a trend of mergers and cooperation among large retail businesses, more popular application of digital technologies, etc., require Vietnamese commercial businesses to make the early direction of strategic market development, as well as the need to update technology, improve product quality, diversify portfolios to expand markets, and build competitive positions. Accordingly, the implementation of strategic market management will coordinate the efforts of enterprises to achieve the goals of the general strategies and of the strategic market in particular.

After the equitization process at Hanoi Trade Corporation, under the support of BRG Group, Hapromart chain has been gradually showing a more positive image in the market. In addition to maintaining and renovating the old sales locations, the brand also expanded a number of new stores to increase the domestic market share and improve competitive strength. Hapromart's managers are well aware that this process needs businesses to increase efficiency, focus resources on markets where they have strengths. Accordingly, in order to be able to make sound and reasonable decisions in operating and developing business in the market, it is necessary to apply and implement strategic market management. Therefore, the article conducts research on strategic market management of commercial enterprises to form basic theories, and empirical research at Hapromart chain to illustrate these points.

## 2. Theoretical framework

Commercial businesses is defined as "a business unit lawfully established for the purpose of carrying out commercial business activities, organizing the movement of goods, purchasing goods at the place of production and selling them at the place where have the demand to make a profit" (Pham Thuy Hong, 2017, 26). According to Pham Thuy Hong (2017), commercial enterprises have characteristics operating in the field of distribution, acting as a bridge between production and consumption without producing goods, usually expressed in the form of wholesale and/or retail. Therefore, for commercial businesses, establishing and managing strategic market becomes especially important due to the characteristics of businesses operating with many products in many different markets, and subject to strongly influenced by large and small changes in consumer markets.

Based on the identifications of (Kotler et al. 2019, Porter 2008, Aaker and Moorman 2017), strategic market can be understood as "an attractive market with a sufficiently large scale, high growth potential in the long term, enable the strategic business units to be profitable, and create a superior competitive advantage to meet future customer needs." Strategic market management is formed and developed based on the principles of strategic management, allowing enterprises to adapt more effectively to rapid changes in the market (Reich, 2002). According to Aaker and Moorman (2017), strategic market management is a

system designed to help manage the formulation and change of business strategy and strategic vision, thereby developing business markets in a consistent, focused and long-term manner. Implementing strategic market management that allows businesses to best understand and best serve the markets in which they are competing will lead to longer-term success (McNamee, 2000).

The strategic market contents of the commercial enterprise are formed and developed based on the market orientation and customer base of the enterprise, that is, mainly referring to the issues of distribution, consumption and sale on the market (Nguyen Bach Khoa, 2004). Strategic market management helps the enterprises identify, regulate, utilize and control the necessary resources and skills such as human resources, technology, finance, organization, and communication to create and exploiting competitive advantages from consumer markets, as well as adjusting and developing market selection and market positioning; making trade spending decisions related to production/production planning; business communication and trade promotion plans; distribution and sales plans in the consumer market (Nguyen Hoang Viet, 2010).

The review shows that most of the studies have approached strategic market management according to the process, which includes linked activities from market situation analysis, planning, execution and market assessment (Aaker and Moorman 2017, Slater 2015, Anderson et al. 2009, Reich 2002). Market analysis is the first part of strategic market management, aimed at helping businesses identify and select markets or market segments to serve, and seek to establish some sustainable competitive advantage (Walden and Carlsson, 1993) by providing more value to customers than competitors (Slater, 2015). The foundation of this activity is to review and analyze environmental, market, and internal factors to provide the necessary information for managers to detect key strategic issues, as well as performance gaps, and develop early responses to sudden and persistent market changes (Reich, 2002).

Strategic market planning is the next stage in the process. Strategic market planning should take a long-term view as well as consider short-term market developments and consider various parameters to plan for each strategic market (Silverblatt and Korgaonkar, 1987). Strategic market planning will typically include setting strategic market business objectives, identifying viable strategies, and selecting and proposing market supply values (Nguyen Canh Chat, 2009). In particular, selecting and providing value to customers in the market has an important meaning in attracting, building and engaging a loyal customer base while increasing customer satisfaction with products and services of the enterprise. A number of customer values such as performance, features, flexibility, ease of access, waiting time, ease of use, etc. are often considered and evaluated by commercial enterprise administrators when selecting a proposal of customer value supply (Siggelkow and Terwiesch, 2020). To improve and add more value to customers, it is necessary for managers to create close links with related partners. According to Siggelkow and Terweisch (2020), developing a deep connection with partners such as suppliers and distribution intermediaries is of great

significance in creating competitive advantages and effectively operating the supply chain of goods across the world market relative to competitors.

Making strategic decisions quickly and reacting highly to market conditions in strategic market planning allows for more effective execution of business plans in strategic markets (Joyce and Woods, 2003). In essence, execution is the process of transforming strategic plans into specific actions in the market (Wheelen et al., 2014), including setting short-term goals, implementing functional plans such as marketing, finance, human resources, production and sourcing, R&D (David 2015, Slater et al. 2010).

In any management process, evaluation is always necessary and important when managers want to control the evolution and results of business strategies, plans and activities. All strategies may need to be adjusted in the future due to constantly changing business environment factors (Nguyen Hoang Long and Nguyen Hoang Viet, 2015). The strategic market assessment phase includes basic activities (1) review of the environmental factors of the current strategy; (2) measure performance; (3) take corrective measures (David, 2015). Evaluating performance in strategic markets requires enterprises to design quantitative and qualitative criteria such as financial results or the relevance of market strategies (David, 2015).

## 3. Research objectives and methods

### *Objectives of the study*

The article aims to propose solutions to improve the strategic market management of Hapromart chain by 2025, with a vision to 2030.

### *Research sample*

Currently, in the market of Hanoi and the Northern region, the Hapromart chain has 18 stores with an average staff size of about 20 peoples, and the number of employees at the Hanoi supermarket company – Hapromart is 50 peoples. Accordingly, the total staff is about 410 peoples, of which the general and sales managers are about 117 people, accounting for 28.5% of the staff. All managers of Hapro supermarket chain are aware of and participate in strategic market management activities. Therefore, the survey sample of the article includes all 117 managers of Hapromart chain.

### *Research Methods*

The article conducts a survey of strategic market management at Hapromart supermarket chain by using multiple-choice questionnaires. The questionnaire is designed with the main content of the survey divided into 4 large groups, corresponding to 4 stages in the strategic market management process. The article uses a 5-likert scale, with 1 being "least effective" and 5 being "most effective". Based on theory and consultation with experts, the authors have developed and adjusted the questionnaire for the official survey.

The questionnaire was sent to 117 managers of Hapromart chain in two ways, directly and via email. In which, there are 52 managers who were directly surveyed with the average

time for answering about 30 minutes each person. The remaining 65 survey questionnaires were sent to a personal email and received responses between June 1 and June 25, 2021. The number of questionnaires that received responses was 43 votes, of which 31 were guaranteed. validity of the answers. Thus, the total number of valid survey questionnaires collected was 83 votes, accounting for 70.94% of the votes distributed. After receiving the questionnaires, the authors cleaned the information, filtered the questionnaires and coded the necessary information in the questionnaires, entered and analyzed the data by software SPSS 23. Conduct statistics to describe the collected data. In addition, the article also conducts expert interviews with senior managers to have a closer look at the situation of strategic market management at the research units.

## 4. Situation of strategic market management of Hapromart chain

### 4.1. Analysis of strategic market situation

Since Hapro completed the equitization process, the analysis of the strategic market situation of Hapro in general and of the Hapromart chain in particular has changed in a more positive direction, when this chain has been more interest in the collection of business market data. However, the results of surveys and interviews with experts show that almost stores in chain do not have systematic research documents about the market situation, economic, social competition or customer variables. Mainly the information that the supermarket chain is getting is from the analysis of the general business environment of Hapro Trade Corporation. This has resulted in Hapromart not being able to establish a target customer group, or further a strategic market. Hapromart still chooses to serve the mass market with the traditional way of providing products and services to customers.

**Figure 1. Assessing the responsiveness of Hapromart chain's strategic market analysis**
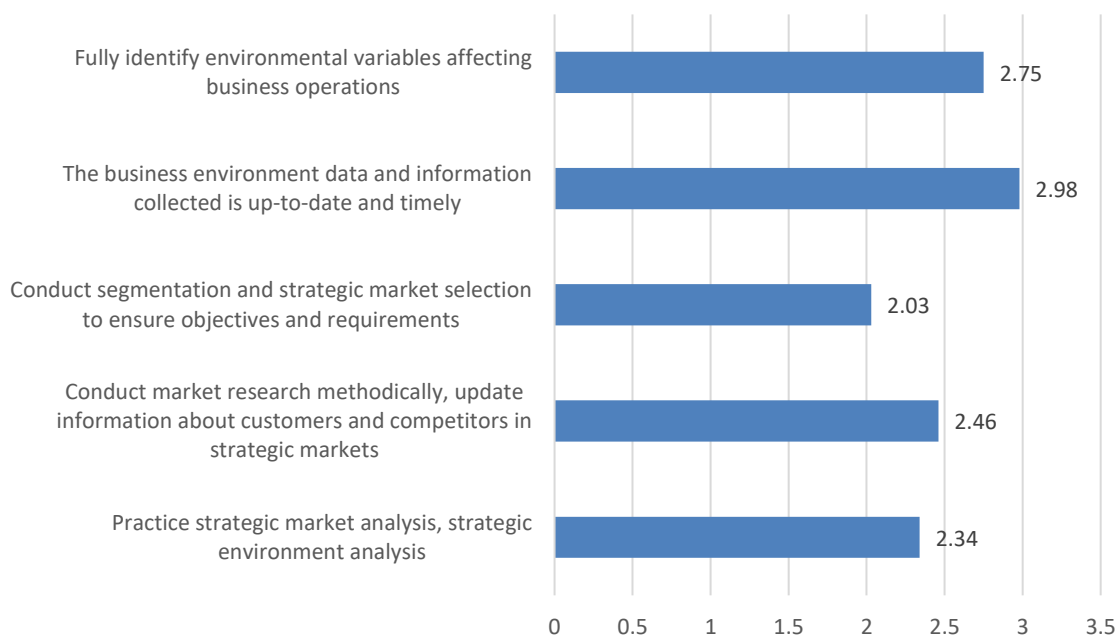


*Source: Survey results*

### *4.2. Status of strategic market planning*

In general, the contents of strategic market planning are done quite well by Hapromart chain. This is shown by the survey results (Figure 2).

**Figure 2. Assessing the responsiveness of Hapromart chain's strategic market planning**



*Source: Survey results*

Regarding the goal setting of the strategic market, interviews with managers at Hapromart showed that the business goals are built based on the long-term development orientation of the supermarket chain and of Hapro Trade Corporate. The process of proposing, selecting and evaluating targets is carefully carried out, ensuring the requirements of feasibility and challenges in the market.

Hapromart's development focus is on building a supermarket chain with strong competitiveness and sustainable development in the market. Accordingly, the long-term goals developed by Hapro are customer- and market-oriented, following three important points: (1) reducing supply costs through close connection with suppliers (2) building a distribution system that is convenient in supplying to the market, (3) reasonably diversifying new product models to add value to the product. However, the construction of objectives based on a one-way process of imposition has led many managers to lack of consideration and discussion of assumptions in the strategic market, therefore they couldn't distinct customer values for each strategic market, as well as a lack of adaptation to market situations.

Regarding planning of market strategy and competitive strategy in the strategic market, the level of closeness and regulation in this activity is not really high and common in the Hapromart chain. The planning process usually stops at annual or short-term planning in the strategic market (2 years) and there is almost no direction and text of the market strategy. The contents of Hapromart's strategic market planning are mostly drawn from the general plan and strategy documents, leading to low effectiveness of planning activities, affecting Hapromart's market position. This limitation also makes the process of providing customer

value to Hapromart's strategic market not highly appreciated by both businesses and consumers. Although, interviews show that most of Hapromart's managers make decisions based on customer needs and competitive pressures of the market. However, the value propositions offered to customers today are still simple, have no difference, and make a prominent impression on customers compared to other supermarket chains in the market. If Vinmart is "convenient", Circle-K is "24/24", K-mart is "Korean", the "specialty" of Hapromart is not really shaped. This is reflected in the relatively low evaluation score for this criterion, only 2.18.

In strategic planning for partnership development, Hapromart chain has been closely following in cooperation and keeping relationships closer. In recent years, Hapromart has made comments, analyzes and assessments to better understand the strengths, limitations as well as the needs and desires of suppliers, thereby planning appropriate methods of relationship management. This is clearly shown in the survey results, when the average rating of partnership development in the market reached a high level of 4.22. Currently, administrators have basically developed and implemented policies to evaluate suppliers regularly to ensure the stability, variety, and reasonable prices of products. According to Hapromart's reports, the company's current sources of goods all meet the delivery requirements in terms of quality, quantity, and time at a reasonable price.

*4.3. Situation of business plan implementation in strategic market*

**Figure 3. Assessing the responsiveness of business plan implementation in strategic market at Hapromart chain**



*Source: Survey results*

With the contents of strategic market planning, Hapromart has concretized into actionable contents in the market. First of all, in terms of setting short-term goals, this content is quite careful, with a focus on defining specific tasks for each short-term period in connection with the long-term overall. The breakdown of tasks helped bring more realism to the short-term goals implemented. Therefore, generally, the setting of short-term goals in the strategic market is assigned to each Hapromart store in the chain, thereby allowing the stores to develop their own achievable goals in business year, which be detailed and suitable to specific business conditions, with a focus on profit targets.

Regarding the implementation of the marketing plan to meet the strategic market, Hapro chain is having a marketing plan that is designed and flexibly adjusted with the supply value and service quality for customers in the market. The Hapromart supermarket chain always ensures a rich product portfolio, covering all kinds of goods and needs of customers. In food field, there are the raw agricultural products (rice, pepper, cashews, cinnamon), processed foods (spring rolls, rolls, dried fruits), beverages.... In consumer goods, there are handicrafts, garments, etc. With the orientation of competition by price, Hapromart always tries to offer the best price to customers in the market. Pricing practices are adjusted based on the value provided and the quality of service to customers. Hapromart implements a synchronous price policy for items in the Hapromart chain of stores. This creates peace of mind and trust in customers when they always receive the same price for the same quality of products and services at any Hapromart supply point. The supermarket system also regularly has promotional events with many great incentives for consumers on special occasions of the year such as Tet and major holidays (such as Reunification Day April 30, Ancestral Anniversary March 10, National Day September 2, International Women's Day March 8, Noel, Valentine's Day February 14, etc.) to stimulate the market's consumption demand. Long-term promotions with many forms such as 2% discount on invoices valued at over 250,000 VND or 3% discount on invoices valued at over 500,000 VND. At the supermarket system, Hapro has designed areas for items with the selling price of 10,000 VND, 20,000 VND (discounted goods), buy one get one free, and promotional items. This not only helps to improve the sales of supermarkets and convenience stores, but also increases the number of loyal customers.

Regarding the implementation of the human resource plan to meet the strategic market, Hapromart has always focused on personnel with a serious, focused and professional level. Human resources for the implementation of strategic market content are recruited, trained and trained, and rotated in accordance with the business objectives of the strategic market. Practical research shows that most people agree with the responsibilities assigned to work operations, and the level of commitment to fulfilling those responsibilities is quite high. Hapromart's current human resource plan has created a close connection in work between different groups of employees in the enterprise, ensuring the reality of personnel and capacity of each member.

The contents of the financial plan have established more appropriate criteria and orientation, allowing better support and linkage of the activities of Hapromart stores in strategic markets. Management has conducted a clearer, more systematic and careful analysis of financial indicators to identify financial strengths and weaknesses of Hapromart, thereby forming judgments about the important financial plan contents. This helps Hapromart to secure financial resources for strategic market activities towards completing and exceeding set targets. The survey results also show that the majority of managers have a positive opinion about the planned financial budget (rated score of 3.78).

Regarding the source of goods, in the list of products being traded today, nearly half are products supplied by member enterprises of Hapro Trade Corporation, so quality, price and support services is always guaranteed at the most reasonable and competitive level. Along with that, Hapromart has also built closer links with external suppliers, allowing reliable sources of raw materials and finished products for the production process at reasonable costs. The survey results showed that most of the managers assessed that the procurement and assurance of raw materials and finished products was effective, making a great contribution to the competitiveness in the market (average score of the survey reached 4.02).

Regarding the implementation of the R&D plan to meet the strategic market, Hapromart's managers are quite conservative about R&D activities. Although Hapro has a Research and Development Center, in reality this department does not have much support or contribution to the business activities of Hapromart supermarkets. Investigations at enterprises show that R&D activities only stop at developing packaging, designs, products or improving quality, but there have not been many breakthroughs in the market.

### 4.4. Status of strategic market assessment and adjustment

To ensure business operation, Hapromart regularly conducts evaluation activities with fairly strict implementation contents. The results of interviews with Hapromart's managers show that at present, strategic market assessment is carried out annually, and the market research department will undertake this activity. Based on basic indicators such as sales, profits from strategic markets, market share of the business compared to competitors, the rate of increase in the number of customers and the average increase in sales per year. For each customer, the managers will build evaluation, reconciliation and comparison reports every 6 months, to ensure financial transparency as well as consider problems arising in the implementation process. strategic market objectives. The survey results also clearly reflect this situation at Hapromart, when most of them believe that the objectives and strategic market orientations are periodically evaluated carefully with specific criteria, with an average score is 3.74.

**Figure 4. Status of strategic market assessment of Hapromart**
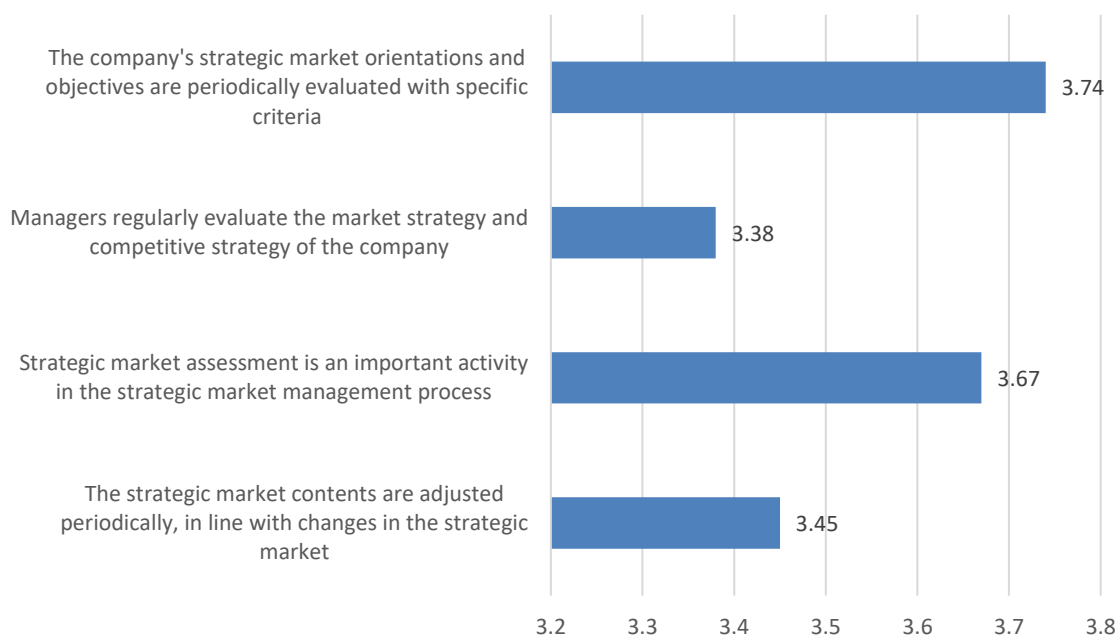
From strategic market assessments, Hapromart's managers will make a number of adjustments at both division and entire Hapromart chain, with operational changes, and specific measures for each area in each stage of strategic market management. The strategic market targets are adjusted more reasonably, with low feasibility, or not guaranteed growth rate in the strategic market, will be changed with appropriate and relevant parameters.

## 5. Directions to improve strategic market management of Hapromart chain

According to many experts, the retail market and consumption trends of Vietnamese people from 2021 are changing the way retail businesses do business. Enterprises are innovating comprehensively such as cutting intermediaries, taking the initiative in all stages of research, market development, design, production (private label), marketing and distribution of goods. This model optimizes the cost and all the perks of direct access, including the opportunity to personalize your brand and engage with your customers. This change brings convenience not only to consumers, but also to producers and sellers who can control the goods from start to finish.

From 2021, online communication and advertising will grow at a much higher rate as a survey shows that 72% of consumers make purchasing decisions based on consultations from social networking sites (Facebook, Instagram or Tiktok). In addition, there is a tendency of buyers to demand delivery as quickly as possible, with 88% of consumers willing to pay an extra fee for express delivery. This has now been well done by retail businesses (such as Co.op Mart, Vinmart, etc.), especially in the field of fast-moving consumer goods (food, chemicals, cosmetics...). Along with that, the application of technology to retail is becoming popular and this trend is expected to explode from 2021, creating conditions for businesses to

have a breakthrough from diverse service standards, efficient and fast. Retailers also forecast that artificial intelligence in the industry will be fully utilized.

Retailers, mostly domestic enterprises, are also working to close the consumption gap between urban and rural areas. Currently, Vietnamese businesses have been able to simultaneously develop large shopping centers (Co.op Extra, Vinmart...) along with convenience stores. Therefore, from 2021 onwards, when the urban retail market is saturated, modern shopping will reach the rural market with more than 70% of the population and 80% of the country's area. This is a potential consumption market for businesses to develop distribution channels, with shopping demand increasing exponentially due to the rapid improvement in income of rural consumers.

With such forecasts about the shift of the retail market, in order to better improve strategic market management, Hapromart chain can consider a number of solutions as follows:

Firstly, in order to build a complete and systematic database, closely follow the market competition situation, and avoid depending on the results of analysis of the general business environment of Hapro Corporation, Hapromart needs to obtain own a department dedicated to strategic market research. This group of staff needs to be trained and effectively apply scientific and modern strategic market analysis tools such as external factor evaluation (EFE) matrix and internal factors evaluation (IFE) matrix, SPACE, BCG, GS, TOWS. The implementation of this solution will allow Hapro chain managers to fully and accurately identify and evaluate developments and changes in the development trend of the competitive market and the environment, thereby obtaining a large amount of necessary data for planning and adjustment strategic market. A good strategic market situation analysis will help chain managers clearly identify the target customer group, thereby selecting strategic market segments. In the opinion of the authors, Hapromart should focus on the group of customers who are consumers in the age group of 40-60, with stable incomes and many characteristics of Hanoi's consumer culture, tending to favor the Hanoi brand.

Second, the supermarket chain needs to be based on the overall development strategy and goals of BRG Group, and Hapro Trade Corporation to get a long-term view, thereby establishing a system of long-term business goals. In the process of determining long-term goals, it is necessary for managers to take into account existing resources and advantages, as well as consult experts from higher-level managers, as well as collect solicit input from lower-level managers and business professionals of the chain.

Third, with the forecast that consumer goods and food groups will maintain high growth rates, Hapromart's managers should plan a market development strategy and expand the business system through the form of M&A. The market development strategy should be based on customer orientation on the basis of determining the size and growth potential of the market. Based on data from demand analysis and customer decision-making, Hapromart should develop an optimal retail product plan according to product group classifications that

identify both alternatives that Hapromart expects to be attractive and excel in the strategic market. This strategic planning allows Hapromart to connect back to the defined function of the category and includes a high level of practicability to arrange product classification, merchandising display, price and promotion for goods, optimizing all retail activities in Hapromart's store chain. This will be a huge competitive advantage for Hapro in the market, besides the existing advantage of convenient location, easy access to customers.

Fourth, Hapromart must choose and supply the values that match the wishes of customers in the market. This requires Hapromart to clearly identify the needs, motives, habits and buying behavior of customers. Accordingly, Hapromart needs to build a clear step-by-step plan, through each stage, what changes, upgrades, and renewals the customer value will need in the strategic market. Strategic market managers need to be able to answer questions such as "what defines customer value in different segments", "how is customer value measured", "how information technology is used to increase customer value", "how current trends in customer value impact supply positioning". Having these answers means that Hapromart has selected differentiated values for the strategic market segment, and devised an appropriate positioning strategy with its marketing efforts.

Fifth, Hapromart also needs to differentiate its product portfolio and arrange goods at each store in the retail chain. The goal of the store system is to maximize sales and profitability, by adjusting the technique of building product catalogs to suit the needs of local customers, the system of stores and the determination of specific requirements at each store in the system. To create a highlight in the market, Hapromart needs to pay attention to developing more private brands. This makes it possible for Hapro to deal with suppliers and have a good profit margin, when developing private labels that will provide customers with added value through the labeled product, while also creating more competitive advantages and profit margins for retailers thanks to an extensive product portfolio, good prices.

Sixth, continue to upgrade and standardize the entire supermarket chain system and create a close connection between the selling points in the BRGMart system in the direction of differentiating the retail market coverage, penetration and development. Hapromart should have a clear orientation in expanding and further developing its network of Hapromart supermarket chains at convenient locations and locations in developed cities and areas to facilitate easy access for people in shopping. At the same time, Hapromart needs to further develop online sales on the e-commerce platform, based on the BRGShopping application.

Seventh, Hapromart needs to implement an appropriate R&D plan and ensure its ability to innovate and compete in the strategic market. This requires managers to make decisions to develop the focus for this activity at the company. The company should consider adding more budget for R&D activities, as well as develop a clear strategy in R&D implementation. Hapromart can rely on the results obtained from R&D activities for export activities to obtain a diverse and high-quality source of goods for the domestic market. An important point for the R&D department is that they need to focus on studying the needs of

domestic consumers closely so that they can supplement and update new and potential developing products in the market, as well as research more modern and effective sales operations.

Finally, Hapromart needs to prioritize and gradually move towards building a marketing information system (MIS) on the basis of organizing information sources, establishing structure and operating, including: marketing research system, system marketing investigation system, marketing decision support system. It is necessary for these departments to be properly and sufficiently equipped with computers with appropriate software for all networked units (LAN, WAN, Internet) and to train a high skill staffs to exploit modern information technology well with compatible software such as CALIPLAN, GEOLINE, MEDIEC, ACDAD... It gradually led Hapromart build databases on information and communication, customer profiles, products and prices, distribution and sales, and advertising. advertising and promotion, on the effectiveness/cost of Hapro's strategic market management.

## 6. Conclusion

The business environment with many changes is clearly putting businesses in an adaptive spiral to compete. As one of the first supermarket chains in Hanoi market, Hapromart has been aware of this inevitable trend in business activities in market. With the increasing awareness of the importance of strategic market management of managers, Hapromart has been gradually applying the principles and contents of strategic market management to business practice on the market. Besides the good points, it can be seen that the Hapromart supermarket chain still has many shortcomings and limitations. This has somewhat hindered the chain's growth momentum in the city's retail market. Accordingly, the implementation of the proposed solutions will be able to help Hapromart solve some of the main limitations, thereby further enhancing its competitiveness in the strategic market. It can be seen that the article has achieved certain results, but the limitation of the article is that it has not evaluated the relationship between implementing strategic market management and business results of commercial enterprises. Accordingly, the research direction in the future may be to build and develop a research scale on this relationship.

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# ORGANIZATIONAL CULTURE AND EMPLOYEES' LOYALTY: THE ANALYSIS OF VIETNAMESE ENTERPRISES APPLYING JAPANESE ORGANIZATIONAL CULTURE

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## Abstract

*Japan is known as one of the most homogenous nation with rich culture. The culture has been significantly influenced by traditional culture for thousands of years and modern society with the advanced level of technological progress. It is often said that organizational culture is of great contribution to the success of Japanese enterprises. The firms' success in this paper is evaluated by employees' loyalty because employees have been always considered as a key resource which greatly leads to the success or failure of the organization. Several studies on organizational culture and employees' loyalty have been implemented, and most studies show positive or causal relationship between organizational culture and the loyalty of employees by using quantitative analysis. This study, however, focuses more specific on the approach to investigate the effect of Japanese organizational culture on employees' loyalty. The paper achieved three major outcomes including the literature review on organizational culture in general and Japanese organizational culture in particular, the organizational culture of Vietnamese enterprises applying Japanese organizational culture, and statistical analysis of questionnaires to conclude the effect of Japanese organizational culture on employees' loyalty.*

*Keywords: Organizational culture, employees' loyalty, Japanese, Vietnamese enterprises.*

## 1. Introduction

In the era of advanced technology, the easiness to find new jobs gives a pressure for companies to retain their employees. The struggles to keep turnover rate low and to optimize the investment in human resources draw companies to come up with various benefit schemes, competitive salary, improving working environment, etc. The discussion on how to improve employees' loyalty also emphasizes on the issues of building organizational cultures. However, in a flat world (Friedman, 2005), understanding how employees embrace the organizational culture is very important to enterprises. Studying a company operating in three countries (Poland, India and England), Barabasz & Kuźmierz (2014) is the most relevant to the current study. In which, they found employees' level of commitment varies depending on the nationality, age and position, despite the coherence of organizational culture among these branches. Challenging the common knowledge that a strong organizational culture will help

to improve employee loyalty, they suggest employee loyalty could be the result of other factors, such as employee's assessment of development opportunities. Furthermore, as they find no clear evidence about a causal relationship between organizational culture and loyalty, the effect of organizational culture on employees' loyalty should be further examined. Using a unique dataset of Vietnamese firms which apply Japanese management style, this paper further investigates the relationship between organizational culture and employee loyalty. The context itself is unique, employee in Japan has significant lower rate of turnover (OECD, 2017), suggesting a high level of loyalty. Watts (1985) attribute this to the "lifetime employment system", which gives employees a higher degree of job security. Under this system, employees tend to commit himself to the company for the rest of his working career. These are unique and important parts of Japanese firms' organizational culture. Because of which, employees in Japan, with a high level of loyalty, are not expected to change their jobs as frequently as ones from other countries. However, little is known about the effect of this organizational culture on employees' loyalty in Vietnamese enterprises applying Japanese organizational culture. Recognizing the urgence of topic, this paper consists of the following objectives: Summarizing literature review on organizational culture in general and Japanese organizational culture in particular; Pointing out theoretical model and the questionnaire to investigate the effect of Japanese organizational culture on employees' loyalty; Analyzing the effect of Japanese organizational culture on employee's loyalty by Statistical Analysis of questionnaire to conclude.

## 2. Literature reviews

### 2.1. Definition

Organizations have their own characteristics, more generally known as organizational cultures or corporate cultures which is defined culture which originally came from an expression of the organization as 'something cultivated' (Watson, 2006). Schein (2004) concluded that most academics and practitioners investigating organizations indicate the definition of culture is the environment and practices that organizations expand around people. As a result, organizational culture is consisted of more 'superficial' dimensions such as patterns of behavior and visible symbols and ceremonies, and more deeply seated and underlying values, assumptions and beliefs. Consequently, all these aspects lead to easily understanding among members of an organization at work and know how they should behave. Consequently, the paper defines organizational culture as a system of shared values that involves a company's people, organizational structure and control systems to produce behavioral norms. The interest in corporate culture is derived from the organizational behavior specialists and from the empirical studies.

## 2.2. Dimensions of organizational culture

**Figure 1. The Denison' Organizational Culture Model**
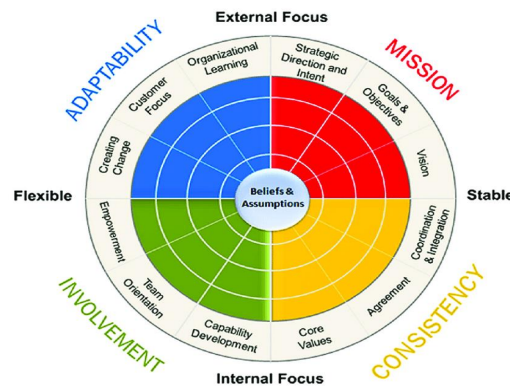
Although there are several models, Denison model still gains reputation when it comes to organizational culture. The model has distinct features compared to other models (Denison & Mirsha, 1995). First of all, the Denison model is behaviorally based. Secondly, it was designed and created within working environment. Thirdly, the model uses business language to explore business-level problems. In addition, it is linked to bottom-line business results. Furthermore, the model is fast and easy achieve. Finally, it is applicable to all levels of the organization. More specifically, the Denison model consists of four key traits including mission, adaptability, involvement and consistency. Each trait is assessed by three indicators of managerial practice (Denison & Mishra, 1995).

## 2.3. Japanese organizational culture

### 2.3.1. Tangible structures and processes

*Typical architecture:* Japanese businesses are always interested in space and working environment because it brings effective labor productivity and quality assurance. Japanese offices as well as factories are always kept clean, neat and organized in accordance with the spirit of Japanese famous 5S (Seiri – sifting, Seiton – arranging, Seiso – clean, Seiketsu – care, Shitsuke – ready). For large companies, in addition to the headquarters, buildings such as museums, research institutes or galleries are also built.

*Product:* Japanese products have long been famous around the world for their sophistication, detail, compactness, elegance, convenience in use and high quality at reasonable prices. Japanese businesses always pay attention to every detail of the product to satisfy the highest needs of consumers. Each product is not simply a product, but it is also associated with a meaning that makes the product of a Japanese business unique and has its own characteristics.

*Language:* Honorifics (Keigo) is an important and extremely difficult part of Japanese in general and business language in particular. Honorifics are divided into three main

categories: respectful speech, humble speech and polite speech. Therefore, it is not only difficult for foreigners to learn Japanese, but also difficult for Japanese people to use it appropriately in different context.

*Ritual:* Japan is a country with many typical rituals in business, such as encouragement, reward, and starting a new day with a greeting ceremony (chorei). At the chorei ceremony, company members often do morning exercises together and chant the company's slogan. With meetings organized by the corporate board, new employees are often encouraged to sing the Company's songs with a healthy, optimistic attitude or shout out the company's philosophical slogans. Japanese companies also often organize year-end ceremonies (Bonenkai) to summarize the achievements of the old year and celebrate the new year (Shinenkai).

*Logo:* In Japan, the family symbol (Kamon) was used, starting from the Heian period (794-1185) to distinguish people from the same clan. In the Muromachi period (1336-1573), family symbols were used as logos of stores. During the Edo period (1603-1868), merchants began to widely use family symbols as symbols and logos of shops and companies they founded. Therefore, businesses established since the Edo period used the family symbol as their logo. Many businesses have used these logos to this day. However, in later periods, businesses began to hire their own designers and more modern in order to differentiate and personalize the business.

*Uniforms:* As it may be, few countries in the world have opportunities to wear uniforms as much as Japan. The reason Japanese people wear uniforms is that wearing uniforms shows politeness, neatness, and a sense of discipline. The uniform also shows the importance of team spirit and does not show any difference from those around in the group. One of the other reasons is that Japanese businesses want to show hospitality (Omote nashi) and professionalism through wearing uniforms.

*Slogan:* Slogans of Japanese companies are often short, concise and attached to the company's image. For example, the slogan of Panasonic company is "Ideas for life" which shows that products made by Panasonic company are good "ideas" for life, giving people around the world a new life, always devoted to the future of the earth and the development of society. This represents Toshiba's mission to provide customers with innovated and surprising products and services. In addition, this slogan means appreciating people and the earth, and always aiming to build a safe and secure society.

### 2.3.2. Values and principles

*Business philosophy:* It can be said that very few Japanese businesses do not have a business philosophy. Through its business philosophy, the enterprise honors a key value system that defines foundation for development. Japanese businesses are also aware of the increasing socialization of production and business activities. As a result, the business philosophy is also meaningful as a brand that expresses the identity of business to customers and society.

*Core values:* Because of the spirit of hospitality (Omote nashi), Japanese businesses always uphold the interests of customers, bringing the highest satisfaction to users of their products and services. Therefore, in each production process and stage, they always promote the quality of products and services to satisfy customer needs at the highest level. Moreover, Japanese enterprises always apply 5S, Kaizen as well as other methods such as TQM, JIT, Lean, etc in daily production to improve quality as well as productivity and reduce costs. The initiatives and improvements in Japanese enterprises are largely achieved through improvement proposals (Kaizen Teian) with enterprises' encouragement. In Japanese enterprises, unified action through Report (Hokoku) including Communication (Renraku) and Discussion (Sodan) has become a characteristic culture. Japanese companies also always value people and always invest a large part of their budget in training. In addition, Japanese companies always attach great importance to long-term and sustainable development, so they always attach great importance to environmental protection, compliance and community-oriented actions.

### 2.3.3. Basic Underlying Assumptions

Japan is a country that values traditional culture and implicit notions often stem from national culture. These concepts are very difficult to change because this is part of personality and lifestyle. These concepts have influenced and created a unique feature in the culture of Japanese businesses.

*Collectivism:* Japanese always identify themselves as belonging to a certain group. They live and work with devotion and assimilation. Collectivism in Japan can be traced back to familism. Familyism is a fundamental value that is reflected in corporate management such as lifetime employment, salary increases according to seniority, etc. In Japanese businesses, small team work becomes very typical. The ideal group size is 5-7 people because of the old Japanese custom of working in small family factories.

*Responsibility:* Because the Japanese always consider themselves part of a team, they will not do anything to affect those around and perform the assigned tasks at the best level. They strictly follow the company's regulations. They always think they receive good things from the group and others and try to repay that favor.

*Obedience:* It is rare in a country where the employee's obedience to the leader is as strong as in Japan. The employees show an absolute obedience to their superiors and respect for those with experience in the business. This is explained from the typical concepts in Japanese corporate culture, employees always have gratitude and respect for those who have given them jobs and created an income source to support their families.

*Parsimony:* The thrift at work is very common in Japanese businesses. The employees know how to save for the business, not for personal gain. This shows that in the production process, Japanese factories are always looking for ways to maximize savings from the use of phones, lighting, office supplies to saving materials, and preserving them properly.

*Diligence:* Japanese are very hardworking people, which has become a characteristic of Japanese people known to the world. Many employees in Japanese enterprises continue to work after working hours. They come home very late and only have a few hours to rest to prepare for the next working day (Yassine et al., 2016).

## 2.4. Overview of studies on organizational culture on employees' loyalty

Several studies on organizational culture and employee's loyalty have been implemented, and most studies showed the positive or causal relationship between organizational culture and the loyalty of employees by using quantitative analysis.

Yiing & Ahmad (2009) examined the effect of organizational culture on leadership style, employee commitment and its relationship with job satisfaction, commitment and performance. Results showed that leadership significantly related with employee commitment and culture play an important role to build this relationship, as far as organizational commitment had significant relation with job satisfaction but not with the performance. Awan & Mahmood (2010) examined the relation between leadership style, organizational culture and job satisfaction and employee commitment in universities of Pakistan. It was found that these librarians worked under bureaucratic leadership style and they were not significant related to the job commitment, organization culture. Some of them were highly committed to their organization, the only reason they librarians were less satisfied and less committed to work because they did not have job growth. Besides, Lund (2003) examined the effect of organizational culture on job satisfaction of marketing employees in USA. One-way analysis methodology was used and the result shows that job satisfaction signification varied from organization culture-to-culture, clan culture (mentoring, loyalty, tradition) and adhocracy culture (innovation, entrepreneurship and flexibility) higher level of job satisfaction then hierarchy culture. Bellou (2010) examined organizational culture relation on job satisfaction regarding gender and age. Results suggested that some cultural types effect on employees' job satisfaction they may be personal growth opportunities, good reputation. Pantouvakis & Bouranta (2013) studied the relation between learning culture and job satisfaction on customer satisfaction in different service sectors and found the positive strong relationship of learning culture with employee job satisfaction and customer/client expectations because when employee learnt about their services and he/she educated their customers regarding to services that they provided, it increased the customer satisfaction as well as employees' job satisfaction.

In Vietnam, Tran & Nguyen (2007) studied the impact of organizational culture on employees' performance and loyalty and examined how different types of culture influenced employees' loyalty in different enterprises. It was found that innovative culture had significant impact on employees' loyalty in different types of enterprises. In another approach, Truong & Do (2012) examined the relationship between organizational culture and employees' engagement in FPT Information System and Ha & Bui (2016) studied CMC Telecom Ho Chi Minh city. Besides, Tran (2018) also studied impact of organizational

culture on employees' commitment in construction firms; Ha & Tran (2021), Ha & Vo (2021) conducted researches on manufacturing firms. Most of them used similar dimensions of organizational culture including empowerment, training and development, teamwork orientation, communication or reward and recognition, creativity and creating changes. In addition, Dang & Nguyen (2014) used some more dimensions including future orientation, equity and consistency, and effectiveness of decision making. These studied showed that most of dimensions had significant positive impact on employees' engagement except reward and recognition (Dang & Nguyen, 2014; Tran , 2018), future orientation, equity and consistency (Dang & Nguyen, 2014). Specifically, Bui & Le (2017) applied Denison's model to examine relationship between organizational culture and employees' loyalty in Lilama company in Vietnam and found significant impact of 9 dimensions of organizational culture. It can be seen that the study of Tran & Nguyen (2007) studied organizational culture on employees' performance and loyalty in general and focused on types of culture and other studies mostly focused on employees' engagement in a specific company. This showed a research gap for the authors to study impact of organizational culture on employees' loyalty in Vietnamese enterprises applying Japanese organizational culture.

## 3. Research Methodology

As mentioned above, several studies on organizational culture and employee's loyalty have been implemented and most studies showed positive or causal relationship between organizational culture and employees' loyalty by using quantitative analysis. However, approaches to corporate culture and employee loyalty in each study were different. Organizational culture is fragmented into many factors, each with a certain degree of influence on employee loyalty. In this research, the model of Denison (1990) was applied as it has been used to study organizational culture widely in the world. For employee loyalty, according to Manpower (2002), employees are loyal if they are willing to work for the organization in long run, they do not want to leave and work for other organizations, they are proud of the organization and happy to introduce to other people. In this study, the mentioned dimensions were used as measurements to conduct the research.

**Table 1. Denison's Organizational Culture Model Dimensions**

| Organisational culture dimensions | Organisational culture sub-dimensions | Measurements |
|---|---|---|
| **Mission** | Strategic Direction & Intent | SDI1, SDI2, SDI3, SDI4, SDI5 |
| | Goals & Objectives | GOS1, GOS2, GOS3, GOS4, GOS5 |
| | Vision | VIS1, VIS2, VIS3, VIS4, VIS5 |
| **Consistency** | Coordination & Integration | COI1, COI2, COI3, COI4, COI5 |
| | Agreement | AGR1, AGR2, AGR3, AGR4, AGR5 |
| | Core values | COV1, COV2, COV3, COV4, COV5 |
| **Involvement** | Capability Development | CAD1, CAD2, CAD3, CAD4, CAD5 |

| | Team Orientation | TEO1, TEO2, TEO3, TEO4, TEO5 |
|---|---|---|
| | Empowerment | EMP1, EMP2, EMP3, EMP4, EMP5 |
| **Adaptability** | Creating change | CRC1, CRC2, CRC3, CRC4, CRC5 |
| | Customer focus | CUF1, CUF2, CUF3, CUF4, CUF5 |
| | Organizational learning | ORL1, ORL2, ORL3, ORL4, ORL5 |

*Source: Denison (1990)*

Denison's model was developed by four basic characteristics including involvement, consistency, adaptability, and mission, and each of them having three sub-groups. Employees evaluate their perception of each aspect of corporate culture on a scale of 1 to 5. These evaluations were independent variables in the model. Since then, by statistical analysis, it is possible to find out how each of these variables impacts the dependent variable which is employee loyalty. Determining the effect each element of corporate culture on employee loyalty helps businesses determine which aspects need improvement and which aspect has been met. From there, businesses can create reasonable policies to manage their employees. To better assess the effects of each dimension of organizational culture on employees' loyalty, correlation coefficient was used.

A non-probability sampling or convenience sampling was applied to conduct the research. 110 questionnaires were given to Vietnamese employees and managers where Japanese organizational culture is applied in small and medium sized enterprises and 102 responses were valid to analyze.

## 4. Findings and Analysis

All 102 responses met the basic requirements of the survey and were used for analysis. Of which, 43 respondents indicated that they intend to quit their job in the next 1 year - hereafter called the Unloyal, (accounting for 42.2%), 59 respondents have no intention to quit in the next 1 year hereafter called the Loyal (accounting for 57.8%).

### 4.1. Analyze the answers about Mission

**Figure 2. Average score of each group on Mission questions**

*Unit: Point*
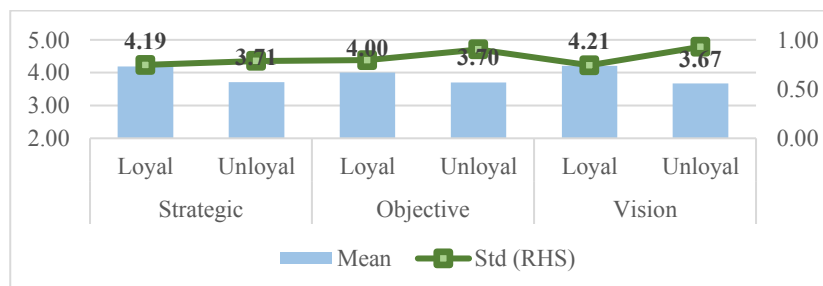


*Sources: conducted by authors, 2020*

Figure 2 shows the difference in scores clearly between Loyal and Unloyal groups in all 3 criteria. Of the three factors, the company's orientation and vision received a higher average score from the Loyal group (4.19 and 4.21 respectively). The average score of the Loyal group was significantly higher than that of the Unloyal group in all 3 criteria. The

reason for this difference comes from the fact that most employees who want to make a long-term commitment feel that the company's vision is clear and potential, thereby increasing motivation and inspiration to work. Besides, when the company's vision and orientation are in line with the employees' vision and orientation, it will help employees feel more engaged. From the above results, it can be concluded that employees' assessment of the company's mission has a direct effect on whether they want to stick around for a long time, thereby affecting the employee turnover rate of that company.

To better assess the effects of the Mission team on employee loyalty, the research team used the Correlation coefficient. The Correlation table of questions for the Loyalty variable is shown in the Table 3. The results show that most of the questions are positively correlated with employee loyalty. That is, the higher the employee's assessment of the corporate culture, the higher the likelihood that the employee will be loyal. In which, the Vision group has the highest correlation, the Strategic group has a fairly evenly distributed correlation in 5 questions, the Objective group has the lowest correlation.

**Table 2. Correlation table of Mission questions**

| SDI1 | SDI2 | SDI3 | SDI4 | SDI5 |
|------|------|------|------|------|
| 0.31 | 0.25 | 0.30 | 0.32 | 0.32 |
| GOS1 | GOS2 | GOS3 | GOS4 | GOS5 |
| 0.17 | 0.33 | - 0.02 | 0.16 | 0.22 |
| VIS1 | VIS2 | VIS3 | VIS4 | VIS5 |
| 0.29 | 0.40 | 0.28 | 0.22 | 0.35 |

*Sources: conducted by authors, 2020*

First, with the Strategic group, the average correlation of the 5 questions was 0.3, a number that is not too bad compared to the other groups. In particular, the last two questions about employees knowing and believing in the success of the company's strategy have the highest correlation coefficient for employee loyalty. Next, for the Objective group of questions, the average correlation was only 0.17. Compared to the common ground, this number is actually quite low. In which, question 3, "The company's goals are ambitious" even recorded a negative correlation. This means a company with too ambitious goals, not in line with its current capabilities, easily makes employees feel distrustful. In addition, questions 1 and 4, respectively, about the suitability of the target to the market, as well as tracking the progress of the goal implementation, did not have much of a significant effect on employee loyalty. In contrast, question 2 about long-term and short-term goals provides employee motivation with the highest correlation coefficient with employee loyalty.

Finally, for the group of questions about the company's vision, the average correlation coefficient of this group with employee loyalty is 0.31. Most of the questions in this group recorded a fairly good correlation coefficient compared to other groups, especially, question number 2 recorded the highest correlation. This question reads: "The leaders in this organization have a long-term orientation". Compared to the remaining questions about the effect of Vision on employees, this second question represents the long-term vision of "leaders". Studies show that leaders always have a key role in influencing employee

engagement, and the number 0.4 in this survey shows that leaders' long-term vision has a significant influence.

In general, 3 factors: Strategy, Objective and Vision all have positive effects on employee loyalty, especially the Vision factor. The company's vision always has a certain influence. It builds employee confidence in the company's ability to grow in the future. In addition, the company's vision in line with the employee's vision will also contribute to attracting that employee to continue to stick around to achieve his or her future goals. Employees work not only for income, but most also have the desire to assert themselves. The results are in line with Bui & Le (2017) as companies with the right vision and in line with the development of the company and society will attract the right personnel for that development themselves. However, the vision should not be too ambitious, it will make employees feel pressured and harder to stick with the company.

### 4.2. Analyze the answers about Consistency

The difference in mean scores between Loyal and Unloyal groups is not much in the group of questions about Consistency. Overall, however, the average score of employees in the Loyal group was 1.1 to 1.2 times higher than that of the Unloyal group. In which the question of coordination and cohesion had the highest difference in average scores, followed by the question of core values and finally the agreement. From there, it can be seen that employees are very interested in coordination and operation within the company. At the same time, being able to reach consensus in the work environment is also extremely important.

**Figure 3. Average score of each group on Consistency questions**

*Unit: Point*
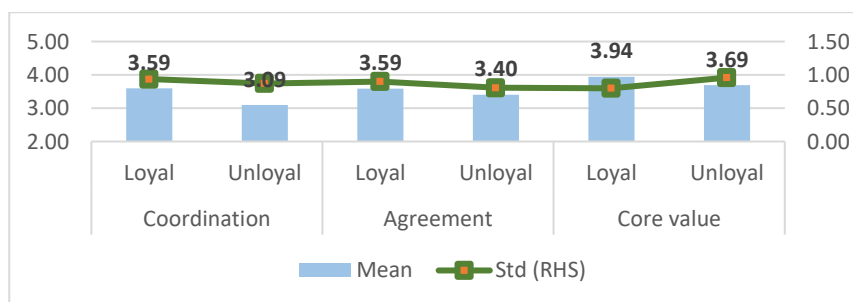


*Sources: conducted by authors, 2020*

**Table 3. Correlation table of Consistency questions**

| COI1 | COI2 | COI3 | COI4 | COI5 |
|---|---|---|---|---|
| 0.36 | 0.25 | 0.32 | 0.20 | 0.19 |
| **AGR1** | **AGR2** | **AGR3** | **AGR4** | **AGR5** |
| 0.15 | 0.04 | 0.02 | 0.23 | 0.12 |
| **COV1** | **COV2** | **COV3** | **COV4** | **COV5** |
| 0.06 | 0.14 | 0.23 | 0.08 | 0.23 |

*Sources: conducted by authors, 2020*

In Table 3, the questions in the Consistency group have a lower degree of equivalence than the Group Question Task. In which, the 1st question of the Coordination Group has the highest corresponding number of 0.36%, the lowest is the 3rd question of the Coordination Group with the corresponding coefficient of 0.02%. The group of questions about Coordination recorded an average correlation coefficient of 0.26 points, in which the question with the highest correlation coefficient was: "Our approach to do business is very consistent and predictable". Thus, being consistent in business methods has the most positive effect on employee loyalty. This result was supported Bui & Le (2017) as once there is a right and consistent business method, it is easy for employees to learn to work on those foundations. In addition, the coordination between team members as well as between different teams also has a positive effect on employees' loyalty.

The Agreements group of questions recorded an average correlation coefficient of 0.12, the lowest of all question groups. This is also the group that recorded a rather low average rating. In particular, the 2nd and 3rd questions have almost no correlation with employees' loyalty. Specifically, these two questions talk about the ease of consensus on particular issues. Thus, in a company, consensus is not always a good thing. Finally, the Core Value group of questions recorded an average correlation coefficient of 0.15. This is not a large correlation number when compared to the rest of the question groups. In which, the 3rd and 5th questions about agreeing with the company's Core Value recorded the highest correlation coefficient.

### 4.3. Analyze the answers about Involvement

**Figure 4. Average score of each group on involvement questions**

*Unit: Point*
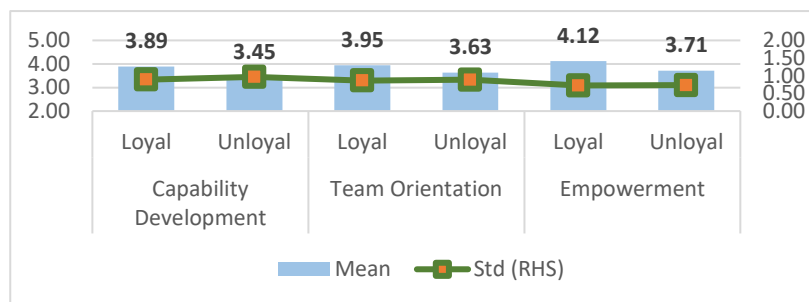


*Sources: conducted by authors, 2020*

The average scores given by loyal employees continue to be high, overwhelming those of employees intending to quit. Led by a group of questions *about Empowerment. Employees who choose to stay dedicated claim that they are authorized by management to perform many tasks, so they feel contributed to the growth of the company and gradually create a sense of belonging. Second place is the group of questions about Team Orientation at work. On average, loyal employees give 3.95 points in related content. There are questions* about personal development. The group of loyal employees rated 3.89 points, 1.13 times higher than

the group of unloyal employees. Most of those who intend to leave their jobs believe that they have no opportunity to develop their skills and are not valued by the company.

**Table 4. Correlation table of Involvement questions**

| CAD1 | CAD2 | CAD3 | CAD4 | CAD5 |
|------|------|------|------|------|
| 0.23 | 0.30 | -0.07 | 0.27 | 0.29 |
| TEO1 | TEO2 | TEO3 | TEO4 | TEO5 |
| 0.14 | 0.12 | 0.21 | 0.29 | 0.20 |
| EMP1 | EMP2 | EMP3 | EMP4 | EMP5 |
| 0.29 | 0.27 | 0.18 | 0.17 | 0.37 |

*Sources: conducted by authors, 2020*

Table 4 shows a positive correlation between questions belonging to the Involvement group and employee loyalty. The group of questions about Capability Development recorded an average correlation coefficient of 0.20, not a high number. However, if the question type is 3, the remaining group of questions also recorded a higher correlation coefficient. Because question 3 records a correlation coefficient of -0.07, this is a question about the skills needed in the job to ensure that no unnecessary problems arise. This is similar to the results of Bellou (2010), Dang & Nguyen (2014), Ha & Tran (2021) when an employee is competent enough to do the jobs without ever having problems, that employee seem to want to grow and do harder jobs. Good employees do not expect to stay in one job for life. In contrast, questions about creating conditions for employees to develop themselves had significant correlations with employee loyalty. In which, the second question: "The company continuously invests in the skills of its employees" recorded the highest correlation. This means that employees always have a need for self-development and focusing on this need will attract better quality workers.

The group of questions about Team Orientation only recorded an average correlation coefficient of 0.19. In which, the first two questions recorded a rather low correlation coefficient. The content of these two questions emphasizes the importance of teamwork for a company. The company that attaches too much importance to teamwork or only cares about teamwork in the team but does not care about this relationship between the teams, will have a relatively small effect on employee loyalty. The remaining questions about the quality of teamwork are considered to be quite important in attracting employees. This result is conformity with Ha & Bui (2016), Bui & Le (2017), Tran (2018) and Ha & Vo (2021).

The group of questions about Empowerment recorded an average correlation coefficient of 0.27. This is quite a high number, even higher if the 3rd and 4th questions are not taken into account. Out of the 6 questions in this group, the first 2 questions about the redistribution of jobs and tasks for employees; The next 2 questions assess the employee's influence on the work at the company (2 questions have the lowest correlation coefficient) and the last 2 questions evaluate the employee's influence on the team and company. Thus, what employees really care about is how much the company, colleagues, and leaders trust them to assign tasks to them; and how the company, colleagues, and leaders perceive their value in work. This was supported by Ha & Tran (2021) as properly assessing the capacity of employees, giving appropriate rights is what helps to retain good employees.

### 4.4. Analyze the answers about Adaptability

### Figure 4. Average score of each group on involvement questions

*Unit: Point*
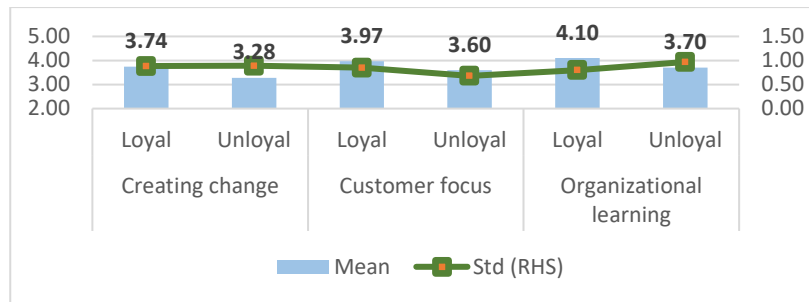


*Sources: conducted by authors, 2020*

On average, loyal employees score is 1.4 times higher than unloyal employees when asked questions about the company's innovation (3.74/3.28). This ratio is 1.1 times with the group of questions about customer orientation and learning organization. From the above numbers, it can be seen that employees attach great importance to organizations that are agile and flexible in changing to meet the needs, competition and daily changes of the market as well as those of competitors. Companies that meet this will have a lower number of employees wanting to leave and vice versa.

### Table 5. Correlation table of Adaptability questions

| CRC1 | CRC2 | CRC3 | CRC4 | CRC5 |
|------|------|------|------|------|
| 0.27 | 0.31 | 0.30 | 0.13 | 0.17 |
| **CUF1** | **CUF2** | **CUF3** | **CUF4** | |
| 0.26 | 0.22 | 0.18 | 0.26 | |
| **ORL1** | **ORL2** | **ORL3** | **ORL4** | **ORL5** |
| 0.23 | 0.15 | 0.25 | 0.24 | 0.34 |

*Sources: conducted by authors, 2020*

Correlation coefficient Table 5 shows that the group of questions about Adaptability has a good correlation with employee loyalty. In which, the first group of questions about Creating Change recorded an average correlation coefficient of 0.25. In which, 2 questions 4 and 5 recorded quite low scores. The remaining questions recorded higher correlation coefficients. Questions 2 and 6 recorded the highest correlation. Specifically, these two questions are: "The company responds well to competitors and other changes in the external business environment" and "Company has policy to support innovation". Employees are interested in company change, but not passively, but proactive change based on observations of competitors and the market. In addition, a company that recognizes employees' change efforts will be more attractive than the rest.

The Customer Focus group of questions recorded an average correlation coefficient of 0.23. Among them, questions 1 and 4 have the greatest correlation. These two questions measure the company's level of customer care. Finally, the Learning group of questions recorded an average score of 0.22. In which, the fifth question about the company creating

excitement for employees to learn is what has the greatest correlation with employee loyalty. While the question about whether the company has training courses for employees recorded the lowest correlation. Thus, it is not a good thing to open many courses, training sessions, and ask as many employees to participate in the course. What employees really care about is their interest in learning. So, companies can have many different ways to acquire knowledge instead of boring classes. This is in line with Lund (2002), Pantouvakis & Bouranta (2013), Bui & Le (2017) as adaptability and a learning culture has a moderate effect on employees' loyalty. In particular, the company's focus on changing, or focusing on customers, or improving the knowledge of employees have positive effects.

## 5. Conclusion

In this research, the results reflect a relationship between organizational culture and employees' loyalty. The score of the Loyal group on cultural characteristics in an enterprise is often higher than the score of the Unloyal group. Employees who value the organizational culture better are more likely to stay with the company. In particular, Strategy, Vision, Creating Change and Capacity Development are the factors with the biggest difference in the evaluation level between the two groups Unloyal and Loyal. Thus, organizational culture also significantly affects employee loyalty. In which, the strategy and vision reflect the development orientation of the company and reflect the vision of the leader. If it doesn't align with the employee's orientation, it's easy to make the employee feel reluctant to stick around for a long time. Besides, the fact that companies' changes to meet the market demand is also something that employees care about. Disloyal employees score this factor much lower than loyal employees. Finally, employees who join an organization will not want to stagnate themselves and not grow. Thus, having courses to improve employee capacity is something that not only the company but also the employees always want. In fact, most businesses that apply Japanese culture have regularly applied capacity building courses, so that employees in the business always excel every day. This can help the working atmosphere become more effective, creating motivation for both the company and employees. In general, the culture of each business is not built in a day or two. It is a long process and each employee also contributes to the organizational culture which in turn affects the working attitudes of employees as well as their loyalty.

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# THE IMPACT OF INTERNET BANKING SERVICE QUALITY ON CUSTOMER SATISFACTION: AN EMPIRICAL STUDY IN BIDV

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## Abstract

*The main objective of the research is to examine internet banking service quality's impact on customer satisfaction of Bank for Investment and Development of Vietnam (BIDV). This study is a quantitative study using the SERVQUAL model developed by Parasuraman et al. (1988) in internet banking service to define 5 dimensions of internet banking service quality as independent variables and customer satisfaction is the dependent variable. Questionnaires were also given for 320 customers and 300 surveys which were valid for analysis. The Cronbach alpha, Reliability Test, Explanatory Factor Analysis (EFA), Correlation Coefficient and Regression Model were applied. The results illustrated that Tangibles, Reliability, Responsiveness, Assurance, and Empathy have positive impact on customer satisfaction, in which Reliability has the highest impact. This study shows that, apart from the traditional banking, the development of the emergence of Internet banking on customer satisfaction can also be carried out by using SERVQUAL model.*

*Keywords: internet banking services, customer satisfaction, SERVQUAL model, BIDV.*

## 1. Introduction

With the increasing trend of remote service on web-based and cloud-based systems, customers these days not only want the traditional services but also the experience of convenience on the internet platforms, that is why the emergence of Internet banking has become a disruptive technology for the banking industry in general and for the customer in particular. Nowadays, people are overwhelmed by workload that they do not have enough time to go to the bank to handle their banking transactions. The term Internet banking, also known as E-banking, means that all users use a personal device and browser to get connected to their bank's system website or application in order to perform any virtual banking function. According to Nguyen (2018), internet banking is the delivery of banks' information and services by banks to customers via different delivery platforms which might be used with different terminal devices, kind of a personal computer and a mobile with browser or desktop software, telephone or digital television. Online banking was introduced in the early 1980s, from the time many people have started using these facilities. Internet banking gives a person an account, makes money transfer from account to other accounts, and also pays bills such as phone or electricity. In addition, people do not need to wait a long time in the bank or another

shop. The best thing about internet banking is that it is fast and available to people all around the world, at any time if they need.

The Bank for Investment and Development of Vietnam (BIDV) is one of the largest commercial banks in Vietnam. Moreover, BIDV ranked in the top 10 largest corporate income tax payers in Vietnam in 2019 and 2020. BIDV is also a leading experienced bank providing a full range of modern and convenient banking products and services. However, Internet banking services have been growing rapidly in data- based systems as well as the increasing trend of customer demands for internet banking users. Furthermore, the competition in the internet banking system is more challenged than other internet banking firms in the world as well as in Vietnam. Therefore, to remain competitive internet banking users in BIDV, the firm needs to analyze customer satisfaction towards internet banking service. As a result, internet banking of BIDV knows how to evaluate customer satisfaction; hence, they can clarify to satisfy their customer.

There were several studies on this topic in other emerging markets, but there was a lack of research in the context of banking industry in Vietnam. To give a correct answer for that statement in a more specific way, this paper attempts to analyze the impact of the Internet banking service quality to customer satisfaction of BIDV based on the research of online banking services in order to find out the dimensions of internet banking service quality that impact customer satisfaction, so bank managers may have suitable policies to increase customer satisfaction. The SERVQUAL model was applied to conduct the research; therefore, authors would like to test the model fit in the context of banking industry in Vietnam.

## 2. Literature review

### 2.1. Internet Banking

Internet banking is known as E-banking. According to the customer's perspective, Internet banking is implemented in a very convenient way to accommodate one's accounts because it's definitely available 24 hours per day, and a week. Additionally, the information is present. Complex cash management package with fast transfer information was included in the online banking system for associated customers thus enabling customers to have timely, convenient and modern services through electronic channels (Nguyen, 2018). By offering internet banking systems, traditional banking institutions try to lower operational expenses, improve customer banking service, maintain old customers, and broaden market share of customers. Therefore, according to Gonzalez et al., (2008), internet banking has encountered explosive development and changed dramatically conventional banking systems. Both customers and banks can take the advantages of internet banking as a diversified ranges of e-transactions which can save their time and cost (Alkailani, 2016).

In today's modern world, internet banking has grown tremendously and makes an easy and effective way to control money. According to Williamson (2006), online banking gives customers convenience, flexibility, and provides at a low cost compared to brick and mortar banking systems. Suganthi et al., (2001) indicated that the expectation of internet banking is

enhancing service, growing market capability, and reducing costs. If clients are using new technological advancement, the technologies must be rationally cost to charge. Nevertheless, the approval of new technology products may not be feasible for customers. In terms of Saha & Zhao (2005), reliability means dedication to responsibility in areas; for example, the accuracy of bill, qualified record maintenance, and acceptable time limit in delivering the service.

## 2.2. Customer Satisfaction

A variety of definitions have been proposed to explain customer satisfaction. According to  Kotler & Amstrong (2009), there is developing managerial interest in customer satisfaction as a method for considering quality. High consumer satisfaction evaluations are broadly believed to be the best market of an organization's future profit. Satisfaction can be extensively characterized as a post purchase assessment of product quality given pre-purchase forecast. The role of customer satisfaction plays an important position in internet banking as it is a major evaluation of internet banking activity and it connects the operation of consumption or use of the product or service to attitude change, repeat using internet banking service. In technological advancement, the competitive environment is high; therefore, building more relationships with customers is crucial for banking constitutions (Lindgreen et al., 2006). Customer satisfaction illustrates the foundation when building relationships between customer and banking service. Moreover, satisfied customers are considered to keep in touch with the banking organization, purchase more items or services, and purchase more frequently; therefore, this can lead to better performance of banks (Belas and Gabcova, 2016).

As each client has their own taste, they are influenced by gender, culture, demographics, and social foundation. In a broad picture, the increase in customer satisfaction will ensure customer loyalty. Hence, it is compulsory for banks to focus on nurturing the contributing factors of customer satisfaction (Tran & Nguyen, 2020). Ahmed et al. (2017) stated that the best way to satisfy customers and enhance customer relationships with the bank is to improve the quality of service, including the four major factors of communication, technology, human capital and reliability. Customer satisfaction can be found by evaluating the level of satisfaction to overall services quality, assessing the level customer will continue using services, and measuring the level customer will introduce services of banks to other people (Tran & Nguyen 2020, Nguyen et al. 2021).

## 2.3. Internet Banking service quality and Customer Satisfaction

In order to find out about the impact that Internet banking generates on customer satisfaction, the relationship between the two factors must be proved through the research about intermediaries in this relationship. Based on the fundamental notion that, the customers only satisfy with the service if they are served by an exceptional service quality (Rod et al., 2009). Therefore, in the case of internet banking, the key intermediary that connects the relationship of internet banking and customer satisfaction is the high-quality service of internet banking.

To give a more specific view on the determinants of a high - quality service in Internet banking and how it affects the customer satisfaction, Parasuraman et al. (1988) diminished from 10 to 5 components and suggested a model by using a factor analysis. These first dimension is tangible in the case of internet banking: the layout of the website, the content material that website provides to the customers, set up of up-to-date technologies and visually attractive physical facilities Hussaien et al. (2020). Secondly, reliability refers to the functionality of executing the promised offerings to customers (Nguyen, 2018). Thirdly, responsiveness represents the speed of responding to customer enquiries and additionally the rate of service processes, the guarantee measurement incorporates the safety of the offerings, the error-unfastened report of the service facilities (Pakurar et al., 2019). Assurance which delivers the privateness and safety of customer data and information, are proved to be the maximum good - sized elements that make a contribution to better customer satisfaction (Sanjuq, 2014). Finally, the empathy dimension is the factor that creates the least effect to the customer satisfaction which shows the responsibility and service provider's attention to customers whose target is to recognize their needs (Vencataya et al., 2019).

The literature review illustrated that several researchers have been conducted on internet banking and customer satisfaction in other countries in developing countries and emerging economies. Different variables were used to study service quality of internet banking services in researches of Tharanikaran et al. (2017), Raza et al. (2020), Vetrivel et al. (2020). Although there were some differences in variables, those studies found the significant impact of internet banking variables on customer satisfaction such as reliability (Pisnik and Snof, 2010; Hammoud et al., 2018), tangibles and empathy assurance (Ariff et al., 2012; Hamzah et al., 2017)), responsiveness and security (Firdous & Farooqui, 2017; Hammoud et al., 2018; Vetrivel et al., 2020). However, many of them used dimensions of service quality in SERVQUAL model including tangibles, reliability, responsiveness, assurance, and empathy. In Asia and Southeast Asia, Hu and Liao (2011), Munusamy et al. (2010), Supriyanto et al. (2021) applied this model to study in Taiwan, Malaysia and Indonesia, respectively. The contexts of those studies were mostly in private banks or a banking industry in general. In Vietnam, Tran & Nguyen (2020), Nguyen et al. (2021) also used SERVQUAL model to study the impact of service quality on customer satisfaction in a branch of Techcombank and Bac A Bank, but they did not specifically focus on internet banking services. Regarding internet banking and customer satisfaction, Nguyen (2018) studied commercial banks in Vietnam applying SERVQUAL model. It can be seen that there was a lack of research on internet banking and customer satisfaction applying SERVQUAL model in a specific bank like BIDV.

In BIDV, there were no direct researches in the area of customer satisfaction and internet banking. As a result, the study would like to fill the research gap created by the SERVQUAL model which is very popular in many studies applicable in services. This model was used in many fields such as: banking, hospitality and tourism. In this paper, the authors

chose the SERVQUAL model to analyze the level of 5 dimensions impact on customer satisfaction in terms of internet banking services.

## 3. Research methodology

### *3.1. Research hypothesis*

The authors designed five hypotheses based on the conclusion of Wilson et al. (2008) which presented below by the relationship between five dimensions of service quality (Parasuraman et al., 1988) and customer satisfaction, the following main hypotheses are developed:

*H1: The tangible dimension has a positive impact on customer satisfaction.*

*H2: The reliability dimension has a positive impact on customer satisfaction.*

*H3: The responsiveness dimension has a positive impact on customer satisfaction.*

*H4: The assurance dimension has a positive impact on customer satisfaction.*

*H5: The empathy dimension has a positive impact on customer satisfaction.*

### *3.2. Research model*

**Figure 1. Research Model**
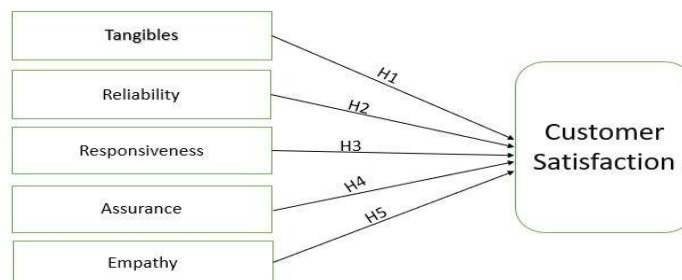


*Source: Parasuraman et al., 1988*

Following the literature review, there are a colossal number of previous researches regarding the impact of internet banking on customer satisfaction. In addition, a good model to assess internet banking in the service sector and customer satisfaction is based on the five dimensions of the model connected internet banking which is known as the SERVQUAL model (Wilson et al., 2008). As mentioned above, this study was not to generate the new theory but to test the current theory and to find out the relationship among service quality and customer satisfaction. Based on that reasoning, quantitative data analysis was chosen for the scope of the research. Independent variables included Tangibles, Reliability, Responsiveness, Assurance, and Empathy; dependent variable was Customer satisfaction. The questionnaires were designed including 20 measurements for independent variables (Parasuraman et al. 1988, Nguyen et al. 2021) and 3 measurements for dependent variable (Tran & Nguyen 2020, Nguyen et al. 2021). The questions are asked with the 5-point of Likert scale. These numbers illustrate that: number 1 means strongly disagree, number 2 means disagree, number 3 means neutral, number 4 means agree, number 5 means strongly agree. To be more specific, the respondents will select the answer that expresses the suitable which they agree with the statement.

### 3.3. Data collection and data method analysis

Data analysis is a part that provides on how the data is broken down and clarified in the nature of contributory parts and the correlation between these parts is determined. Saunder et al. (2009) determined the two methods of data analysis consisting of quantitative and qualitative data analysis procedures. In quantitative analysis, descriptive and inferential statistics are used to analyze data. The descriptive statistics was applied to aggregate the collected data into tables, bar and pie charts in order to increase the reader's understanding and to make it easier in comparing and finding results. Mean, standard deviation, percentage were the used elements of the descriptive statistics in data analysis. On the other side, inferential statistics is applied to generalize and make estimation after the result is found out. The study also incorporated Cronbach alpha, the reliability coefficient test and exploratory factor analysis (EFA) to investigate the reliability and relevance of observed items and of the SERVQUAL model. In this study, Cronbach's alpha from 0.6 is acceptable according to the analysis of Nunnally & Bernstein (1994) and the correlation coefficient Pearson (r) is significant only if the observed significance level (sig.) is less than the significance level $\alpha = 5\%$. The relationship between customer satisfaction and internet banking service quality dimensions could be found out by applying the regression analysis in this study. In this study, the analysis instrument used is SPSS (Statistical Package Social Science) version 20.

### 3.4. Sampling

Sampling technique, also known as sample selection, is one of the filtering methods that optimizes the data for a study by using only sub-group data for the research model instead of using the whole population. The customer satisfaction of BIDV's customers is the main target of the research question. A non-probability sampling or convenience sampling is the researcher's decision to select respondents. The purpose of the method is finding easy access for data samples since there is no particular time during which all the guests are around to retrieve data without difficulty, so researchers cannot carry out probability techniques. As a consequence, it is impossible to contact everyone who may be sampled. Also, due to time constraint accessibility, the non - probability sampling is more convenient to carry out rather than the probability sampling technique.

The study was experimented at BIDV to find out how the customers perceived internet banking service quality and what factors they felt most satisfied about it. Hence, the sample was chosen from the customers of BIDV bank. However, BIDV provides a wide range of services such as: make money transactions, lending money, saving accounts, etc. The research only emphasized customers using internet banking service only.

After the target sample was being chosen, 320 surveys were given out to Internet banking customers during March to April, 2021. The researcher went to the welcoming desk of several BIDV banks to collect data for the total number of surveys. The guests came with different purposes and have a wide range of ages from 18 years old to above 65 years old. As different people in different ages range had various demands for the online banking, so the

result would be more generalized. Among 320 sent-out-surveys, there were 300 completed surveys which were valid for analysis.

## 4. Result and discussion

In terms of demographic design, the descriptive statistics results of personal information who are using internet banking in the bank BIDV included in gender, age, education, number of using on monthly basis. The details are described in Table 1.

**Table 1. Demographic profile of respondents (n = 300)**

| Variables | Characteristics | Frequency | Percentage |
|---|---|---|---|
| Gender | Female | 145 | 48.33% |
| | Male | 155 | 51.67% |
| Age | 18-24 | 56 | 18.67% |
| | 25-45 | 79 | 26.33% |
| | 46-65 | 91 | 30.33% |
| | over 65 | 74 | 24.67% |
| Educational level | College | 70 | 23.33% |
| | Bachelor | 71 | 23.67% |
| | Master/PhD | 80 | 26.67% |
| | Higher | 79 | 26.33% |
| The number of using | 0 - 50 | 79 | 26.33% |
| | 50 - 100 | 84 | 28% |
| | 100 - 150 | 73 | 24.33% |
| | Higher | 64 | 21.33% |

*Source: Conducted by authors, 2021*

- *Reliability Test*

**Table 2. Cronbach's Alpha Coefficients**

| No. | Observed Variables | Code | Cronbach's Alpha |
|---|---|---|---|
| 1 | Tangibles | TA | 0.835 |
| 2 | Responsiveness | RS | 0.809 |
| 3 | Reliability | RI | 0.753 |
| 4 | Empathy | EM | 0.861 |
| 5 | Assurance | AS | 0.854 |
| 6 | Customer satisfaction | CS | 0.890 |

*Source: Conducted by authors, 2021*

According to table 2, there are 6 scales included in 23 observed variables measuring the impact of internet banking on customer satisfaction in BIDV. From that, the reliability exceeds a minimum at 0.753. The case becomes qualified when measuring the variable that has alpha reliability of 0.6 or higher (Hoang and Chu, 2008). As a result, all dimensions are appropriate to do factor analysis; therefore, all variables accepted for Exploratory Factor Analysis (EFA).

- *Exploratory Factor Analysis*

**Table 3. KMO and Bartlett's Test**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | .746 |
|---|---|---|
| **Bartlett's Test of Sphericity** | Approx. Chi-Square | 2898.581 |
| | df | 190 |
| | Sig. | .000 |

*Source: Conducted by authors, 2021*

The table 3 above shows that KMO coefficient = 0.746 > 0.5; therefore, the use of the EFA is relevant with research data. In terms of Barlett's Test of Sphericity, the figure shows that the Sig. = 0.000<0.5 which shows that observed variables are remarkably correlated with group factors.

- *Correlation Analysis*

**Table 4. Correlations**

| | | TA | EM | RS | AS | RI | CS |
|---|---|---|---|---|---|---|---|
| TA | Pearson Correlation | 1 | .203** | .104 | .082 | -.018 | .407** |
| | Sig. (2-tailed) | | .000 | .073 | .158 | .755 | .000 |
| | N | 300 | 300 | 300 | 300 | 300 | 300 |
| EM | Pearson Correlation | .203** | 1 | .003 | -.061 | .031 | .410** |
| | Sig. (2-tailed) | .000 | | .959 | .290 | .593 | .000 |
| | N | 300 | 300 | 300 | 300 | 300 | 300 |
| RS | Pearson Correlation | .104 | .003 | 1 | .235** | -.033 | .378** |
| | Sig. (2-tailed) | .073 | .959 | | .000 | .571 | .000 |
| | N | 300 | 300 | 300 | 300 | 300 | 300 |
| AS | Pearson Correlation | .082 | -.061 | .235** | 1 | -.160** | .296** |
| | Sig. (2-tailed) | .158 | .290 | .000 | | .006 | .000 |
| | N | 300 | 300 | 300 | 300 | 300 | 300 |
| RI | Pearson Correlation | -.018 | .031 | -.033 | -.160** | 1 | .310** |
| | Sig. (2-tailed) | .755 | .593 | .571 | .006 | | .000 |
| | N | 300 | 300 | 300 | 300 | 300 | 300 |
| CS | Pearson Correlation | .407** | .410** | .378** | .296** | .310** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | |
| | N | 300 | 300 | 300 | 300 | 300 | 300 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | |
| a. Dependent Variable: CS | | | | | | | |

*Source: Conducted by authors, 2021*

Table 4 shows that the tangible dimension has high correlation with empathy (0.203) and the responsiveness dimension (0.104). Besides, the empathy dimension has correlation with the reliability dimension (0.031). From that, the dependent variable (CS) has high correlation with the 5 dimensions (TA, RS, RI, EM, AS). To sum up, based on these dimensions with correlation, it proved that the Pearson correlation among these independent variables is smaller than 0.3. Hence, the 5 variables are acceptable to do regression analysis.

- *Regression analysis and Hypothesis Testing*

$R$ square is a purpose to assess the compatibility of dependent variables (CS) and independent variables (TA, RS, RI, EM, AS). From that, this is showing the level of each component in the scale which can be explained by the dependent variable. However, $R$ square

is a function which proves that its value does not go down based upon the number of variables in a model. This means that the more variables added to the model, the higher R square. The result of the regression model summary is shown below:

**Table 5. Regression Model Summary**

| Model Summary[b] | | | | | |
|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .754[a] | .569 | .561 | .36309 | 1.623 |
| a. Predictors: (Constant), RI, TA, RS, EM, AS | | | | | |
| b. Dependent Variable: CS | | | | | |

*Source: Conducted by authors, 2021*

The number of R is closer to 1.0, at 0.754 which means that it is a very strong model. The adjusted R Square = 0.561 means the five factors TA, RS, RI, EM, AS can explain by 56.1% for the dependent variable CS. Put another way, 43.9% of the variation in dependent variables is explained by external variables. Moreover, the Durbin-Watson test used to detect the autocorrelation among variables is measured at 1.623. This figure mentioned in Durbin - Watson is in the range of positive autocorrelation.

**Table 6. Regression ANOVA**

| ANOVA[a] | | | | | | |
|---|---|---|---|---|---|---|
| | Model | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 51.099 | 5 | 10.220 | 77.520 | .000[b] |
| | Residual | 38.760 | 294 | .132 | | |
| | Total | 89.859 | 299 | | | |
| a. Dependent Variable: CS | | | | | | |
| b. Predictors: (Constant), RI, TA, RS, EM, AS | | | | | | |

*Source: Conducted by authors, 2021*

F - test is used in variance analysis to test the probability of getting a result of dependent variables between linear relationship and independent variables or not. From the table 6 above, the value of F coefficient calculated from R square is 77.520 and the value of Sig. is very small at 0.000 (< 0.05). Hence, the regression model is appropriate with the data collected.

Based on the regression analysis results shown in the table 7, the relationship between the five dimensions and customer satisfaction is illustrated subsequently formula:

**CS = 0.288 TA + 0.292 RS + 0.357 EM + 0.282 AS + 0.359 RI**

The regression formula above demonstrated that customer satisfaction has a linear relationship with the independent variables including Tangibles (standardized β: 0.288), Responsiveness (standardized β: 0.292), Empathy (standardized β: 0.357), Assurance (standardized β: 0.282), and Reliability (standardized β: 0.359). The analytical independent variable of standardized β is greater than 0, so all the dimensions have a positive relationship with customer satisfaction.

**Table 7. Regression Analysis**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -.175 | .188 | | -.931 | .352 | | |
| | TA | .231 | .032 | .288 | 7.290 | .000 | .943 | 1.061 |
| | RS | .203 | .027 | .292 | 7.390 | .000 | .937 | 1.067 |
| | EM | .259 | .029 | .357 | 9.094 | .000 | .952 | 1.050 |
| | AS | .175 | .025 | .282 | 7.048 | .000 | .914 | 1.095 |
| | RI | .182 | .020 | .359 | 9.242 | .000 | .974 | 1.027 |

a. Dependent Variable: CS

*Source: Conducted by authors, 2021*

The results of this calculation also show the impact of five dimensions on customer satisfaction. Specifically, the reliability dimension has the biggest impact on customer satisfaction with the highest standardized β at 0.359. From the formula, the second factor that has an impact on customer satisfaction is the empathy dimension with standardized β at 0.357. The assurance dimension has the least impact on internet banking as it has standardized β of 0.282. As a result, if the bank BIDV wants to improve customer satisfaction, the Board of Directors needs to put development factors in consideration.

- *Discussion*

In the comparison with previous researches, Hu & Liao (2011) also used SERVQUAL model and identified the same results as all 5 dimensions had significant impact on customer satisfaction and the most impactful factor was reliability. However, given that the research was conducted 20 years ago in Taiwan, there is a variety of variability in the customer perception about internet banking. Therefore, the accuracy of the research result in the current context must be further examined. Following the same pattern, the research of Hamzah et al. (2017) and Supriyanto et al. (2021) also identified the relationship between internet banking service quality and customer satisfaction under key dimensions using the SERVQUAL model. The authors have affirmed the popularity of the SERVQUAL model in evaluating process quality dimension. Results also showed that internet banking services quality with all dimensions of SERVQUAL model have positive significant impact on customer satisfaction in banking industry.

*Hypothesis (H₁): The tangibles have a positive impact on customer satisfaction.*

The analytical results are statistically significant, Sig. = 0.000, with the standardized beta coefficient of 0.282. This independent variable has a positive impact on customer satisfaction in the bank, so the hypothesis (H₁) is accepted. This result matches the results of Rod et al. (2009), Hamzah et al. (2017) and Supriyanto et al. (2021) who identified that

tangible dimensions have a positive relationship with customer satisfaction on internet banking in their study of the banking industry in New Zealand, Malaysia and Indonesia context, respectively. The result is also in line with Nguyen (2018) in a study of commercial banks in Vietnam.

*Hypothesis (H₂): The responsiveness has a positive impact on customer satisfaction.*

The result is significant because Sig. = 0.000, and the coefficient of standardized beta is 0.292. This means that this variable has a positive impact on customer satisfaction. Therefore, the hypothesis (*H₂*) is accepted. Previous evidence also indicated that there is a strong positive relationship between responsiveness and customer satisfaction in the banking system (Firdous and Farooqui, 2017; Hammoud et al., 2018; Vetrivel et al., 2020). It was found that if the responsiveness goes higher, customer satisfaction has a right direction to go higher than before (Nguyen, 2018).

*Hypothesis (H₃): The reliability has a positive impact on customer satisfaction.*

The result is significant, Sig. = 0.000, and the coefficient of standardized beta is 0.359. Hence this independent variable has a positive impact on customer satisfaction and the hypothesis (*H₃*) is accepted. This factor also has the biggest positive impact on customer satisfaction. Back to previous studies, Pisnik & Snoj (2010) and Hammoud et al. (2018) also carried out research that reliability in service quality has a relatively with customer satisfaction. Interestingly, Munusamy et al. (2010) found that reliability has no significant impact on customer satisfaction while Hamzah et al. (2017) showed a positive significant impact in Malaysian banking industry. In Vietnam, Nguyen (2018) also proved that reliability had the greatest significant impact on customer satisfaction.

*Hypothesis (H₄): The empathy has a positive impact on customer satisfaction.*

The significance level is 0.000 and the standardized beta coefficient is 0.357. Therefore, the variable has a positive impact on customer satisfaction and the hypothesis (*H₄*) is accepted. This result of the research also matches with results of Rod et al. (2009), Jayaraman et al. (2010), Hamzah et al. (2017), Supriyanto et al. (2021) that empathy has a positive impact on customer satisfaction Although it is contradicted with the result of Munusamy et al. (2010), in Vietnam context, Nguyen (2018) showed the same result with this study.

*Hypothesis (H₅): The assurance has a positive impact on customer satisfaction.*

The statistical figure shown is the Sig. = 0.000 and the standardized beta coefficient is 0.282. Besides, the assurance shows that the least standard beta influence on customer satisfaction. Thus, the hypothesis is accepted and this variable has a positive impact on customer satisfaction. Therefore, this result is in line with Ariff et al. (2012), Nguyen (2018) which found the measurement of assurance have a great influence and appealing with customer satisfaction base on Malaysia's internet banking. Similarly, in other studies of

Hammoud et al. (2018), Vetrivel et al. (2020) and Supriyanto et al. (2021) the significant of security with similar measurements also had significant impact on customer satisfaction.

## 5. Conclusion

Internet banking services have been growing rapidly in data- based systems as well as the increasing trend of customer demands for internet banking users. Furthermore, the competition in the internet banking system is more challenged than other internet banking firms. Therefore, to remain competitive internet banking users in BIDV, the firm needs to analyze customer satisfaction towards internet banking service. As a result, internet banking of BIDV knows how to evaluate customer satisfaction; hence, they can clarify to satisfy their customer. In this paper, the SERVQUAL model developed by Parasuraman et al. (1988) has been applied in design questionnaires by using 5 dimensions of internet banking service quality included in tangibles, reliability, responsiveness, empathy, and assurance. This study proved that this model can fit the context of banking in Vietnam. Furthermore, the data were collected from the survey questionnaires were sent to 320 customers who are using internet banking of BIDV and 300 valid answers aim to identify the rate of internet banking service quality influence on customer satisfaction. Besides, the study provides variables that affect customer satisfaction included in (1) Tangibles, (2) Reliability, (3) Responsiveness, (4) Empathy, (5) Assurance with the hypothesis indicated that all five scales positively affect customer satisfaction in BIDV. In other words, the internet banking service and customer satisfaction has a positive relationship with Pearson analysis. The regression analysis also illustrated that reliability has the highest impact on customer satisfaction; therefore, providing correct and timely services are very important. Besides some limitations as the authors mentioned above, the study still needs some future studies. The research paper can broaden the studies in terms of other services offered by the BIDV banking system. Furthermore, future study still can study internet banking in other banks in Vietnam and with a colossal number of samples and the questionnaire can open questions to have more information by the users. In addition, the study can apply other statistics method and data analysis to figure out the impact of internet banking on customer satisfaction.

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# FACTORS INFLUENCING GREEN CONSUMPTION BEHAVIOR OF GENERATION Z IN VIETNAM

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## Abstract

*In the context of industrialization and modernization, environmental pollution is not a new phenomenon, but still remains the world's greatest problem. At the same time, green consumption plays an increasingly important role in protecting environment. The study finds out the factors that affect the green consumption behavior of Vietnamese Generation Z by conducting a survey in March, 2021. After that, a research model is applied to test the Generation Z in Vietnam, thereby identifying the factors affecting green consumption in this generation. Based on the research results, several solutions are proposed to help the government and businesses promote green consumption among young people as well as stimulate green consumption behavior of Generation Z in order to reduce environment problems.*

*Keywords: green consumption behavior; generation Z; Compliance; Social Impact; Risk and Trust.*

## 1. Introduction

### 1.1. Research motivation

In the context of industrialization and modernization, environmental pollution is not a new phenomenon, but still remains the world's greatest problem. In Vietnam, environment is becoming more and more polluted due to forest burning, personal vehicles, and especially plastic waste. In that context, green consumption plays an increasingly important role in protecting environment. The concept of green consumption refers to the use of environmentally friendly products for addressing environmental problems (recyclable or energy-saving) (Halkier, 1999). Currently, green consumption is quite popular in developed countries and begin being concerned in developing countries when citizens awareness of environmental protection is increasing. Environmental protection laws, policies and regulations are promulgated in many parts of the world, and many of them refer to sustainable consumption, especially green consumption.

In Vietnam, green consumption has recently become a new trend that people are more concerned about the safety, health and environmentally friendly lifestyle. Moreover, when focusing on economic development, Vietnam faces a lot of environmental problems when

natural resources are severely reduced while water pollution, marine pollution, land pollution and air pollution are high. At the same time, the health of people in general and young consumers, in particular, are being seriously threatened.

In recent years, many young consumers in Vietnam have awareness of the importance of environmental protection,  and they want to have access to green consumption but do not know where to start, do not know how to contact agencies or organization to protect environment. Sometimes, unorthodox information online leads young people to act negatively towards the environment.

Although there are many researches study green consumption concept in the world, a number of studies on green consumption in Vietnam are still very small. In addition, in previous empirical studies, researchers just pointed out the factors affecting green consumption of many generations while no study focused on a particular generation. separate. Especially, in the current period, Generation Z is gradually stepping out into society and becoming the main source of labor. They are young people with innovative thinking, which can be a source of promoting green products. Moreover, Generation Z is the individuals who create trends in the present time and in the future. They are extremely creative individuals, quickly to absorb new information sources, social networks and tend to break standard stereotypes, old loops of Generation X, Generation Y - the generation of their grandparents, parents who lived and were born at a time of war in the country. Thus, their behavior greatly affects the development of the country's future. Therefore, the right awareness at an early age about the issue of green consumption is extremely urgent and necessary for this GenZ.

The study focusses on discovering the factors affecting the green consumption behavior of GenZ. GenZ has grown up in the high technology era and has an impact on those around them since they are both trendsetters and pioneers of new trends. Based on the research paper, the group aims at stimulating the green consumption behavior of Generation Z, contributing to the education and building of consumption habits as well as reducing the amount of waste in the environment.

The structure of this paper is organized as follows. Section 2 presents the literature review and hypothesis development used in the study. After that, the model will be applied to test the GenZ in Vietnam, thereby identifying the factors affecting green consumption in this generation. In Section 3, the results of the model are analyzed first and the discussions are then reported. Based on the research results, the group proposes several solutions to help the government and businesses promote green consumption among young people in Section 4.

## 1.2. Research objective

The specific objectives of this research are to study the green consumption behaviors theory of the empirical studies and then find out the factors that affect the green consumption behavior of Vietnamese Gen Z.

*1.3. Research methodology*

The study uses both quantitative and qualitative methods as the main research methodology. In this paper, quantitative research conducted a survey of 580 people who used to be and are consuming green products, applying to Generation Z (1997 - 2012) by using Google Form, so as to test the proposed conceptual model. With qualitative method, research is implemented through the collection of information from internet sources and the reports of regulatory agencies, organizations, as well as previous studies, which gives the author a better overview of green consumption behavior of Gen Z in Vietnam.

**2. Literature review and hypothesis development**

*2.1. Research approach on green consumption*

*2.1.1. Definition of Green consumption*

The Green Consumption Conference (held in Oslo, Norway in 1994) said that green consumption is a way of using products in an efficient and resource-saving way, reducing wastes that pollute the environment without affecting future generations.

According to Mr. Peter D. Bennet (1988), consumer behavior is the behavior that consumers display in finding, purchasing, using, and evaluating products and services expected to satisfy their personal needs.

In this study, the authors use the definition of Economic and Consumption newspaper: green consumption behavior is a series of activities such as buying, selling, using, and disposing of environmentally friendly products such as using recyclables, reusable items, fuel-efficient products, biodegradable packaging, in which consumers must be aware of their responsibility to the environment but still satisfy daily personal needs.

*2.1.2. The overview about the green consumption*

Green consumption is promoted by numerous elements. Initially, Consistence with green utilization Ho Huy Tuu et al. (2018) with "Factors influencing green consumption conduct of Nha Trang occupants ", or Peattie (2010) with "Green consumption: Behavior and Norms".

One of the drivers that make a huge improvement in green purchasers is Social influence. Maichum et al. (2016) have shown that discussing the prevailing burden on insight to perform or not play out the conduct in the examination "Applying the model of the hypothesis of expected conduct to explore the aim to purchase green results of Thai shoppers". On the other hand, Wiriyapinit (2007) showed that kids' purchase purposes are affected by the obeying established by guardians in a Thai family. Different researchers like Lee (2008) or Ho Huy Tuu et al. (2018) additionally showed that society impacts utilization conduct. A study by Huynh Dinh Le Thu et al. (2021) researched this factor through questions about the influence of the crowd such as professionals, friends, and family on buying behavior. In addition, in the issue of social influence, the group refers to self-image. Sirgy (1982) developed a novel image/product congruence theory that suggests that consumers will

consume certain products or brands that can better represent their image. A person's image is environmentally friendly, so it can show a good image of himself to others (Lee, 2008). Also, Baker and Ozaki (2008) found that green behaviors are influenced by pro-environment self-image. Environmental behavior can provide consumers with a distinctive social and self-image in addition to improving their image when purchasing green products (Nyborg et al., 2006).

Having faith in green consumption has an incredible impact on persuading customers to purchase green items. Consumers believe that green-label products are healthier than conventional products (Magnusson, 2003). Each faith about conduct is attached to the result of that faith and directs an idealistic or cynical disposition towards that behavior (Azjen, 2005). As per Avitia et al. (2011), buyers of organic items are strongly affected by trust, which is clarified by trust in business sectors and associations just as worries about wellbeing and the climate. Trust strongly influences the behavior of health products consumption (Vu Anh Dung et al., 2012). Likewise, Ho Huy Tuu et al. (2018) showed that trust unequivocally impacts wellbeing item utilization conduct.

Moreover, the danger factor from non-green items was additionally referenced, affecting the considering private purchasers to frame green utilization. Aman et al. (2012) mention that an ever-increasing number of customers are worried about environmental dangers and that will build the aim to purchase green items. Likewise, Ho Huy Tuu et al. (2018) additionally brought up the dangers of positive effects on the green purchasing behavior of Nha Trang individuals.

Besides that, the risk factor from non-green products was also mentioned, having a strong impact on the thinking of private consumers to form green consumption. More and more consumers are concerned about environmental risks, which will increase the intention to buy green products (Aman et al, 2012). The fears from these risks help impact positively on the green consumption behavior of Nha Trang people (Ho Huy Tuu et al., 2018). As consumers become more health-conscious, they have more intention to consume green products (Yii et al., 2020).

In addition, there are many other factors affecting green goods consumption behavior such as Price (Mahenc (2008), Laroche et al. (2011), Peattie (2011), Agyeman (2014)) jointly suggested that high green product prices are an environmental effect.

### 2.2. Research overview of Generation Z

The recent trends show that Gen Z has a large purchasing power which holds a significant position in the economy. According to Pew Research Center, Gen Z appearing in the period from 1997 to 2012, is the next generation of Millennials. This is also considered as technology generation due to being exposed to technology very soon.

Social Media Link had shown a figure that 96% of Gen Z respondents spend time finding out information carefully and reading all of the reviews of products before making a purchase.

Gen Z youngers are the main consumption source of many brands. They require more stringent environmental problems, especially from living, shopping, and eating. Pew Research Center confirms that this modern generation always upholds the sustainability, environmental friendliness of industrial models and products, along with paying attention to the ethical values of businesses. Furthermore, Gen Z also contributes to creating a large labor market in the future that becomes the top concern of many businesses. This generation is also the potential huge buying capability of one country.

## 2.3. The high points in Green consumption in Viet Nam

According to research by Kantar, the Covid-19 epidemic has made many Vietnamese consumers tend to change their consumption habits, towards safe and sustainable products. 57% of customers stop buying products that are harmful to the environment and 23% of people surveyed are willing to spend money on products that are useful for health and the environment.

According to the survey results of the Vietnam Report, under the impact of the Covid epidemic, Vietnamese consumers favor reusable packaging, the great demand for supply chain traceability, and the interest in packaging materials. Along with that, the survey also showed that the impact of the epidemic caused consumers to increase by 55.83% in ordering food through the electronic website.

In addition, packaging enterprises are also tending to change their positive views, thinking that changing packaging made from "green" materials is sustainable in the "new normal" period (according to the Bank Times).

## 2.4. Research model and hypotheses

### 2.4.1. Proposed research model

Many factors contributing to green consumption have been pointed out by both domestic and foreign research papers. Meanwhile, the empirical studies proved that there were four factors affecting significantly on green consumption: Compliance with green consumption, Social influence, Trust and Risk (Sirgy 1982; Baker and Ozaki 2008; Nyborg et al., 2006; Ho Huy Tuu et al. 2018; Yii et al., 2020). However, these studies found out the above factors separately. Therefore in order to suit the research target group that find out the factors that affect the green consumption behavior of Vietnamese Gen Z, the authors collect and build a research model including both 4 factors as follow:

**Figure 1: Proposed research model**
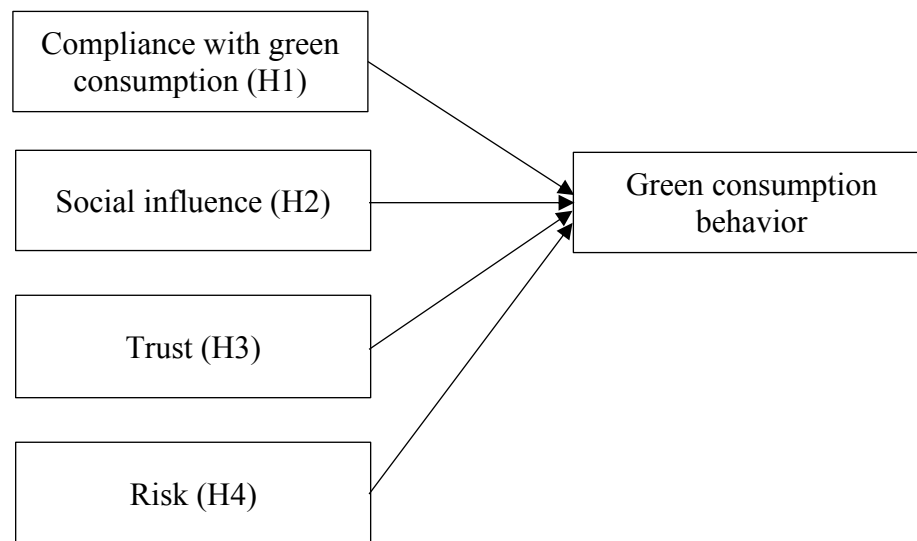
**The hypotheses associated with the research model include:**

H1: Compliance with green consumption has a positive impact on green consumption behavior.

H2: Social influence has a positive impact on green consumption behavior

H3: Trust has a positive impact on green consumption behavior

H4: Risk has a positive impact on green consumption behavior.

*2.4.2. Research data and methodology*

The research team collected quantitative data through the Google Form online survey due to the complicated developments of the Covid 19 epidemic. The use of Google Form brings many benefits, collecting survey results extremely convenient, fast, easy to synthesize, back up results and group does not have inadequacies in the collection process. The research team has developed a detailed questionnaire suitable for people of Generation Z, specifically with the group of people born between 1997 and 2012. Besides, the team also used secondary data reliably, referring to previous research of the authors in Vietnam and around the world.

The research team builds and develops scales based on research models and many theories, using the Likert scale with 5 very popular levels as follows: scale from 1 to 5 according to the level of " Never", "Very little", "Slightly", "Frequently", "Very often"; and scale from 1 to 5 according to the level of "Totally disagree", "Disagree", "Normal". "Agree", "Totally agree". This scale is frequently used in research projects on socio-economic issues because those issues are multi-faceted. Before the research team created the complete-scale, the team conducted a trial survey of 50 people, revised and discussed the contents of the survey to help the participants make sure to understand the concepts and words that mean it. related to green consumption.

## 3. Research results

### 3.1 Description of the research object

The authors conducted a survey of 580 people who used to be and are consuming green products, applying to Generation Z (1997 - 2012) based on demographic factors built by occupation, gender, income, and expenditure... With 580 forms gathered in the period of 3 months in 2020, the research team eliminated 175 results that did not satisfy the quality standards or had duplicate answers, the remaining 405 votes were satisfactory. It showed the description of the survey sample in Table 3.1.

**Table 3.1. Research sample characteristics**

| Characteristics (n=405) | | Number (person) | Percentage (%) |
|---|---|---|---|
| Job | Student | 59 | 14.6% |
| | College student | 294 | 72.6 % |
| | Worker | 52 | 12.8% |
| Gender | Male | 137 | 33.8% |
| | Female | 268 | 66.2% |
| Monthly income | Under 5 million | 144 | 35.6% |
| | Over 5 million won | 77 | 19% |
| | Depending on family | 184 | 45.4% |
| Monthly spending | Under 1 million | 89 | 21.9% |
| | 1 million - 5 million VND | 264 | 65.2% |
| | 5 million – 8 million VND | 27 | 6.7% |
| | Over 8 million | 25 | 6.2% |
| Usage Status | Ever used | 225 | 55.6% |
| | Using | 180 | 44.4% |

*Source: Compiled from the research team's statistics*

### 3.2. Assessing the accuracy of the scale

The research team applied Cronbach's alpha scale to discover how much or how limited contribution. The proceeds of the reliability analysis of the scale by Cronbach's alpha coefficient indicate the scales have large authenticity and value from 0.7 to 0.9. In which 29 analyzed variables all satisfied the criteria ($\geq 0.6$), 3 variables did not meet the criteria of the classification (HV 2, HV 5, and TT 6). From 29 variables and 4 factors in Table 3.2, it proves that all variables are used in the next model because of assurance.

**Table 3.2. Results of the reliability analysis of the scale**

| The scale | Symbol | Number of observed variables | Cronbach's alpha |
|---|---|---|---|
| Green consumer behavior | HV | 5 | 0.748 |
| Compliance with green consumption | TT | 5 | 0.738 |
| Social influence | AH | 8 | 0.818 |
| Trust | TG | 6 | 0.816 |
| Risk | RR | 5 | 0.838 |

*Source: Analytical results of the authors*

### 3.3. EFA exploratory factor analysis

**Table 3.3.1: KMO and Bartlett test results**

| KMO coefficient | | 0.861 |
|---|---|---|
| Bartlett's test | Chi-square value | 3508.016 |
| | Df | 190 |
| | Sig. | 0.000 |

*Source: Analytical results of the authors*

The group indicates the following results: the Barlett significance level and the KMO index both met the criteria (sig.= 0.000 < 0.05 and the KMO index was 0.861> 0.5), this demonstrate that the data used for the analysis are consistent. Completely reject the hypothesis H0: the result of Barlett's test does not correlate with each other in the population observed variables obtained is 3508,016 with Sig significance level. = 0.000 < 0.05 (completely satisfied). Thus, the variables are correlated with each other and satisfy the conditions of factor analysis.

Initially, the model ran for the first time, including the variable TT_2, but the analysis results were mixed between the factors, so the authors removed TT_2 and continued to run the second model with the remaining 20 independent variables. And after the second-factor analysis, these independent factors are kept unchanged, shown in table 3.3.2 below:

**Table 3.3.2. Results of factor analysis EFA**

| Variables | Factors |
|---|---|
| Social influence | AH_2, AH_3, AH_5, AH_6, AH_7, AH_8 |
| Trust | TG_1, TG_2, TG_4, TG_5, TG_6 |
| Risk | RR1, RR_2, RR_3, RR_4, RR_5 |
| Compliance | TT_1, TT_3, TT_4, TT_5 |

*Source: Analytical results of the authors*

### 3.4. Correlation analysis

**Table 3.4. Results of analysis of Pearson correlation coefficient**

| | | Behavior | Compliance | Social influence | Trust | Risk |
|---|---|---|---|---|---|---|
| | | HV | TT | AH | TG | RR |
| Behavior | Pearson correlation | 1 | 0.533 | 0.556 | 0.505 | 0.423 |
| | Sig. | | 0.000 | 0.000 | 0.000 | 0.000 |
| | N | 405 | 405 | 405 | 405 | 405 |
| Compliance | Pearson correlation | | 1 | 0.414 | 0.279 | 0.133 |
| | Sig. | 0.000 | | 0.000 | 0.000 | 0.007 |
| | N | 405 | 405 | 405 | 405 | 405 |
| Social influence | Pearson correlation | 0.556 | 0.414 | 1 | 0.518 | 0.287 |
| | Sig. | 0.000 | 0.000 | | 0.000 | 0.000 |
| | N | 405 | 405 | 405 | 405 | 405 |
| Trust | Pearson correlation | 0.505 | 0.279 | 0.518 | 1 | 0.384 |
| | Sig. | 0.000 | 0.000 | 0.000 | | 0.000 |
| | N | 405 | 405 | 405 | 405 | 405 |
| Risk | Pearson correlation | 0.423 | 0.133 | 0.287 | 0.384 | 1 |
| | Sig. | 0.000 | 0.007 | 0.000 | 0.000 | |
| | N | 405 | 405 | 405 | 405 | 405 |

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

*Source: Analytical results of the authors*

Based on the above Pearson model, the study assessed two issues including the correlation between the dependent and independent variables and the correlation between the independent variables. Sig values of Green Consumer Behavior, Compliance, Social Influence, Trust, and Risk variables are all less than 0.05 which means that the four independent variables are linearly correlated with the Behavior dependent variable. It proves that the independent variables all affect the dependent variable "Green consumption behavior". Then, performing the correlation model before the regression model shows up that the possibility that the independent variable will affect the dependent variable in the regression will be greater.

*3.5. Regression analysis*

**Table 3.2. Multiple Regression Analysis**

| Factor | Unstandardized coefficients | | Standardized coefficients | t | Sig. | Collinearity statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std.Error | Beta | | | Tolerance | VIF |
| (Const) | -0.029 | 0.176 | | -0.162 | 0.871 | | |
| TT | 0.372 | 0.041 | 0.347 | 9.051 | 0.000 | 0.823 | 1.215 |
| AH | 0.218 | 0.038 | 0.246 | 5.690 | 0.000 | 0.646 | 1.548 |
| TG | 0.159 | 0.035 | 0.191 | 4.496 | 0.000 | 0.667 | 1.499 |
| RR | 0.188 | 0.031 | 0.232 | 6.127 | 0.000 | 0.842 | 1.188 |
| Adjusted R square: 0.512 <br> Durbin-Watson statistics: 2.024 <br> F Statistics (ANOVA): 106.846 <br> Sig.: 0.000 | | | | | | | |

*Source: Analytical results of the authors*

VIF multicollinearity does not occur because of multicollinearity without multicollinearity. The Durbin-Watson ratio is 2.024 (line 1-3), so no order correlation series appear. most model. F value = 106,846 with Sig value. of test F = 0.000 < 0.05, concluding that the linear regression model can be generalized and applied to the population.

Besides, $R^2$ shows that 51.2% of the variation in green consumption behavior of Generation Z is explained by four independent variables (compliance with green consumption, social influence, trust, and risk). All independent variables are consistent, no variables are removed, and are significant (sig.=0.0000<0.005). Then, all hypotheses H1, H2, H3, and H4 are thoroughly supported.

*3.6. Discussing the research results*

After the correlation and regression analysis, the factors that positively change the green consumption behavior of generation Z in Vietnam, in order of magnitude in descending order of magnitude: ( 1) Green Consumption Compliance (TT), (2) Social Impact (AH), (3) Risk (RR), (4) Trust (TG). Combining analysis and comparison with the actual situation of the research subjects in the research context, it was found that the above results have the similarity that "Green consumption compliance" has the strongest positive influence (**β** = 0,372). ) to green consumption behavior. Young people of Generation Z are mostly students and students who are still under the supervision and management of their families, schools,

and localities, so green consumption is compliance. The results show that when complying with green consumption, young people are more inclined to buy green goods.

"Social influence" has the second strong impact on green consumption behavior ($\boldsymbol{\beta}$ = 0,218). Young consumers increase the use of digital platforms, adopt social platforms the fastest, so the impact on green consumer behavior is increased, motivated by influencers, easily pursuing the habit of consuming green goods. Maichum et al. (2016), Wiriyapinit (2007) also found out that factor Social influence impact the purchase green results of shoppers. What famous people accomplish will inspire many more people, particularly young ones, to follow in their footsteps. This is how society influences Generation Z's green consumption habits. In addition, the young people of Generation Z want to stand out, be recognized, and want to express their ego, they want to better represent their image: a young person who cares strongly about the issues of society, the world, and humanity.

The product's "risk" affects green consumption behavior with $\boldsymbol{\beta}$ = 0,188, positively affecting green shopping behavior. It is an affirmation that when there are perceived risks related to the product, as well as the living environment around young consumers, and from there, environmentally friendly green consumption behavior also spread to others strongly. The epidemic is happening, young people are also more concerned about their own and family's health, and consumption of sustainable and environmentally friendly products tends to be stronger. There are many researches also revealed that the fears from these risks help impact positively on the green consumption behavior of people (Ho Huy Tuu et al., 2018; Aman et al. 2012; Yii et al., 2020).  Moreover, due to their well-educated conditions and the ability to absorb information quickly, young people know the consequences if they do not prevent the global warming, which leads them to use green products more in the future.

"Trust" is the last element of the model that positively influences green consumption behavior with $\boldsymbol{\beta}$ = 0.159. Young people believe in the policies of the Party and State, organizations, and businesses. As a result, this group of people is more motivated to implement their green consumption behavior. According to the results of the analysis of the authors, the belief factor has a positive impact on green consumption behavior. As well as the results of the world's critical, trust is explained by trust in markets, organizations as well as concerns for health and the environment. This result is also the same to the studies of Avitia et al. (2011), (Vu Anh Dung et al., 2012), Ho Huy Tuu et al. (2018), which showed that Trust strongly positively influences the behavior of health products consumption. Likewise, all beliefs about behavior are tied to the outcome of beliefs and adjust an optimistic or pessimistic attitude toward that behavior. But this belief is slightly shaken, consumers still do not fully trust what agencies, organizations, and businesses are doing. From here, it can be seen that the belief that the young generation has a positive change in green shopping but has not had a powerful impact on consumption habits.

**4. Solutions and Conclusions**

*4.1. Solutions*

*For the government*, the State needs to create conditions for businesses to comply with green production, support the price of green products to stimulate consumption and complete the legal framework, green production and consumption policies in the most synchronized way, seriously handle and tax strongly on businesses that pollute the environment or do not have a protective move. environmental protection in production and supply.

Along with that, strengthening the communication so that people are aware of the consequences of environmental pollution, promoting deployment to each locality, asking them to seriously carry out daily waste sorting. The State must perform the key tasks set out, encouraging ministries to label and green label Vietnam. Building an online inbox with the fastest frequency of answering questions solves young people's questions about green consumption. The State should set up a website, update all information about products of businesses that are environmentally friendly, consumer-friendly and publicize a blacklist of products/businesses that do not guarantee environmental issues, accompanied by the development of a set of rules, guiding consumers on how to recognize green products according to green and material indicators. It is necessary to listen to feedback from young consumers, establishing the management of the operation of consumer protection organizations. From there, it is an effective information channel for listening to the feedback of young consumers.

*For ministries and departments,* the most important thing is to increase education for young people of Generation Z. Most of them are still in school, subject to the education of families and schools. The Ministry of Education may ask the school to create online seminars and exchanges to promote student awareness.

*For businesses,* food and beverage delivery businesses can link with restaurants to synchronize packaging using environmentally friendly materials. At the same time, to support restaurants, businesses can provide promotional codes, discount codes to attract buyers, and increase consumption for restaurants.

For Generation Z, the spread of social influence has a very strong impact through trends or trends in the world. By promoting multimedia, social media sites, green consumer behavior is strongly accessible to this generation. Businesses can create strong slogans associated with the environment, green consumption, in line with the trend that is prevalent with today's youth, or in combination with KOLs (Key opinion leader), influencers will have a positive effect, inspiring Generation Z. Thereby building people's trust in consumption use green.

What businesses need to do is supplement the healthy and environmentally friendly certificate to create trust about the product. Businesses need to invest in materials, uses,

durability, and design of green products as well as practical actions to strengthen the trust of customers, especially young people.

## *4.2. Conclusions*

Discovering the factors that influence green consumer behavior is an important goal of this topic. The four independent variables of Compliance (TT), Social Impact (AH), Risk (RR), and Trust (TT) all make sense, and the impact on the green shopping habits and behaviors of Generation Z. Although the epidemic is still complicated, negatively affecting the lives of the vast majority of Vietnamese people but awareness of green consumer behaviors of young consumers are not changed in a negative way. This has brought positive effects, gradually achieving certain results on raising awareness as well as creating green consumption habits for young people of Generation Z in particular, along with domestic and foreign businesses. However, there are still some limitations that have not been overcome. In addition, it is necessary to strictly and optimally apply the proposed measures to maintain and continue to promote green consumption behavior even more in the future.

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# THEME 3

# FINANCE - BANKING - ACCOUNTING

# INTENTION TO SWITCH FROM TRADITIONAL BANKING TO DIGITAL BANKING BY INDIVIDUAL CUSTOMERS IN VIETNAM

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## Abstract

*The banking industry is digitalizing both the way it operates and provides services. Digital banking is becoming more popular, but still new to many people in Vietnam. The object of this article is to evaluate the factors affecting the behavioural intention to change from using traditional banking to digital banking services of Vietnamese individual customers. The author utilised Cronbach's Alpha test, Confirmatory Factor Analysis (CFA) and Structure equation model (SEM) to analyse the survey data collected from 319 respondents who are only using traditional banking services or simultaneously using traditional banking services with digital banking services. The result of the data analysis depicts that (1) The satisfaction with current service and support of traditional bank (CSS) has a negative impact on expected performance of digital banking; (2) Performance expected from digital banking (PE) has a positive effect on intention to switch from traditional banking (ITS); (3) Compatibility (COM) positively correlates with intention to switch (ITS); (4) Perceived threat of security (PTS) has no effect on trust (TRU) and (5) Trust (TRU) has no impact on the switching intention (ITS). From the research results, the author proposes some recommendations to encourage the intention to adopt digital banking in Vietnam.*

*Keywords: Digital banking; Intention so switch; Performance expectency.*

## 1. Introduction

In recent years, the banking industry in Vietnam has been one of the pioneers in participating the Fourth Industrial Revolution (Industrie 4.0). In particular, the Vietnamese commercial banks are on the way to digital transformation of operations and services provided to their customers. Digital transformation is claimed to be a global trend and an irreversible process. The Vietnamese Government also facilitates the digital transformation process of commercial banks through the decision to approve the "National Digital Transformation Program to 2025, orientation to 2030". In addition, the banking sector digital transformation plan is a component of the National Digital Transformation Program. According to Pham (2021), it is urgent for banks to change their business models due to the emergence of Fintech firm. The digitalization will help the banks save approximately 60 percent to 70 percent of their operational costs and provide their customers with better experience (Pham, 2021). In addition, Nguyen (2021) reported that 42 percent of banks in Vietnam are ready for the digitalization process and 28 percent have combined the

digitalization strategy with their business strategy. However, the development of digital banking in Vietnam faces many challenges such as the insufficient legal framework which relates to standard platforms for digital banks. Moreover, the infrastructure of banks is still inadequate. The information technology, security system, marketing and operating activities are still needed to be improved (Nguyen et al., 2020). Moreover, the percentage of Vietnamese people conducting transactions with bank account is arround 40 percent and only 20 percent of customers make online transactions, which is lower than countries in ASEAN and Asia like Singapore, Indonesia, China, Korea and so on (Nguyen, 2019; State Bank of Vietnam, 2020).

In Vietnam, acknowledging the significance of digital development, however, people still misunderstand the concepts between E-banking, including Mobile banking and Internet banking, and digital banking. Many people assume that Mobile banking or Internet banking applications are digital banking. In addition, using cash is an ingrained habit of Vietnamese people and around 63 percent of Vietnamese have bank account, while this percentage is much higher in other countries. This is the reason why the Goverment of Vietnam aims to strive the goal that at least 80 percent of adults will have transaction accounts at banks by 2025 and the number of non-cash payment transactions increased by 20 to 25 percent annually. Guru et al. (2003) highlighted that approximately 20 percent of customers are inclined to switch to another financial service provider if their present bank does not provide online banking services. Due to the advance of digital banking services, customers will not have to visit physical branches of banks to conduct transactions and bank staff also do not have to meet customers in person to complete transactions such as signing documents, tracking records and so on (Nguyen, 2020). The major hinderance for the success of the application of the new technology is how to persuade customers to use it as an alternative for the traditional one (Laukkanen et al., 2007). Especially, the culture of Vietnamese people is considered group oriented and relative truth (Nguyen, 2015). Hence, it is harder to encourage them to switch from the old to a new technology. Therefore, if Vietnamese customers see more benefits and feel comfortable when using digital banking services, encouraging them to change from traditional banking to digital banking services will be easier. This requires the research to determine what factors and how they affect the behavioral intention of individual customers to use digital banking.

Although the amount of research on intention to use E-banking is significant, behavioural intention to use digital banking is a new research field in the world. In Vietnam, the development of digital banking in Vietnam is in the early stage; hence, only a few research papers have addressed it. There have been researches on the use of digital banking services using Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). While the research by Nguyen (2020), Nguyen et al. (2020) and Tran (2021) applied TAM, Nguyen et al. (2020) utilised UTAUT model. However, research on the intention to switch from traditional banking to digital banking is limited in

number. Thus, this article is dedicated to examining the factors affecting intention to switch to digital banking of Vietnamese traditional banks' customers. The results might help banks tailor suitable strategy to attract new and maintain existing customers. The next section will be dedicated to literature review. After that, the research methodology will be demonstrated, and the results will be discussed. Limitations of this research will also be mentioned. Consequently, the paper will present the managerial implications for the digital banks in Vietnam.

## 2. Literature review

### 2.1. Overview of digital banking

Sarma (2017) stated that digital banking is a transformation process of all traditional banking activities and services into a digital environment. The digital transformation is not only confined to services supplied to customers, but also in the way banks operate. In addition, Napoletano (2021) defined the term digital banking as the combination of online and mobile banking services. According to Nguyen (2020), digital banking is an operating model utilising a platform of technology to transmit data and conduct transactions among banks and customers. This procedure is done with support of digital devices connected to computer software with the Internet. It is convenient for customers since they do not have to visit the physical branches. Indeed, what they need is to conduct transactions through the Internet with smart phones, tablets, laptop and so on. In terms of the banks, their staff do not have to meet with their customers to complete transactions. Currently, there are still many of Vietnamese people misunderstanding that digital banking is a mobile banking application or transactions on a banking website (Nguyen, 2020). Digital banking aims to digitize all banking operations, from core operations to operations. E-banking, including Mobile banking and Internet banking, helps provide customers with basic functions such as checking balances, checking transactions, transferring money through the Internet. Hence, digital banking includes E-banking, which not only includes full banking features on a digital platform, but also digitizes the entire process with customers: Account opening, registration, card issuance, customer care, after-sales and others.

Besides, Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) and Innovation Diffusion Theory (IDT) (Rogers, 1995) measured the impacts on service adoption or intention to switch to new services of factors such as: Compatibility, performance expectancy and so on. Gefen et al. (2003) researched the intention of consumers to repeatedly visit electronic retail outlets and proposed that the Technology Acceptance Model (TAM) should be expanded with factor trust. This study is dedicated to investigating the intention to use digital banking services using the following factors: (1) Current service support of traditional banking; (2) Performance expectancy; (3) Perceived threat of security; (4) Trust and (5) Compatibility.

## 2.2. Hypotheses

According to Zeithaml et al. (2002), customer service support is support offered by the bank in the form of  frequent asked questions (FAQs), guide line, help pages as well as personal assistance. Guru et al. (2003) reported that around 20 percent of customers showed their readiness to switch to other financial service providers if their bank did not supply online services. In addition, the proliferation of the technologies has changed consumer expectation. Indeed, nowadays, customers' pleasure is measured in a matter of seconds and minutes. Vietnamese people tend to being risk-averse, especially the middle-aged ones (Nguyen, 2015; Nguyen et al., 2020). Hence, they are not familiar with and also not always willing to try the products or services which are non-traditional and require technology skills (Nguyen et al., 2020). Since the digital banking services are completely provided on a digital platform, even existing customers expect bank's assistance pre, while and post using the service (Singh & Srivastava, 2020). Nguyen (2020) claimed that digital banking is an essential service in boosting customer's loyalty. If customers are not satisfied with the current service support, they will expect another provider to help them meet their needs. In terms of digital banking, the more unsatisfied with the current support services of traditional banks, the more they want to meet their demand with digital banking services. Therefore, this study proposes the following hypothesis:

*H1: Current service support has a negative impact on performance expectancy*

Performance expectancy is the degree to which customers believe the services will help them achieve higher efficiency in their tasks (Venkatesh et al., 2003). This concept is consistent with the expected switching benefits in the study of Kim and Kankanhalli (2009) and Liu et al.  (2019), which refer to a customer's perceived value in switching from the current service to a different service. Bhattacherjee et al. (2012) claimed that performance expectancy is the same as perceived usefulness which is the extent to which the potential customers expect performance improvements owing to the use of the new products or services. Kholoud (2009), Li (2010) and Nguyen and Cao (2011) explored that performance expectancy and acceptance of E-banking have a positive relationship. Performance expectancy has been proven to be a stable and consistent determinant of new information technology acceptance in various study fields over time (Bhattacherjee et al., 2012). In the studies of Kim and Kankanhalli (2009), Alotaibi (2018) and Liu et al. (2019), expected switching benefits have been claimed to be positively associated with the intention to switch from current service to the new one. In the context of digital banking, the customer's expectation for performance of digital banking will positively affect the intention to switch from traditional banking to digital banking (Suma & Shankar, 2020; Nguyen et al., 2020). Thus, this research proposes the following hypothesis:

*H2: Performance expectancy has a positive impact on the intention to switch from traditional banking to digital banking*

Perceived threat of security are perceptions of the costs that customers may suffer when using online the services (Nguyen, 2020). In terms of the intention to switch from the traditional computing to the cloud computing service, perceived threat of security was proven to have a negative impact on intention to switch (Liu et al., 2019). Regarding to digital banking, the customer's account information and transaction information might be hacked, and their money might be stolen since most transactions are completed online. Thus, the customers' perceived threat of security is the fear that their personal and transaction information could be stolen by cyber attacks. Nguyen (2020) and Nguyen et al. (2020) proved that perceived threat of security has a negative impact on intention to use digital banking. According to Glover and Benbasat (2010) and Fortes and Rita (2016), the risk is discouraging customers to use electronic services. Hence, this study proposes the following hypothesis:

*H3*: *Perceived threat of security has a negative impact on trust*

According to Gefen et al. (2003), trust of a customer is his or her feel of safety while using the product or service. In other words, they can use services without worrying about risks or other issues. Moreover, trust is is one of the elements of the revised UTAUT model which affects the behavioural intention to use a new product or service (Alharbi, 2014). Yoon (2002) found that the trust in website impacted online purchasing intention of customers. A high level of trust is an incentive for the use of the services (Page & Luding, 2003). Establishing trust is concerned as the main barrier preventing customers adopting cloud computing solutions (Alharbi, 2014). In terms of digital banking, most services are performed online, not through a bank branch; hence, it requires banks to build trust in their relationship with thier customers. In other words, the more trust customers have, the more likely they are to use digital banking services (Nguyen, 2020). Trust has been proven to have a positive impact on the intention to use digital banking (Nguyen et al., 2020). Therefore, the study proposes the following hypothesis:

*H4*: *Trust has a positive impact on the intention to switch from traditional banking to digital banking*

Compatibility is the changing process of new technology which is widely popularized in life and work (Rogers, 1995). Furthermore, compatibility is also defined as the degree to which the new products or services are perceived as being consistent with the current needs and experiences of potential customers (Hsu et al., 2007). Podder (2005) and Gibson (2009) explored the impact of compatibility on customer's adoption in E-banking services. Regarding digital banking, services provided online should require customers to have electronic technology devices and skills to use such devices. In order to use digital banking services effectively, a customer's place of residence and work also needs to have favorable conditions and infrastructures for them to use the services. For instance, the Internet, 3G or 4G network are required for digital banking services. Besides, if the people around also use it, the use of the service will be more compatible. Lastly, the higher the compatibility of digital

banking services, the higher the customer's intention to adopt these services. Therefore, the author proposes the following hypothesis.

**H5**: *Compatibility has a positive impact on the intention to switch from traditional banking to digital banking*

Finally, the research model and all the hypotheses are depicted in the Figure 1 below.

**Figure 1. The research model and hypotheses**
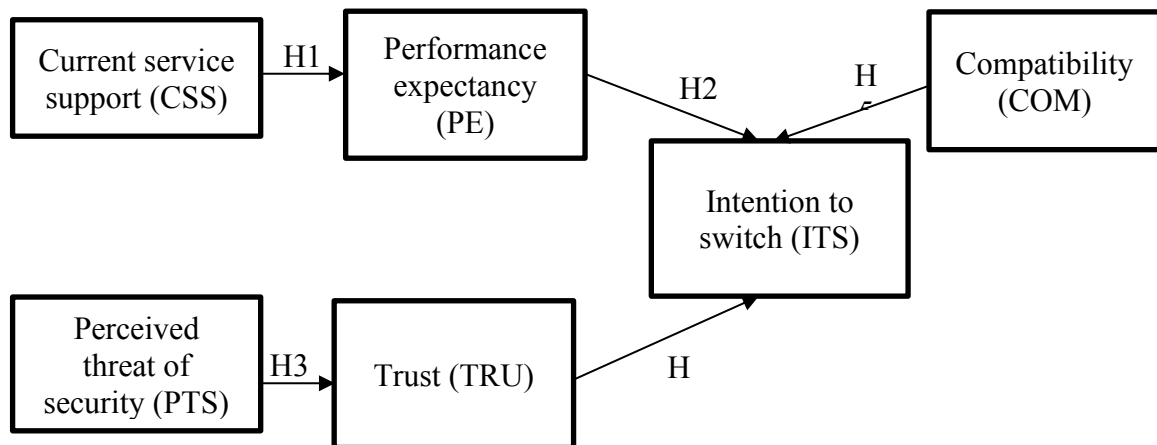


*Source: Proposed by the author*

## 3. Methodology

### *3.1. Research design*

The author developed a questionnaire including statements to measure the variables in the research model. The questionnaire is based on several previous study on E-banking, Mobile banking, Internet banking and digital banking services. In addition, the translation – back translation method was utilised to build the survey questionnaire which meets the language standards. To be specific, first, the author synthesized the studies to build a questionnaire in English. Second, these questions were translated into Vietnamese. Lastly, the author translated these questions back to English. Besides, the respondents demonstrated their agreement through a 5-point Likert scale. To be specific, number 1 is equivalent to "Totally disagree", 2 is "Partially disagree/ Disagree", 3 is "Neutral/ Normal", 4 is "Partially agree/ Agree" and 5 is "Totally agree". The reason why the 5-point Likert scale was employed instead of 7-point Likert scale, 9 or 11-point scale is that it has been most recommended by the researchers. To be specific, the five-point Likert scale would reduce the frustration level of patient respondents as well as increase the response rate. Consequently, this will enhance the response quality (Sachdev & Verma, 2004; Dawes, 2008). The questionnaire which was given to the respondents is illustrated in Table 1 below.

## Table 1. Questionnaire

| Code | Items | Reference |
|------|-------|-----------|
| **COM** | *Compatibility* | |
| COM1 | Using digital banking fits well with my work | Nguyen and Cao (2011); Liu et al. (2019), |
| COM2 | Using digital banking fits well with the way I manage my finance | |
| COM3 | Using digital banking fits well with my needs | |
| COM4 | Transactions with digital banking system are as easy as cash transactions | |
| **CSS** | *Current support service of traditional bank* | |
| CSS1 | The service manual is easy to find | Singh and Srivastava (2020) |
| CSS2 | My bank is open and receptive to customers' needs | |
| CSS3 | My bank is accurate in responses to my queries | |
| CSS4 | My bank is able to provide me with personalized newsletters/alerts that recommend new products to help me to keep my costs down and maximize my returns. | |
| **PE** | *Performance expectancy of digital banking* | |
| PE1 | I feel that the digital banking is very useful and convenient | Nguyen and Cao (2011) |
| PE2 | I feel that the digital banking saves me more time and money | |
| PE3 | Using E-banking increases my productivity and quality of work | |
| PE4 | Digital banking helps me quickly complete all my banking related tasks | |
| **PTS** | *Perceived threat of security* | |
| PTS1 | I feel that providing bank account information (credit card, debit card ...) is dangerous | Fortes & Rita (2016); Singh and Srivastava (2020); Nguyen and Cao (2011) |
| PTS2 | I feel that using digital banking may not guarantee my privacy | |
| PTS3 | I feel that signing up online services is risky | |
| PTS4 | I find using digital banking more risky than going to traditional banks | |
| **TRU** | *Trust* | |
| TRU1 | In my opinion, banking website and applications are reliable | Fortes & Rita (2016) |
| TRU2 | Banks exactly follow what they announce about digital banking | |
| TRU3 | Digital banking provider exactly conducts what it commits | |
| TRU4 | Digital bank tries to bring the best values to customers | |
| **ITS** | *Intention to switch from traditional banking to digital banking* | |
| ITS1 | I plan to increase the use of digital banking more in the future | Davis (1993); Fortes & Rita (2016); Liu et al. (2019) |
| ITS2 | I plan to spend more time researching digital banking services | |
| ITS3 | I plan to switch from traditional banking services to digital banking | |
| ITS4 | I look forward to switching to digital banking | |

*Source: Synthesized by the author*

### 3.2. Data collection and sample

The dataset was collected in the form of direct or online questionnaire by convenience method. To be specific, the author created a questionnaire on Google Forms. The link then shared to colleagues and friends of the author. Moreover, the author also took time to survey banking customers in person. The random customers were asked whether they had time for a short survey. The questionnaire did not contain any questions related to names, addresses or other contact details of the customers; hence, the dataset was kept confidential and for research purpose only. After screening 322 responses for bias ones, the final valid responses were 319. According to Samuels (2015), this sample size is acceptable. Finally, the dataset with 319 valid questionnaires were used for multivariate analysis with SPSS 22.0 and AMOS 20.0 software.

The demographic description of the dataset was illustrated in the Table 2 below. The proportion of the female customers in the sample was higher than that of male, 54.9 percent and 45.1 percent respectively. In terms of education level, a majority of respondents had at least bachelor's degree who made up 74.6 percent. Next came intermediate, college and high school with 14.4 percent, 7.8 percent and 3.1 percent in order. Regarding the occupation, the proportion of people running business was highest with 34.2 percent. Public servants accounted for 33.2 percent, while the housewife and people doing other jobs account for 19.7 percent and 12.9 percent. Lastly, VND 5 million to 10 million is the most prevalent level of income in the sample at 31.3 percent. The second most popular income level is less than VND 5 million with 30.4 percent. Ranking the third and the fourth were VND 11 million to 16 million and more than 16 million with 23.5 percent and 14.7 percent correspondingly.

There are many studies including demographic variables in the model. This research, however, did not include these variables in the model since the proportion of respondents focusing excessively on one group could not help evaluating the impact of this variable on the difference in the responses. According to Table 2, the respondents of the survey are mainly the University and Postgraduate students (74.6 percent). Thus, adding demographic variables to the model can be irrelevant in explaining the differences in the responses of the groups.

**Table 2. Descriptive statistics**

|  |  | **Number of people** | **Percentage (%)** |
|---|---|---|---|
| Gender | Male | 144 | 45.1 |
|  | Female | 175 | 54.9 |
|  | Total | 319 | 100 |
| Education | High school | 10 | 3.1 |
|  | Intermediate | 46 | 14.4 |

| | | | |
|---|---|---|---|
| | College | 25 | 7.8 |
| | University/ Postgraduate | 238 | 74.6 |
| | Total | 319 | 100 |
| Occupation | Public servant | 106 | 33.2 |
| | Business | 109 | 34.2 |
| | Housewife | 63 | 19.7 |
| | Others | 41 | 12.9 |
| | Total | 319 | 100 |
| Income | Less than 5m VND | 97 | 30.4 |
| | 5m – 10m VND | 100 | 31.3 |
| | 11m – 16m VND | 75 | 23.5 |
| | More than 16m VND | 47 | 14.7 |
| | Total | 319 | 100 |

*Source: The author's analysis*

### 3.3. Data analysis

After the data was collected, the reliability of all constructs was examined with Cronbach's Alpha coefficient. According to Hair et al. (2006), the alpha requires a cut-off of 0.6. Besides, Nunally & Burstein (1994) stated that the item-total correlation is required to be greater than 0.3. Then, confirmatory factor analysis (CFA) is utilized to assess the convergent and discriminant validity. The indexes applied to test the model fit were referred from Hu & Bentler (1999). Hu & Bentler (1999) explored that, the model would be fit if CMIN/df $\leq$ 3; CFI $\geq$ 0.9; GFI $\geq$ 0.9; RMSEA $\leq$ 0.06; PCLOSE $\geq$ 0.05. In terms of the validity and reliability, Standardized Loading Estimates is required to be $\geq$ 0.5; Composite Reliability (CR) $\geq$ 0.7; Average Variance Extracted (AVE) $\geq$ 0.5; Maximum Shared Variance (MSV) < Average Variance Extracted (AVE); Square Root of AVE (SQRTAVE) > Inter-Construct Correlations.

Subsequently, structural equation model (SEM) was used to estimate influences of the factors on the intention to switch to digital banking with significance level of 5%. Last but not least, Bootstrap test was performed to assess the reliability of estimates.

## 4. Results

Cronbach's Alpha of all scales after extracting unsatisfactory variables and EFA are described in Table 3. All Cronbach's Alpha were higher than 0.7 and all total variable correlation coefficients were higher than 0.3. Besides, EFA was conducted with Principal Axis Factoring extraction and Promax rotation method. The results showed that KMO = 0.761; Sig. of Bartlett's Test of Sphericity = 0.000; Cumulative (%) = 62.723 and Eigenvalues = 1.388. All of these indices met the requirement.

**Table 3. Cronbach' alpha and EFA after extracting unsatisfactory variables**

| Items | Factor | | | | | |
|---|---|---|---|---|---|---|
| | PE | CSS | TRU | PTS | COM | ITS |
| Cronbach's Alpha | 0.909 | 0.912 | 0.842 | 0.844 | 0.743 | 0.811 |
| PE3 | 0.883 | | | | | |
| PE4 | 0.854 | | | | | |
| PE2 | 0.822 | | | | | |
| PE1 | 0.822 | | | | | |
| CSS3 | | 0.880 | | | | |
| CSS4 | | 0.852 | | | | |
| CSS1 | | 0.850 | | | | |
| CSS2 | | 0.823 | | | | |
| TRU1 | | | 0.814 | | | |
| TRU3 | | | 0.769 | | | |
| TRU4 | | | 0.757 | | | |
| TRU2 | | | 0.718 | | | |
| PTS2 | | | | 0.812 | | |
| PTS1 | | | | 0.756 | | |
| PTS3 | | | | 0.751 | | |
| PTS4 | | | | 0.729 | | |
| COM1 | | | | | 0.679 | |
| COM3 | | | | | 0.674 | |
| COM2 | | | | | 0.642 | |
| COM4 | | | | | 0.614 | |
| ITS1 | | | | | | 0.908 |
| ITS2 | | | | | | 0.766 |
| KMO (Kaiser-Meyer-Olkin) | | 0.761 | | | | |
| Sig. (Bartlett's Test) | | 0.000 | | | | |
| Cumulative (%) | | 62.723 | | | | |
| Initial Eigenvalues | | 1.388 | | | | |

*Source: The author's analysis*

Figure 2 illustrates the indicators to examine model fit. In Figure 2, Chi-Square/df = 2.032; GFI = 0.912; CFI = 0.950; TLI = 0.940; RMSEA = 0.057 and PCLOSE = 0.099. As can be seen from Table 4, all scales' composite reliability (CR) were higher than 0.7 and all scales' average variance extracted (AVE) were higher than 0.5. These approved the convergent and the discriminant validity.

**Figure 2. Confirmatory factor analysis - CFA**
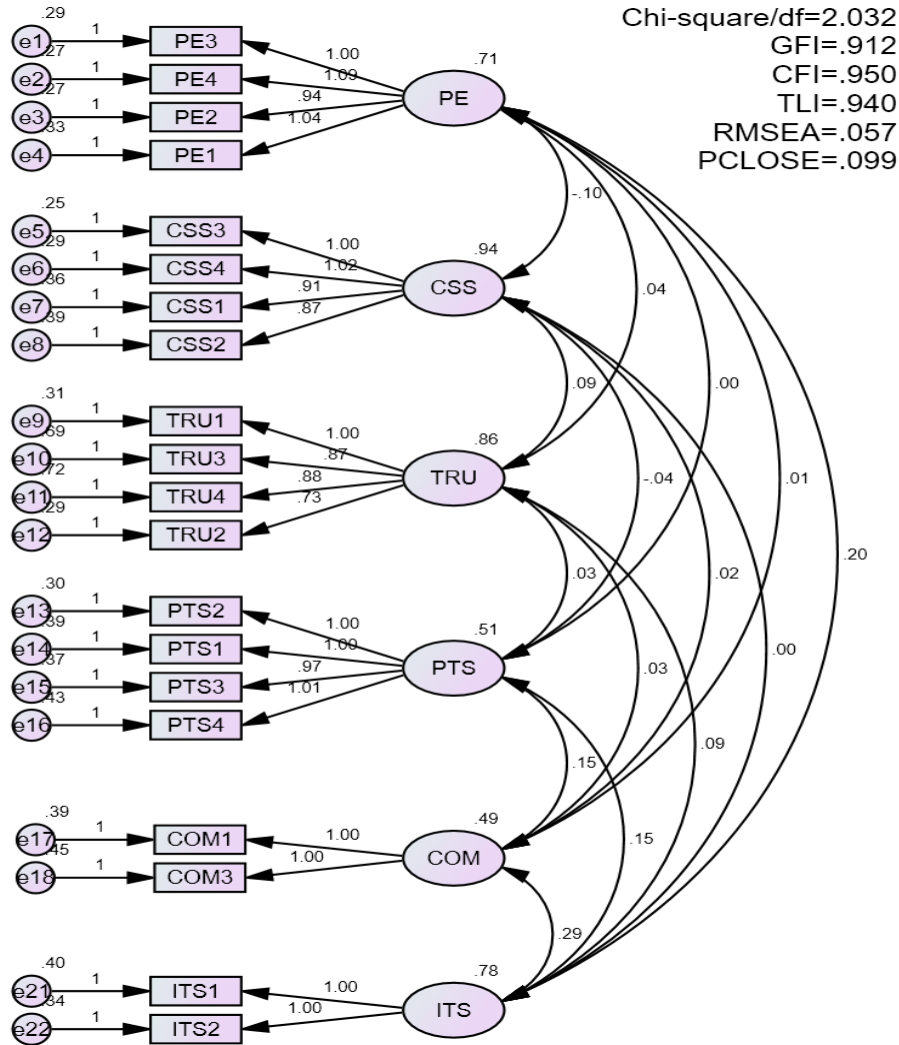


*Source: The author's analysis*

**Table 4. The convergent and discriminant validity of variables**

|        | CR    | AVE   | MSV   | MaxR(H) | COM   | PE     | CSS    | TRU   | PTS   | ITS   |
|--------|-------|-------|-------|---------|-------|--------|--------|-------|-------|-------|
| **COM** | 0.702 | 0.542 | 0.222 | 0.706   | **0.736** |        |        |       |       |       |
| **PE**  | 0.910 | 0.716 | 0.070 | 0.911   | 0.022 | **0.846** |        |       |       |       |
| **CSS** | 0.912 | 0.722 | 0.016 | 0.917   | 0.037 | -0.127 | **0.850** |       |       |       |
| **TRU** | 0.845 | 0.578 | 0.013 | 0.861   | 0.043 | 0.046  | 0.095  | **0.760** |       |       |
| **PTS** | 0.845 | 0.577 | 0.094 | 0.847   | 0.306 | 0.005  | -0.063 | 0.040 | **0.760** |       |
| **ITS** | 0.811 | 0.682 | 0.222 | 0.812   | 0.471 | 0.264  | 0.004  | 0.112 | 0.230 | **0.826** |

*Source: The author's analysis*

Furthermore, the structural equation model (SEM) was applied. As can be seen from Figure 3, the values of all model-fit indices met the requirements: Chi-Square/df = 1.979; GFI = 0.910; CFI = 0.951; TLI = 0.943; RMSEA = 0.055; PCLOSE = 0.151.

**Figure 3. Structural equation model - SEM**
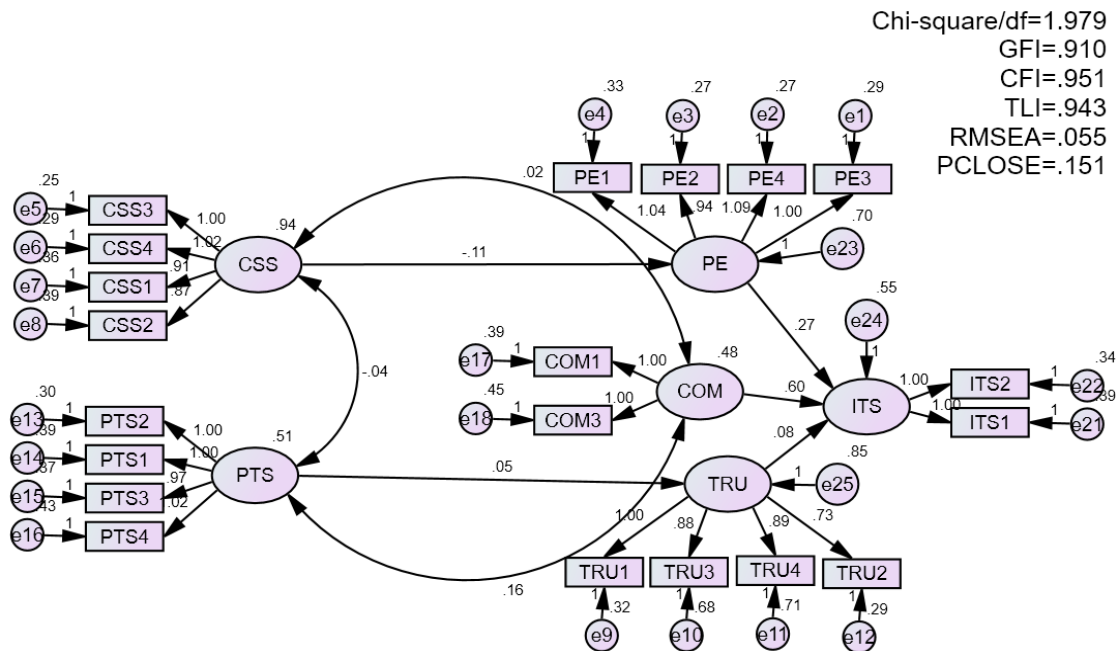


*Source: The author's analysis*

The regression weights were depicted in Table 5. The significance level of 5% was selected; hence p-value needed to be less than 0.05. To be specific, current customer support of traditional banking (CSS) negatively impacted performance expectancy for digital banking (PE) ($\beta$ = -0.11); performance expectancy (PE) positively influenced intention to switch (ITS) ($\beta$ = 0.267) and compatibility (COM) had a positive impact on intention to switch (ITS) ($\beta$ = 0.604). Perceived threat of security was not found to impact trust since p-value was higher than 0.05. Besides, trust showed no influence on intention to switch. In other words, the hypotheses H1, H2 and H5 were accepted, while H3 and H4 were rejected.

**Table 5. Regression weights and p-value**

| Hypotheses | Paths | | | Estimate | S.E. | C.R. | p-value | Result |
|---|---|---|---|---|---|---|---|---|
| **H1** | PE | ← | CSS | -0.110 | 0.053 | -2.067 | 0.039 | Accepted |
| **H3** | TRU | ← | PTS | 0.053 | 0.085 | 0.622 | 0.534 | Rejected |
| **H2** | ITS | ← | PE | 0.267 | 0.063 | 4.272 | *** | Accepted |
| **H5** | ITS | ← | COM | 0.604 | 0.090 | 6.726 | *** | Accepted |
| **H4** | ITS | ← | TRU | 0.083 | 0.058 | 1.422 | 0.155 | Rejected |

*Source: The author's analysis*

Finally, the author conducted 1000 bootstraps. The values of CR calculated by absolute value of Bias/SE-Bias shown in Table 6. All CR value is less than 2, which is depicted in Table 6. Hence, the reliability of the estimates was confirmed.

**Table 6. Critical ratio (CR)**

| Parameter | | | SE | SE-SE | Mean | Bias | SE-Bias | CR |
|---|---|---|---|---|---|---|---|---|
| **PE** | ← | CSS | 0.051 | 0.001 | -0.127 | 0.000 | 0.002 | 0 |
| **TRU** | ← | PTS | 0.071 | 0.002 | 0.038 | -0.003 | 0.002 | 1.5 |
| **ITS** | ← | PE | 0.069 | 0.002 | 0.252 | -0.003 | 0.002 | 1.5 |
| **ITS** | ← | COM | 0.072 | 0.002 | 0.476 | 0.000 | 0.002 | 0 |
| **ITS** | ← | TRU | 0.060 | 0.001 | 0.086 | 0.000 | 0.002 | 0 |

*Source: The author's analysis*

## 5. Discussion and managerial implications

### 5.1. Discussion

The results depicted that the compatibility and performance expectancy had a positive impact on intention to switch from traditional banking services to digital banking services. This result was in accordance with the results from the researches by Podder (2005), Gibson (2009), Kholoud (2009), Li (2010) and Nguyen and Cao (2011). Especially the compatibility had a stronger impact on intention to switch from traditional banking to digital banking than performance expectancy did. If the digital banking fits well with the working and living conditions of the customers, they will be likely to switch from traditional banking to digital banking. In other words, when the customers' place of residence and work has sufficient infrastructure and equipment, the customers themselves are also skilled in using technology equipments and everyone around them also uses it for daily work, the customers are likely to use the digital banking services. In addition, if they expect that the digital banking will bring them more benefits like convenience, time and cost savings, there is a high chance that they will adopt digital banking. It can be seen that in the age of technology and eventful lives, the customers are looking for solutions that help them get their tasks completed more efficiently and effectively. King (2012) also affirmed that the future trend of banking is that banking services will become more and more accessible, normal and easy like buying a cup of coffee or a loaf of bread.

Moreover, the satisfaction of customer with current service support of traditional banking was found to have a negative correlation with the performance expectancy for digital banking service. If customer feel that the traditional banking does not meet their needs, they will expect the digital banking will facilitate them more as customers' pleasure is measured in a matter of seconds and minutes. This could be a development for the result explored by Guru et al. (2003) which was about online banking service.

Perceived threat of security and trust was found to not impact intention to switch. This was consistent with the result founded by Nguyen (2020) and Nguyen et al. (2020). To be specific, the trust does not have a direct influence on the intention to switch from traditional banking to digital banking. With the expectation for the benefits brought by the digital banking services as well as the feel that using digital banking services is compatible with their living and working conditions, the customers might seek the belief that there are no risks to use digital banking and then they change their intention accordingly.

### 5.2. Managerial implications

The satisfaction with support of current traditional banking showed negative impact on performance expectancy for digital banking and performance expectancy for digital banking showed positive influence on intention to switch to digital banking. Therefore, it is necessary for banks developing their digital services to be easy and convenient to use. The interface of the application and website needs to be eye-catching and user-friendly. Besides, operation instructions are easily found. They also need to take care of customers accurately and punctually. The banks need consulting services 24/7 and 7 days a week. Even having to consult and at night, the staff needs to be friendly and welcoming to customers. All in all, the service quality should always be at the forefront because no matter how impressive the advertising is, if the service is not good, customers will also leave the bank. By doing so can the banks maintain their reputation and brand image which helps them maintain and attract more customers. Furthermore, even there is no significant impact of trust on intention to switch from traditional banking to digital banking, banks are still suggested to ensure the privacy of its services otherwise customers' expectancy might not be met. To ensure quality banking services, the prerequisite is confidentiality and safety.

Moreover, banks can coordinate with each others, schools, University and even State Bank of Vietnam to organize training sessions, events or campaigns to educate people about personal finance in general and the use of digital banking services in particular. Especially for middle-aged and elderly people, people in rural, remote, border and island areas. Because these people are less exposed to banking services technology. When customers are equipped with knowledge and skills to use technology, they feel that digital banking is compatible with their lives and they expect digital banking services to bring more added values for them. The banks can also participate in charity projects to bring electricity and the Internet to rural, remote, border and island areas. Thereby helping more people to access banking services.

In addition, banks should also hire key opinion leaders (KOLs), influencers and celebrities to review their services. Instead of rampant advertising, now social networks such as TikTok, Facebook, Instagram and so on are being interested by many people. The videoclips reviewing the services need to highlight the convenient features of the service; hence, the customers can see that they can save time and costs if using digital banking. Banks can also contact film crews, skillfully integrating their brand and product images into TV or movie footage. Korea, Japan or Thailand have been very successful in including their

domestic brands in movies and have since caused a culture fever. Digital banking services can also be inserted into the subconscious of the audiences through this way.

## 6. Limitations and future research

In this research, there are some limitations which could be improved in the future research. Firstly, the concept of digital banking was relatively new with many customers. Hence, the customers could not have understood exactly what digital bank was which might affect the research's result. Secondly, the sample size could be enlarged to give more objective results in the future research. Thirdly, the respondents of the survey were mainly banking customers from Hanoi. In the futurte, the research could be conducted with data collected from other cities or provinces in the North, the Middle and the South of Vietnam. Other determinants affecting intention to switch from traditional banking to digital banking should also be considered. The model in the future research could also include demographic variables.

## 7. Conclusion

The development of digital banking is an inevitable trend in the world and in Vietnam. Especially, digital banking has been supported by the Vietnamese Government and many banks are in the process of digital transformation. Digitalization process will bring win-win situation for the banks and their customers. It helps the banks operate and provide services to customers more effectively and efficiently. In terms of customers, they will feel satisfied and be facilitated with more flexible, accurate and value-added services. By combining several studies, the research model was proposed and responses from questionnaires were analysed to estimate factors affecting intention to switch to digital banking form traditional banking. Some limitations of this study were also determined for better research in the future. Finally, the managerial implications have been given based on the results and discussions to help the banks tailor appropriate strategies to maintain existing and attract potential individual customers.

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# VALIDITY OF THE APT IN EMERGING MARKETS IN THE WAKE OF US - CHINA TRADE WAR: EMPIRICAL EVIDENCE FROM VIETNAM

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## Abstract

*This paper is set out to explore the performance of the APT in the Vietnamese market in the context of the U.S - China trade war 2018. Testing on the listed stocks in Vietnamese stock exchanges provides a certain impact of the trade war on the asset pricing models' effectiveness. Specifically, the trade war casts the effects on the prediction power of economic forces on the expected returns of the Vietnamese stocks. This is the first study to bring light into the investigation of the validity of the APT in the Vietnamese economy in the wake of the trade war.*

***Keywords**: APT, Trade war, Economic factors, Validity*

## 1. Introduction

Since the Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) were originally formulated in the last century, both of these pricing models have retained a central place in the thoughts of practitioners and academic scholars in the finance field. Much of the available empirical to date have worked on their validity as well as the comparison between their effectiveness in predicting assets' expected returns in the contexts of developed countries but have left these issues as open questions in lower-middle emerging markets like Vietnam. In fact, there are also some papers yielding the insight of the two models' performance into developing economies. Specifically, Dhankar, R. and Singh, R. (2005) and Basu, D. and Chawla, D. (2010) test CAPM and APT in Indian stock market, Febrian, E. and Herwany, A. (2010) and Zainul K. and Shintabelle R. M. (2015) do this sort of research in the Indonesian economy, Raza, et al. (2011) and Mohammad, et al. (2012) apply the tests in Pakistani setting as well as Rahman and Baten (2006) put their consideration of CAPM's testability in Bangladesh. Additionally, the CAPM is employed to examine the market integration in the emerging markets by Bruner, et al. (2008). Nonetheless, it appears that to present, there is only the paper studied by Phong and Hoang (2012) about the performance of the Fama- French three factors model, and CAPM sheds very fresh light on the association between expected returns and betas in the Vietnamese context. Hence, whether both CAPM and APT, in particular APT, hold in this market is still questionable and worth investigating.

This paper stresses the effectiveness of the APT on the Vietnamese market because of three key reasons. The foremost importance is that in a bipolar order of international relations,

Vietnam is considered as a U.S pivot in Asia (Pietrasiak, 2018), especially in the wake of the trade war between the U.S and China. Since the increasing trade tension is the greatest risk of global economies, Vietnam is publically suggested as the "winner" of the war because of its sizeable achievement in both export and foreign investment. Consequently, employing APT to deeply investigate this opportunity - taker's capital market performance gains considerable attention of financial practitioners and academia. Furthermore, with the advantages of the U.S-Vietnam Bilateral Trade Agreement (BTA), Free Trade Agreements (FTAs), and a coming Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Vietnam is evaluated by the World Bank to be one of the most dynamic emerging economies in East Asian region. Additionally, with the mass privatization of state-owned enterprises after "Đổi Mới"- Innovation initiated by the National Congress of the Communist Party of Vietnam in 1986, its stock market yields many characteristics of an emerging market (Hai, et al., 2014). Thus, using the Vietnam market in this research will be an ideal paradigm to satisfy the question of whether the performance of the APT is significantly associated with the trade tsunami as well as to empirically convey these models' practices in emerging stock markets.

The contribution of this paper is threefold. First, the article takes the U.S- China trade war as a watershed event to document the comparative dynamics of the APT in the Vietnamese stock market before and during the war. Because this war is currently delivered on the global stage and spreading its threat on the international economic growth, the serious attention on it to the extent of the beneficiary's capital market like Vietnam's will open the door to more fruitful theoretical and applied for work. The study also adds to the growing body of empirical research that concentrates on testing the APT in emerging markets. As earlier mentioned, despite bearing emerging markets' features as the profound representative, the Vietnamese capital market's practices have witnessed the empirical absence of research investigating the relationship between assets' expected returns and generating factors, in particular with the utility of these asset pricing models.  To the best of the author's knowledge, there has so far been just one published empirical study of the CAPM and Fama-French three-factor model, by Phong and Hoang (2012), which emphasizes the Vietnamese environment. As a result, this article must be given precedence as the first empirical work directly not only on the trade war's effect but also the validity of the APT in Vietnam. Hence, it will serve as a basis for other scholars to develop publishable studies about the related work in this worth-to-research destination. Lastly, the findings of the APT's performance in the Vietnamese market will lend support to investors as well as investment portfolio managers about applying these asset pricing models together with external forces such as the trade war to make an investment decision.

By way of preview, the research studies the performance of the APT on the 150 stocks traded on Vietnamese stock exchanges during the period from January 2015 to October 2019, which is divided into two sub-samples based on the starting time of the U.S- China trade war from January 2015 to March 2018 and April 2018 to October 2019. The paper casts the

effects on the APT validity in the way that if oil price and term structure provide significant forecasts on average returns on the first period, the prediction during the second period is impacted by the oil price and industrial production growth rate.

The rest of this paper will be processed as follows. Section 2 reviews extant literature. Section 3 presents methodology and data sample. Section 4 discusses the empirical results. Section 5 concludes.

## 2. Literature Review

After the publication of the Sharpe (1964), Lintner (1965), and Mossin (1966) articles, considerable attention has been given to CAPM such as Merton (1973), Mayers (1973), Breeden (1979), Tim, et al. (1988), Harvey (1989), Kandel and Stambaugh (1995), Ravi and Zhenyu (1996), Santos and Veronesi (2006). Although it has been dominant in the finance literature, there are mixed results among scholars about the CAPM's validity. Black, et al. (1972) presents the two empirical tests of the asset pricing model, which are time-series and cross-sectional regressions of portfolios' excess returns. Both of the tests show that the traditional form of asset pricing model that states that an asset's expected risk premium is associated with its systematic risk is inconsistent with the tested data while the cross-sectional one demonstrates the linear relation between mean excess return and estimated betas. Roll (1977) criticizes the CAPM based on the mathematics of efficient set. In particular, with the hypothesis that the true market portfolio is ex-ante efficient, it is challenging to use a proxy for the portfolio, and even applying the linear relation between return and beta is also difficult. Furthermore, the deviations from the mentioned relation cannot explain the performance and the beta does not take investors' attitudes toward risk into account. After Roll (1977)'s criticism, a wave of papers responds to the testability of CAPM. Certain studies confirm Roll's (1997) conclusion. For instance, when Reinganum (1981) examines the portfolios formed on firm size or earning per share, he documents the anomalies strongly suggest both the misspecification of a single period CAPM and the inefficiency of capital markets. MacKinlay (1987) using a specific alternative hypothesis to reject CAPM. Harvey (1989) also finds that the dynamic behavior of asset returns is not explained by CAPM that is formulated by Sharpe-Lintner. Fama and French (1996) document the insufficiency of beta in CAPM in explaining expected returns. One reason for their conclusion is that there are other variables such as earning per share, cash flow per price, and firm sizes that have significant additional explanatory power on expected returns. Furthermore, the pricing model is weakened by the anomalies of average returns. In the meanwhile, Ross (1977) documents that there are somewhat sufficient conditions strengthening the status of CAPM, however, there still lacks potential testability of extending CAPM from its original framework. It is noteworthy that Mayers and Rice (1979) replied to the criticism relating to the asset pricing model of Roll (1977) by employing three sets which are tests of portfolio performance applying security market line, tests of the effects of information events using residual analyses, and tests of the CAPM. Their paper concludes that Roll's criticisms are overstated

and the CAPM cannot be invalidated.

In the wake of criticism of the CAPM's validity, Ross (1976) formulates the APT which is completely treated as an appropriate alternative to the CAPM. A stream of asset pricing research is implemented based on APT. Roll and Ross (1980) report empirical tests for the APT of Ross (1976). Their results are evident enough to ascertain the APT. Among the pioneering research about using observed factors on the APT basis, Chen, et al. (1986) - CRR argues that there are effects of the other macroeconomic variables on asset pricing. They document the significant prices of the variables such as interest rate spread, expected inflation changes, industrial production, and bond yield spread. McElroy and Burmeister (1987) also support the APT with estimated macroeconomic forces, whose results are somewhat consistent with CRR. Besides, there is a growing number of papers that expand APT in an international setting. Cho (1986) employs the inter-battery factor to examine the APT's validity in a global context. This paper basing on a cross-sectional test rejects the joint hypotheses that the capital market is internationally integrated and the APT is internationally valid. However, it is inconclusive of which element lead to the failure. Bodurtha, et al. (1989) expands CRR's work to an international set with two additional macroeconomic factors that are gold price and money supply. Their empirical results strongly support the impact of economic forces on the stock market from an international perspective. However, as similar to CAPM, the APT is itself controversial due to its testable ability. Shanken (1982) argues APT is not testable because of its inadequate formulation. Further to Shanken (1982), testing APT on the same data basis of Roll and Ross (1980), Brown and Weinstein (1983) find a significant conflict result against APT. The other studies such as Lehmann and Modest (1988) and Shanken and Weinstein (2006) are also in sort of the invalidity of APT.

In addition to examining CAPM and APT separately, the rapidly growing volume of empirical analysis sheds considerable light on comparing their effectiveness. Specifically, Chen (1983) uses Ross's APT to document that APT offers better performance than CAPM. Besides, he presents that estimated factor loadings are not affected by some variables such as own variances and firm size. Chen's conclusion about the effect of firm size is consistent with that of Chan and Chen (1988).  Bower, et al. (1984) and Connor and Korajczyk (1988) evidence that APT outperforms CAPM in terms of explaining and forecasting expected return. They also suggest authorities putting greater weight on APT rather than the traditional CAPM. Dybvig and Ross (1985) refute the results of Shanken (1982) by arguing that APT is testable on a subset and show that APT outperforms CAPM in terms of the valid testability in the subset. To some extent, both models forecast a large fraction of the security returns as estimated by Ferson and Korajczyk (1995).

The two central asset pricing theories have been not only widely researched in developed economies or an international environment but also have drawn the attention of a large corpus of literature in emerging markets so far. As an example, Gökgöz (2007) investigates the effectiveness of CAPM in Turkish stock markets and shows that the model is

valid in the stated markets. Phong and Hoang (2012) and Rahman and Baten (2006) also provide consistent results in the contexts of Vietnam and Bangladesh respectively. To be more affirmation on the performance of APT and CAPM in emerging countries, Raza, et al, (2011) and Mohammad, et al. (2012) separately conclude that CAPM and APT hold in the Pakistani economy. Further to Pakistan, the Indian setting is taken by Dhankar and Singh (2005) employing APT and CAPM, their study evidence that APT provides a better indication of stock risk as well as the return of required rate rather than CAPM although Basu and Chawla (2010) later demonstrate the complete failure of CAPM in this country. Febrian and Herwany (2010) and Zainul and Shintabelle (2015) explore the validity of both CAPM and APT in the Indonesian stock market. They witness the outperformance of APT over CAPM in explaining portfolios' excess returns.

## 3. Methodology and Data

The APT was proposed by Ross (1976) and comes from the linear relation that the mean-variance model is valid for any assets. Accordingly, the APT consists of the three propositions that are the validity of a factor model to measure securities returns, the ability to mitigate a firm risk with a large enough number of securities, and the absence of arbitrage in well-managed markets. The return $(r)$ on the asset $i$ can be illustrated by the below equation:

$$r_i = E_i + b_{i1}\delta_1 + b_{i2}\delta_2 + b_{i3}\delta_3 + ... + b_{ik}\delta_k + \varepsilon_i \ (1)$$

In which $E_i$ is the expected rate of return of asset $i$; $b$ is the return on asset's sensitivity to the factor $\delta$'s fluctuations or factor loadings (Chen (1983)); $\delta$ is the mean zero factors common to all assets.

The equilibrium expected return on the asset $i$ ($E_i$) is measured by the equation:

$$E_i = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2} + \lambda_3 b_{i3} + ... + \lambda_k b_{ik} \ (2)$$

In which, $\lambda$ is the risk premium relating to risk factor $\delta$.

Motivated by the APT, Chen, et al. (1986) look at the relationship between economic forces and the stock markets with a set of observable macroeconomic factors chosen mainly based on economic institution. They are the spread between long and short interest rates; expected and unexpected inflation; the spread between high and low-grade bonds; and oil price. Their economic factor analysis is also employed by modern financial researchers and has shown significant evidence such as Bodurtha, et al. (1989) and Shanken and Weinstein (2006).

With the outperformance of the APT over the CAPM as analysed in the literature review, this paper employs the APT model developed by Chen, et al. (1986) to investigate whether the macroeconomic forces have effects on the Vietnamese market in the context of the U.S- China trade war 2018. Their study document that the returns of assets are systematically affected by the five macroeconomic forces included industrial production's growth rate, change in expected inflation, change in unexpected inflation, the difference

between the returns of low-grade bonds and long-term government bonds, difference between the yields of long-term government bonds and treasury bills. Their model is one of the first investigations into observed factors (Dimson and Mussavian, 1999) and has served as the basis of remarkable publications such as Bodurtha, et al. (1989), Dimson and Mussavian (1999), or the recent research is Shanken and Weinstein (2006). However, it is noteworthy that among those five economic forces, the excess returns of low-grade bonds over long-term government bonds are challenging to estimate because currently, the rating of corporate bonds in Vietnam is underexplored. The reasons for that are due to the high fee of rating as well as the limited professional bond-rating organizations in the Vietnamese context. As a result, to address the data shortfall of the bond risk premium, this study utilizes oil price as a replacement. The inclusion of the oil price is also consistent with Chen, et al. (1986) although they find no effect of the price factor on stocks' expected returns. However, in the international dimension researched by Bodurtha, et al. (1989), the oil price is documented to be a significant factor in explaining the average stock returns. Therefore, utilizing those macroeconomic variables to examine the APT's validity in the Vietnamese context will valuably add to these research mainstreams to date.

Specifically, the examining five-factor model is:

$$R_{it} = \alpha_i + \beta_{1i}MP_t + \beta_{2i}DEI_t + \beta_{3i}UI_t + \beta_{4i}OG_t + \beta_{5i}UTS_t + \varepsilon_{it} \quad (3)$$

In which:

$R$: the return on the stock i

$MP_t$: the industrial production's growth rate for time t

$DEI_t$: the change in expected inflation for time t, measured by the difference between the expected inflations of period t and t-1;

$UI_t$: the unexpected inflation for time t, measured by the difference between realized and expected inflations;

$OG_t$: the world oil price for time t;

$UTS_t$: term structure for time t, measured by the excess return of long-term government bonds over Treasury bills;

$\beta$s: loading factors of the five economic forces of stock i for time t;

$\varepsilon$: residual.

The methodology of Chen, et al. (1986) is that the exposure of stocks to the macroeconomic forces, which are betas, is estimated by regressing the stocks' returns on these macroeconomic variables. The estimated betas then are employed as independent variables with the stocks' returns are the dependent variable to generate the sum of the risk premium related to the macroeconomic factors. Finally, the resulting estimations are tested for significant differences from zero to determine if the stocks' returns are affected by the chosen macroeconomic variables.

Strictly follow the analysis of Chen, et al. (1986), the procedure for estimating the APT in this paper is as follows:

Stage 1: The equation *(3)* is regressed to obtain the loading factors βs.

Stage 2: The estimated βs are used as independent variables to produce the sum of the risk premium ($R_i$) such that:

$$R_i = \gamma_{0i} + \gamma_{1i}\beta_{1i} + \gamma_{2i}\beta_{2i} + \gamma_{3i}\beta_{3i} + \gamma_{4i}\beta_{4i} + \gamma_{5i}\beta_{5i} \quad (4)$$

The coefficients of γ from the equation (4) are used to determine whether the five chosen macroeconomic forces, which are MP, DEI, UI, OG, and UTS respectively, yield any effect on the stocks' returns by the equation:

$$R_i = \gamma_{0i} + \gamma_{1i}\beta_{1i} + \gamma_{2i}\beta_{2i} + \gamma_{3i}\beta_{3i} + \gamma_{4i}\beta_{4i} + \gamma_{5i}\beta_{5i} + \eta_i \quad (5)$$

In which $R_i$ is the excess return on the stock i and $\eta_i$ is the unexpected return on the stock i.

According to the timeline of the trade war, in March 2018, the incumbent U.S president signs a memorandum to impose the tariff on Chinese goods (Wong and Koty, 2019), which sparks the trade war between the two potent economies. As being substantially affected by the war, the Vietnamese stock market witnesses a drastic downward with the non-stop withdrawal of foreign investors in the following months as well as the large fluctuations of Vietnamese currency (VND) against the U.S dollar (USD) (Binh, et al. 2018). Therefore, to investigate to impact of the trade war on the performance of the APT in the Vietnamese market, the paper considers March 2018 as the breaking event to research, and the research sample covers the period from January 2015 to October 2019 which is partitioned into two sub-periods which are Jan2015- Mar2018 and Apr2018-Oct2019.

The paper researches the listed stocks in both Hanoi and Hochiminh stock exchanges that are the two official stock exchanges of Vietnam. Basing on the criteria that stocks are continuously listed for at least 2 years and non-stop trading in these markets, the paper selects 150 stocks for the studied periods to extract the data of these stocks' historical prices. The Vietnamese macroeconomic data such as industrial production and the realized inflation are extracted from the General Statistics Office of Vietnam, the data of the yields of long-term government bonds and treasury bills are collected from an investing company. The crude world oil price data is retrieved from the World Bank database, the OG variable is measured by the rate of change in crude oil price, which is equal to (the price of t-price of t-1)/price of t-1. Interestingly, the expected inflation is estimated based on the method of Frankel (1982) which employs the interest rate term structure. The test is conducted by the monthly data in both periods with a bootstrap regression for a stronger result in the second period.

The summary of the data sample of the five macroeconomic variables in equation (3) is reported in Table 1:

**Table 1: Descriptive statistics of the five macroeconomic factors**

| Variable | No. of Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| *MP* | 56 | 0.0059014 | 0.1436149 | -0.7453864 | 0.2468845 |
| *DEI* | 56 | -0.000562 | 0.0021598 | -0.0093584 | 0.0049954 |
| *UI* | 56 | 0.0005863 | 0.0021529 | -0.0049226 | 0.0093715 |
| *OG* | 56 | 0.0032321 | 0.1217255 | -0.2059808 | 0.3869227 |
| *UTS* | 56 | -0.0001605 | 0.0027061 | -0.01019 | 0.00568 |

**Note:** *MP* is the industrial production's growth rate; *DEI* is the change in expected inflation, measured by the difference between the expected inflations of period t and t-1; *UI* is the unexpected inflation, measured by the difference between realized and expected inflations; *OG* is the world oil price; *UTS* is the term structure for, measured by the excess return of long-term government bonds over Treasury bills. The data sample is for 150 stocks for the period from January 2015 to October 2019.

This research employs the Augmented Dickey-Fuller (ADF) test for the unit root of the five independent variables of the equation (3). It is noteworthy that the paper does not report the unit root test for the dependent variable that is stocks' returns because they are up to 150 stocks in the sample, however, they are stationary. The results of the unit root test of the five macroeconomic variables in equation (3) are reported in Table 2:

**Table 2: Unit root test for the five macroeconomic factors**

| Variable | Test Statistic | P- value | Result |
|---|---|---|---|
| *MP* | -6.049 | 0.0000 | Stationary |
| *DEI* | -3.983 | 0.0015 | Stationary |
| *UI* | -3.954 | 0.0017 | Stationary |
| *OG* | -6.557 | 0.0000 | Stationary |
| *UTS* | -4.726 | 0.0001 | Stationary |

**Note:** *MP* is the industrial production's growth rate; *DEI* is the change in expected inflation, measured by the difference between the expected inflations of period t and t-1; *UI* is the unexpected inflation, measured by the difference between realized and expected inflations; *OG* is the world oil price; *UTS* is the term structure for, measured by the excess return of long-term government bonds over Treasury bills. The data sample is for 150 stocks for the period from January 2015 to October 2019.

## 4. Results

The results to obtain βs from equation (3) are partitioned into two researched periods are from January 2015 to March 2018 and from April 2018 to October 2019. The summary of the five βs for the first period is reported in Table 3:

**Table 3: Descriptive statistics of the loading factors in equation (3)**
**for the first period**

| Variable | No. of Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| *Beta1* | 150 | -0.024787 | 0.183559 | -0.905716 | 0.4583643 |
| *Beta2* | 150 | -92.63203 | 712.9645 | -2,951.996 | 2,067.021 |
| *Beta3* | 150 | -86.44076 | 714.4282 | -2,944.205 | 2,090.78 |
| *Beta4* | 150 | -0.0148791 | 0.1663949 | -0.5105818 | 0.858741 |
| *Beta5* | 150 | 4.076196 | 10.40513 | -13.19404 | 75.53378 |

**Note:** *Beta1* is the loading factor of the industrial production's growth rate; *Beta2* is the loading factor of the change in expected inflation; *Beta3* is the loading factor of the unexpected inflation; *Beta4* is the loading factor of the world oil price; *Beta5* is the loading factor of the term structure. The data sample is for 150 stocks for the period from January 2015 to March 2018.

The summary of the five βs for the second period is reported in Table 4:

**Table 4: Descriptive statistics of the loading factors in equation (3)**
**for the second period**

| Variable | No. of Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| *Beta1* | 150 | -.0497409 | .2676362 | -1.157994 | .6775294 |
| *Beta2* | 150 | -4.398165 | 17.28458 | -71.26781 | 87.84635 |
| *Beta3* | 150 | -.7045726 | 9.925324 | -46.6888 | 46.67124 |
| *Beta4* | 150 | -.0831206 | .3473046 | -1.905921 | .8265261 |
| *Beta5* | 150 | .9829376 | 6.161364 | -18.73736 | 24.41638 |

**Note:** *Beta1* is the loading factor of the industrial production's growth rate; *Beta2* is the loading factor of the change in expected inflation; *Beta3* is the loading factor of the unexpected inflation; *Beta4* is the loading factor of the world oil price; *Beta5* is the loading factor of the term structure. The data sample is for 150 stocks for the period from April 2018 to October 2019 and regressed by a bootstrap regression.

The final result to investigate whether the five chosen macroeconomic forces, which are MP, DEI, UI, OG, and UTS respectively, cast any effect on the stocks' returns is documented in Table 5 which consists the columns (1) and (2) respectively reports the regression results of the equation (5) for the periods from January 2015 to March 2018 and from April 2018 to October 2019.

**Table 5: Regression results of** $R_i = \gamma_{0i} + \gamma_{1i}\beta_{1i} + \gamma_{2i}\beta_{2i} + \gamma_{3i}\beta_{3i} + \gamma_{4i}\beta_{4i} + \gamma_{5i}\beta_{5i} + \eta_i$

| | (1) (Jan15 to Mar18) | (2) (Apr18 to Oct19) |
|---|---|---|
| | R | R |
| Beta1 | 0.008 | 0.016** |
| | (0.010) | (0.007) |
| Beta2 | 0.00007 | 0.00019 |
| | (0.00015) | (0.00013) |

| | | |
|---|---|---|
| Beta3 | -0.00006 | -0.00024 |
| | (0.00015) | (0.00022) |
| Beta4 | -0.034*** | 0.014** |
| | (0.011) | (0.006) |
| Beta5 | 0.001*** | 0.00004 |
| | (0.00016) | (0.00041) |
| _cons | -0.048*** | -0.044*** |
| | (0.002) | (0.002) |
| Obs. | 150 | 150 |
| R-squared | 0.124 | 0.094 |

Standard errors are in parenthesis

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

**Note:** *Beta1* is the loading factor of the industrial production's growth rate; *Beta2* is the loading factor of the change in expected inflation; *Beta3* is the loading factor of the unexpected inflation; *Beta4* is the loading factor of the world oil price; *Beta5* is the loading factor of the term structure.

As can be seen from Table 5, the loading factors of the oil price are highly significant in both sub-periods and this result is consistent with Bodurtha, et al. (1989). The significance of the world oil price in the test demonstrates the impact of international commodity price in determining the stocks' expected returns (Bodurtha, et al. (1989)). In addition to the oil price, the excess return of long-term government bonds over the Treasury bill is strongly significant to explain the average returns of Vietnamese stocks before the trade war. In the meanwhile, as the effect of the war, the growth rate of industrial production replaces the term structure's explanatory power to predict the expected returns of Vietnamese stocks, which is also consistent with Chen, et al. (1986) and Bodurtha, et al. (1989) as well as reasonable because as earlier mentioned, Vietnam benefits from the war through increasing a considerable amount of export which make a great contribution to its production.

In general, among the five selected macroeconomic variables, some of them are documented to be significant in explaining the stocks' expected returns in the Vietnamese stock markets, they are the growth rate of industrial production, oil price changes, and term structure. In the meanwhile, the changes in expected and unanticipated inflations cast no effect on explaining the stocks' expected returns in the Vietnamese stock markets. This result of the related inflation variables is somewhat consistent with that of Chen, et al. (1986), Bodurtha, et al. (1989), and Shanken and Weinstein (2006). These papers offer no explicit

explanation for such findings; however, the reasons can be threefold. First, the five selected macroeconomic factors may not be the most influential ones to explain the stocks' expected returns (Chen, et al. (1986)) of the international dimension in general and in the Vietnamese stock market in particular. The five-factor model of Chen, et al. (1986) is later investigated by several researchers such as Bodurtha, et al. (1989) and Shanken and Weinstein (2006) in other contexts and also yield mixed results. Second, the Vietnamese stock market somewhat has its own characteristics of a still-developing market rather than well managed as the other stock markets such as the U.S, as a result, the validity of the APT model is still questionable for the Vietnamese context. Last but not least, as one of the limitations of the research time that the author mentions in the Conclusion Remarks Section, the research time is for two periods from January 2015 to March 2018 and from April 2018 to October 2019. We may know the fact that the impact of macroeconomic factors takes time to cast an effect on its subjects and the stocks' expected returns are no exception. Consequently, this reported time may not long enough for some of the selected macroeconomic variables to affect the stocks' expected returns on the Vietnamese stock market.

## 5. Conclusion

This paper employs the recent trade war between U.S and China as a watershed to investigate whether it has an impact on the performances of the APT on the Vietnamese environment. Accordingly, the research period from January 2015 to October 2019 is partitioned by the trade war starting in March 2018 into two subsamples which are from January 2015 to March 2018 and from April 2018 to October 2019. The research is conducted on the data of 150 stocks continuously traded on Vietnamese stock exchanges and the Vietnamese macroeconomic factors including the industrial production's growth rate, the expected inflation changes, the unexpected inflation changes, the oil price, and the term structure. With the APT test in the Vietnamese market, among the five economic forces, there is only oil price produces the consistent significance in both periods before and during the trade war. Further to the oil price, the term structure also provides good explanatory power to the stocks' expected returns before the trade war. In the meanwhile, during the trade war, the growth rates of industrial production gain their strength in predicting the stocks' average returns instead of the oil price.

This paper contributes to the extant literature and investment practice in three ways. Firstly, it is the first attempt to take the trade war between the U.S and China into account as the breaking point to examine the performance of the APT model. Additionally, the study addresses the research gap that there is limited attention on testing the APT in Vietnam which is considered as the central opportunity-taker of the trade war. To the best of the author's knowledge, this is the first academic paper to yield a fresh light into the investigation of the APT in Vietnam. Also, the investors, as well as portfolio managers, can benefit from this research's findings for investment decision-making.

There is a caveat in this research regarding the APT's performance during the trade war. In particular, because the studied period during the trade war is from April 2018 to October 2019 which is a short period, although the bootstrap method is applied, the test result may cast concerns among researchers. Therefore, this research leaves this limitation to be covered by future studies.

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# REALITY OF APPLYING RESPONSIBILITY ACCOUNTING IN AUTOMOBILE MANUFACTURING ENTERPRISES IN VIETNAM

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## Abstract

*The article further clarifies the content of responsibility accounting (RA) in the enterprise, and focuses on clarifying the current situation of applying responsibility accounting in automobile manufacturing enterprises in Vietnam according to 5 aspects: Unit division into responsibility centers; Decentralization of authority and assignment of responsibilities to managers in responsibility centers; Estimation; Implementing and evaluating the performances in responsibility centers. Based on the research results, the author gives discussions and recommendations to improve and further promote the application of RA in automobile manufacturing enterprises in Vietnam.*

***Keywords****: Responsibility accounting, application of responsibility accounting, automobile manufacturing enterprises in Vietnam.*

## 1. Introduction

In the context of international economic integration, managers want to make optimal decisions need to rely on advanced management techniques. Among them, the one that helps businesses develop sustainably is responsibility accounting (RA) (Tran, 2017). RA has been increasingly asserting its role and important position in economic management and has become a method of managing and controlling the efficiency of business operations (Meda, 2003).

However, the RA is a higher development of management accounting, so when being applied, there are certain conditions such as: High-level management decentralization means associated with responsibility and authority; Accompanying that is a team of appropriate administrators to fulfill responsibilities assigned or decentralized; Along with that is the request of administrators about the accounting information system to provide a basis to help them grasp the situation, evaluate performance, as a basis for reporting to higher levels and also is the basis for higher governance to evaluate the performance of lower level administrators...

Although RA has been studied a lot in the world, but in Vietnam RA has only been researched and gradually there are enterprises applying for the past few years. However, the number of studies is still limited, the application of the content of RA in enterprises has not been adequate yet. Besides, the researches on applying RA has just focused on applying each specific content of the RA to each industry, field or type of enterprise without consensus and

summarization into specific  directions and guidance to help businesses understand and apply effectively. Therefore, it is very necessary to find out the common points and specific features that complement the theory and practice about the RA are still young in Vietnam.

On the other hand, compared to Vietnamese manufacturing enterprises in general and other enterprises in the automobile industry in particular, automobile manufacturing enterprises have many specific factors such as large investment capital, advanced, complicated production technology including many stages, so there are responsibility centers stratified in the enterprise as well as requires cost control to each stage, so it is suitable for research and application of RA. Along with that, the survey of RA realities in automobile manufacturing enterprises in Vietnam shows that the application of RA in these units has been initially implemented, but the manifestation of RA is not clear. Managers and accountants still have confusion in the perception of RA and management decentralization according to functions, tasks, and performance evaluation of departments has not been set out concretely and unsystematically; Managers' awareness of RA is still limited... Therefore, the study aims to provide recommendations to help these units fully and effectively implement the RA, thereby achieving the goals of the organization is an urgent requirement in present conditions.

This article aims to clarify the current situation of RA application in automobile manufacturing enterprises in Vietnam. Since then, giving discussions and recommendations to improve and further promote the application of RA in units in the next time. The research is carried out on the basis of a combination of both qualitative and quantitative research methods.The research results show that the application of RA in automobile manufacturing enterprises in Vietnam has begun to be implemented, but the manifestation of RA is not clear.

The article has the following structure: the next section clarifies the concept and content of the RA in enterprises; Part 3 is research methodology; Part 4 is the results of research on RA reality in automobile manufacturing enterprises in Vietnam; Part 5 is the discussion and recommendation from the research results and the last part is the limitation and future research direction.

## 2. Concept and content responsibility accounting in the enterprises

### 2.1. Responsibility accounting concept

The RA is a part of the management accounting that has the function of collecting, synthesizing and reporting accounting data related to the responsibilities of each manager in the organization, through reports related to costs, revenue, and performance of each department that they have a responsibility to control, to assess the responsibilities and performance of each manager (Atkinson et al., 1997). According to Martin (2012), RA is a tool to measure and evaluate the performance of the departments related to investment, profits, revenue and costs that each department has the right to control and be responsible for. The RA is also a basic tool of management control and is determined by four essential factors: assigning responsibilities, setting performance measurement indicators, evaluating performance

and delivering rewards. In which, measuring and evaluating performance is based on both financial information and non-financial information (Hansen and Mowen, 2007).

### 2.2. Responsibility accounting content in the business

According to researchers (Atkinson et al., 1997; Hansen and Mowen, 2007; Hanini 2013; Tran Trung Tuan, 2015; Cao Thi Huyen Trang, 2020), RA content in enterprises includes some basic issues as followings:

Divide the units into responsibility centers: responsibility center is a part or a function whose achievements are directly responsible by a specific administrator (ACCA, 2010). Determination of types of responsibility centes depends on the firm's size, scope and specificity in its operations, the complexity of the economic process, and the ability to scoping over powers and responsibilities (Nowak, 2000). In terms of management accounting, responsibility centers includes 4 categories: cost center, revenue center, profit center and investment center (Hanini, 2013; Zimnicki, 2015).

- Decentralization and assignment of responsibilities to managers in responsibility centers: This is one of the main contents of the RA (Higgins, 1952). The superior administrators need to authorize subordinate administrators in responsibility centers with clear authority to manage and the administrators of each responsibility centers are responsible for the results as well as the effectiveness of their implementation in their centres. Administrators need to be authorized in accordance with the activities in the responsibility centers that they undertake to make the right decisions to achieve planned results.

- Estimation: The managers in each responsibility centers are responsible for estimation. After the budget has been approved, the budget is the basis for the superior leaders to allocate resources, as well as a basis for subordinate leaders to perform their tasks to achieve the set objectives. For example, with the cost center making budget such as direct raw material cost, direct labor cost, overheads cost... With the revenue center, making budget of product consumption, sales volumes.

- Implementing: In order to collect information processed in responsibility centers, RA applies general accounting methods such as invoice method, account method, price calculation method and balance synthesis (Chanko, 1967; Luong Thi Thanh Viet, 2018) and technical methods of management accounting suitable for each center (Tran Thi Hong Mai et al., 2020). For example, to collect performance information of cost centers, RA bases on related invoices such as invoices of materials delivery, tools, spreadsheets and fixed asset depreciation amortization...

- Performance eveluation in responsibility centers: To evaluate the responsibility centers assigned, the target system of the enterprise must include the targets of estimate of the beginning of the period, the targets for the implementation period (Luong Thi Thanh Viet, 2018). Since then, the RA will evaluate the achievements as well as the responsibility of the managers at the responsibility centers by taking the performance results of responsibility

centers, comparing with the original estimate data. In which, the criteria for estimating, implementing as well as evaluating the responsibility centers assigned must be associated with the tasks that enterprises have assigned to responsibility centers (Doan Ngoc Que et al., 2011).

Thus, it is possible to generalize the contents of RA in enterprises as Figure 1 below:

**Figure 1: The responsibility accounting content in the enterprise**
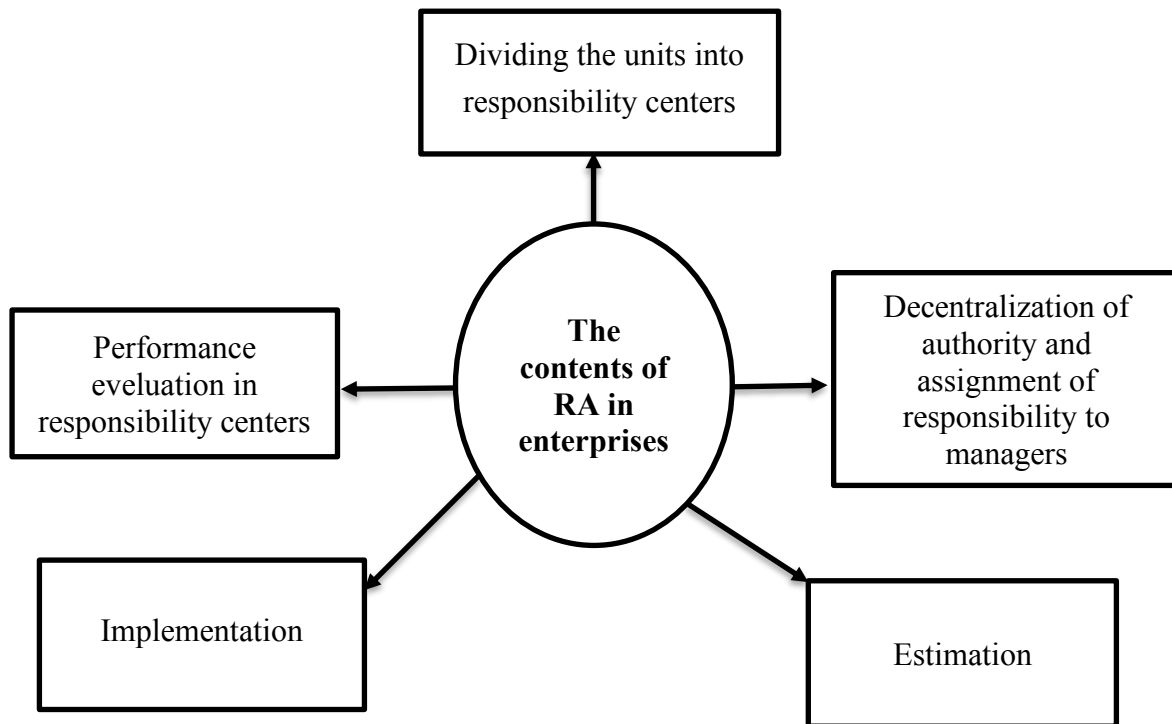


*(Source: Source: Authors synthesized)*

**3. Research method**

The research is carried out on the basis of a combination of both qualitative and quantitative research methods. In which:

Qualitative research is used to establish questionnaires, which is done through ground theory method (GT), expert interviewing method and group discussion to determine the content of RA in enterprises and application of RA in automobile manufacturing enterprises in Vietnam. The author has conducted in-depth interviews with 8 experts. In which, there are 4 lecturers and 04 practical experts at automobile manufacturing enterprises in Vietnam. The author has continued to use group interview with 15 lecturers of Faculty of Accounting - Auditing, Thuongmai University.

The questionnaire is designed with 2 parts: (1) Part 1 is general information about enterprises and interviewees; (2) Part 2 is the content of RA in enterprises to find out the current situation of applying RA in automobile manufacturing enterprises in Vietnam according to 5 criteria: Establishing responsible centres; Decentralize and assign responsibility to responsibility centers; Estimation; Implementation; Performance evalueation

at responsibility centers. Scales was developed from the reference of research works of organizations and reserachers.

Quantitative research is used to evaluate the level of application of RA in automobile manufacturing enterprises in Vietnam using the Likert scale with 5 options and a jump of 0.8. Then the assessment is based on the average value as follows: From 1 to 1.8: Poor; From 1.81 to 2.6: Weak; From 2.61 to 3.4: Average; From 3.41 to 4.2: Fair and from 4.21 to 5.0: Good (Nguyen Dinh Tho, 2013).

To conduct the research, the author sent 300 questionnaires to the respondents, in each enterprise, the author sent 1-2 quesionnaires to Chairman of the Board of Directors, General Director, Director, Deputy Director, Head of Departments, deputy chiefs, chief accountants and people who are directly involved in the management accounting in automobile manufacturing enterprises in Vietnam. The questionnaires are sent via post or email. Ballot delivery time will be from March 17, 2020 to October 16, 2020. The number of votes collected was 245 (with the response rate of 81.7%), of which 218 valid votes were entered and analyzed.

## 4. Results of research on the application of responsibility accounting in automobile manufacturing enterprises in Vietnam

### 4.1. Overview of the automobile industry in Vietnam

In the international and Vietnamese industrial classifcation system, automobile products, assembly, manufacture and basic components are classifed under ISIC 29 group, including motor vehicles and automobile motors (ISIC 2910), car bodies, trailers (ISIC 2920) and automotive parts (ISIC 2930) (See Table 1):

**Table 1: Automotive subsectors and corresponding ISIC codes**

| Series | ISIC | Content |
|--------|------|---------|
| 1 | 2910 | Manufacture of motor vehicles |
| 2 | 2920 | Manufacture of bodies for motor vehicles; manufacture of trailers and semi-trailers |
| 3 | 2930 | Manufacture of bodies for motor vehicles; manufacture of trailers and semi-trailers |

Immediately after the economic embargo policy was lifted in 1995, large international automobile groups established factories in Viet Nam. At the time, automobile manufacturers had high expectations of the Vietnamese market with its population of over 70 million and its per capita income of about USD 300. With over 20 years of experience, Viet Nam's motorcycle industry has developed rapidly, leading to the creation and strong development of an interlinked system of motorcycle spare parts and accessories. Currently, motorcycle

assembly and manufacturing enterprises have achieved a localization rate of over 80 per cent, with some models achieving a rate over 90 per cent. In the past 20 years, the Vietnamese automobile industry has undergone various stages of development.

- From 1995 to 1999, foreign automobile manufacturers were allowed to invest in Viet Nam.

- The period 2000-2005 was characterized by continuous development, a stable macroeconomic environment and a policy of maintaining domestic production.

- The period from 2006 to today can be referred to as the post-WTO period, with many fluctuations in the macroeconomic and policy environment.

Since 1995, when foreign automobile assembly enterprises began investing in Viet Nam, the number of locally assembled vehicles increased rapidly, from 3,500 in 1995 to over 240,000 vehicles in 2017. The Association of Automobile Assembly Manufacturers (VAMA) was established in 2000 with more than 10 members, and today includes up to 20 members, both domestic and foreign manufacturers.

### 4.2. Sample description

The results in Table 2 show that the respondent is the chief accountant with the highest proportion of 32.11% and the lowest one is the Head (deputy) of the department, accounting for 23.39%. The majority of respondents are from 30 - 39 years old (accounting for 42.2%) with main work experience from 11 to 20 years (accounting for 35.78%).

**Table 2: Statistics of the sample**

|  | Quantity | Rate **(%)** |
|---|---|---|
| ***Respondent of feedback*** | 218 | 100 |
| Board of Directors | 15 | 6.88 |
| Head (Deputy) of department | 51 | 23.39 |
| Executive Board of Directors | 43 | 19.72 |
| The foreman (deputy foreman) of the workshop | 22 | 10.09 |
| Chief Accountant | 70 | 32.11 |
| Accountants | 54 | 24.77 |
| ***Age group*** |  |  |
| 20 – 29 | 41 | 18.81 |
| 30 – 39 | 92 | 42.20 |
| 40 – 49 | 65 | 29.82 |
| Trên 50 | 20 | 9.17 |
| ***Work experience*** |  |  |
| Under 5 years | 37 | 16.97 |
| 5 – 10 years | 67 | 30.73 |
| 11 – 20 years | 78 | 35.78 |
| Over 20 years | 36 | 16.51 |

*(Source: Authors synthesized and analyzed)*

### 4.3. The application of responsibility accounting in automobile manufacturing enterprises in Vietnam

*4.3.1. Divide the units into responsibility centers*

The survey results (Table 3) show that 100% of respondents think that types of responsibility centers in automobile manufacturing enterprises in Vietnam including: cost center, revenue center, profit center and investment center. On the other hand, the mean value related to the division of units into responsibility centers in automobile manufacturing enterprises in Vietnam reached 3,576, ranging from 3.41 to 4.2 (Table 2). This shows that the division of units into responsibility centers in automobile manufacturing enterprises in Vietnam is quite good on a 5 - point scale.

**Table 3: Descriptive statistics of the division of units into responsibility centers in automobile manufacturing enterprises in Vietnam**

| Content | Mean | Std |
|---|---|---|
| 1. Enterprises divide their organizational structure into responsibility centers according to the nature of their operations | 3.76 | 1.08 |
| 2. There is a clear description of the responsibility centers within the business | 3.92 | 0.81 |
| 3. Responsibility centers within the business have clear and co-ordinated corporate in the relationship | 4.18 | 0.72 |
| 4. Each responsibility center has a leading manager | 3.68 | 0.66 |
| 5. Each responsibility center has its own identity and uniformity | 2.34 | 0.94 |
| **Average** | **3.576** | **0.842** |

*(Source: The author's collection and analysis)*

*4.3.2. Decentralize and assign responsibilities to managers in the responsibility centers*

Survey results show that 100% of automobile manufacturers in Vietnam implement the decentralization of individuals and divisions in the unit but mainly decentralization and assignment of responsibilities according to functions (accounting for 74.77%), while decentralizing according to responsibility centers accounting for only 20.18%.

The mean value related to decentralization and assignment of responsibilities for managers responsibility centers in automobile manufacturing enterprises in Vietnam (Table 4) reached 3.943, ranging from 3.41 to 4.2. This shows that the opinions all agree that businesses decentralize and assign responsibilities to managers in responsibility centers and achieve a fair level.

**Table 4: Statistics on the decentralization and assignment of responsibilities to the managers of responsibility centers in automobile manufacturing enterprises in Vietnam**

| Series | Question | Content | Quantity | Rate (%) |
|---|---|---|---|---|
| 1 | Does your business implement decentralization of authority to individuals and divisions in the unit | Yes | 218 | 100 |
| | | No | 0 | 0 |
| 2 | Form of Decentralization of authority and assignment of responsibilities in responsibility centers in your business | Decentralization by function | 163 | 74.77 |
| | | Strategic decentralization | 5 | 2.29 |
| | | Decentralization of responsibility centers | 44 | 20.18 |
| | | Other | 6 | 2.75 |

*(Source: Authors synthesized and analyzed)*

*4.3.3. Estimation*

Survey results (Figure 2) show that 100% of automobile manufacturing enterprises in Vietnam carry out estimations, mainly static estimates (accounting for 72.02%), with the main method of making estimates based on the past (accounting for 89.91%).

**Figure 2: Statistics on estimation in automobile manufacturing enterprises in Vietnam**
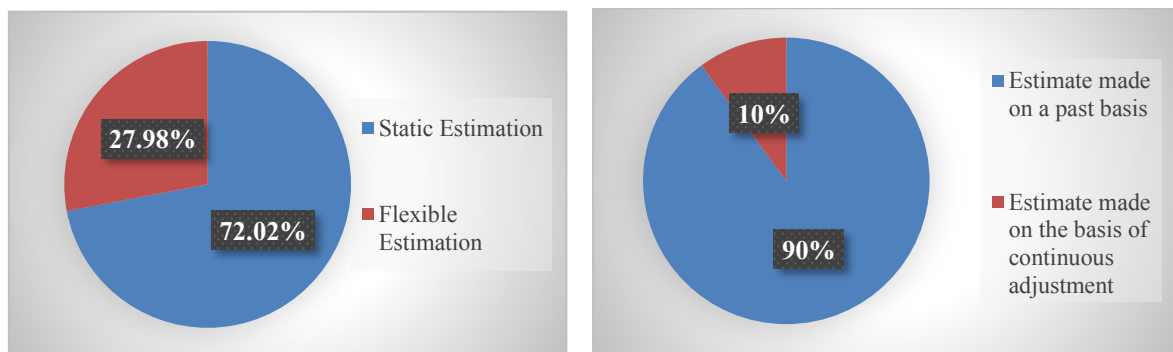


*(Source: Authors synthesized and analyzed)*

Survey results (Table 5) show that all businesses estimate cost, revenue, profit as well as capital estimates. To have capital estimates, businesses use many different methods such as Net Present Value (NPV) (accounting for 100%), Profitability Index (PI) (100%), Ratio Internal Profit (IRR) (52.75%)... with the applied technique of discounted cash flow.

**Table 5: Statistics on estimation in automobile manufacturing
enterprises in Vietnam**

| Series | Question | Content | Quantity | Rate (%) |
|---|---|---|---|---|
| 1 | Types of estimates | Estimation of costs | 218 | 100 |
| | | Estimation of revenue | 218 | 100 |
| | | Estimation of profit | 218 | 100 |
| | | Estimation of capital | 218 | 100 |
| 2 | Estimation method | Net Present Value (NPV) | 218 | 100 |
| | | Profitability Index (PI) | 218 | 100 |
| | | Ratio Internal Profit (IRR) | 115 | 52.75 |
| | | Payback period (PB) | 69 | 31.65 |
| | | Others | 13 | 5.96 |
| 3 | Capital budgeting techniques | Discounted cash flow | 218 | 100 |
| | | Non-discounted cash flow | 0 | 0 |

*(Source: Authors synthesized and analyzed)*

*4.3.4. Implementation*

Research results (Table 6) show that car manufacturers in Vietnam all collect cost-related performance information at cost centres including: (1) financial information (100% of respondents) such as direct raw material costs, direct labor costs, overhead costs, sales costs, and administrative costs incurred in the period; (2) non-financial information such as information about product and service quality in the period (reaching 100%), information related to internal processes in the period (accounting for 25.69%), information related to learning and development in the period (accounting for 88.53%) and other information (accounting for 16.05%).

Information collected in revenue centers in surveyed units includes: (1) financial information such as revenue collected by each type of product (accounting for 100%), and each responsibility centers (accounting for 29.82%) and the whole enterprise (accounting for 100%); (2) non-financial information including customer relationship information (reaching 100%), information about internal processes (accounting for 43.11%), information on learning and development processes (reaching 100%).

Information collected in profit centres includes: (1) financial information such as the profit of each type of product (accounting for 44.04%), the profit of each responsibility centers (accounting for 14.68%), and profit of the whole enterprise (reaching 100%) and others (accounting for 20.64%); (2) non-financial information such as customer relationship information (reaching 100%), to internal process (accounting for 61.47%), information reflecting the process learn and develop implementation period (reaching the rate of 100%).

Information collected in investment centers includes: (1) financial information such as ROI (100%), RI (86.23%), EVA (63.76%), and ROCE (57.34%) and other indicators (accounting for 53.67%); (2) non-financial information including investor relations (22.02%), the number of high profitability projects (91.74%), and the number of new investment projects and information related to the learning and development process (reaching 100%).

**Table 6: Satistics on implement of responsibility accounting in automobile manufacturing enterprises in Vietnam**

| Series | Question | Content | | Quantity | Rate (%) |
|---|---|---|---|---|---|
| 1 | Cost centres | Financial information | Direct raw material costs | 218 | 100 |
| | | | Direct labor costs | 218 | 100 |
| | | | Overhead costs | 218 | 100 |
| | | | Sales costs | 218 | 100 |
| | | | Administrative costs | 218 | 100 |
| | | Non-financial information | Information about product and service quality | 218 | 100 |
| | | | Information related to internal processes | 56 | 25.69 |
| | | | Information related to learning and development process | 193 | 88.53 |
| | | | Other information | 35 | 16.05 |
| 2 | Revenue centres | Financial information | Revenue collected by each type of product | 218 | 100 |
| | | | Revenue collected by each responsibility | 65 | 29.82 |
| | | | Revenue collected by the whole enterprise | 218 | 100 |
| | | Non-financial information | Customer relationship information | 218 | 100 |
| | | | Information about internal processes | 94 | 43.11 |
| | | | Information on learning and development processes | 218 | 100 |
| 3 | Profit centres | Financial information | The profit of each type of each product | 96 | 44.04 |
| | | | The profit of each responsibility centers | 32 | 14.68 |
| | | | The profit of the whole enterprise | 218 | 100 |
| | | | Others | 45 | 20.64 |
| | | Non-financial information | Customer relationship information | 218 | 100 |
| | | | Information about internal processes | 134 | 61.47 |
| | | | Information on learning and development processes | 218 | 100 |
| 4 | Investment centres | Financial information | Return on investment (ROI) | 218 | 100 |
| | | | Residual income (RI) | 188 | 86.23 |
| | | | Economic value added (EVA) | 139 | 63.76 |

| Series | Question | Content | | Quantity | Rate (%) |
|---|---|---|---|---|---|
| | | Non-financial information | Return on capital employed (ROCE) | 125 | 57.34 |
| | | | Information about investor relations | 48 | 22.02 |
| | | | The number of high profitability projects | 200 | 91.74 |
| | | | The number of new investment projects | 218 | 100 |
| | | | Information on learning and development processes | 218 | 100 |

*(Source: Authors synthesized and analyzed)*

*4.3.5. Performance eveluation in responsibility centers*

Research results (Table 7) show that performance eveluation in cost centers include cost difference, product cost difference (reaching 100%). Meanwhile, the difference in the non-financial ratios is less (44.5%).

For the performance eveluation of revenue centers, all surveyed enterprises used the turnover difference ratio (reaching the rate of 100%), the non-financial indicators only reaching 47.25%.

The criteria for performance eveluation  of profit centers include profit difference (reaching the rate of 100%), the difference in the rate of return on revenue (reaching 60.56%), the difference in the rate return on cost (reaching 56.89%) and difference in non-financial indicators (reaching 39.45%).

Regarding the criteria to evaluate the performance of investment centersinclude ROI difference (53.67%), RI difference (accounting for 56.42). %), EVA difference (45.41%), ROCE difference (35.78%), while the difference between non-financial indicators is lower (14.22%).

**Table 7: Statistics on performance eveluation in responsibility centers in automobile manufacturing enterprises in Vietnam**

| Series | Question | Content | Quantity | Rate (%) |
|---|---|---|---|---|
| 1 | Performance measurement indicators of cost centers | Cost difference | 218 | 100 |
| | | Product cost difference | 218 | 100 |
| | | The difference in the non-financial ratios | 97 | 44.5 |
| 2 | Performance measurement indicators of revenue | Revenue difference | 218 | 100 |
| | | The difference in non-financial indicators | 103 | 47.25 |
| 3 | Performance | Profit difference | 218 | 100 |

| Series | Question | Content | Quantity | Rate (%) |
|---|---|---|---|---|
| | measurement indicators of profit centers | The difference in the rate of return on revenue | 132 | 60.56 |
| | | The difference in the rate return on cost | 124 | 56.89 |
| | | The difference in non-financial indicators | 86 | 39.45 |
| 4 | Performance measurement indicators of investment centers | ROI difference | 117 | 53.67 |
| | | RI difference | 123 | 56.42 |
| | | EVA difference | 99 | 45.41 |
| | | ROCE difference | 78 | 35.78 |
| | | The difference in non-financial indicators | 31 | 14.22 |

*(Source: Authors synthesized and analyzed*

## 5. Discussions and recommendations

### 5.1. Discussion

The research results show that the application of RA in automobile manufacturing enterprises in Vietnam has begun to be implemented, but the manifestation of RA is not clear as follows:

- Determination of types of responsibility centers is based on vertical and horizontal management functions, not according to the scope of responsibility, the scope of management decentralization (or responsibility for costs, or responsibility for revenue. , or responsible for both costs and revenue, or long-term investment-related responsible). This leads to the units facing certain difficulties in identifying responsibility centers as well as the appropriate boundary between responsibility centers to ensure that there are no overlapped functions, tasks and easy to operate.

- The decentralization is performed according to functions such as production, sales, personnel, accounting... but there is not decentralization and assignment of responsibility to administrators under 4 separate centers for the purpose of cost evaluation of performance of responsible centers.

- Estimates of annual production and business activities are not made in details for each responsibility centers. The criteria used in the estimate are still traditional and there is no distinction between the indicators used between different departments; There is no diversity in the inclusion of non-financial indicators in the estimates. The purpose of the estimation is to provide plans on costs, revenue, profits, and capital that have not been used in combination to assess management responsibility in each responsibility centers. On the other hand, the estimates made in automobile manufacturing enterprises in Vietnam today are mainly static estimates, while making flexible estimates is not much.

- The information collection system in auto manufacturing enterprises in Vietnam has not been designed to collect information on each responsibility centers in order to assess the management responsibility of the responsibility centers in these enterprises. .

- Financial indicators are paid more attention than non-financial indicators in assessing the performance of responsibility centers.

*5.2. Recommendations*

Based on the limitations analyzed in part 5.1, in order to improve and further promote the application of RA in automobile manufacturing enterprises in Vietnam, the article gives the following recommendations:

- To define responsibility centers as well as the boundaries of responsibility centers, to ensure that there are no overlapped functions, tasks and easy to operate, automobile manufacturers in Vietnam need to define the scope of responsibility, the scope of management decentralization (or responsibility for costs, or responsibility for the revenue, or responsible for both the cost of the revenue or the long-term responsibility related to investment). Then, based on the organizational structure, the unit will determine the levels belonging to one of the responsibility centers to monitor and report.

- In the coming time, the units need to decentralize authority and assign responsibilities to 4 separate centers: cost center, revenue center, profit center and investment center to serve the purpose of performance evaluation

- The estimation system of automobile manufacturing enterprises in Vietnam must be made in detail to each responsibility centers to form the overall estimate of the enterprise. The estimation system should be designed to be able to both provide plans and assignment of tasks to responsibility centers and ensure that partial managers' responsibilities can be analyzed and evaluated.

- The information collection system at automobile manufacturing enterprises in Vietnam (invoices and bills, accounts, accounting books...) should be designed to be able to collect implement information by each responsibility centers for evaluation management responsibilities according to responsibility centers in these units.

- In order to assess responsibility centers, the criteria system of an automobile manufacturer in Vietnam must fully include financial and non-financial indicators. Depending on each responsibility centers, these indicators are different. Units depend on their specificity as well as management requirements to set appropriate targets.

**6. Limitations and future research directions**

The limitation of the article is that the findings of the study are based entirely on the perceptions of managers, chief accountants and accountants in automobile manufacturing enterprises in Vietnam. The self-assessment score-based findings may therefore exhibit some degree of bias. Moreover, the article only studies the application of RA in automobile manufacturing enterprises in Vietnam in general but has not studied the application of RA in

these units in each specific field. Therefore, the author proposes the next research direction to study the application of RA in automobile manufacturing enterprises in specific fields such as manufacturing motor vehicles; manufacturing motor vehicle bodies, trailers and semi-trailers; manufacturing spare parts and accessories for motor vehicles and vehicle engines.

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# THE AUDIT EXPECTATION GAP:
# A REVIEW OF THE ACADEMIC LITERATURE

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## Abstract

*After appearing for the first time in Liggio (1974), the term "audit expectation gap" (AEG) has received the attention of many researchers. Recently, the audit expectation gap has been highlighted as a hot spot in the auditing research because of the collapse of some spectacular and corporations such as Enron. The objective of this paper is to provide an overview of the previous studies and to summarize their findings and implications as a basis for determining the appropriate model and methods for the empirical studies about the audit expectation gap in the future.*

*Keywords: audit expectation gap, AEG, definition, structure, evidence on the existence.*

## 1. Introduction

Although making a lot of sense for the economy, external auditing has to face the criticism or lawsuits from the users whenever there is a bankruptcy, collapse of a company or corporation. One of the causes of this problem is the audit expectation gap. The audit expectation gap is detrimental to the financial reporting and auditing process, as the users are unsatisfied with the performance of the external auditor. The unfulfilled users' expectations impair the value of auditing, the credibility, earnings potential and prestige associated with the work of auditors. Porter et al. (2005) suggested that when the credibility and reputation of the auditing is reduced to a certain extent, the role of this profession will become useless.

Furthermore, despite the fact that many studies aimed at building the concept and structure of the AEG, but there is still inconsistency between these studies for many reasons:

(1) The groupings of interest groups are different. Some studies approach the AEG from the users and the professions, whereas some evaluate AEG just from the users or the auditors.

(2) The content of the investigation is different such as: the responsibilities of auditors, messages communicated through the audit report, the level of audit's assurance.

The aim of this paper is to make stakeholders of auditing to monitor, control or investigate AEG with the same understanding. This will allow professionals and the public to understand and standard setters or regulators to supervise upon the identical approach. Therefore, understanding the definition, structure and the existence of the audit expectation

gap are necessary to reduce the gap to an acceptable low level. The paper is divided into the following sections: definition of the audit expectation gap; structure of the audit expectation gap; evidence on the existence of the expectation gap.

## 2. Literature review of the definition of the audit expectation gap

The concepts of the AEG when viewed from the subject are divided into two groups (He, 2010):

(1) The first group evaluates the AEG which is the difference in expectation and perceptions between information users and auditors. The researches based on this approach such as Liggio (1974), Cohen Commission (1978), Monre and Woodliff (1993),…

Liggio (1974, 27) defined AEG as "the difference between the levels of expected performance as envisioned by the independent accountant and by the user of financial statements".

Monroe and Woodliff (1993, 62) stated that "An "audit expectation gap" exists when there are differences in beliefs between auditors and the public about the duties and responsibilities assumed by the auditors and the messages conveyed by audit reports".

(2) The second group considers the AEG is the difference in expectation and perceptions of only one party such as public, society or the user of financial statements such as definitions proposed by Cohen Commission (1978) and Porter (1993).

The definition of AEG in the Cohen Commission's (1978, xi) term of reference: "a gap may exist between what the public expects or needs and what auditors can and should reasonably expect to accomplish".

Porter (1993, 50) gave a more sophisticated definition of the AEG that "the gap between society's expectations of auditors and auditors' performance as perceived by society".

In two conceptual approaches mentioned above, the second group is evaluated as more appropriate because it ensures the reliability and objectivity of the research, especially empirical studies.

## 3. Literature review of the structure of the audit expectation gap

Because there are differences in the subject identified in AEG concepts, previous researchers built many different models of AEG. While some studies established AEG models based on the difference in perceptions of auditors and users, other studies are based only on users' viewpoint.

### 3.1. Structure of the AEG based on auditors' and users' viewpoint

*\* The audit expectation gap model of Innes et al. (1997)*

The study of Innes et al. (1997) suggested that the AEG needs to be analyzed on both normative and empirical approaches. The normative approach looks at the perceptions of what the auditors should do while the positive approach looks at the perception of what the auditors are doing.

**Figure 1: Audit expectation gap model of Innes et al. (1997)**
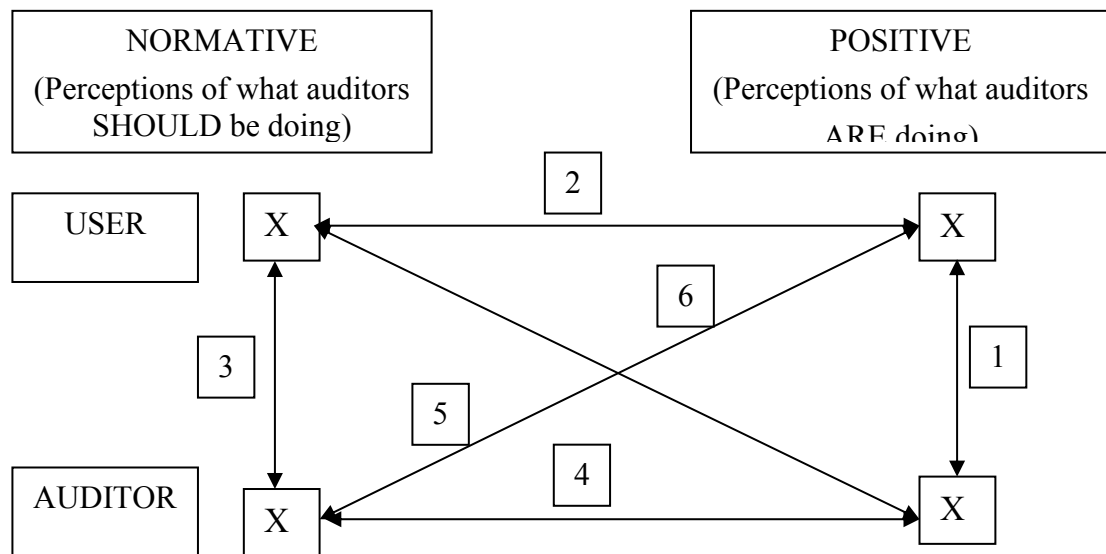


According to the Innes et al. (1997) study, AEG consists of six components:

(1) The gap between the users' and the auditors' perception of the work the auditors are doing.

(2) Gap between users' perception of what the auditors should do and what the auditors are doing.

(3) The gap between the users' and the auditors' perception of what the auditors should do.

(4) Gap between auditors' perception of what they should do and what they are doing.

(5) Gap between the auditors' perception of what they should do and the users' perception of what the auditor are doing.

(6) Gap between users' perception of what the auditors should do and the auditors' perception of what they are doing.

*\* The audit expectation gap model of Turner et al. (2010)*

The AEG model in Turner et al. (2010) study was adapted from Parasuraman et al. (1985).

In the figure 2, Gap 1 represents the difference between what auditors perceive the customer expects and what the customer actually expects of accounting auditing services.

Gap 2 is the difference between the auditors' understanding of customers' expectations and the design of the auditing service. This gap is referred to as the standards gap and results when a service firm does not properly translate customer expectations into service designs and standards.

Gap 3 is the difference between how the auditing service is designed and how the service is actually delivered. This gap is referred to as the delivery gap and occurs when a service firm fails to deliver service according to existing service standards.

Gap 4 is the difference between the auditing service delivered to the customer groups and the implicit and explicit service promises made by the auditor to the customer groups. In the marketing literature, this gap is known as the communications gap and is caused when promises from the service provider do not match service performance.

Service customers compare what they receive in a service against what they expected to receive and form their quality judgments of that service based on the gap between expectations and perceptions. The communications gap has been addressed by the accounting profession, which has attempted to provide guidance and expanded explanations of the responsibilities of auditors, with regard to the audit report. Customer Gap denotes the difference between what the service customer expects from the auditing services and what this customer perceives regarding the auditing services.

**Figure 2: Audit expectation gap model of Turner et al. (2010)**
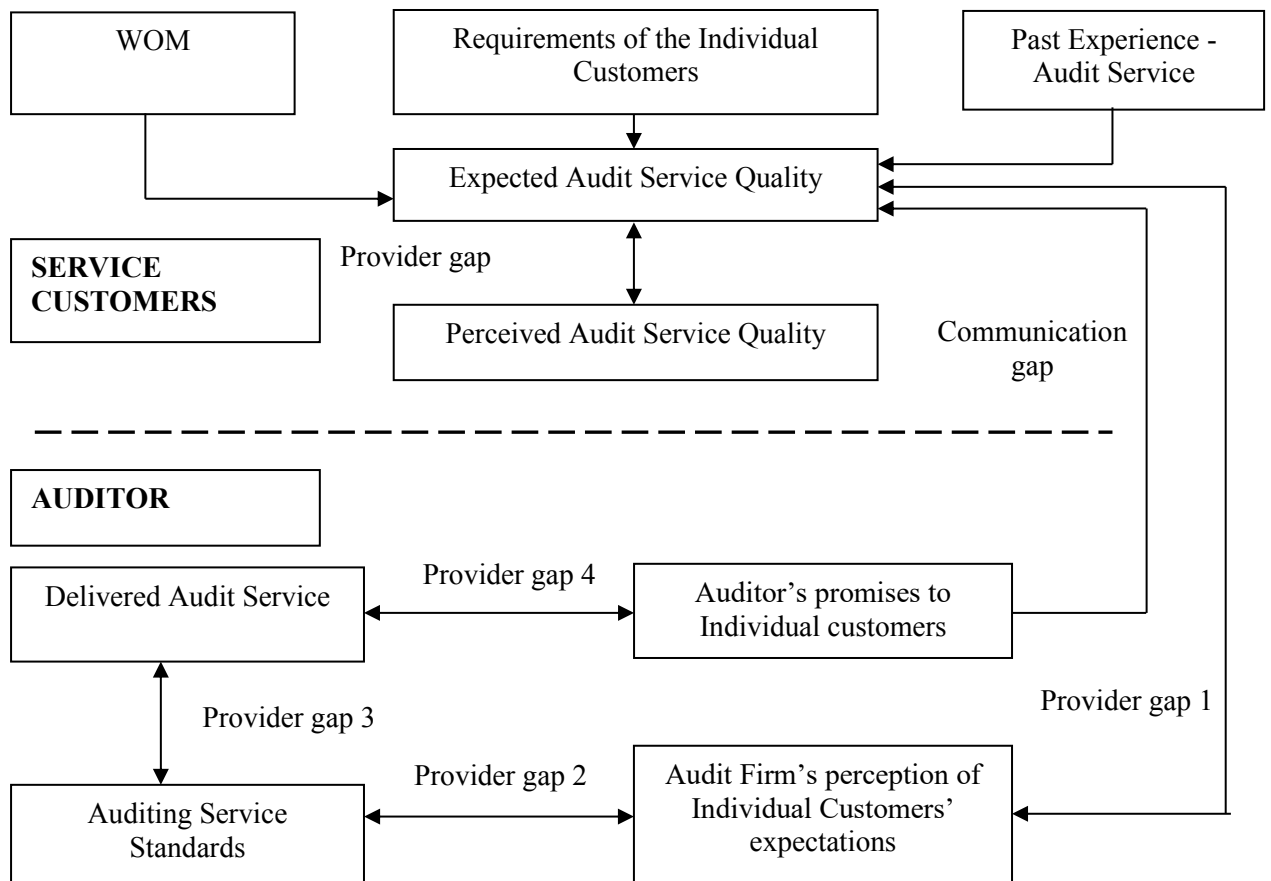
*\* The audit expectation gap model of Ruhnke and Schmidt (2014)*

**Figure 3: Audit expectation gap model of Ruhnke and Schmidt (2014)**
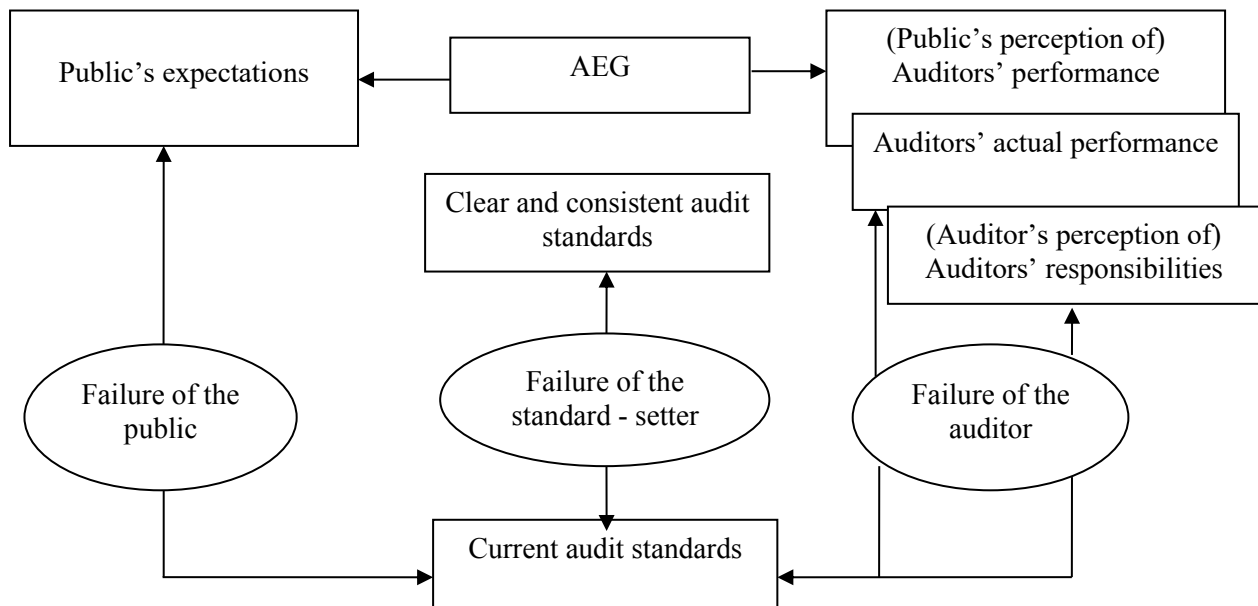


Ruhnke and Schmidt (2014) distinguish between three types of failure to which the audit expectation gap can be attributed: these are indicated in Figure 3. This approach towards analysing the audit expectation gap is useful because any strategies to narrow the gap must necessarily address the relevant cause of failure.

### 3.2. Structure of the AEG based on only users' viewpoint

*\* The audit expectation gap model of MacDonald (1988)*

In the diagram, the hatched horizontal line represents the full possible gap between the highest public expectations from audits (point A on the extreme left) to public perception of what is actually obtained from audits (point E on the extreme right). Point C represents what is called for by present auditing and accounting standards by way of auditor performance and quality of financial information reported.

The segment to the left of that point (line segment A to C) represents possible public expectations that go beyond what is called for by existing standards governing auditor performance and the content and quality of financial reporting. This segment is labeled the "Standards gap".

The segment to the right of point C (line segment C to E) represent possible public perceptions that auditor performance or audited financial information fall short of what is called for by the profession's existing standards. This segment is labeled the "Performance gap".

**Figure 4: Audit expectation gap model of MacDonald (1988)**
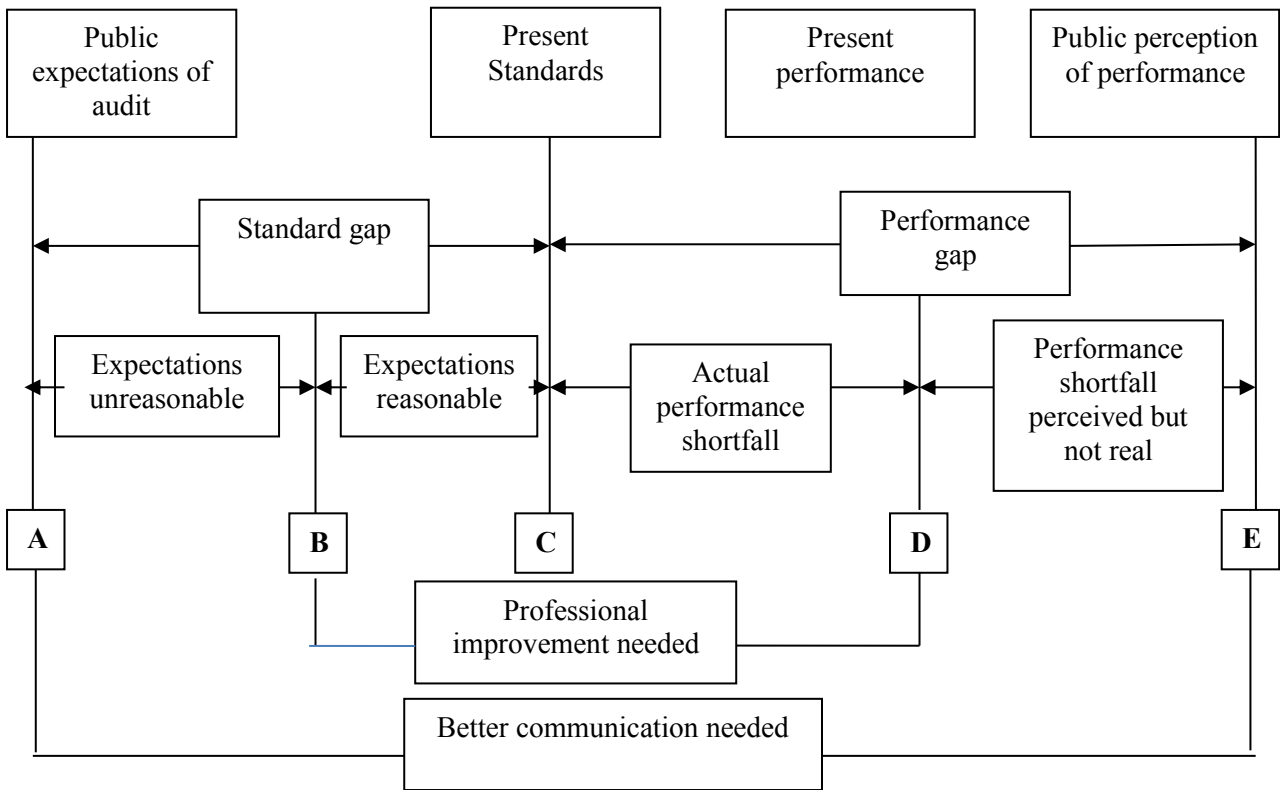


*\* The audit expectation gap model of Porter (1993)*

**Figure 5: Audit expectation gap model of Porter (1993)**
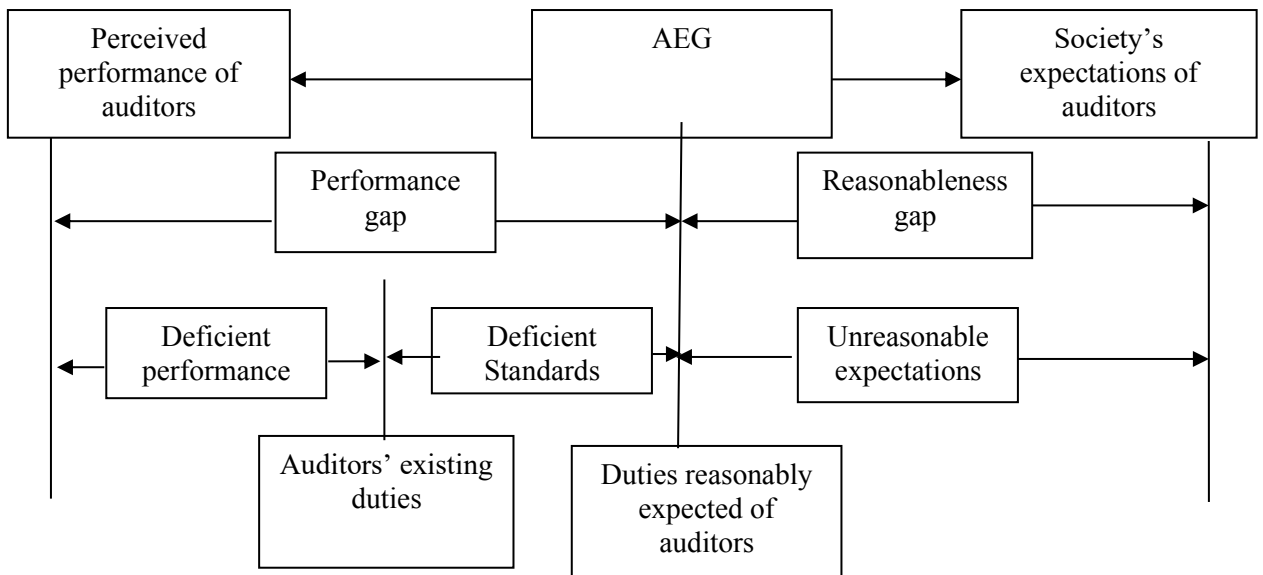


According to the Porter's model (1993), the AEG has two major components:

(1)    A gap between what society expects auditors to achieve and what they can reasonably be expected to accomplish (designated the "reasonableness gap").

(2)      A gap between what society can reasonably expect auditors to accomplish and what they are perceived to achieve (designated the "performance gap"). This may be subdivided into:

(2.1) A gap between the duties which can reasonably be expected of auditors and auditors' existing duties as defined by the law and professional promulgations ("Deficient standards"); and

(2.2) A gap between the expected standard of performance of auditors' existing duties and auditors' perceived performance as expected and perceived by society ("Deficient performance").

Because of the different approaches, the components of the AEG in the studies are very diverse. However, in order to reflect the nature of the AEG fully and correctly as well as to measure the AEG objectively, the AEG model of Porter (1993) is considered the most suitable.

## 4. Literature review of the existence of the expectation gap

The number of studies regarding the existence of AEG is very large. However, the typical areas where the AEG arises in the empirical studies include: auditor's responsibilities; messages communicated through the audit report, the level of audit's assurance.

### 4.1. The existence of the audit expectation gap related to the auditor's responsibilities

The Cohen Committee (1978) noted that the auditor's fraud detection responsibilities may be the largest gap of AEG when they found that a significant proportion of users ranked fraud detection as one of the most important audit objectives. Research by Gramling et al (1996) in the US showed that 86% of no audit experience respondents agreed that auditors should detect all frauds, while only 24% auditors agreed with that statement. In a study by Monre and Woodliff 's (1993) in Australia, surveyed students believe that auditors have more responsibility than business managers in detecting and preventing fraud. The results of Grant et al.'s study (1997) showed that 68.9% of users believe that auditors are required to report suspected fraud to a government agency. The similar results have been shown in many researches such as: Best et al. (2001) in Singapore, Fadzly and Ahmad (2004) in Malaysia, Dixon et al (2006) in Egypt, Onulaka (2014) in Nigeria, Taslima and Fengju (2020) in Bangladesh… Thus, the AEG related to auditor responsibilities of detecting, preventing and reporting the fraud still exists in many countries in the world.

In addition, Best et al (2001) showed that there are significant differences between auditors and bankers, investors regarding the auditor's responsibilities in maintaining the accounting system. Specifically, the auditors believed that this responsibility rests with the management of the auditee, while bankers and investors attributed this responsibility to the auditors. This result has also been shown in some previous studies in Singapore such as the study of Low et al (1988) or Hian (2000). However, this gap did not exist in the study of Schelluch (1996) in Australia. According to Best et al. (2001), Australia has adopted the long

form audit report while Singapore up to 2001 is still using the short form report.

The auditor's responsibility for the effectiveness of the auditee's internal control system has also been evaluated as an important aspect of the AEG in many empirical studies. Schelluch (1996) not only showed that there exists an expectation gap related to the auditor's responsibility for the effectiveness of internal control, but also suggested that this can be reduced by improve the wording used in the audit report. Studies that inherit Schelluch's method (1996) in many countries also gave similar results such as the study of Best et al. (2001) in Singapore, Fadzly and Ahmad (2004) in Malaysia, Dixon et al. 2006) in Egypt, Agyei et al (2013) in Ghana…

Potter's study (1993) in New Zealand assessed the AEG related the auditor responsibilities and showed that 90% of the 200 respondents believe that the auditor is responsible for detecting fraud, 30% of the respondents on the rating of fraud detection as the main objective of the audit. The study of Pierce and Kilcommins (1996) evaluated the difference between the perceptions of the 1st year financial accounting students (who have not studied audit), the 2nd year (who have studied 1 audit module) and the 3rd year (divided into completed and incomplete audit courses) in aspects: auditor responsibilities, ethical and regulatory frameworks of auditing, audit reports. The results showed that the 2nd year students had significantly improved cognitive performance compared to the freshmen, similarly the 3rd year group achieved even more significant improvement in all areas in an impressive way. However, the auditor's responsibility is the area where there is the largest misunderstanding of all year students, even for third-year students who have completed a course in auditing. The authors argued that education can improve students' awareness but does not significantly affect the perception of auditors' responsibilities, especially those related to fraud and illegal acts. Other Studies gave similar results on the existence of AEG related to the auditor's responsibility from the user's side such as: Chinwuba và John (2013), Gbadago (2015)…

In Vietnam, several studies on the AEG related the auditor's responsibilities have been carried out and most of these studies inherited the Porter's (1993) definition, structure and method of measuring AEG. Nguyen and Dang (2019) and the results of this research indicated that AEG in Vietnam consists of three components: the resonableness gap (31%), the deficient standard gap (49%) and the deficient performance gap (20%). Hong and Thuong (2020) also shown that there is the existence of AEG related to the auditors' responsibilities and the factors creating this gap include: the auditors have not fully performed their responsibilities based on the standards, the dificient standards which could not respond to the requirements of society and the users' requirement of audit result could not easily perform.

### 4.2. *The existence of the audit expectation gap related to the messages communicated through the audit report*

In the Cohen Commission report (1978), the result showed that the readers were misinterpreting the audit reports because the information conveyed in the audit report was not

clear. Moreover, the users understood the meaning of the report based on their knowledge and experience and this understanding did not match the message the report wants to convey. Holt and Moiser (1990) noted that there were significant disagreements between auditors and users of the audited financial statements regarding the meaning of unqualified audit report. Another unreasonably ascribed meaning to the unqualified audit report is the effectiveness of the auditee. Humphrey et al (1993) found that 62% of non-audit respondents believe that unqualified audit report ensures that the auditee is operating effectively. The study of Michael et al. (2000) found that users believe that an unqualified audit report proves that the management is effective and the company is financially secure. Chenok (1994) also showed that some people believe that the audit report with an unqualified opinion means that the auditor has certified that there is no fraud and that the company is doing well and will continue to work well and does not face any unforeseen problems in the near future.

Research by Hatherly et al (1991) selected 140 MBA students at the University of Edinburgh and divided them into 2 groups by age (meaning representative of the experience of the respondents). Each group received the same company's financial statements but attached 2 different audit reports, 1 short audit report and 1 extended audit report (SAS 58 reporting template). The results showed clear evidence of the extended audit report's ability to change the reader's perception. Aspects of significant change in reader perception included in the extension of the audit report include: the auditor's impartiality and objectivity, the audit opinion relating to the financial statements as a whole, the financial statements apply appropriate accounting policies, management's responsible for the financial statements. However, according to the author, the "halo" effect of the extension as well as the auditor's responsibility related to fraud and the reliability of financial statements is not mentioned or mentioned but not yet clear. has clearly made user expectations far beyond before. Therefore, it is possible that the extension of the audit report helps to close the expectation gap in some respects but widens the gap in others.

Nguyen and Nguyen (2020) provided empirical evidence that users of audit and assurance services in Vietnam still rely on audit reports to make economic decisions. With the results obtained through this survey, it can be seen that the society often puts more expectation on the auditor's responsibilities in detecting all errors and frauds of audited firms, while there is not much difference in opinion between users of audit in the role of audit and auditors in keeping assurance and trust of investors.

### 4.3. The existence of the audit expectation gap related to the level of audit's assuarance

In the UK, Humphrey et al (1993) noted that the most important difference between auditors and users is the auditor's responsibility to ensure that all fraud has been detected. Specifically, up to 86% of non-audit respondents agree while only 43% of auditors support this statement. In Ruhnke and Schmidt' study (2014), they asked users and auditors about the level of audit assurance required by current auditing standards. Interestingly, only 55% of auditors correctly identified the level of assurance required by the audit standard. According

to Ruhnke and Schmidt (2014), this is because the concept of reasonable assurance has moved from high to reasonable in 2003 in Germany, and this is also considered one of the failures of auditors in their practice, but partly because there is no clear definition of reasonable assurance in the German national auditing standards. Thus, the public's failure to perceive audit assurance is not surprising (Ruhnke and Schmidt, 2014). Besides, the studies of McEnroe and Martens (2001), Onumah et al. (2009), Bedard et al. (2012),... also show that users expect a level of audit assurance is much higher than the auditor.

Beck (1973) mentioned that 71% of users in the survey group want the audit to ensure the effectiveness of management, 81% think that the audit ensures the financial performance of the auditee. As such, the role that users of information assume the auditor plays is much broader than is required by professional standards. Epstein and Geiger (1994) studied investors' perceptions of the degree of assurance associated with the detection of material misstatement by auditors. The results showed that with a material misstatement of error: 51% of investors believe they should receive reasonable assurance while 47% want absolute assurance. In particular, for material misstatement related to fraud: up to 71% of investors believe that auditors must provide absolute assurance and only 26% want reasonable assurance. Thus, most investors expect the auditor to provide absolute assurance in detecting material misstatements.

## 5. Conclusion and direction for future research

The article has systematized previous studies on the AEG in terms of the definition, the structure of AEG and the empirical studies proving the evidence of the existence of AEG. However, the AEG is a crucial issue associated with the external auditing function and has significant implication on the development of auditing standards and practices. In addition, because of the complex and multidimensional nature of the AEG, only a few researchers have proposed the method of measuring this gap and there are many controversial issues when applying these methods in empirical studies.  Moreover, the existence of AEG is inevitable, but we can narrow this gap in many ways such as: improving efficiency, independence of auditors; audit education for users; improving the audit standards… However, the number of studies on the factors affecting the AEG in Vietnam is very limitted while it is important to identify and measure the factors affecting AEG to establish appropriate plans which ensure the reputation of the profession and maintain the public confidence in the audit.

In the future, based on the conducted research overview, the authors will inherit to develop a new method of measuring AEG in the new research context – Vietnam from the viewpoint of users with the 5 – Point Likert scale and propose a a model of factors affecting the AEG for the adoption in Vietnam.

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# VIETNAMESE WORKERS' INTENTION TO PARTICIPATE IN VOLUNTARY SOCIAL INSURANCE: A CASE STUDY IN BAC NINH PROVINCE

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## Abstract

*The purpose of this study was to investigates factors that affect the intention to participate in voluntary social insurance of workers. The study adopted a structural equation modeling (SEM) to examine the preferred factors that affect workers' intention to participate with a sample of 240 respondents in Bac Ninh Province, Vietnam. The results show that TRA and TPB theories provide an appropriate model for explaining customer intention to participate; especially with Moral Responsibility, Understanding, Attitude, State Contribution Support and Customer Consulting. Furthermore, moral responsibility plays the most important role in workers intention to participate in voluntary social insurance. The results offer important implication for policymakers and voluntary social insurance providers and further research in this area could be investigated.*

*Keywords: intention, voluntary social insurance, Bac Ninh, moral responsibility, understanding, attitude, state's support, consultant, SEM.*

## 1. Introduction

Social insurance is an opportunity to reimburse part of the income of employees if they end up losing or decrease their income due to illness, maternity, occupational accident and occupational disease, disability, unemployment, old age, death, on the basis of a financial fund owing to the contribution of the parties to social insurance, with the protection of the State under the statute, to guarantee the safety of life for workers and their families as well as to contribute to the protection of social security (Social Insurance Law, 2014). Social insurance policy is a major policy in Vietnam, and an integral part of the social security policy system. The improvement of the social insurance system and the development of voluntary social insurance programs have been described as one of the key alternatives to the development of the social insurance system and have been institutionalized in a variety of legal documents.

Resolution No. 21-NQ/TW of 22 November 2012 stated: "Social insurance and health insurance are two significant social insurance programs (Central Executive Committee, 2012). They are the core pillars of the framework of social welfare, leading to social development and equality. Socio-political stability and socio-economic growth are assured. When engaging in voluntary social insurance, low-income freelance workers will benefit from pensions that will help to ensure their old age. However, by the end of 2020, the number of voluntary social

insurance applicants will hit almost 1.1 million, an increase of 494 thousand people, nearly doubled in comparison to 2019 (only about 2.2 percent of the workforce in the age group is the farmer and the worker of the informal sector participating in voluntary social insurance) (Vietnam Social Insurance, 2020). Bac Ninh is a province located in the main economic area of Northern Vietnam with higher economic growth and living standards than other regions, but the number of employees engaging in voluntary social insurance is still very low, only 0.2% of the total number of participants in 2020 (Bac Ninh Social Insurance, 2020).

The aim of this study is to examine the current situation of workers participating in voluntary social insurance in the Province of Bac Ninh, Vietnam in order to provide effective strategies to encourage more workers to participate in voluntary social insurance. Faced with the low number of voluntary social insurance participants in the province of Bac Ninh and the general possibility of social insurance imbalances in the near future, the problem of attracting voluntary social insurance participants has become even more relevant.

## 2. Literature review and hypothesis development

### *Literature Review*

Many researches related to social insurance are attracting attention of many researchers (Han, 2016; Kolsrud, 2018; Lin; & Zhu, 2006; Parsons et al., 2003; Qin et al., 2015). Parsons et al., (2003) have examined the role of voluntary social system including Finland, Sweden and, more importantly, Denmark for unemployment. In other contexts, especially less advanced economies, it is suitable to develop the voluntary social system to reduce reasonable individual risk-rating when compulsary social system is overwhelming. In a survey of 600 employees in six provinces in the province of Fujian, Lin & Zhu, (2006) showed that the decision to take part in voluntary insurance depends on awareness of social security, ethical responsibility and an understanding of volunteer social insurer. In addition, Qin et al., (2015) suggested that stable employment, income and insurance policies in each locality affect the participation of workers. In the meantime, Han (2016) argued that if they considered the benefits and the insurance policy of immigrants to have an effect, the implementation of policy and propaganda should be increased to the point where immigrants will understand the policy and the Government will understand and meet the needs of the workers. Kolsrud (2018) also explored social insurance coverage for non-standard workers in OECD countries, where non-standard workers were also not covered in collective bargained social insurance schemes. Consequently, voluntary social insurance was subsidized to minimize the risk and protect the basic life for those who are non-standard workers or unemployment.

In Vietnam, numerious of studies focus on voluntary social insurance (Cuong et al., 2014; Dung & Sinh, 2019; Nam, 2019; Phuong & Song, 2014; Thao, 2017). Phuong & Song, (2014) has mentioned about the current situation of employees participating in voluntary social insurance in Vinh Phuc province with 200 surveys. Through data analysis mainly by descriptive statistical method, the author has pointed out 7 factors affecting the employees'

decision to participate in unemployment insurance, which are: Unstable employment and low income (82%), lack of information (56%), do not trust (27%), do not need insurance (11%). Combined with the opinions of the interviewees, the study proposes several solutions to attract employees to participate in voluntary social insurance in the province such as raising awareness of the need to participate in voluntary social insurance, strongly reforming the service work of the social insurance agency; and creating supportive policies for beneficiaries of social welfare. Cuong et al., (2014); Dung & Sinh, (2019); Nam, (2019) and Thao, (2017) has investigated in researching factors affecting the interest or decision to participate of voluntary social insurance of workers from different Province such as Nghe An Province, Ben Tre Province, Tra Vinh Province, Thach That district - Ha Noi City and Vietnam. These researches mainly focused on consumer behaviour theories TRA or TPB with different factors such as social security awareness, employees' behavior, understanding of voluntary social security insurance, the social effect of voluntary social insurance, employee income, social media, volunteer social insurance policy, the awareness of adult health at age, family expectation, ethcal responsibility,income, perceived risk and moral responsibility. As can be seen from different factors, these researches on different places have brought out different results with both positive and negative affects. Therefore, it is essential for the researcher to investigate about Intention to Participate in Voluntary Social Insurance of Vietnamese workers: A case study in Bac Ninh Province – one of the most important industrial zones in the north of Vietnam.

### Research Hypothesis

- Moral responsibility

Vietnamese people have the concept that children must have the responsibility to take care of their parents when they get old. However, when society is developing, many people have had a change in perception. People live more responsible for themselves, especially interested in savin when they have a stable income to have a independent in the old age, do not become a burden to the family and do not must depend on descendants.

*H1: Moral responsibility has a positive influence on the decision to participate in voluntary social insurance to express the desire to protect oneself.*

- People's understanding of voluntary social insurance

Understanding insurance is one of the factors affecting the intention to participate in voluntary social insurance. The intention to participate in voluntary social insurance increases when the level of knowledge the voluntary social insurance increases. Therefore, the understanding of social insurance has a positive effect on interest in participating in social insurance.

*H2: Understanding of voluntary social insurance has a positive impact on participating in voluntary social insurance.*

- Attitude towards participating in social insurance

When workers have positive attitudes with the voluntary social insurance policy. The intention to find information, participate and make contributions to social insurance will increase.

*H3: Attitude towards voluntary social insurance has a positive influence on intentions to participate in voluntary social insurance.*

- State's Support

The State opens supportive policies to attract workers, and this increases the decision to participate in voluntary social insurance.

*H4: State's Support has a positive impact with the participation of voluntary social insurance.*

- Customer Consultant

The consulting for workers on voluntary social insurance that is well done and thoughtful will have good effects on the decision to participate in voluntary social insurance.

*H5: Customer Consultant that have a positive influence on interest in participating in voluntary social insurance.*

In addition, the study does not research the influence of demographic factors but focuses more on psychological factors, so the demographic variables are integrated into the model in terms of controlled variables, in order to  better affirm the causal nature of the psychological variables. Therefore, this study does not provide hypotheses for them.

**Figure 1: Research model on intention to purchase voluntary social insurance**
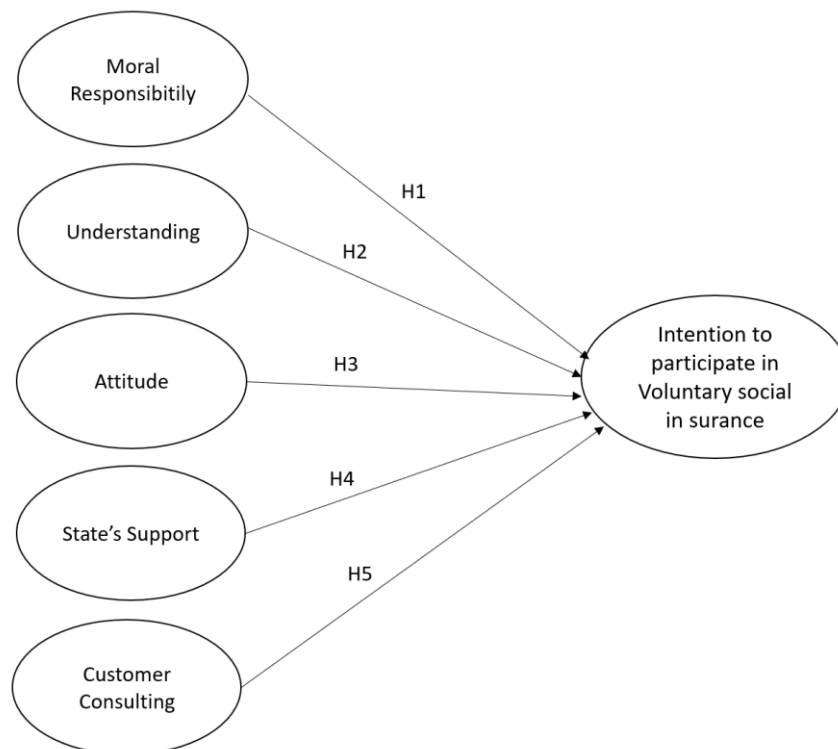
## 3. Research Methodology

The analytical methods used in this study are descriptive statistics to have an overall assessment of all factors, as well as test Cronbach's Alpha coefficient, analyze discovery factors to build and test scales of these analyzes were carried out with the help of SPSS software. Also, the study also used AMOS software to test the reliability, discriminant value, convergence value, the uniqueness of concepts and scales, and test hypotheses and tissue suitability. Figure in the study by Structural Equation Model (SEM).

### Participants

From a total of 240 respondents, 109 (45.42%) respondents are male, and 131 (54.28%) are female. The 31-40 age group represents 40.42% of the respondents and 41-50 age group represents 25.83%. Most of the respondents have finished their high school (37.92%, n = 91). The respondents' monthly income ranged mainly from VND 5 - 9 millions (35.84%) to 9 – 15 millions (27.08%).

### The Current Situation of Participating in Voluntary Social Insurance

The current situation of the respondents in participating in voluntary social insurance is presented in Table 1.

**Table 1: The current situation of participating in voluntary social insurance**

|  |  | Frequency | Percentage |
|---|---|---|---|
| Status of participating | Not participate | 157 | 65.42 |
|  | Have been participating | 83 | 34.58 |
| Reasons for not participating | Low / unstable income | 53 | 33.76 |
|  | Unclear about the voluntary social insurance policy | 61 | 38.85 |
|  | Not knowing about voluntary social insurance | 24 | 15.29 |
|  | No demand to participate in voluntary social insurance | 19 | 12.1 |
| Status of participation in voluntary social insurance | Have stopped participating | 27 | 32.53 |
|  | Still participating | 56 | 67.47 |
| Reasons for stop participating | Unstable income source | 11 | 40.74 |
|  | The policy of voluntary social insurance is not good | 3 | 11.11 |
|  | No longer need to participate in voluntary social insurance | 8 | 29.63 |
|  | Voluntary social insurance does not bring many benefits | 5 | 18.52 |

## 4. Results

### Table 2: Construct validity

| Construct | Item | Average value | Standard deviation | Corrected Item-Total Correlation | Cronbach's Alpha if item Deleted | Cronbach's Alpha |
|-----------|------|---------------|--------------------|----------------------------------|----------------------------------|------------------|
| **Moral Responsibility** | MR1 | 3.65 | 1.204 | 0.852 | 0.664 | **0.793** |
| | MR2 | 2.80 | 1.410 | 0.010 | 0.925 | |
| | MR3 | 3.51 | 1.261 | 0.743 | 0.697 | |
| | MR4 | 3.59 | 1.265 | 0.718 | 0.706 | |
| | MR5 | 3.53 | 1.280 | 0.749 | 0.694 | |
| **Understanding** | UN1 | 3.67 | 1.076 | 0.785 | 0.718 | **0.798** |
| | UN2 | 3.65 | 1.165 | 0.688 | 0.736 | |
| | UN3 | 2.78 | 1.226 | 0.448 | 0.791 | |
| | UN4 | 3.55 | 1.216 | 0.631 | 0.748 | |
| | UN5 | 3.62 | 1.258 | 0.680 | 0.735 | |
| | UN6 | 2.52 | 1.316 | 0.192 | 0.851 | |
| **Attitude** | ATT1 | 2.58 | .834 | 0.853 | 0.743 | **0.840** |
| | ATT2 | 2.50 | 1.086 | 0.624 | 0.819 | |
| | ATT3 | 2.63 | 1.124 | 0.627 | 0.820 | |
| | ATT4 | 2.64 | 1.137 | 0.650 | 0.810 | |
| **State's Support** | SS1 | 1.85 | 0.884 | 0.904 | 0.837 | **0.893** |
| | SS2 | 1.98 | 1.023 | 0.674 | 0.883 | |
| | SS3 | 2.06 | 1.053 | 0.730 | 0.871 | |
| | SS4 | 2.02 | 1.012 | 0.703 | 0.877 | |
| | SS5 | 2.03 | 1.024 | 0.702 | 0.877 | |
| **Customer Consulting** | CCS1 | 2.84 | .906 | 0.850 | 0.679 | **0.756** |
| | CCS2 | 2.81 | 1.156 | 0.628 | 0.700 | |
| | CCS3 | 2.80 | 1.237 | 0.638 | 0.696 | |
| | CCS4 | 2.82 | 1.246 | 0.672 | 0.689 | |
| | CCS5 | 2.91 | 1.186 | 0.675 | 0.690 | |
| | CCS6 | 2.81 | 1.444 | -0.074 | 0.832 | |
| | CCS7 | 2.88 | 1.201 | 0.643 | 0.696 | |
| | CCS8 | 2.95 | 1.412 | 0.031 | 0.812 | |
| **Intention** | INT1 | 3.59 | 1.102 | 0.871 | 0.798 | **0.898** |
| | INT2 | 3.47 | 1.210 | 0.774 | 0.878 | |
| | INT3 | 3.46 | 1.192 | 0.759 | 0.889 | |

Table 2 above summarizes the descriptive statistics and the reliability of the variables in the research model. The results showed that 6 observed variables all have Cronbach's Alpha index> 0.7, satisfying conditions of good reliability given by Hair et al. (1998) . Furthermore, observing the summary table, it can be seen that when removing MR2, UN6, CCS6, CCS8, the variables including these questions tended to increase their reliability. Therefore, the above questions are excluded from the research model.

**Exploratory Factor Analysis (EFA)**

The EFA method was used to understand the underlying relationship of the factors before going to the SEM for testing of the suggested model and hypotheses.

**Table 3: KMO and Bartlett's Test**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.824 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 4332.938 |
| | df | 300 |
| | Sig. | .000 |

As shown on Table 3, the KMO index measuring the appropriateness of sampling is 0.824 (satisfying the condition of $0.5 \leq 0.824 \leq 1$) and the value of the significance of Bartlett's Test of Sphericity test is 0, satisfies the condition ($0.000 < 0.05$) in which it is significant for the EFA to be considered as fitting (J. Hair et al., 2010)

**Table 4: EFA Pattern Matrix**

| Construct | Item | Factor Loading | Cronbach's Alpha |
|---|---|---|---|
| Moral Responsibility | MR1 | 0.988 | **0.925** |
| | MR3 | 0.829 | |
| | MR4 | 0.824 | |
| | MR5 | 0.837 | |
| Understanding | UN1 | 0.990 | **0.905** |
| | UN2 | 0.767 | |
| | UN4 | 0.773 | |
| | UN5 | 0.854 | |
| Attitude | ATT1 | 0.952 | **0.819** |
| | ATT3 | 0.739 | |
| | ATT4 | 0.712 | |
| State's Support | SSP1 | 0.983 | **0.893** |

| | | | |
|---|---|---|---|
| | SSP2 | 0.720 | |
| | SSP3 | 0.774 | |
| | SSP4 | 0.770 | |
| | SSP5 | 0.742 | |
| Customer Consulting | CCS1 | 0.972 | 0.904 |
| | CCS2 | 0.707 | |
| | CCS3 | 0.773 | |
| | CCS4 | 0.775 | |
| | CSS5 | 0.799 | |
| | CSS7 | 0.739 | |
| Intention | INT1 | 0.970 | 0.898 |
| | INT2 | 0.851 | |
| | INT3 | 0.764 | |

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Table 4 represents the results of the pattern matrix of EFA. Factor loadings > 0.7, as identified by J. Hair et al. (2010), indicate different factor structure. This research used 0.7 as a cutoff value for factor loadings. Because of that, UN3 and ATT2 are removed due to their factor loading are smaller than 0.7.

**Confirmatory Factor Analysis (CFA)**

The measurement model's overall goodness of fit was assessed using the model fit indices listed in Table 5

**Table 5: Goodness of fit indicator of CFA**

| Measure | Estimate | Recommended value (J. Hair et al., 2010) | Interception |
|---|---|---|---|
| $\chi 2/df$ | 1.083 ($\chi 2 = 281.464$, df = 260) | $1 < \chi 2/df \leq 2$ | Good fit |
| GFI | 0.918 | $\geq 0.9$ | Good fit |
| CFI | 0.995 | $\geq 0.9$ | Good fit |
| TLI | 0.994 | $\geq 0.9$ | Good fit |
| RMSEA | 0.019 | $\leq 0.03$ | Excellent fit |
| $\chi 2/df$ = Chi-square / degrees of freedom<br>GFI = Goodness of fit index<br>CFI = Comparative fit index<br>TLI = Tucker-Lewis index<br>RMSEA = Root mean square error of approximation | | | |

Accordingly, model-fit analysis of 6 scale variables in the study all meets the above conditions. Therefore, the variables on the scale meet the level of the model's suitability, which indicates a good level of fit.

**Table 6: Final measurement model testing results**

| Construct | Item | Factor Loading | CR | AVE | Cronbach's Alpha |
|---|---|---|---|---|---|
| Moral Responsibility | MR1 | 0.988 | **0.928** | **0.764** | **0.925** |
|  | MR3 | 0.829 |  |  |  |
|  | MR4 | 0.824 |  |  |  |
|  | MR5 | 0.837 |  |  |  |
| Understanding | UN1 | 0.990 | **0.911** | **0.721** | **0.905** |
|  | UN2 | 0.767 |  |  |  |
|  | UN4 | 0.773 |  |  |  |
|  | UN5 | 0.854 |  |  |  |
| Attitude | ATT1 | 0.952 | **0.849** | **0.658** | **0.819** |
|  | ATT3 | 0.739 |  |  |  |
|  | ATT4 | 0.712 |  |  |  |
| State's Support | SSP1 | 0.983 | **0.903** | **0.645** | **0.893** |
|  | SSP2 | 0.720 |  |  |  |
|  | SSP3 | 0.774 |  |  |  |
|  | SSP4 | 0.770 |  |  |  |
|  | SSP5 | 0.742 |  |  |  |
| Customer Consulting | CCS1 | 0.972 | **0.912** | **0.635** | **0.904** |
|  | CCS2 | 0.707 |  |  |  |
|  | CCS3 | 0.773 |  |  |  |
|  | CCS4 | 0.775 |  |  |  |
|  | CSS5 | 0.799 |  |  |  |
|  | CSS7 | 0.739 |  |  |  |
| Intention | INT1 | 0.970 | **0.904** | **0.760** | **0.898** |
|  | INT2 | 0.851 |  |  |  |
|  | INT3 | 0.764 |  |  |  |

As of Table 6, according to J. Hair et al. (2010), the suitability testing conditions for scale and variable questions are reliability (Cronbach's Alpha) ≥ 0.7, composite reliability (Composite Reliability) ≥ 0.7, Factor Loadings ≥ 0.6 and extracted variance (AVE) ≥ 0.5. It can be seen that the data analysis results of the above data sets satisfy the requirements.

**Table 7: Square root of AVE and constructs correlation coefficients**

| Variables | Mean | Std. Deviation | MR | UN | ATT | SSP | CCS | INT |
|---|---|---|---|---|---|---|---|---|
| MR | 3.4150 | 0.95072 | **0.874** | | | | | |
| UN | 3.3000 | 0.85491 | 0.113 | **0.849** | | | | |
| ATT | 2.5885 | 0.86525 | 0.276[**] | 0.191[**] | **0.811** | | | |
| SSP | 1.9883 | 0.83713 | 0.144[*] | 0.036 | 0.217[**] | **0.803** | | |
| CCS | 2.8531 | 0.74968 | 0.079 | 0.067 | 0.132[*] | 0.111 | **0.797** | |
| INT | 2.6313 | 0.79910 | 0.397[**] | 0.279[**] | 0.288[**] | 0.193[**] | 0.181[**] | **0.872** |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | | |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | | | | | | |

To avoid the case of multicollinearity, constructs correlation coefficients was performed (Fornell & Larcker, 1981). Accordingly, if the square root of the AVE for each variable is greater than the maximum correlation index of that variable, then the variables in the data set that are satisfied are not multicollinear (or satisfying the discriminant validity).

**Structural Equation Model (SEM)**

Following the establishment of an acceptable measurement model, the structural model was examined as part of the confirmatory factor analysis (CFA). The proposed model was determined to match the data using the goodness of fit indices shown in Table 8.

**Table 8: Goodness of fit indicator of SEM**

| Measure | Estimate | Recommended value (Hair et al., 2014) | Interception |
|---|---|---|---|
| $\chi 2/df$ | 1.344 ($\chi 2 = 362.852$, df = 270) | $1 < \chi 2/df \leq 2$ | Good fit |
| GFI | 0.891 | $\approx 0.9$ | Acceptable fit |
| CFI | 0.978 | $\geq 0.95$ | Excellent fit |
| TLI | 0.975 | $\geq 0.9$ | Good fit |
| RMSEA | 0.038 | $\leq 0.05$ | Acceptable fit |
| $\chi 2/df$ = Chi-square / degrees of freedom | | | |
| GFI = Goodness of fit index | | | |
| CFI = Comparative fit index | | | |
| TLI = Tucker-Lewis index | | | |
| RMSEA = Root mean square error of approximation | | | |

In this paper, we will use **T-test to analyse Gender, and One-way ANOVA for Age, Education, Occupation and Income (see Appendix A).**

The sig T-Test value < 0.05 **(Appendix A, Table A.1)**, it can be concluded that there is a statistically significant difference in the intention level of the respondents of different genders.

Hansen (2005) indicated that If the sig. in ANOVA < 0.05, there is a statistically significant difference in the intention level of the respondents of different groups, and there is no statistically significant difference in the intention level of the respondents of different age groups if the sig in the ANOVA table $\geq$ 0.05 **(Appendix A, Table A.2)**,.

It can be seen from the table that Age, Education and Income have ANOVA sig > 0.05, indicated that there is no statistically significant difference in the intention level of the respondents of different groups. In contrast, there is a statistically significant difference in the intention level of employees working on different jobs.

Construction industry and Education, health, culture, society; and Construction industry and Other jobs all have sig < 0.05 **(Appendix A, Table A.3)**, which means there are difference in intention among workers in Construction industry compared to Education, health, culture, society; as well as Construction industry compared to other jobs.

Table 9 shows the results of the structural model with path coefficients, indicating the significance of all hypotheses.

**Table 9: Table of Significance Level**

| Hypothesis | Structural Path | | | $R^2$ | Standardized Beta | p. value | Results |
|---|---|---|---|---|---|---|---|
| H1 | INT | <= | MR | 0.242 | 0.350 | p. $\leq 0.001^{***}$ | Accepted |
| H2 | INT | <= | UN | 0.242 | 0.269 | p. $\leq 0.001^{***}$ | Accepted |
| H3 | INT | <= | ATT | 0.242 | 0.120 | p. $\leq 0.1^{*}$ | Accepted |
| H4 | INT | <= | SSP | 0.242 | 0.106 | p. $\leq 0.1^{*}$ | Accepted |
| H5 | INT | <= | CCS | 0.242 | 0.149 | p. $\leq 0.1^{*}$ | Accepted |

*** The level of importance is $\geq$ 99.99%

** The level of importance is $\geq$ 99%

* The level of importance is $\geq$ 90%

The table has shown that 23.2% of 240 samples are explained by the above model. Accordingly, all of the variables satisfy the condition of p.value. $\leq$ 0.1 (value below 90% at the acceptable level given by (J. Hair et al., 2010)

According to the standardized Beta value:

- Each time Moral Responsibility increased by one unit, Intention will increase by 0.350 units.

- Every time Understanding increased by one unit, Intention would increase by 0.269 units.

- Every time Attitude increased by one unit, Intention would increase by 0.120 units.

- Every time State's Support increased by one unit, Intention would increase by 0.106 units.

- Each time Customer Consulting increases by one unit, Intention will increase by 0.149 units.

It can be seen that Moral Responsibility has the greatest impact on the intention to participate in voluntary social insurance, followed by Attitude, Customer Consulting, Understanding and State's Support. The results show that Moral responsibility and Attitude variables contribute high to employees' intention to participate in voluntary social insurance. Bac Ninh is one of the developed provinces, so people's awareness and understanding is relatively good. Many people have worried about bad things that may happen in life and understand the need to have a stable source of income in retirement to be able to reduce the burden on the family. Responsibility to self is also responsibility to family and society and enhances the role of the individual himself. Furthermore, people in Bac Ninh Province are more willing to listen and discuss and have good attitude with voluntary social insurance. Therefore, their understanding of social insurance are getting higher in order to make intention to participate in voluntary social insurance to have regular income in retirement in the future. In addition, variables such as Customers Consulting and State's Support have a contribution to employees' intention to participate in voluntary social insurance but are very small. This shows that the government's policy to support voluntary social insurance services has not really met the needs of employees, and customer care has not really been paid much attention.

## 5. Conclusions

Through survey results from the questionnaire as well as data collected from the social insurance agency of Bac Ninh province, it can be seen that the number of employees participating in voluntary social insurance is still increasing year by year, however, the rate still very small compared to those participating in compulsory social insurance. The results obtained from the use of data analysis software SPSS 25 to provide a linear structure model (SEM) showed that all factors are affecting the employee's intention to participate in voluntary social insurance include Moral Responsibility, Understanding, Attitude, State Contribution Support and Customer Consulting. Since then, some recommendations are suggested to improve the factors affecting the employees' participation in voluntary social insurance.

It is essential for the workers to have more knowledge about how to Communication work in Bac Ninh province has obtained certain results. However, there are still some limitations in communication such as the content is still common, not targeting specific groups of people, the number of works is not many. Therefore, many workers still do not fully

understand the voluntary social insurance policy. To overcome this problem, in the coming time, it is necessary to promote communication in terms of both quality and quantity; reform both propaganda methods and propaganda content. Moreover, the consultant need to improve the services to pay attention more about customers, share information, mobilize and encourage employees to participate in voluntary social insurance. The Government will promulgate an action plan and implementation of the reforms of social insurance policies, including many contents on voluntary social insurance, building a multi-tiered social insurance model, submitting to the Congress for amendments and supplements of legal documents (Labor Law, Social Insurance Law, Employment Law, Health Insurance Law, ...), social pension design, coverage expansion of social insurance.

Voluntary social insurance policy has been implemented since 2008, with the expectation to support freelance workers, people with low and precarious incomes to enjoy a monthly pension, and medical care in old age. Voluntary social insurance is one of the policies that play a significant role in Vietnam's social security system. Improving the effectiveness of the voluntary social insurance policy and expanding coverage is an extremely important thing to promote its role in helping stabilize social security for the people and developing the country's economy.

**Appendix**

**Table A.1:T-test**

|  | Levene's sig. | **Independent-samples T-test** |
|---|---|---|
| Equal variances not assumed | 0.267 | 0.010 |
| Equal variances assumed |  | 0.010 |

**Table A.2: Levene's Test**

|  | sig Levene Statistic | ANOVA |
|---|---|---|
| Age | 0.003 | 0.259 |
| Education | 0.306 | 0.654 |
| Occupation | 0.503 | 0.042 |
| Income | 0.065 | 0.125 |

**Table A.3: Multiple comparisons**

| (I) NGHENGHIEP | (J) NGHENGHIEP | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|
| Agriculture, forestry & fisheries | Construction industry | -.165 | .238 | .489 |
|  | Education, health, culture, society | .447 | .245 | .069 |
|  | Small & Retail Business | .000 | .282 | 1.000 |
|  | Other | .399 | .256 | .121 |
| Construction industry | Agriculture, forestry & fisheries | .165 | .238 | .489 |
|  | Education, health, culture, society | .612* | .231 | .009 |
|  | Small & Retail Business | .165 | .269 | .541 |
|  | Other | .564* | .243 | .021 |

| | | | | |
|---|---|---|---|---|
| Education, health, culture, society | Agriculture, forestry & fisheries | -.447 | .245 | .069 |
| | Construction industry | -.612* | .231 | .009 |
| | Small & Retail Business | -.447 | .275 | .106 |
| | Other | -.048 | .249 | .847 |
| Small & Retail Business | Agriculture, forestry & fisheries | .000 | .282 | 1.000 |
| | Construction industry | -.165 | .269 | .541 |
| | Education, health, culture, society | .447 | .275 | .106 |
| | Other | .399 | .285 | .164 |
| Other | Agriculture, forestry & fisheries | -.399 | .256 | .121 |
| | Construction industry | -.564* | .243 | .021 |
| | Education, health, culture, society | .048 | .249 | .847 |
| | Small & Retail Business | -.399 | .285 | .164 |

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# IMPACT OF CHARACTERISTICS OF THE AUDIT COMMITTEE ON TAX AVOIDANCE: THE CASE OF VIETNAM

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## Abstract

*This study aims to examine the impact of the characteristics of the audit committee on tax avoidance in Vietnam. The article uses data of non-financial firms listed on the Ho Chi Minh City and Ha Noi Stock Exchange over the period 2010–2019. By using the FEM and SGMM estimation for panel data, the empirical results show how the characteristics of the audit committee affect tax avoidance differently. Specifically, we find that the size of the audit committee has a positive correlation to tax avoidance while the proportion of female members, financial and accounting experts of the audit committee can constraint tax avoidance behaviors. Our finding provides some important implications for listed firms to enhance the role of the audit committee in constraining tax avoidance behavior.*

***Keywords:*** *audit committee size; audit committee independence; gender; financial experts; tax avoidance.*

JEL codes: G32, H25, H26

## 1. Introduction

If tax evasion is an illegal act, tax avoidance is considered a legal activity. As a for-profit entity, maximizing shareholder's wealth is one of the managers' key criteria.. Therefore, when facing the goals of business performance as well as the need for capital, tax avoidance is an indispensable way in the management strategy, because from the perspective of businesses, tax is an expense. Large fees with mandatory character are managed by the legal network. For that reason, tax avoidance activities are becoming more and more popular with increasing sophistication and complexity in companies. Based on agency theory, many studies show that tax avoidance is associated with corporate governance because managers always have incentives to minimize tax costs and help enterprises' value increase. Plesko (2002) shows that tax accounting disparity increases when managers seek to increase accounting profit but not taxable profit in order to minimize tax costs. This phenomenon is said to be the manager's implementation of the tax planning strategy. In addition, managers of listed companies always have an incentive to minimize income tax costs but at the same time

still want to show effective business results through increased profit after tax and make it stable over time for their own personal gain.

Economists believe that the corporate governance mechanism generally contributes to solving the agency problem and propose different governance mechanisms to build an appropriate one for firms. As such, governance mechanisms often focus on the controlling role of management (Fama, 1980; Fama & Jensen, 1983), the ownership structure (Jensen & Meckling, 1976; Nguyen, 2020), the labor market, and the board of directors (Grossman & Hart, 1980; Hart, 1983). Many studies on corporate governance have documented the effectiveness of firms controlled by good managers (Shleifer & Vishny, 1997; John & Senbet, 1998; Gillan, 2006). Given the importance of the firm's control mechanism, many experts and researchers appreciate the role of the supervisory mechanism in corporate governance in ensuring the responsibility of managers. Most national laws require listed companies to have an independent audit and audit committee. Not only are they important factors in the statutory governance structure, but they also reflect the importance of the audit committee in the important functions of the corporate governance mechanism. The main function of the audit committee is to ensure the quality of financial statements and control systems (Collier, 2006; Oussii & Taktak, 2018). McMullen (1996) also argues that the presence of an audit committee makes financial statements more reliable. These studies demonstrate that a high quality audit committee combined with an independent auditor effectively fulfills their primary task of overseeing the financial reporting process. The literature agrees that the audit committee is the "apex" of internal control and has an important role in controlling the system (Ashfaq & Rui, 2019; Lisic et al., 2019).

In addition, corporate finance researchers often view tax liability only as market imperfections that affect capital structure and dividend policy, while public finance researchers have also not incorporated the possibility of the problem that is represented in their previous analyses. In developing countries, tax codes are complex and make it easy for firms to get tax evasion (Khlif & Amara, 2019). Tax avoidance is also found important in developing countries. Minh Ha et al. (2021) find that tax avoidance has a negative impact on the value of businesses in Vietnamese listed firms. Therefore, firms find it more and more important to find appropriate corporate governance to oversee tax avoidance in developing countries like Vietnam. However, although internal control as well as audit committee may have an important role in oversight tax avoidance, there are fewer studies investigating the relationship between audit committee structure and tax avoidance. Tjondro and Olivia (2018) find that the audit committee has relation to the trade-off between tax avoidance and cost of debt. Hsu et al. (2018) provide evidence that financial experts on the audit committee oversee the corporate tax planning process according to the firm's business strategy. Based on agency theory, this study extends the literature by investigating the impact of the number of auditing board characteristics on tax avoidance in an emerging economy such as Vietnam.

## 2. Literature review and hypothesis development

When a company decides whether to implement tax avoidance, it must consider many issues related to the benefits received and the costs incurred in doing so. And when implementing tax avoidance behavior, the manager considers the benefits achieved, which include the benefits that the manager receives (rewards, promotions) versus the costs that may arise (auditing costs, fines, reputational damage). Thus, the tax avoidance behavior depends mainly on the representatives (i.e. managers) as well as the control system to oversee the manager's decision (i.e. internal control). Forker (1992) argues that the existence of an audit committee can improve the internal control system and considers it as an effective monitoring device to improve the quality of information disclosure. Beasley and Salterio (2001) also argue that the board of directors and the audit committee are important internal monitoring mechanisms. Meanwhile, Sun and Liu (2014) argue that the effectiveness of the audit committee depends on six characteristics of the audit committee, including: having a member who is an expert in finance and accounting, the ratio of directors from 10 years of operation in the audit committee, the percentage of independent members, the ownership percentage of the audit committee, gender and size of the audit committee.

In order to follow the principles of appropriate corporate governance, firms are required to have an audit committee implementing the principles of responsibility and accountability. An audit committee is in charge of controlling the process of financial reporting and internal controller (Annisa & Kurniasih, 2012). Board of directors are obliged to develop an audit committee consisting of at least 3 members appointed or dismissed by the board of commissioners, and they are responsible to the board of commissioners as well (Pohan, 2008). However, the large audit committee may not enhance its effectiveness. Directors in large boards may also face greater difficulties in expressing their opinions in the limited time available during board meetings (Lipton & Lorsch, 1992). Nguyen and Dang (2020) show that audit committee size increases bank risk due to low effectiveness. Based on these arguments, we propose the hypothesis related to audit committee size as follow:

*H1: Size of the audit committee has a negative relationship with tax avoidance.*

Previous studies have emphasized that moderators have two characteristics, including risk- takers and risk-averse (Tandean & Winnie, 2016). Watson and McNaughton (2007) argue that women are generally considered more risk averse than men and tend to make decisions carefully. In supporting  this view, prior studies found that female members on board can enhance firm performance (Ararat & Yurtoglu, 2020) (Smith et al., 2006). Green and Homroy (2018) also find that female members on Board committees increase corporate governance effectiveness and enhance firm performance. According to findings from previous studies, we predict that females on the audit committee can enhance audit committee effectiveness and put constraints on tax avoidance. Thus, we propose the hypothesis H2 as following:

*H2: The percentage of female members in the audit committee has a negative relationship with tax avoidance.*

Independent directors on Board were found to be important in corporate governance in literature. Liu et al. (2015) report the positive relationship between board independence in firm performance in China. Shan (2019) finds that board independence has a negative relation to managerial ownership and reduces agency problems. Similar to the Board, the decisions of the audit committee are significantly influenced by independent members, who are outside the company and participate in the management as capital contributors, representatives of the companies' big stockholders. Tandean and Winnie (2016) argue that the independent members can help plan the company's long-term strategies and periodically evaluate strategy implementation to reduce actions related to tax avoidance. Following our expectation, we propose the hypothesis H3 related to audit committee independence as follows:

*H3: The percentage of independent members in the audit committee has a negative relationship with tax avoidance.*

Finally, listed companies need to select a group of experts with expertise in finance and accounting to join the audit committee (Tandean & Winnie, 2016). The audit committee is then empowered to act independently in performing its duties and responsibilities. The responsibility of the audit committee in corporate governance is to ensure that the company has been run under relevant laws and regulations in the areas of finance and accounting. Therefore, the selection of finance and accounting professionals on the audit committee makes the implementation more independent of the auditors. Collision between management and financial and accounting professionals becomes more difficult, which reduces tax avoidance actions (Watts & Zimmerman, 1983; Tandean & Winnie, 2016). We propose the final hypothesis H4 related to financial and accounting experts in the audit committee as follows:

*H4: The proportion of financial and accounting experts in the audit committee has a negative relationship with tax avoidance.*

## 3. Methodology

### 3.1. Empirical model

Based on the agency theory, the empirical model has the form:

$$Tax\_Avo_{it} = \beta_1 Aud\_Com_{it} + \alpha X_{it} + \varepsilon_{it} \quad (1)$$

The dependent variable Tax_Avo is tax avoidance. Previous studies did not measure the dependent variable alone because they assumed that each way of measuring the dependent variable has its limitations. However, previous studies used the following two common measures:

First, Hanlon and Slemrod (2009) and Hanlon and Heitzman (2010) measure tax avoidance behavior based on effective tax rate (ETR). ETR is based on the idea that managers are aware that effective tax planning has the potential to reduce tax costs (Dyreng et al.,

2008). The practice shows that the measurement by ETR reflects strategies to avoid tax, defer the payable tax expense to later periods, but does not affect the current corporate income tax expense on the financial statements. In addition, ETR is also unaffected by changes in tax policy, thus providing an accurate estimate of tax avoidance behavior at the firm dynamic level (Dyreng et al., 2008). ETR is measured by current tax paid by the company in accordance with laws of taxation on taxable income.

ETR = Current tax expense/pre-tax income   (2)

Dyreng et al. (2008) and Hanlon and Heitzman (2010) suggest that the lower the ETR, the higher the firm's tax avoidance behavior.

Second, Manzon Jr and Plesko (2001) gave a way to determine BTD (Book-tax difference) as the total difference between accounting income before tax and taxable income, then, temporary difference and permanent difference, indicating that the company is practicing tax avoidance. Desai and Dharmapala (2006), Wilson (2010), Lisowsky (2010), Rego and Wilson (2012) all agree that measuring tax avoidance behavior by BTD is an effective measure because when there is an appearance between income tax calculation according to the accounting records and under the tax law will cause tax avoidance. This difference is calculated as the difference between the profit as recognized by accounting standards on the financial statements (Accounting profit before tax, EBIT) and the taxable income (TI). However, in order to avoid the large difference between the cross-units due to the size of the enterprise affecting the regression results, this indicator is converted to a relative value (%) equal to the ratio between the income difference accounting and tax income relative to property value.

$$Total\ BTD = \frac{EBIT-TI}{AvAssets}\ (3)$$

Inside:

Total BTD: total book-tax difference

EBIT: Earnings before income tax are recognized according to accounting regulations

TI: Taxable income is recognized under tax law

AvAssets: Average value of assets for the year

Audi_Com is the explanatory variable for the characteristics of the audit committee. Following the previous studies, we would like to test four characteristics of the audit committee  including: size of the audit committee (committee size), the percentage of female members in the audit committee (gender), the percentage of independent members on audit committee (independence), and the proportion of financial and accounting experts on audit committee (expert). The selection of audit committee characteristics is based on previous studies and exploitable data sources.

Following previous papers, the article uses control variables for the model including: firm size (Desai & Dharmapala, 2006; Richardson et al., 2013; Richardson et al., 2015;

Tandean & Winnie, 2016); Institutional ownership (Richardson et al, 2012; and Tandean & Winnie, 2016; Waluyo, 2017); quality of independent audit (Richardson et al., 2013; Tandean & Winnie, 2016; Waluyo, 2017); ratio of long-term debt to total assets (Richardson et al., 2013); and ROA (Richardson et al., 2013).

**Table 1: Variable definition**

| Variables | Definitions and measures |
|---|---|
| Tax avoidance | |
| ETR | effective tax rate, calculated by Equation 2 |
| BTD | Total book-tax difference, calculated by Equation 3 |
| Audit committee characteristics | |
| ACSIZE | size of the audit committee |
| ACGEN | the percentage of female members in the audit committee |
| ACIND | the percentage of independent members |
| ACEXP | the proportion of financial and accounting experts in the audit committee |
| Control variables | |
| FSIZE | Firm size: Logarithm of firm total asset |
| INSOWN | Institutional ownership: the proportion of ownership of the shares owned by institutional owners and blockholders at the end of the year |
| QINAU | Quality of independent audit: Get one if a firm uses Big 4 external audit service and zero otherwise |
| LEV | Firm leverage: long-term debt/total asset |
| ROA | Return on asset ratio: Net income/Total assets |

### 3.2. Data

Our data comprise 468 non-financial firms listed on the Ho Chi Minh City and HaNoi Stock Exchange over the period 2010–2019. Some listed firms are not included in our data because they did not publish audit committee information. Financial data was collected from Datastream, and data of the audit committee is collected manually on firms' annual reports. After excluding some outliers, our data includes 3672 firm-year observations.

### 3.3. Estimated method

We use Fixed Effect Model (FEM) and System Generalized Method of Moment (SGMM) for panel data. SGMM developed by Arellano and Bond (1991) has been widely used because it addresses the endogeneity of the exploratory variables through a variety of instrumental variables (Arellano & Bover, 1995; Arellano, 2003). In addition, we also apply the Hansen test with over identification to examine whether there is a correlation between the instrumental variable and the residual in the model.

## 4. Results and Discussion

### 4.1. Descriptive statistics

Table 1 presents the summary statistics of all variables. The mean of ETR and BTD is higher than the sample of Armstrong et al. (2012). It indicates that tax avoidance in developing countries like Vietnam may be higher than in developed countries. The mean of audit committee size is 8.82. It is lower than in financial firms US samples of Sun and Liu (2014) or Nguyen and Dang (2020). Moreover, the means of ACGEN and ACIND is quite low (0.412 and 0.372 respectively), implying that the proportion of female and independent members on the audit committee is not high. There are many differences in audit committee size, proportion of independent members as well as proportion of female members of firms in our sample. However, the mean of ACEXP is higher and the standard deviation is just 0.157.

Table 2 shows the correlation coefficients between our primary variables. As expected, most of the audit committee variables are significantly correlated with firm tax avoidance. The absolute maximum value is 0.665 for the coefficient between ETR and BTD. This indicates that their inclusion will not present any problem of multicollinearity.

**Table 2: Descriptive statistic**

|  | Obs | Mean | Std. Dev | Min | Max |
|---|---|---|---|---|---|
| ETR | 3672 | 0.178 | 0.124 | 0.003 | 0.289 |
| BTD | 3672 | 0.009 | 0.078 | 0.001 | 0.012 |
| ACSIZE | 3672 | 8.842 | 0.367 | 0.000 | 9.000 |
| ACGEN | 3672 | 0.412 | 1.162 | 0.000 | 1.000 |
| ACIND | 3672 | 0.372 | 0.195 | 0.000 | 0.889 |
| ACEXP | 3672 | 0.568 | 0.157 | 0.000 | 0.778 |
| FSIZE | 3672 | 8.750 | 0.875 | 5.840 | 12.110 |
| INSOWN | 3672 | 0.587 | 0.298 | 0.054 | 0.723 |
| QINAU | 3672 | 0.672 | 0.712 | 0.000 | 1.000 |
| LEV | 3672 | 0.452 | 0.184 | 0.001 | 0.975 |
| ROA | 3672 | 0.015 | 0.028 | -0.840 | 0.095 |

Note: This table reports some summary statistics for our 468 non-financial firms over the period 2010-2019. See Table 1 for variable definitions.

**Table 3: Correlation matrix**

| | ETR | BTD | ACSIZE | ACGEN | ACIND | ACEXP | FSIZE | INSOWN | QINAU | LEV | ROA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ETR | 1.000 | | | | | | | | | | |
| BTD | 0.665** | 1.000 | | | | | | | | | |
| ACSIZE | -0.227*** | 0.630* | 1.000 | | | | | | | | |
| ACGEN | -0.499 | -0.247** | 0.393 | 1.000 | | | | | | | |
| ACIND | 0.425** | -0.115*** | 0.220** | 0.336* | 1.000 | | | | | | |
| ACEXP | -0.493 | -0.339*** | 0.273 | -0.326** | 0.114 | 1.000 | | | | | |
| FSIZE | 0.378* | 0.387** | 0.273*** | 0.142 | 0.338*** | 0.417* | 1.000 | | | | |
| INSOWN | -0.206** | 0.338 | -0.338 | 0.377 | 0.338 | -0.264 | -0.160*** | 1.000 | | | |
| QINAU | -0.290 | -0.243*** | -0.249*** | 0.299** | 0.094** | 0.382* | -0.420* | 0.296*** | 1.000 | | |
| LEV | 0.554*** | -0.379 | 0.145 | -0.522* | 0.380 | -0.339** | 0.117 | 0.273* | 0.311 | 1.000 | |
| ROA | 0.375 | -0.095 | 0.387** | 0.601 | 0.206*** | -0.152 | -0.420** | 0.339 | 0.289 | 0.234** | 1.000 |

*Note: This table reports the correlation matrix for primary variables. *, **, *** indicate statistical significance at the 1%, 5% and 10% level respectively. See Table 1 for variable definitions.*

### 4.2. Main results

Table 4 reports the results of Equation 1 that examines the relationship between audit committee characteristics and tax avoidance. For each of the tax avoidance measures, we run fixed effect regressions. Regression 1 reports that the coefficients on AC SIZE are negative and statistically significant with ETR but positive and significant with BTD. It indicates that audit committee size increases tax avoidance and strongly supports hypothesis H1. Our results are consistent with prior study. Audit committee size may reduce audit committee effectiveness (Nguyen & Dang, 2020) and therefore reduce their role in constraining tax avoidance. This is because the large size makes the audit committee more complex and reduces their effectiveness in decision making. As expected, the coefficients on ACGEN are positive and significant with ETR, but negative and significant with BTD, indicating that female members can enhance audit committee effectiveness on constraining tax avoidance. This finding is consistent with prior studies that suggest that females have better performance on board or audit committees than counterparts (Sun et al., 2011; Abbott et al., 2012). Our hypothesis H2 was strongly supported. Although the coefficients on ACIND are positive and negative with ETR and BTD respectively, they are not significant. We do not find strong evidence that audit committee independence can reduce tax avoidance. Thus, this result does not support hypothesis H3. However, the coefficients on ACEXP are positive and negative with ETR and BTD respectively. Both coefficients are statistically significant and give us firm evidence that accounting and financial experts on the audit committee can constraint tax avoidance behaviors. This result is consistent with previous studies. For example, Zalata et al. (2018) find that financial and accounting experts can enhance audit committee effectiveness and constraint earning managements. This result strongly supports hypothesis H4. Overall,

although not all four of our hypotheses were supported, we find firm evidence that the audit committee has an important role in constraint tax avoidance behavior.

The results of some control variables also give us some interesting findings. First, the coefficients on FSIZE are negative and significant with ETR, but positive and insignificant with BTD, implying that firm size may increase tax avoidance. This finding well supports prior studies. For example, Offenberg (2009) found that large firms have low effectiveness of control systems and thus may increase tax avoidance. Second, as expected, we find that external audit quality has an important role in constraining tax avoidance behavior. The coefficients on QINAU are positive and negative with ETR and BTD respectively. The literature finds that the main role of external audit is to enhance financial report quality and prevent earning management (Lin & Hwang, 2010). In addition, external audits may enhance a firm's internal corporate governance (Fan & Wong, 2005). These findings provide some implication that large firms should focus on audit committee characteristics and consider using external audit service with high quality.

**Table 4: Fixed effect estimation results for audit committee characteristics - tax avoidance relation.**

|  | ETR | | BTD | |
|---|---|---|---|---|
| Independent variables | Coeff | t-stat | Coeff | t-stat |
| ACSIZE | -0.024*** | -3.152 | 0.001** | 1.987 |
| ACGEN | 0.012** | 2.214 | -0.000*** | -2.952 |
| ACIND | 0.009 | 0.924 | -0.002 | -0.875 |
| ACEXP | 0.005** | 2.075 | -0.001* | -1.786 |
| FSIZE | -0.021* | -1.872 | 0.004 | 1.478 |
| INSOWN | 0.005 | 1.214 | 0.000* | 1.272 |
| QINAU | 0.018* | 1.798 | -0.001** | -2.120 |
| LEV | -0.007 | -0.875 | 0.014 | 1.219 |
| ROA | 0.011 | 1.247 | 0.000 | 0.756 |
| Const | 0.423 | 0.217 | 0.017** | 1.954 |
| Industry dummy | yes | | yes | |
| Year dummy | yes | | yes | |
| R-square | 0.323 | | 0.347 | |
| Obs | 3672 | | 3672 | |

*Note: This table presents fixed effect method estimations relating audit committee characteristics and tow specific tax avoidance measures. All columns use country fixed effects. All variables were defined in Table 1.  * Significance at the 10% level. ** Significance at the 5% level. *** Significance at the 1% level.*

*4.3. Robustness test*

As a robustness test, we applied the System GMM method to estimate Equation 3 and the results were reported in Table 5. The signs of coefficients on ACSIZE remain negative and positive with ETR and BTD and consistent with our first results, supporting hypothesis H1. Similarly, the robustness results also provide evidence of the negative relationship between the proportion of female members on the audit committee and tax avoidance behavior. The signs of coefficients on ACGEN remain unchanged with our first results and continue supporting hypothesis H2. However, unlike our first results, Table 5 reports that the coefficient on ACIND is positive and significant at 10% level with ETR (not significant with BTD), implying that independent members on the audit committee may constrain tax avoidance behavior. Based on these robustness test results, the hypothesis H3 may be supported but not strong. Finally, the coefficients on ACEXP are positive and significant with ETR and negative and significant with BTD. The signs of these coefficients remain unchanged with our first results. Therefore, we find strong evidence of a positive relationship between financial and accounting experts on the audit committee and tax avoidance behavior.

**Table 5: System GMM estimation results for audit committee characteristics - tax avoidance relation**

|  | ETR | | BTD | |
|---|---|---|---|---|
| Independent variables | Coeff | t-stat | Coeff | t-stat |
| ACSIZE | -0.036*** | -2.419 | 0.000* | 1.821 |
| ACGEN | 0.041* | 1.821 | -0.002** | -2.142 |
| ACIND | 0.007* | 1.725 | -0.004 | -1.524 |
| ACEXP | 0.092*** | 3.342 | -0.000** | -1.927 |
| FSIZE | 0.036*** | 2.415 | -0.003* | -1.786 |
| INSOWN | -0.008 | -1.532 | 0.000 | 0.954 |
| QINAU | 0.026** | 1.896 | -0.001*** | -3.842 |
| LEV | 0.017 | 1.674 | 0.000 | 0.547 |
| ROA | -0.036* | -1.782 | 0.002 | 1.238 |
| Const | 0.214 | 1.117 | 0.067* | 1.826 |
| Hansen J test (p-value) | 0.423 | | 0.245 | |
| AR(1) (p-value) | 0.000 | | 0.014 | |
| AR(2) (p-value) | 0.324 | | 0.425 | |
| Obs | 3672 | | 3672 | |

*Note: This table presents System GMM estimations relating audit committee characteristics and two specific tax avoidance measures. All variables were defined in Table 1. * Significance at the 10% level. ** Significance at the 5% level. *** Significance at the 1% level.*

In the System GMM method, we test the instrument validity by using Hansen's J statistic of overidentifying restrictions. The test results that were reported in Table 5 show that

the models do not reject the null hypothesis of valid instruments (because all p-values are higher than 0.1). In addition, we also use the Arellano and Bond (1991) AR (1) & AR (2) tests for first and second order serial autocorrelation to check whether deeper lags of the instrumented variables are correlated with deeper lags of the disturbances. The results show that our instruments applied in the models are appropriate.

## 5. Conclusion

This study examines the relationship between audit committee characteristics and a firm's tax avoidance behavior. By using panel data of 468 non-financial firms listed on the Ho Chi Minh City and Ha Noi Stock Exchange over the period 2010–2019, our results provide strong evidence about the relationship between audit committee characteristics and tax avoidance behavior. Specifically, we find that audit committee size has a positive correlation with tax avoidance. However, the proportion of female members, financial and accounting experts on the audit committee can constraint tax avoidance behaviors. Our findings provide several important policy implications for shareholders and regulators. First, shareholders should investigate audit committee characteristics to manage tax avoidance activities. Second, regulators should pay special attention to large listed companies with large audit committees or a low proportion of female members, financial and accounting experts on audit committees because of high potential tax avoidance. Tax avoidance is one of the issues that shareholders should pay attention to since these activities are tied to their interests. While tax avoidance can be beneficial to companies in the short term, it carries risks in the long run because it can be illegal. When corporate owners decide whether to accept tax avoidance behaviors, they must consider a variety of issues related to the benefits, costs, and risks that may arise from doing so. Therefore, the company owners who want to control tax avoidance activities, need to pay attention to the characteristics of the audit committee, such as the gender and size of the committee, the number of independent members, financial and accounting experts.

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# DETERMINANTS OF ACCESS TO CONCESSIONAL LOANS

# FOR ENVIRONMENTAL PROTECTION: EVIDENCE FROM VIETNAM

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## Abstract

*The Environment Protection Fund is a state-owned institution that mainly provides concessional loans for environmental projects in Vietnam. Understanding the factors of access to green finances contributes not only in theory but also in the practice of identifying the financing constraints, and thereby supporting several policy implications. After conducting in-depth interviews with 32 individuals from the six largest and most experience Environment Funds and their clients in Vietnam, we identified three factors affecting access to concessional loans for environmental protection. The first group is factors from the demand side (borrowers), including firm characteristics (age, size, ownership type, business sector of firms) and project characteristics. The second group is financing constraints from the supply side (lenders), including collateral requirements, paperwork requirements, and shortage of capital. The third group of factors included limitations in the priority sector, geographical distance, and asymmetrical information affecting access to concessional loans. These findings suggest that Environment Funds should broaden lending policies by using other collateral methods such as property or assets formed from the loan instead of third-party guarantees. Moreover, Environment Funds should design fair loan packages for different applicants, such as commercial and non-commercial environmental projects. In emerging markets, firms need to build a trusted relationship with the Environment Funds. Therefore, these institutions can consider lending based on the financial indicators of the enterprises instead of only using the asset-based lending method, indirectly increasing the firms' accessibility to environmental finance.*

*Keywords: Access to Environmental Finance; Concessional Loans; Environment Funds; Green Finance.*

## 1. Introduction

The Environment Protection Fund (Environment Fund) is the main capital channel for investment in environmental protection in Vietnam. The Environment Fund is a non-profit, state-owned institution that must self-cover management costs and preserve capital. We have identified 48 different Environment Funds nationwide, including the Vietnam Environment Fund (national level) and 47 Provincial Environment Funds (local level). Among these funds, 26 have been in stable lending activities, some established and operating for more than ten years.

Concessional loans with lower interest rates (< 50% commercial interest rates) are one of the main instruments of the Environment Funds, comprising more than 95% of its total activity. By the end of 2019, the system of Environment Funds had accumulated more than 4,300 billion Vietnamese dong (VND) over 581 environmental projects. Indeed, concessional lending activities at Environment Funds are growing in both quality and quantity (Figure 1).

**Figure 1. Results of Lending Activities of Environment Funds from 2004 - 2019**
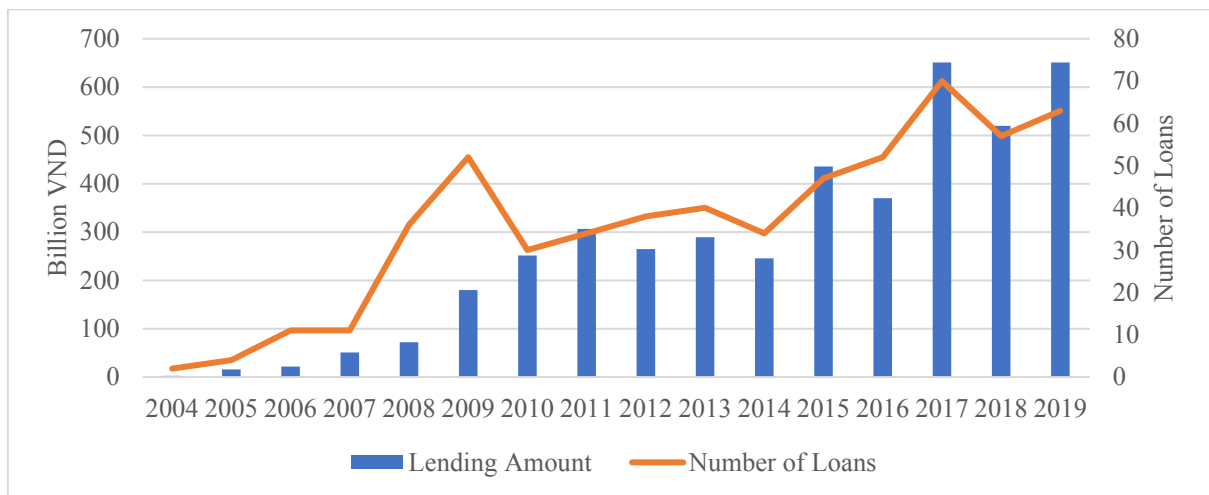


*Source: Authors' calculation from reports of Environment Funds*

According to Decree 40/2019/ND-CP dated May 13th, 2019, Environment Funds provide the loans under a list of 15 environmental protection fields that are eligible for financial support. The lending activities of the Environment Funds focus mainly on solid waste treatment, wastewater treatment, and environmentally friendly products (Figure 2).

**Figure 2. Lending Performance by Environmental Projects Categories from 2004 - 2019**



| Category | Percentage |
|---|---|
| Solid Waste Treatment | 39% |
| Wastewater Treatment | 34% |
| Waste Collection Facilities | 7% |
| Environmentally Friendly Products | 17% |
| Others | 3% |
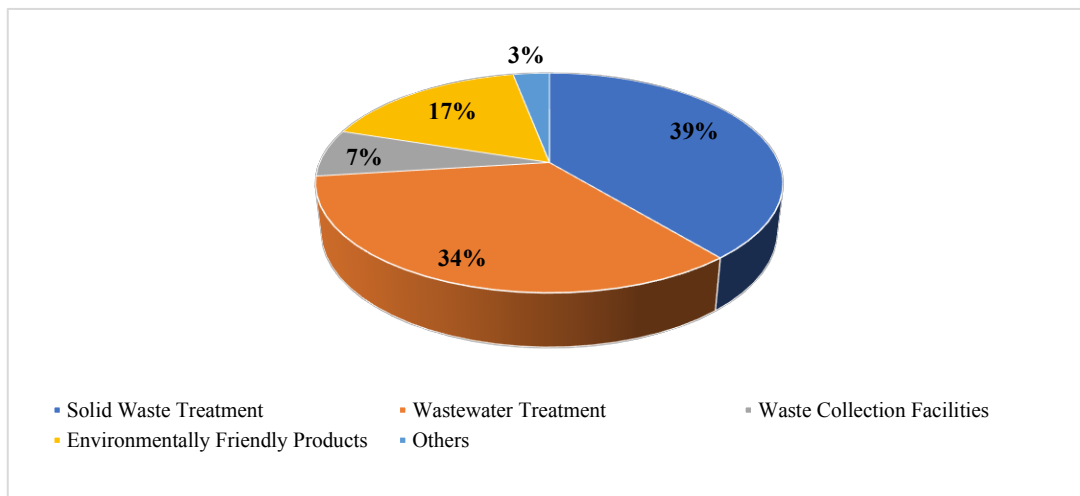
*Source: Authors' calculation from reports of Environment Funds*

Although there has been significant progress, the Environment Funds still face many difficulties. First, Vietnamese banks have been more interested in their green lending portfolio. Still, the major obstacle banks face is their inadequate capacity to process green credit appraisals, including the risk assessment and evaluation of new technologies (T. C. Nguyen et al., 2018). This reason leads to almost all environmental projects applying for loans from Environment Funds with long experience in green finance. Due to the small size of capital, Environment Funds have not been able to meet the actual needs of environmental protection investment projects. Besides, the demand for green investment in Vietnam will increase shortly (Kristiane Davidson et al., 2020). Second, according to the State's regulations, the Environment Funds must preserve their capital sources, which also affects the credit growth of the Environmental Funds due to cautious lending activities. Third, environmental projects are often more difficult to access loans than conventional projects (Baietti et al., 2012). Based on these reasons, it is necessary to study the factors affecting access to preferential loans for environmental protection.

Our analysis makes an essential contribution to the field of environmental finance in developing nations. Identifying influencing factors to access green finance helps the firm become aware of financing constraints and access requirements, thereby enhancing their chances of grant success. Moreover, environmental lending organizations can gain deep insight into the approval process of preferential loans and the development of appropriate lending policies.

This paper is organized into five sections: Section 1 gives a brief overview of environmental finance and the research gap. The second section is the literature review and qualitative research model that the authors developed. In the third section, data, collection, and methodology are presented. Section 4 describes the results of qualitative research and our discussion of findings. Conclusion and implications are drawn in the final section.

**2. Literature Review**

Financial inclusion is the use of financial services by individuals and firms (Beck et al., 2009). Therefore, improving access to finance means improving, to some extent, the availability of financial services at fair prices.

**Figure 3. Differences between Access to and Use of Financial Services**
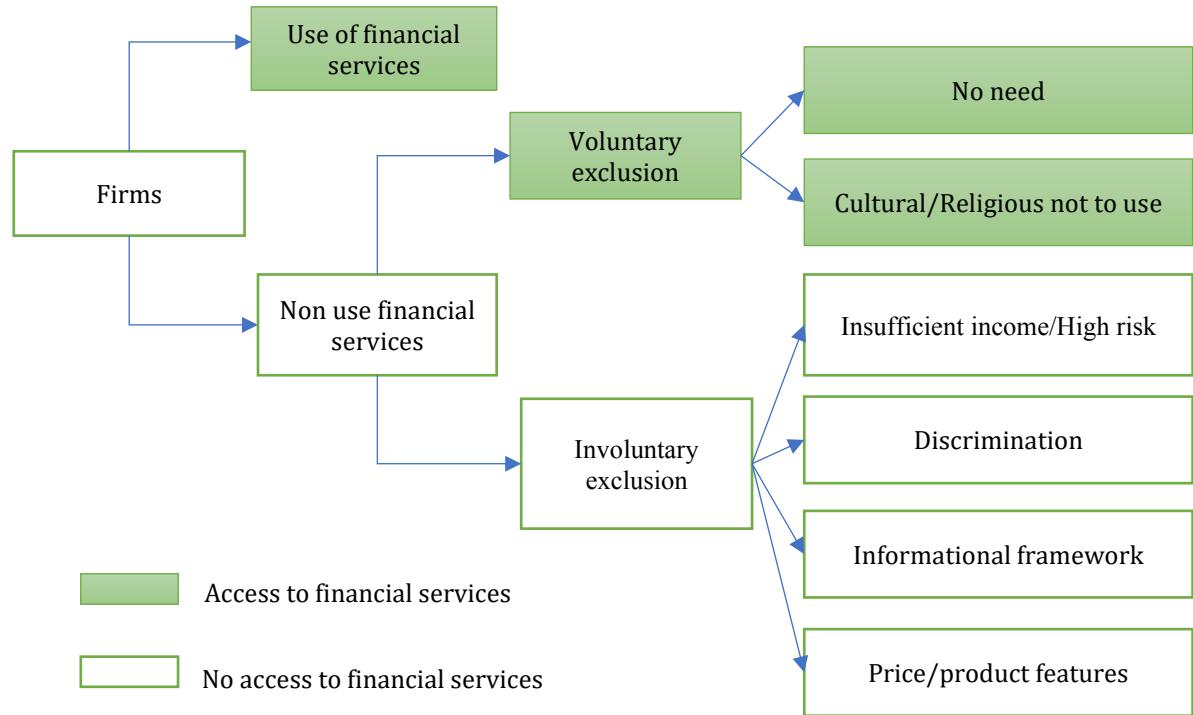


*Source: Beck, Kunt, and Honohan 2009*

Figure 3 shows the difference between financial access and the use of financial services. Firms that voluntarily choose not to or involuntarily be unable to use financial services. Indeed, some enterprises do not willingly use financial services simply because there is no need or for religious and cultural reasons. In contrast, some firms have a high demand for financial services but do not have access (involuntarily). There are many reasons, including that the firms cannot borrow from the bank (unbankable) because they have insufficient revenue, profit, or collateral, making the lending risk is too high. It may also be due to discrimination against certain groups of people on social, religious, and moral backgrounds. In addition, lack of information, cost of access, high prices of financial services, or inappropriate product characteristics may all impact firms' access to financial services. These factors can be divided into three distinct groups, including (1) Factors from the demand side (borrowers), (2) Factors from the supply side (lenders), (3) Other factors (Table 1).

**Table 1. Main Factors Affecting Access to Finance**

| No. | Determinants | | Source |
|---|---|---|---|
| **I** | **Factors from the demand side (borrowers)** | | |
| 1 | Owner's or manager's characteristics | Age | (N. Nguyen and Luu 2013) |
| | | Gender | (Rahman, Rahman and Belas 2017), (N. Nguyen and Luu 2013), (Gamage, 2013) |
| | | Education level | (N. Nguyen and Luu 2013) |
| | | Experience | (N. Nguyen and Luu 2013), (Thanh et al., 2011), (Gamage, 2013) |
| | | Perception of owner or manager regarding access to finance | (Gamage, 2013) |
| 2 | Firm's characteristics | Firm size (number of employees, total assets, profit) | (N. Nguyen and Luu 2013), (S. Nguyen and S 2016), (Christa Hainz, Tatjana Nabokin, 2013) |
| | | Firm age | (N. Nguyen and Luu 2013), (Gamage, 2013) |
| | | Industry sector | (Beck et al. 2006), (Thanh et al. 2011), (Gamage, 2013) |
| | | Legal forms of ownership | (N. Nguyen and Luu 2013), (Beck et al. 2006); (Gamage, 2013), (Christa Hainz, Tatjana Nabokin, 2013) |
| | | Innovation firm | (Rahman, Rahman and Belas 2017) |
| 3 | Financial status | Having audited financial statements | (Berger and Udell 2002), (Petersen and Rajan 2002), (Gamage, 2013) |
| | | Financial status (Balance sheets, Income statement) | (Berger and Udell 2002) |
| | | Financial ratios | (Petersen and Rajan 2002), (S. Nguyen and S 2016), (Gamage, 2013) |
| | | Business plan | (Abdesamed and Wahab 2014) |
| | | Business development lifecycle | (Thanh et al. 2011), (N. T. B. Le, Venkatesh and Nguyen 2006) |
| 4 | Collateral availability | Availability of loan collateral, Asset tangibility, and use right certificate, real estate | (N. Nguyen and Luu 2013), (Beck et al. 2006), (Berger and Udell 2002), (Thanh et al. 2011), (S. Nguyen and S 2016), (Gamage, 2013), (P. Le, 2012) |
| 5 | Geographic location | Firm's location (urban or rural …) | (N. Nguyen and Luu 2013), (Petersen and Rajan 2002), (Gamage, 2013) |
| 6 | Networking and relationship | Having a relationship with banks, maintain a regular relationship, or already have a credit relationship | (N. Nguyen and Luu 2013), (S. Nguyen and S 2016), (Cenni et al. 2015) |
| | | Having a relationship with government officials | (N. T. B. Le, Venkatesh and Nguyen 2006) |
| | | Relationships with other companies, customers, suppliers, society, and friends | (N. T. B. Le, Venkatesh and Nguyen 2006), (N. T. B. Le and Nguyen 2009) |
| **II** | **Factors from the supply side (lenders)** | | |
| 1 | Type of banks, credit institutions | Access to foreign banks | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| | | Access to the informal source | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| | | Access to leasing finance | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| | | Type of banks (commercial banks or state-owned banks) | (S. Nguyen and S 2016) |
| 2 | Loan policies and characteristics | Collateral requirements | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| | | Bank paperwork/bureaucracy | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |

| No. | Determinants | | Source |
|---|---|---|---|
| | | High-interest rates | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| | | Access to long-term loans | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| 3 | Relationship lending | Soft information | (Cenni et al. 2015) |
| | | Need special connection | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| 4 | Banks' lack of money to lend | | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005) |
| 5 | Inadequate credit/financial information | | (Beck et al. 2006), (Beck, Demirgüç-Kunt and Maksimovic 2005), (Haron et al. 2013) |
| 6 | Information, lending techniques, structure organization | | (S. Nguyen and S 2016), (Beck, Demirgüç-Kunt and Pería 2011) |
| **III** | **Other factors** | | |
| 1 | Development of country and institution | The development of financial intermediaries | (Batra, Kaufmann and Stone 2003), (Beck and Levine 2004) |
| 2 | | The development of the stock market | (Batra, Kaufmann and Stone 2003), (Beck and Levine 2004) |
| 3 | | Institutional development | (Kaufmann, Kraay and Mastruzzi 2003) |
| 4 | | GDP per capita | (Beck et al. 2006) |
| 5 | | Inflation | (Christa Hainz, Tatjana Nabokin, 2013) |
| 6 | | The financial institution's right | (Christa Hainz, Tatjana Nabokin, 2013) |

As we searched for answers, we discovered that previous studies mainly focused on the determinants of the firms' access to financial support, such as preferential loans for poverty reduction and student loans (P. Le, 2012; Luc, 2018; H. H. Nguyen, 2020; L. T. Nguyen et al., 2018; N. Nguyen & Luu, 2013). But there had been no research concerning the accessibility to green finance or concessional loans for environmental protection. Concessional loans for environmental protection mean that financial support for the firms invests in green or environmental projects at more favorable conditions for borrowers than loans at market conditions (Akihisa, 2008). However, access to concessional loans for green investment activities may have different characteristics incentives in the loan policy (low-interest rates), funding sources for the loans are from the state budget, and if the lending objective is only for environmental protection investments. Environmental protection projects are more challenging to access capital than conventional projects (La Rocca, 2012) since many environmental protection projects are not financially attractive compared to other investment options. Consequently, there is a "financially viable gap" or simply other more attractive investments. Also, many projects may be financially attractive, but they cannot obtain the necessary credit for various reasons, such as a capital market gap.

**Figure 4. Environmental Protection Projects Face Higher Financing Constraints**
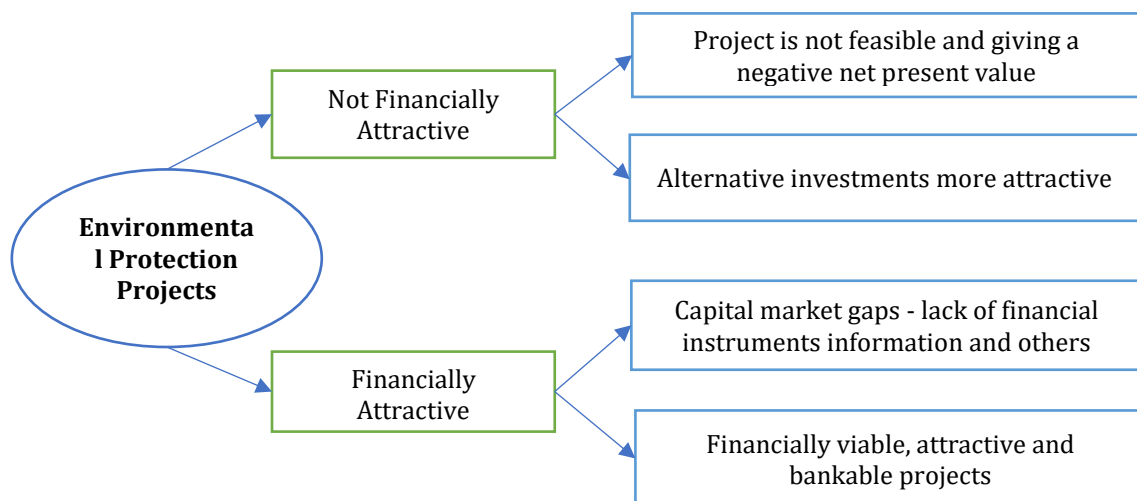


*Source: La Rocca 2012*

La Rocca (2012), OECD (2007), Anderson and Zylicz (1999) agree that environmental protection projects are challenging to reach ordinary lenders such as commercial banks. Environmental protection projects can be classified into three categories: non-commercial projects, commercial projects, and innovative projects with higher risks. Due to these differences, these authors argue that the factors affecting access to preferential loans for environmental protection may have some shared characteristics compared with conventional financial access.

There are several approaches to measuring a firm's ability to access loans. On the one hand, various research approaches from the borrower side by evaluating the firm characteristics, and other factors impact access to finance (Abdesamed & Wahab, 2014; P. Le, 2012; N. Nguyen & Luu, 2013; Popov & Udell, 2012; Thanh et al., 2011). On the other hand, previous studies estimate the influence of firm characteristics and other factors on firms' level obstacles. The financing obstacles typically are the requirements of the financial institutions, or in other words, financing constraints from the lender side (Beck et al., 2006; Hainz & Nabokin, 2013; Rand, 2007; Schiffer & Weder, 2001). Therefore, in this paper, we conducted the research using an approach from both the demand and supply sides, and the associated research model is shown in Figure 5.

**Figure 5. Proposed Qualitative Research Model**
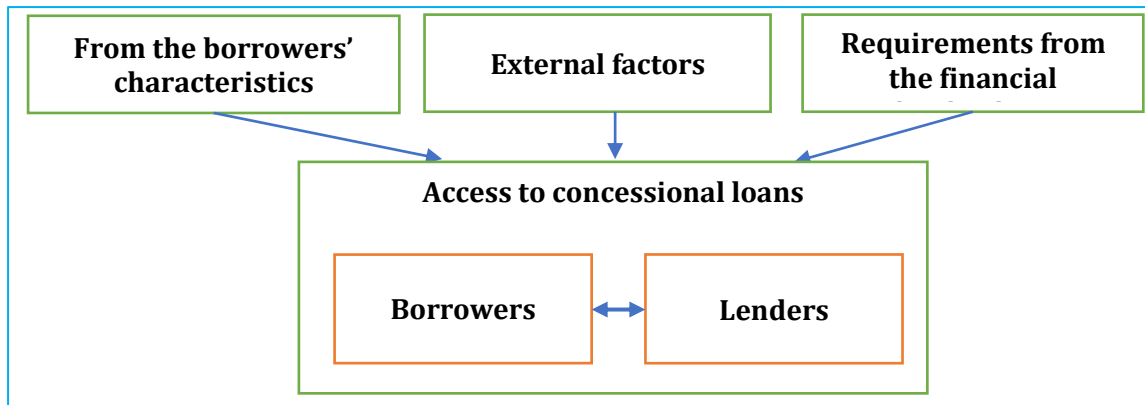
## 3. Data and Methodology

### 3.1 Study Design

Qualitative in-depth interviews were used due to a lack of previous research on access to concessional loans for environmental protection activities in Vietnam, despite available literature exploring access to conventional finance. Therefore, it is appropriate to observe nature and authentically use in-depth interviews to discover the factors affecting access to preferential loans for environmental protection. Using a qualitative research method may achieve the study's goal as the first step to initially identify the typical factors of accessibility to concessional loans for environmental protection. This research is a prerequisite for subsequent quantitative analysis in the future with a larger sample size.

### 3.2 Sample and Procedure

The research team conducted in-depth interviews in six Environment Funds with lending activities and 12 enterprises that have received preferential loans from these financial institutions. The total number of interviewees was 32 individuals; the number and structure of interviewees are listed in Table 2. Interviews were conducted over five months, from September 2020 to January 2021.

Regarding the Provincial Environment Funds, we selected the five Funds with a lot of experience in concessional lending activities according to criteria such as having large total lending value, large-scale capital, and extended operating time. Therefore, we conducted depth interviews with credit officers from Ho Chi Minh, Dong Nai, Binh Duong, Ba Ria Vung Tau, and Ha Noi local Environment Funds. Interviewees from the Environmental Funds were with leaders or senior credit officers and lasted two to three hours. Interview questions were open-ended and focused on receiving, appraising, and approving loans and the difficulties and advantages of accessing the concessional loans of the firms[1]. Working with

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[1] The authors conducted in-depth interviews with credit officers with a set of 21 questions. However, due to the limitation of the length of the article, the authors did not include questions in the article. In case readers request, we are ready to provide information.

these Funds, we may obtain insight into the lending process, the firm's accessibility to concessional loans, and environmental financing obstacles that the firms face.

Interviewees from 12 enterprises that have borrowed money from six Environment Funds mentioned above were with representative business leaders who participated in the loan process at the Environment Funds (Director, Deputy Director, or Chief Accountant)[2]. Different types of businesses or loan projects were selected to ensure an accurate representation. For each Environment Fund, two enterprises were interviewed.

**Table 2. The Number of Participants in In-Depth Interviews**

| Organization | Number of organization | Number of the participant in each organization | Total |
|---|:---:|:---:|:---:|
| Vietnam Environment Fund | 1 | 10 | 10 |
| Provincial Environment Fund | 5 | 2 | 10 |
| Firms that received loans from the Funds | 12 | 1 | 12 |
| **Total** | | | **32** |

*Source: Authors' research and suggestion*

Most of the interviewees were management leaders with a high level of education (University Graduate or Postgraduate). The average age was 40 - 50 years, with more than 15 years of work experience on average.

### 3.3 Analytical Method

All interviews were hand-recorded by the authors, then processed, typed, and stored on a computer. To ensure objectivity and truthfulness in the discussions, we did not identify the personal information and did not make audio recordings. The study applies a comparative situational data analysis process and some applications of theory development techniques. The authors regularly discussed theories and related categories during data collection and then analyzed them after digitizing the interview data. We then identified the main topic categories covered in the interviews and codified the factor concepts while looking for any overlap between these factors. Finally, we compared cases, similarities and differences, and occurrence frequency between study results and study overview.

### 4. Results and Discussion

After being analyzed and synthesized, the data show that the factors affecting access to concessional loans at the Environment Fund have specific characteristics and are presented in Table 3.

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[2] For enterprises, the authors interviewed with a set of 12 questions. However, due to the limitation of the length of the article, the authors did not include questions in the article. In case readers request, we are ready to provide information.

**Table 3. Summary of Main Findings**

| Determinants | No. of opinions in agreement | Percentage | Ranking by group | Ranking by all factors[3] |
|---|---|---|---|---|
| **The group from the demand side (Borrowers)** | | | | |
| Type of environmental projects | 23 | 71.9% | 1 | 4 |
| The firm core business is in the environmental sector | 20 | 62.5% | 2 | 5 |
| Firm size | 19 | 59.4% | 3 | 6 |
| Firm age | 17 | 53.1% | 4 | 7 |
| Legal forms ownership | 16 | 50.0% | 5 | 8 |
| Manager's experience in the environmental field | 15 | 46.9% | 6 | 10 |
| Having audited financial statements | 8 | 25.0% | 7 | 12 |
| Financial status | 5 | 15.6% | 8 | 13 |
| **The group from the supply side (Lenders)** | | | | |
| Collateral requirements from Environment Funds | 28 | 87.5% | 1 | 1 |
| Environment Fund's lack of money to lend | 26 | 81.3% | 2 | 2 |
| Environment Fund's paperwork and procedure requirements | 23 | 71.9% | 3 | 3 |
| **Other factors** | | | | |
| Geographic distance and information asymmetry | 15 | 46.9% | 1 | 9 |
| Restrictions in the priority sector (portfolio) | 13 | 40.6% | 2 | 11 |

*Source: Authors' research and calculation*

The collateral requirements, the Environment Fund's lack of loan capital, and the requirements for paperwork and procedures are, in order, the three factors with the highest financing obstacles. Meanwhile, the financial ratios of enterprises, having audited financial statements, and restrictions in the portfolio for the priority sector are considered less influential since very few interviewees agreed on these factors.

### 4.1 Group of Influencing Factors from the Borrower's Side

### 4.1.1 Owner's or Manager's Characteristics

Factors such as age, gender, education level, and management experience may affect accessibility to green finance. Fifteen interviewees (46.9%) out of 32 argued that management

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[3] Ranking by all factors from 1 to 13 in order from the opinion with the highest number of consensuses.

experience, especially in the environment, affects access to concessional loans for environmental protection. This criterion can be assessed by the time involved in the environmental activities of the enterprises. Indeed, the management experience of business leaders is an essential predictor for business performance when considering loan access (Abdesamed and Wahab, 2014; N. Nguyen and Luu, 2013; Thanh et al., 2011; Gamage, 2011). Therefore, more experienced business leaders are better able to obtain concessional loans.

*4.1.2 Enterprise's Characteristics*

There were 20 individuals (62.5%) who agreed that firms with their primary business in the environmental sector would have better access to green finance. Firms in the environmental field enjoy many preferential policies, understand procedures, and grasp information better than other enterprises. Moreover, exporters face fewer financing barriers due to export support policy (N. Nguyen and Luu, 2013), and businesses with more tangible assets may have easier access to loans due to the advantage of loan security (Gamage, 2011).

There were 19 participants (59.4%) who said that the size impacts access to green finance. Large-scale companies may have easier access to concessional loans due to their advantages, such as higher financial capacity, broader network and relationships, more extended borrowing experience, longer business operation experience, and more valuable experience in project implementation. Enterprise size measured in terms of total assets, rather than the number of employees, was considered a more accurate reflection of the true nature of a firm. Small-scale enterprises face significant obstacles in accessing finance in general (Thanh et al., 2011; Beck et al., 2006; Schiffer and Weder, 2001; Musamali and Tarus, 2013). Similarly, enterprises with large assets may increase their relationship factor, leading to easier access to loans (Uchida, 2011).

Enterprises with a long operating time may gain a lot of historical data. Therefore, that helps financial institutions in lending decisions to review and evaluate the firms when applying for concessional loans. Seventeen interviewees (53.1%) reported that firms with longer operating times likely have easier access to green finance. Similarly, firms at a later growth stage will have easier access to green finances than enterprises in the early stages (NTB Le, Venkatesh and Nguyen, 2006; Beck et al., 2006; Schiffer and Weder, 2001; Musamali and Tarus, 2013). And longstanding firms are usually very stable, have their capital, and have less demand for external finances (Rand, 2007). However, a long operation history does not always help enterprises overcome financing constraints (N. Nguyen and Luu, 2013).

Regarding the type of legal form of ownership, many interviewees (16 people, 50%) felt that joint-stock companies have easier access to preferential loans due to the superiority of the organizational model, flexibility, professionalism, and large capital scale. While joint-stock companies have fewer barriers when accessing loans (N. Nguyen and Luu, 2013), state-

owned enterprises are less affected by barriers to financial access because they may directly receive capital support from the government. They are treated preferentially by state financial institutions (Harrison, Love, and McMillan, 2004; Beck et al., 2006). However, the type of ownership structure does not seem to affect access to commercial bank loans (Rand, 2007).

*4.1.3 Environmental Project Types*

Under Decree 40/2019/ND-CP in 2019, the government introduced a list of priority sectors eligible for financial support from the Environment Funds. According to the priority sectors list, the respondents divide environmental projects into two categories.

The first group is environmental projects that do not generate revenue (non-commercial projects), such as wastewater treatment plants for industrial zones or factories where firms must use other sources for investment, operation, and maintenance. The second group is environmental projects that bring in revenue (commercial projects), such as industrial and hazardous solid waste treatment and renewable energy plants. Therefore, we identified that environmental projects have specific characteristics compared to conventional schemes.

Environmental protection projects are challenging to access green finance due to the lack of financial attractiveness and loan capital (La Rocca, 2012). There were 23 interviewees (71.9%) who indicated that commercial environmental projects with a high-profit margin have easier access to concessional loans. Among these projects, commercial projects have more benefits when accessing capital due to the differences in economics. It may be necessary to distinguish between commercial and non-commercial environmental protection projects to appropriately classify the financial support (OECD, 2007; Anderson and Zylicz, 1999).

*4.1.4 Financial Status of Firms*

Surprisingly, only eight respondents (25%) suggested that financial statements and only five participants (15.6%) agreed that corporate financial ratios affect access to preferential loans. This result is understandable because the Environment Funds use lending techniques based on collateral due to the pressure of capital preservation, and enterprises typically use two accounting books. Hence, the reliability and accountability of financial statements are low.

Indeed, commercial banks in Vietnam do not pay much attention to firm performance or firm value profit in the financial statements (Malesky and Taussig, 2009), and creditworthiness is rarely used in appraisal activities of lending institutions (Uchida, 2011; Le, 2012). In Vietnam, when enterprises have two accounting books, one is often the actual book for business activities while the other is for the tax authority, leading to low reliability in the audit report (Le, 2012). Moreover, enterprises with adequately prepared financial statements and high profits have better access to loans (Nguyen and Luu, 2013).

### 4.2 Group of Influencing Factors from the Lender's Side

#### 4.2.1 Collateral Requirements from Environment Funds

Currently, the Environment Fund has mainly two types of loan securities: third-party guarantees (approximately 70%) and property mortgages (approximately 30%). With the principle of capital preservation, it is understandable that the Environment Funds use these forms of collateral.

Up to 87.5% of interviewees replied that the requirements for loan collateral from Environment Funds is the biggest obstacle to access green finance, and 90% of enterprises with long-term loans in Vietnam use real estate or tangible assets, such as machinery and equipment, as collateral (Do and Iyer, 2003). In particular, real estate has a strong positive correlation with loan access. Thus, making real estate the safer and easier option for accessing loans. Indeed, commercial banks lend mainly based on collateral or third-party guarantees, and the smaller bank, the more it relies on collateral for lending decisions (Uchida, 2011). The lending technique used by Environment Funds is asset-based lending, so the collateral method is essential since lending techniques are not based on financial statements or credit scoring (Berger & Udell, 2002). Similarly, the better the loan security measures, the better the access to loans (Rahman and Belas, 2017).

#### 4.2.2 Environment Fund Lack of Money to Lend

The Environment Fund often does not have the loan capital required to meet the borrowing needs of businesses. Up to 26 interviewees (81.3%) indicated that the current lack of loans is quite apparent, and the Environment Fund has not met the actual needs. If the local Environment Funds cannot meet the firms' demand, they will refer them to the National Environment Fund or businesses to borrow money from commercial banks.

Small businesses and enterprises with foreign capital are then affected by credit institutions that lack loan capital. This is the third factor in barriers to financial access of enterprises, according to Beck et al. (2006).

#### 4.2.3 Paperwork and Procedure Requirements

Twenty-three individuals (71.9%) said that although the loan application and procedures are similar to a commercial bank, businesses often face difficulties. The fulfillment of legal documents on investments such as investment policy, construction permits, land allocation and land leases, environmental impact assessment reports, and procurement often take quite a long time to complete.

This is also one of the four most considerable barriers in accessing the finance of enterprises, according to research by Beck et al. (2006). Small and medium firms often face more barriers in terms of paper and procedure requirements than large enterprises. In addition, the criteria on loan documents, procedures, and processes of credit institutions also affect the development of enterprises (Beck et al., 2005).

*4.3 Other Factors*

*4.3.1 Restrictions in Environmental Priority Sectors*

Regarding the role of the policy group as a limitation in the loan portfolio, up to 40.6% of the respondents (13 interviewees) said that the environmental sector is vast, but the loan portfolio is limited to the list in accordance with Decree 40/2019/ND-CP in 2019. The list of preferential loans is no longer suitable to the current situation, and many items are unclear, causing difficulties for both borrowers and lenders. For this limitation, the research team classified other factors under state policy.

*4.3.2 Geographic distance and asymmetric information*

One of the common factors (15 people, 46.9%) was geographical distance and asymmetrical information. The majority of interviewees said that asymmetrical information and geographical distance are related to each other and can be classified into a group of influencing factors. The Environment Fund has only one head office while operating in a large area. The Vietnam Environment Fund lends to the entire country, while the local Environment Fund lends to the whole province. Therefore, the geographical distance between the business and the head office of the Environment Fund affects access through caregiving, customer access, and travel difficulties. Geographical distance is also a cause of asymmetrical information. Firms do not know about the Environment Fund, understand the loan procedures, or are even aware of preferential capital sources at the Environment Fund.

Moreover, geographical distance between the borrower and the bank impacts financial access, but the centralized approval method also affects access to loans due to the organizational structure (Alessandrini et al., 2009).

**5 Conclusion and Implications**

*5.1 Conclusion*

Based on the results of this research, we initially identified several factors that affect firms' access to green finance. In general, the lenders' side factors are the main obstacles the firms face when accessing concessional loans from Environment Funds. Next is the group of factors related to the borrower, and the least affected are the external factors related to the policy. In each group of influencing factors, the results show a different arrangement of influence levels.

First, the group of factors from the demand side, including size, age, industry sector, and firm ownership type, affects access to concessional loans for environmental investment. The characteristics of the environmental projects also affect firms to obtain green finance. Other factors such as manager's characteristics, corporate financial status, or having audited financial statements are unlikely to affect access to concessional loans.

Second, regarding determinants from the supply side, the requirements for collateral due to the regulation on capital preservation are the most significant constraint for a firm

when accessing loans. In addition, the Environment Fund lacks lending capital, affecting access to concessional loans. These are the two most influential factors when looking at the supply side as lenders.

Third, other factors from the government policy also affect accessibility to green finance, including limitations in loan portfolios and the geographical distance between the Environment Funds and firms that increase asymmetric information.

## 5.2 Implications

This study mainly contributes some vital information having managerial implications. In order to promote the ability to access preferential loans for environmental protection, it is necessary not only to enhance the capacity of firms but also to finalize the lending activities of the Environment Funds.

The implications of lending institutions can include increasing the size of capital for Environment Funds by mobilizing and attracting more capital sources. Environment Funds should reduce the financing obstacles by using other collateral methods such as property or assets formed from the loan instead of third-party guarantees. Concerning credit policy, green finance needs to clearly classify the type of project (commercial and non-commercial) to make reasonable lending decisions and policymaking. Finally, there should be more incentives to support firms that are not active in the environmental sector but carry out environmental protection projects to achieve sustainable development.

On the side of businesses, it is necessary to professionalize the organizational structure to accelerate the legal implementation of application procedures to accelerate the loan progress. Second, for emerging markets, firms need to build more confidence with financial institutions. That can lead to financial institutions applying modern lending technology based on firms' financial statements as well as utilizing credit scoring techniques instead of asset-based lending, as is the present circumstance.

At the same time, it is necessary to strengthen the promotion of information and introduction of concessional loans to reduce asymmetric information between the Environment Funds and enterprises.

Two issues need to be further developed in subsequent research: The first concerns obtaining a larger sample size of the population as data collection becomes more streamlined. The second concerns the quantitative analysis should be developing in the future to confirm our findings.

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# CONTROLLING STANDARD FORM CONTRACTS
# IN THE FIELD OF FINANCE AND BANKING

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## Abstract

*Based on the regulations of the Law on Protection of Consumer Rights of Vietnam 2010 (the LoCP), the paper outlines the research results on (i) standard form contracts in general and standard form contract in the financial and banking sectors in particular which takes into account behavioral economics factors of consumer psychology; (ii) Vietnamese law on controlling standard form contracts in the financial and banking sectors and some shortcomings; (iii) examples in detail of some actual inappropriate terms used in standard form contracts of several large banks and financial companies in Vietnam; (iv) actual implementation of control mechanisms at authorized state agencies and (v) suggestion of solutions to deal with the outstanding shortcomings.*

***Keywords:*** *standard form contract, control, consumer, financial – banking*

## Introduction

The financial and banking services have played and continue to play a key role in the growth and development of economies. In the last few years, the sectors have seen great improvement in provision of finance to consumers. This has been made possible through a combination of technology driven methods, such as the provision of services to open a bank account or register online loans. Despite the significant benefits of the financial and banking services sectors' progress for consumers, consumers nowadays are facing countless of challenges, including legal risks related to terms drafted in advance and provided by banks and the financial companies during contracting processes.

To address such problems, the LoCP has launched the mechanisms on controlling the form and content of a standard form contract to protect consumers against prescriptive, one-sided and unfair terms drafted in advance by the banks and the financial companies. However, on one hand, the current control mechanisms remain ineffective to improve the quality of standard terms in contracts entered into with consumers in the field of financial - banking. On another hand, such mechanism also reveals its less effectiveness in recover the interest of consumers damaged in that transaction. Therefore, as a result of researching legislation, law enforcement practices and reviewing a large number of actual standard terms used by some

banks and financial companies in Vietnam, the paper focuses on making assessments about shortcomings in legal regulations and proposing suggestions for improvement.

## 1. Overview on standard form contracts and laws on standard form contracts

A standard form contract is a contract drafted in advance by one party to use, the other party cannot negotiate or change the contract's content but, instead, have to "take it or leave it" (Deluxe Black's Law Dictionary, 1990). Standard form contracts were first introduced in the industrial revolution in the XIX century with the mass production (Hellwege, 2012). The ability to provide massive production and supply of products and services for countless customers in this XIX-century industrial revolution pushed for the "standardization" of sale contracts' provisions. Standard form contracts were used initially in transportation, insurance and finance (Slawson, 1971).

Nowadays, these contracts have replaced most agreements formed by separately negotiated provisions to regulate transactions in other fields of business. Particularly, concerning about finance and banking fields in Vietnam, most transactions with consumers have formed by standard form contracts, from basic transactions such as opening a bank account, ATM card, SMS Banking, Mobile Banking… to more complex transactions like consumer loans.

The popularity of standard form contracts in the financial and banking sectors in particular and the increasing utility of standard form contracts in modern society in general can be explained by several economic rationales, specifically:

Economists often argue for the uses of standard form contracts for the reasons that the standardization of contracts may reduce transaction costs (Gillette, 2009; Katz, 1998). The application of the standard terms for several transactions may lead to a reduction in contracting costs including not only the cost of negotiation, but also the costs of drafting the contract (Hatzis, 2008). Furthermore, standard form contracts have been a necessary means for businesses to control their agencies in mass-market transactions (Rakoff, 1983). The standard form contracts are applied to reduce such agency cost by not allowing them to agree to any modification to the original contractual terms (Jensen and Meckling, 1976). The reduction in these costs benefits not only the drafters but also the counterparty since in theory it may be enable the drafters to offer lower prices (Kessler, 1939). Furthermore, the standard form contracts are a legal means for traders to alter the default rules provided by law, thereby specifying traders' risk management strategy (Hellwege, 2015).

Although standard form contracts have become an indispensable part of the modern economy, their advent and growth do not come without a price. Beside these aforementioned strengths, the formation of standard form contracts in transactions with consumers are considered to be based on the lack of essential agreement and therefore, these contracts may include oppressive terms for consumers. This is the indispensible consequence originating from the inherent element of the relation between business operators and consumers - the

inequality in negotiation power based on two latent failures towards contracts in the market: monopoly and imbalance of information (Ramsay, 2007).

Besides, the results of behavioral economics research show that, given the fact that consumers are systematically affected by these cognitive biases such as overload information (Grether and partners, 1985) and over-optimism (Ausubel 1991, 1997), sophisticated sellers have responded strategically to exploit such biases to maximize profits. For example, there are the studies of Ausubel (1991, 1997) and Oren Bar Gill (2012). These studies concluded that that credit card companies in the US earned supra normal profits because individuals underestimate the future extent of their borrowing on the card. Since they did not intend to use the card as a borrowing mechanism from the outset (reflecting also over-optimism) they pay little attention to the interest rate charged on the card but were concerned about the immediate costs of the annual fee, this will result in pressure to reduce the annual fee but maintain a high interest rate and increase late payment charges and fees. In addition, the problem of deferred cost is compounded by the complexity of contractual terms. This complexity will compel consumers to rely on salient terms to make their decisions. As a result, consumers are seduced to pay attention to salient attractive up-front charges, and thus may end up with arrangements that are inefficient.

In order to overcome these limitations, the laws on standard form contracts, on a worldwide scale, were first introduced in the 1930s in Italia, next in Israel in the 1960s and Europe in the early 1970s. During the 1980s, all member countries of the EC were convinced of the necessity of specific legislation on general terms in consumer contracts (Hondius, 1987).

In Vietnam, the definition and legal provisions regulating standard form contracts were first introduces in the Civil Code 1995, followed by the Civil Code 2005, the Law on Consumer Protection 2010 and the Civil Code 2015. During the 2000s, together with the economic development, Vietnam had to deal with an actual situation, that is, traders use standard form contracts manifesting their unilateral will which mainly favours their interests over the consumers. This situation required specific legal provisions on the controlling role of the State to protect consumers in transactions using standard form contracts. Therefore, to ensure the impartiality in such transactions between traders and consumers, the scope of the LoCP has regulated standard form contracts in order to protect the consumers' interests.

## 2. The law on controlling standard form contracts in transaction with consumers in the field of financial and banking sectors in Vietnam and some shortcomings

In Vietnam, in addition to the basic provisions in the 2015 Civil Code, the issues of controlling standard form contracts in transaction with consumers are generally regulated in the LoCP and guiding documents. In particular, as well as other sectors, the financial and banking sectors are generally governed by the following main contents:

### 2.1. Subject of control

Under the LoCP and guiding documents, subject of controlled standard form contracts can be divided into two groups, including: (i) essential goods and services on the list promulgated by the Prime Minister subject to a Registration Review and (ii) other goods and services that are not subject to registration. Accordingly, it can be said that the state administrative body for consumer protection have the right to intervene in any standard form contracts used to form transactions with consumers, including the financial and banking sectors.

### 2.2. Scope of control

The Ministry of Industry & Trade and the Department of Industry & Trade are empowered by the law to control standard form contract regarding the following issues:

#### 2.2.1. Controlling the form and language of standard form contract

The contract's form and language are prescribed in Article 7, Decree No. 99/2011/ND-CP dated 27/10/2011 detailing and guiding a number of articles of the LoCP (hereinafter referred to as Decree No. 99/2011/ND-CP), including: (i) The language is Vietnamese; the contents are clear and understandable; the font size of the text is at least 12; and (ii) the paper background and ink color used in standard form contracts must contrast. These requirements on the contract's form are in order to assure the ability of consumers to access easily and fully the contract's content.

The clarity and straightforwardness of standard terms are broadly required on the worldwide scale. For example, to reflect the common situation in European countries, Article II.9:402 of the Draft Common Frame of Reference (DCFR) for the harmonization of European private law on "Duty of transparency in terms not individually negotiated" states that: "*Terms which have not been individually negotiated must be drafted and communicated in plain, intelligible language.*" The philosophy of this Article aims at creating chance for consumers to perceive fully and exactly the rights and obligations arising from standard terms. Accordingly, they can make rational decision whether to enter into the contract or not.

In relation to font size at least 12, whereas such requirement is basically met in other areas, smaller font size situation has been occurred in banking sectors, especially for bank account and ATM card opening documents (with font size approximate only 8-10), even in the loan documents. Banks explain the reason for such situation since it aims to design compact, convenient dossiers for customers to store, ensure quick procedures with less required pages for signing and save significant printing costs. However, this is one of the troublesome problems causing customers do not read, refuse to read and even cannot read the documents given by the banks.

In relation to the clarity and straightforwardness, there are some examples in standard form contracts of banks and financial companies currently which may not meet above requirement, as following:

**Example 1:** Standard form contracts contain unclear phrases (especially provisions related to the rights of banks and obligations of consumers) such as "under the provisions/ requirements of the bank"; "related expenses". These provisions should be specified or referred to sources of information that customers can search for more information (for example: publicly announced at the bank's website/transaction counter).

**Example 2:** The customer is obliged to pay the fees and expenses prescribed by the bank in each period.

Related to those provisions, it is difficult for the customers to define fees and costs which they can bear during contract process before signing the contract. Meanwhile, for loan contracts, prepayment fees or penalties for breach of contract is confidential information, directly impact the loan's decision of consumer. Accordingly, banks and financial firms need to clarify such provision, such as:

- Supplement the main fees to the contract or debt indenture such as early repayment charges, breach of contract, etc.

- Incurred fees and expenses: regulate that customers are obligated to pay other fees, expenses listed at the counter or publicly announced on the bank's website in accordance with the law.

**Example 3:** The bank is entitled to change the interest rate with a notice sent to customers 30 days before the date of application/ the bank is entitled to change the interest rate at their decision.

Customers may be in a passive state when above provisions are applied. They even face some risks caused by unforeseen adjustment margin of time and interest rate. Accordingly, to satisfy the requirements of the LoCP, banks must clarify the terms of interest rate changes such as:

- Regulations on objectivity rule of interest rate adjustment to ensure customers can actively research and arrange debt repayment sources;

- If banks wish to change the interest rate in other cases, they should to clearly stipulate these cases arising from objective reasons such as the management policy of the State, customers are no longer eligible to enjoy preferential interest rates (example: a bank officer resigned) so the normal interest rate as publicly announced at the website or at the counters will be applied.

*2.2.2. Controlling the validity of standard terms*

Currently, the most important provision of Vietnam law regulating the control of standard form contract is Article 16 of the LoCP 2010 listing 09 contractual terms which are invalid for consumers if introduced in standard form contract and general trading conditions. Such terms can be divided into three groups as follow:

*Group one*: including terms which exclude or restrict the liability of traders to consumers, concretely:

- Terms excluding liability of organizations or individuals trading goods and/or services to consumers as prescribed by laws (Article 16.1.a);

- Terms restricting or excluding the right to complaint and take lawsuits by consumers (Article 16.1.b);

- Terms excluding liability of organizations or individuals trading goods and/or services through a third party (Article 16.1.g).

*Group two*: including terms which allow traders to unilaterally decide in transactions, concretely:

- Terms allowing organizations or individuals trading goods and/or services to unilaterally change the conditions of contract or general trading conditions (Article 16.1.c);

- Terms allowing organizations or individuals trading goods and/or services to unilaterally determine the consumer who fails to perform one or more obligations (Article 16.1.d);

- Terms allowing organizations or individuals trading goods and/or services to set forth or change the price at the time of delivery of goods or providing of services (Article 16.1.dd);

- Terms allowing organizations or individuals trading goods and/or services to explain the contract in case of different interpretation of the terms (Article 16.1.e);

- Terms allowing organizations or individuals trading goods and/or services to transfer rights and obligations to third parties without the consumer's consent (Article 16.1.i).

*Group three*: including terms which prevent parties from enjoying certain rights, concretely:

- Terms forcing consumers to comply with obligations even if the organizations or individuals trading goods and/or services fail to fulfil their obligations (Article 16.1.h).

There are several examples in standard form contract of banks and financial companies which may be invalidity in according to Article 16 of the LoCP, as following:

*First*, terms allowing organizations or individuals trading goods and/or services to transfer rights and obligations to third parties without the consumer's consent (Article 16.1.i the LoCP).

**Example 1:** The bank is totally entitled to assign or transfer to third parties all or part of their rights, interests and obligations as specified in the contract.

Such term allows the bank to transfer or assign contractual rights and obligations to a third party without the consumer's consent. Therefore, it may be invalidity in according to Article 16.1.i of the LoCP. Accordingly, banks must clearly limit the cases in which they are allowed to assign their contractual obligations to the third parties, such as the case of debt trading or debt settlement. For the other cases, the bank is required to transfer their obligations with the consent of consumers. For example: "The bank is not entitled to transfer

their rights and obligations to the third parties without the consent of the consumers except the cases of debt settlement or debt trading according to the State Bank's provisions."

*Second*, terms excluding liability of organizations or individuals trading goods and/or services to consumers as prescribed by laws (Article 16.1.a the LoCP).

**Example:** There are phrases excluding liability of the bank in the ATM card opening contract such as: "customers is totally obligated for their individual transactions arising from ATM card/ in case the ATM card is forged or taken advantage of…"

For such terms, it is necessary to allow the customer not to be held responsible in the case of the bank's fault or the customer has complied with the provisions of the contract and the law (such as customer has fully implemented their obligation to notify, provide the bank with required documents in case of ATM card loss but the card is not locked by the bank due time specified in the ATM card Opening Regulations).

*Third*, terms allowing organizations or individuals trading goods and/or services to unilaterally change the conditions of contract or general trading conditions (Article 16.1.c of the LoCP).

**Example:** The bank is entitled to amend and supplement the Card Using Terms and Conditions with only announcement on their website.

In according to the law, the bank should to add and clarify the following contents in that term:

- Beside publicly posting on the website, the bank shall provide customers with amendment and supplement information via personal contract methods registered by the customer such as SMS, email;

- Providing customer with specific responding time when receiving such information from the bank;

- Providing customer with the right to terminate signed contract in the case of customer does not agree with its supplement and they are only obligated to pay supplied services (according to Article 18 of Decree 99/2011/ND-CP).

In principle, this approach of the LoCP 2010 creates a quick and effective mechanism controlling standard form contract, which decreases the approach cost for consumers or helps the issuers of standard form contract to self-control the equity of the terms. Therefore, a mechanism preventing the application of unequal terms is developed without the participation of the court or administrative agencies.

However, there are two shortcomings with this approach:

*Firstly*, besides the remarkable advantage of precision, the total forbiddance prescribed in Article 16 of the LoCP also contains some disadvantages, that is, the rigidity and insufficiency to deal with the specific situation and business field of each market. For example:

(i) For contracts that heavily depend on the market change and require a long-term performance such as in the field of financial and banking (for example: ATM opening contract; contract for opening and using payment account), the requirement for traders to contact and re-negotiate with every customer is impossible and infeasible, or

(ii) For merge & acquisition or project transfer transactions, the requirement for enterprises to reach a consent with consumers when they transfer their rights and obligations to a third party is also troublesome, since the objection of just a handful of consumers may cause the enterprises to cease the entire transactions.

*Second*, lacking of a general provision to be the basis for controlling the unfairness of standard terms. The list of invalid terms in Article 16 of the LoCP cannot comprise all types of unfair terms in the market. For instance, a specific case is currently missing is the term on the sanction for violation of parties which is unfair and inappropriate by stating that, the buyer will always be imposed harsher sanction than the seller. Similarly, in case where there is an excessively unfair term that has not been included in the list yet, the competent agencies do not have the legal basis to control such term. The missing of a general provision also means the missing of an important tool to establish a standard for fairness in Vietnamese contract laws as well as to assure the flexibility of the controlling mechanism towards the rapid change of socio - economic life.

### 2.3. Control mechanisms

Corresponding to the two groups of standard form contracts as mentioned in Section 2.1, it can be seen there are three control methods in the LoCP, including:

*First*, Registration Review of standard form contracts

Traders which provide goods or services that are on the list of essential goods and services promulgated by the Prime Minister have the obligation to register their standard form contracts with the state administrative body for consumer protection. After fulfillment of their registration obligation, they are entitled to use their registered standard form document to enter into contract with customers.

*Second*, General Review

For the purpose of controlling standard form contract in the fields of goods and services not on the list of essential goods and services issued by the Prime Minister, state administrative body for consumer protection has the right to require traders to amend or delete contents that violates the LoCP and general principles on entering into contracts. Within ten (10) working days from the date of request's receipt from the competent authority, traders must amend and delete the infringing content and provide their consumers with notification on the amended contents. Besides, the competent authorities have the right to carry out groups of specialized inspection/ examination and punish the violating companies.

With respect to the financial and banking sectors, from October 15, 2015 to October 22, 2018, there are 03 services in this field (including: issuing ATM cards; opening and using

payment account services (applied to individual customers); personal loans (for consumption purposes only)) which subject to Registration Review of standard form contracts according to the Prime Minister's Decision 35/2015/QD-TTg dated August 20, 2015 on amending and supplementing his Decision No. 02/2012/QD-TTG dated January 13, 2012 on promulgating the list of essential goods and services.

During this period, about 60% (about 60/100) banks, financial firms submitted their registration dossiers at Vietnam Competition and Consumer Authority (VCCA), Ministry of Industry and Trade, of which approximately 30% of total banks and firms completed registration obligations (Ministry of Industry and Trade, 2017). Thus, for 3 years of implementing Decision 35/2015/QD-TTg, there remains about 40% of banks and financial firms that did not implement their registration obligation and in total, less than 20% of all banking institutions and financial firms completed their registration obligations regarding to categories of standard form contracts subject to *ex ante* administrative control.

Since October 22, 2018, the Prime Minister issued Decision 38/2018/ QD-TTg of September 5, 2018 amended Decision No. 35/2015/QD-TTG to remove the above services from the scope of essential goods and services subject to Registration Review of standard form contracts. Accordingly, the above-mentioned services as well as all services of banks and financial companies are subject to General Review provided in the LoCP.

Since then, VCCA has carried out 06 groups of specialized inspection and examination in the field of financial and banking (Ministry of Industry and Trade, 2018-2020). Inspection and examination results show there remains contents which are inappropriate to the LoCP on consumer protection in general and standard form contracts in particular in nearly 100% of inspected traders.

With above results, although the implementation has been widely exercised, the control mechanisms including Registration Review and General Review remains ineffective to improve the quality of standard terms in contracts entered into with consumers in the following aspects:

*Firstly,* the level of compliance of the banks and financial firms with consumer protection laws on the standard form contracts has not been significantly improved expressed in number of traders unfulfilled their registration obligations in Registration Review period and the percentage of inspected traders that did not comply with legal regulations in General Review.

*Second*, the ineffectiveness of current control mechanisms since it depends mostly on the self-discipline of business entities and the actual legal consequences of non-compliance are basically administrative violations. Meanwhile, the current punishment level remains inappropriateness as it can not impose enough deterrence which shown in three main aspects: (i) the fine remains low, do not commensurate with the risk of damage occurring to a large number of consumers and the amount of profit that businesses can earn; (ii) the lack of meaning additional sanction or remedial measures which benefit to consumers due to current

fine or remedial measures are just obligations to the state; (iii) the lack of meaning measures to prevent risk, for example, it is not allowed traders to enter into a new standard form contract for a certain period in the case of breaching their obligations without remedy.

Accordingly, in addition to promoting the role of existing mechanisms, it is necessary to research and develop other mechanisms promoting the consumer representative role of consumer protection bodies. Also, it must aim to break the limitation of liability of business entities on the formed transactions within the current administrative penalties.

## 3. Proposed suggestions:

To overcome the aforementioned shortcomings and enhance the legal effect of the mechanism controlling standard form contract in the field of finance and banking, Vietnam can develop the current legislation based on experiences of countries that have effective legal framework on this field as follow:

### 3.1. Scope of control

Defining unfair terms, deceptive, abusive, unbalanced, and other such is not straightforward, but many countries have established parameters by regulation or legislation and have prohibited certain contractual clauses or certain styles in which contracts may be written.

In Vietnam, as analyzed, there exists no definition of an "unfair/invalid term". Meanwhile, in the European Union, the Unfair Terms in Consumer Contracts Directive 93/13/EEC considers a term unfair if it causes a significant imbalance in the parties' rights and obligations arising under the contract, to the detriment of the consumer (Article 3(1)). This excludes the price and quality of the product, provided that these are conveyed in a plain and intelligible language. However, the price and quality of the product can be taken into consideration in the assessment of fairness of other contractual terms. For example, terms that are considered fair for high-value contracts with sophisticated consumers might be considered unfair for low-income consumers. Also, a term in the UK may be questioned as unfair if, contrary to the requirement of good faith, it causes a significant imbalance in the parties' rights and obligations under the contract to the detriment of the consumer (Section 62.4 (Requirement for contract terms and notices to be fair), Part II (Unfair terms), the Consumer Right Act 2015 of the UK).

The missing of a legal provision on definition of an "unfair/invalid term" causes the insufficiency of an important tool to establish a standard on equity in Vietnamese contract laws. The flexibility of the controlling mechanism under the rapid change of socio - economic life is also affected. Moreover, the list of invalid terms in Article 16 should be improved for better use in reality. To overcome these shortcomings, a general provision on invalid terms should be introduced first, and the concrete list will be developed afterwards.

*Firstly*, balanced rules should be in place regarding contractual terms and conditions, product suitability, product regulation, and fair practices, in order to ensure that Vietnamese

consumers are treated fairly and offered a product or service appropriate for them. Based on experiences of some countries as mentioned above and good practices for financial consumer protection, Vietnamese law can introduce a definition on unfair terms if such terms satisfy 03 criteria: (i) causing a significant imbalance in the parties' rights and obligations; (ii) being contrary to the requirement of good faith; and (iii) causing detriment to the consumer. Moreover, Vietnamese law can introduce a definition on unfair terms in the field of financial and banking if it excludes or restricts any legal requirement on the part of a financial service provider to act with skill, care, diligence, or professionalism toward the consumer in connection with the provision of any product or service and/or any liability for failing to do so (Good Practices for Financial Consumer Protection, 2017). Financial service providers should be prohibited from using any term or condition in a consumer agreement that is unfair. Such terms and conditions, if used, should be void and legally unenforceable. Ambiguities in contractual terms and conditions should be construed in favor of the consumer.

*Second*, since the legal principles must be determinative, there is still a need for an open list on unfair terms. This list can be established by developing the 09 cases stipulated in Article 16 of the LoCP, such as: Article.1(i) & (dd) should be supplemented so that contractual terms are only considered as invalid if the traders change the price/transfer rights and obligations to third parties but do not allow the consumers to unilaterally terminate the contract or force the consumers to bear unfavorable legal consequences of this termination (as provided in Article 25 Part 2-3 of the Australian Competition and Consumer Law). Futhermore, Vietnam can rely on examples of unfair terms that can be common in the financial services industry to develop Article 16 of the LoCP including the right of a financial service provider to revise, at any time and without prior notice, the minimum amount and the minimum time for a time deposit, and the right of a financial service provider to close any account of a consumer at any time, without notice or cause given to the customer and without incurring any liability in so doing (Good Practices for Financial Consumer Protection, 2017). Such list is the legal basis for administrative agencies to handle registration dossiers during the time using the administrative control mechanism and for judicial agencies to handle each specific dispute or transaction.

Additionally, in a long term, Vietnamese law can rely on the experience of Directive 93/13/EEC to create a general provision allowing the Court to intervene in certain disputes that are excluded from the list of unfair/invalid terms; empower the Court to interpret general definitions in order to create more specific assessment criteria or supplement new invalid cases via the precedents.

### 3.2. Control mechanisms

In Vietnam, the mechanism of administrative control (especially the Registration Review mechanism) under the LoCP has proved the effectiveness preventing the risks for consumers when entering into standard form contracts with traders; contribute to make the transparent transactions and a fair balance between traders and consumers. Such control

mechanism also directly impacts on the perception of banks and financial companies, gradually contribute to raise their sense of law and respect for consumers' rights. Regarding the socio - economic context of Vietnam, this is still an appropriate mechanism.

However, limitations of the administrative mechanism are the fines limited to administrative sanction level and directly paid to the national budget. In respect of consumers, the fines do not create direct benefits for consumers. In the case of wishing to be recovered the interest of consumers damaged by the invalid standard terms in a certain transaction, consumers need to file a lawsuit with the dispute settlement agencies. Meanwhile, Vietnamese's consumers tend to reluctant to speak out and avoid litigation and procedures for declaring the standard form contract as void or resolving small disputes in the Court are still inadequate such as prolonged periods, complicated procedures.

According to Good Practices for Financial Consumer Protection, regulation and supervision should be used to curb patently unfair terms and conditions, especially in countries where consumers have no effective means to defend themselves after entering into a contract that has unfair terms. Around the world, supervisors in Bolivia, Malaysia, Mexico, Pakistan, Peru, and Portugal analyze consumer agreements on an ongoing basis with the purpose of identifying abusive clauses. The ITU-T Focus Group Digital Financial Services recommends that authorities review consumer agreements "*on a regular basis, such as every six months and as informed by consumer complaints*" (ITU, 2017). New technologies for data analytics and machine learning may help them do so in a less time-consuming manner. However, in some cases, this practice may not be feasible if the authority has scarce resources. Ex post selective analysis may be more appropriate in such cases, where supervisors analyze select types of consumer agreements and take action against the provider of the service based on such analyses (which is done in Australia, Brazil, the United Kingdom, and the United States).

For example, in Australia, Australian Securities and Investments Commission (ASIC) analyzed six contracts used by Bendigo and Adelaide Bank and brought them to the Federal Court of Australia. In such case, the Court declared that, when looking at the contract as a whole, several terms within six contracts used by Bendigo and Adelaide Bank were unfair and, therefore, void. The judge also notes the lack of transparency pertaining to the unfair contract terms. Some of the unfair terms gave the bank broad discretion to unilaterally vary the terms and conditions of the contract without giving the borrower advance notice, or an opportunity to exit the contract without penalty. Other terms allowed the bank to take disproportionate actions in response to a breach by the borrower, for example, by calling a default without giving the borrower an opportunity to remedy a breach, or by calling a default based on events that do not present any material risk to the bank.

In such case, the Court declared that the terms were void from the outset, not from the time of the court's declaration, with the remainder of the contract continuing to bind the parties. The Court also ordered that the contracts be varied by replacing the unfair clauses

with new fair clauses by the parties following successful negotiations between ASIC and Bendigo and Adelaide Bank. Bendigo and Adelaide Bank gave an undertaking to the Court not to use, or rely upon, any of the impugned terms in a manner that is unfair, or causes any customers to suffer loss or damage.

Related to competence of administrative agencies in Australia, under the Australian Competition and Consumer Act 2010, this Act allows the consumer protection agencies to bring a case to the Court. Beside, other competent authorities such as ASIC has administered the law and bring a case to the Court to deal with unfair terms in standard form consumer contracts for financial products and services, including loans.

Accordingly, first of all, with scarce resources, Vietnam can refer such good practice to develop a consumer representation mechanism to initiate standard form contracts based on competent authority's analyses. Under this mechanism, the administrative agencies (including the consumer protection agencies and other competent authorities) select and analyze types of consumer agreements and represent consumers to request the Court to declare the standard form contract as void for having partial or invalid terms based on such analyses.

In addition to ex post selective analysis, some countries, including Mexico, Poland, and Spain, maintain a register of financial consumer contracts that display clauses considered to be abusive or prohibited. Such registers can then be used by consumers to ascertain whether the clauses of a contract they are about to sign or have signed include abusive or prohibited clauses (Good Practices for Financial Consumer Protection, 2017). Such good practice is also appropriate in the case of countries having scarce resources like Vietnam. Accordingly, Vietnam can refer the aforementioned practice to select, analyze types of consumer agreements and then publish a register or handbook of financial consumer contracts that display terms considered to be unfair or prohibited for consumers' references in their contractual proceeding. This task can be implemented by administrative agencies themselves or assigned to consumer protection associations with the approval in advance of administrative agencies before publication of such register or handbook.

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# CREDITABILITY OF SUSTAINABILITY REPORTS:
# THE CONTRIBUTION OF AUDIT COMMITTEES

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## Abstract

*Concerns about the reliability of sustainability reports can be mitigated through assurance. Although the audit committee deals with the monitoring of sustainability issues, there is a possibility of complementarity and substitution between governance mechanisms. This paper explores the relationship between audit committees and sustainability reporting using the Global Reporting Initiative (GRI) as a framework. We find that the audit committee has an additional impact on the board of directors on voluntary sustainability. Our results also show that audit committee independence is associated with the use of Big 4 audit firms for sustainability. However, the negative association between sustainability and assurance committees suggests that assurance can be a burden on small businesses. Overall, the findings suggest that audit committees add credibility and help improve sustainability reporting through their independence, expertise and oversight.*

***Keywords:*** *Audit committees, Sustainability report, assurance statements, auditing, GRI certification.*

## 1. Introduction

Sustainability report has become a mainstream practice for communicating corporate commitment and performance on sustainability issues (Fonseca et al., 2014; Hahn and Kühnen, 2013; Junior et al., 2014; Hahn and Kühnen, 2013; Junior et al., 2014; Perego and Kolk, 2012). In 2015, more than 90% of the world's 250 largest companies published sustainability reports, most of them using the Global Reporting Initiative (GRI) framework as a reference base to improve its high quality (King and Bartels, 2015). However, the credibility and reliability of sustainability reporting is still widely criticized (Cho et al., 2015; Grey, 2010). To address these criticisms and give confidence to the quality of sustainability reports, verification is required by assurance providers such as audit firms or consulting firms. From the perspective of independent auditors - also known as assurance providers - they commit to and provide process assurance about the quality and reliability of the information disclosed (King and Bartels, 2015). The assurance statements also comment on reporting limitations and provide recommendations on how the company can improve its reporting practices (Gürtürk and Hahn, 2015). At the same time, it also emphasizes the extent and importance of the assurance process in enhancing the credibility and reliability of sustainability reporting (Simnett et al., 2009).

The following article will clarify the issues of sustainability reporting, the benefits and disadvantages of the assurance process for sustainability reports. At the same time, through research on the quality of information on sustainability reporting in enterprises in Vietnam conducted by assurance providers, the authors will make some recommendations to improve quality assurance information on sustainability reports of enterprises in the current period.

## 2. Theoretical basis

### 2.1 The assurance of sustainability reports

Sustainability reporting is defined as "measuring, disclosing, explaining and pledging accountability to internal and external stakeholders for the organization's performance towards its sustainability goals" (GRI, 2013). However, to be reliable and useful to stakeholders, the information published must be reliable, appropriately presented, and follow clearly defined rules. Therfore, GRI proposes to follow two sets of principles: one that defines the content of reports and the other with regard to their quality (GRI, 2013). The principles for reporting content focus on consistency between published information and the organizational context, particularly with respect to the organization's operations and stakeholder expectations. These include stakeholder inclusivity (identifying stakeholders and meeting their expectations), sustainability context (presenting information within the broader context of sustainability), criticality Weakness (relevance of topics in the report to the impact of the organization and the decisions of its stakeholders) and completeness (reports must provide sufficient information to evaluate performance organization action). The principles of reporting quality focus on the presentation and transparency of information: balance (information should not focus solely on positive aspects), comparability (information should be comparable in over time and across organizations), accuracy (information must be detailed enough and valuable to evaluate performance), timeliness (regularity and up-to-date information), clarity ( readability and intelligibility of the reports) and reliability (information may depend). Although the development of the GRI framework in sustainability reporting is generally considered to have improved the quality of information (King and Bartels, 2015), the lack of reliability and transparency of sustainability reports has been criticized in the literature (Cho et al., 2015). Sustainability reports appear to be more of a marketing tool to positively influence stakeholder perceptions than a reliable source of information (Cho et al., 2012). The third-party assurance process is often considered the primary response to restoring or enhancing public confidence in these reports (Kolk and Perego, 2010; Manetti and Becatti, 2009; Park and Brorson, 2005).

### 2.2 The benefits and controversies of the assurance process

The benefits of the assurance process reduce uncertainty and information asymmetry among managers and stakeholders (Gürtürk and Hahn, 2015; O' Dwyer et al., 2011). At the same time, assurance processes aim to strengthen stakeholder consultation and accountability (Manetti and Toccafondi, 2012; Perego and Kolk, 2012), improve trust in sustainability reports and increase legitimacy society of an organization (Manetti and Toccafondi, 2012;

Simnett et al., 2009). In addition, controversies over the independence of assurance providers are caused by the commercial relationship between auditors and firms (Perego and Kolk, 2012). These commercial relationships can compromise professional skepticism and the fairness of third-party warranties (Boiral and Gendron, 2011). In addition, management's lack of information capture and the lack of stakeholder involvement in the assurance process have been criticized (Hummel et al., 2017). At the same time, the professionalism of the assurance suppliers and the rigor of the activities in this area seem questionable.

## 3. Status of applying sustainability reporting in enterprises

### 3.1. Trends in environmental and sustainability reporting

Although sustainability report has existed for a long time, the frequency and amount of information presented has increased significantly in recent years (KPMG, 2011) with many large companies not only present this information in their annual report but also prepare separate sustainability reports. Their concerns have been raised about reliability and completeness and the need to ensure sustainability reports (KPMG, 2011; Simnett, Vanstraelen and Chua, 2009). Despite this growing number of reports are receiving third party assurance (KPMG, 2011; O'Dwyer, 2011) and Big 4 accounting firms are gaining increasing market share (O'Dwyer et al., 2011), little is known about the auditor's judgments on these types of engagements, in particular, material judgments which are important because they evaluate reliability of the reported data. These material judgments also form an important input into the negotiations between the auditor and the client with respect to the consequences related to the financial statements. Materiality has been considered a key concept in both audit theory and practice for decades (Messier et al., 2005). Previous research only addressed traditional financial statement audits (Messier et al., 2005) and did not consider the auditor's material judgments in other assurance engagements. As other assurance engagements become commonplace, it is important for auditors and regulators to understand what impacts the auditor's material judgments regarding these types of engagements. The Big4 audit firms (Deloitte, EY, KPMG and PWC) are the largest international professional firms providing audit, assurance, tax, consulting, advisory, accounting, corporate finance services. professional and legal. Among them, ensuring sustainability refers to the assurance of sustainability reports (SR). Professional accountants are qualified for this service because of their professional standards and because they are required to follow ethical principles (Peters and Romi, 2014). At the end of the last century, the financial audit market had to overcome important challenges (Elliott, 1997), which gave rise to the development of new markets. The American Institute of Certified Public Accountants (AICPA) has predicted that there are possibilities for auditors to expand their services and that they will face more competition. In this new context, Big4 accounting firms had to assess the opportunities and threats when undertaking other types of assurance. In recent years, both the provision of new services (SR) and the presence of new agents (certification companies and consultants) in the market are assured. SR rates are guaranteed and Big4's weight in this new market is growing over time.

Mock et al (2013) reported that the rate of SR guaranteed by Big4 increased from 35.4% in 2002-2004 to 51.35% in 2006-2007. In addition, KPMG highlights that Big4's market share has increased from 60% of guaranteed SR in 2005 (KPMG, 2008) to 67% of guaranteed SR in 2013 (KPMG, 2013). Most of the previous studies on assurance engagements refer to the Big4 in general and examine the differences between them and other assurance providers (Simnet et al., 2009; Hassan et al., 2009; Hassan et al., 2009; Perego, 2009). Little is known about the specific Big4's role in this market. Fernandez-Feijoo et al (2015) reported the dominant position of Big4 in securing SR with the following allocation: KPMG 18%, PWC 19%, Deloitte 10% and EY, 14%. The lowest percentage of assurance claims made between 2011-2012 by Deloitte and EY can be explained by the fact that both are headquartered in New York and not until recent years , sustainability becomes an important topic in the US.

Through the study of sustainability reports in countries around the world, the current trend of businesses is towards using assurance suppliers - reputable audit committees to enhance the quality of information on published reports. Large assurance providers like Big 4 will satisfy all these needs of businesses by professionalism, security and specialization.

### 3.2. The reality of publishing sustainability reports at enterprises in Vietnam

Regarding information disclosure, on October 6, 2015, the Ministry of Finance issued Circular No. 155/2015/TT-BTC guiding information disclosure on the stock market, effective from January 1, 2016, replacing Circular No. 52/2012/TT-BTC; towards building a green finance, realizing the National Strategy on green growth for the period 2011 - 2020 and vision to 2050 approved by the Prime Minister in Decision 1393/QD-TTg, Notification Decree 155 stipulates that public companies must disclose information related to sustainable development. Sustainable development content is included in the annual report, or made separately as a separate report. Thus, building sustainable development content is a mandatory requirement for public companies. Surprisingly, in Vietnam, many enterprises and corporations have pioneered in preparing sustainability reports even before there is a mandatory legal requirement such as: Bao Viet Group (BVH), Dairy Joint Stock Company Vietnam (VNM), DHG Pharmaceutical Joint Stock Company (DHG), Century Yarn Joint Stock Company (STK), Novaland Group (NVL), Gia Lai Electricity Joint Stock Company (GEG), Bao Viet Securities (BVS) ), Petrolimex Group (PLX), Saigon Thuong Tin Commercial Joint Stock Bank (STB), FPT Securities Joint Stock Company (FPTS), etc. Some businesses have actively voluntarily applied sustainability reporting frameworks according to the set of standards of the Global Reporting Initiative (GRI). Many pioneering enterprises have conducted detailed assessments of the degree of sustainable integration into their strategies and operations. FPT Securities Joint Stock Company has very well integrated the report contents according to the GRI Standards and 17 sustainable goals of the United Nations into its operations and reports. The company's sustainability report over the years is highly appreciated in both content and form. The report clearly demonstrates the governance processes, including assessment of material issues, risks, feedback and stakeholder

expectations, linking this assessment to the development of specific plans and targets to ensure sustainable growth.

**Figure 1: GRI Standards compliance table at FPT Securities Corporation (FPTS)**



*(Source: FPT's annual report, 2019)*

Meanwhile, the sustainability report of Vietnam Dairy Products Joint Stock Company - Vinamilk (VNM) is prepared according to GRI Standard with a clear structure, concise presentation, combined with the use of drawings, properly illustrated and graphed. VNM's

report has conveyed specific strategies and actions, showing the connection with the global sustainability context in general and Vietnam's dairy industry in particular.

**Figure 2: GRI Standards compliance table at Vietnam Dairy Products Joint Stock Company (VNM)**



*(Source: Vinamilk 's annual report, 2020)*

Making independent sustainability reports certified by third parties is a trend of businesses around the world. By 2011, there were more than 1,200 enterprises with independently audited sustainability reports. In Vietnam, Vinamilk pioneered in auditing sustainability reports because of the significant benefits this report brings. First of all, an audited sustainability report will help increase the level of reliability, transparency and professionalism in operations, helping businesses improve their reputation in the eyes of domestic and international investors. This will help improve the transparency of non-financial information, providing investors and interested parties with a comprehensive and strategic view of the entire operation of the business. This is also a positive factor, contributing to the realization of the Government's National Strategy on Green Growth and the development orientation of the green capital market of the Ministry of Finance. Therefore, when businesses seek independent third-party assurance, it will contribute to building the trust and credibility of stakeholders, and improve operational efficiency through process improvement, risk management. risk and seize the opportunity.

In fact, in the process of implementing assurance for Vinamilk's sustainability report, PwC Auditing Company will support to review the process, make recommendations and provide assurance for the report, in order to help This enterprise successfully implements sustainable development goals. In fact, not all auditing firms can meet the needs of enterprises, especially large enterprises, because there are audit units that do not have a department and consultant on sustainability reports.

**Figure 3: Limited independent assurance report for Sustainability Report at Vietnam Dairy Products Joint Stock Company (VNM)**



*(Source: Vinamilk 's annual report, 2020)*

In Vietnam, Baoviet Holdings can be mentioned as a pioneer in successfully applying Internal Audit to ensure the criteria in the Integrated Report and Sustainability Report according to GRI standards. This is a division under the Board of Directors with the function of providing independent and objective assessments of the internal control system, risk management and corporate governance in the fields of business activities of the Group. delegation to the Board of Directors and General Director on the basis of assurance and consulting activities. In order to ensure the reliability of some indicators in the 2016 Sustainability Report, Baoviet Holdings' Internal Audit Division has ensured a number of sustainability indicators. The Internal Audit Division provides an independent, objective assessment of the selected sustainability indicators and reviews PwC Vietnam's recommendations regarding the scope of the assessment based on established procedures. are specified in the Internal Audit Procedures and International Internal Audit Standards, guidelines published by the American Institute of Internal Auditors. This regulation requires the auditors of the Internal Audit Division to comply with professional ethics standards, risk-based assessment methods for the steps from planning, implementation to drawing conclusions. Based on 11 goals, Baoviet Group has selected from 17 sustainable goals of the United Nations, including 07 goals on building a sustainable society. The assurance services for a number of sustainability indicators in the 2016 Sustainability Report based on the Global Reporting Initiative's 2016 Sustainability Reporting Standards (GRI) include: GRI 401-1: New hires and layoffs; GRI 404-1: Average training hours per year per employee; GRI 404-3: Percentage of employees receiving periodic professional development and performance

appraisals; GRI 405-1: Diversity of management and staff; GRI 413-1: Local community engagement activities, impact assessments and development programs.

At the same time, recommendations to improve the reporting process and presentation of the Sustainability Report are also made clear such as: Composition of the sustainability report working group; Changes to the Sustainability Reporting standard; Training and guidance on the calculation and presentation of reporting indicators; Update the information collection form… Baoviet Sustainability Report 2016 is structured according to GRI standards which are clear and easy to understand with four main contents: GRI 101 General information; GRI 200 Economic issues; GRI 300 Environmental issues; GRI 400 Social issues and 33 specific indicators. With the message "I love the sea", Baoviet wants to convey the message of awareness of environmental protection, especially the marine environment, and at the same time arouse love for the homeland's sea and islands, towards sustainability through the prism. and the perspective of the children themselves - the future generation of the country. With this activity, once again, Baoviet continues to spread the awareness of environmental protection, ecosystem protection, towards sustainability of the whole community. By building a sustainable strategy from 17 sustainable goals of the United Nations, Baoviet has clearly demonstrated the integration of the world's sustainable goals in the development strategy of the business.

**Figure 4: Report Assured by Internal Audit for Sustainability Reporting at Bao Viet Group (BVH)**



*(Source: BVH's Sustainable Development Report, 2020)*

Through actual research on the publication of sustainability reports at enterprises in Vietnam, enterprises are currently aiming to use a combination of internal audits or independent audits to ensure the quality of information on published reports. It can be seen that the audit units have strictly followed the audit principles, showing high professionalism

in their expertise to provide quality information on sustainability reports. Through the use of GRI international standards to provide assurance for sustainability reporting, the audit units reviewed the process, made recommendations and provided assurance for the report, to help businesses successfully achieve their sustainable development goals.

## 4. Discussion

Generally, this study shows that the GRI guidelines are not systematically verified by suppliers, and some of them may even be ignored. Some GRI principles such as context sustainability, clarity of information, and timeliness of reports are almost never considered or addressed. Most reports focus on a few principles that also apply during the verification of financial statements, such as accuracy, reliability, and completeness of information. This trend can be explained by the modeling position of financial audit, which has shaped audit practices in sustainability reporting (Boiral and Gendron, 2011; O'Dwyer et al., 2011). This can also be explained by the predominance of accounting firms, marked by institutional arrangements similar to those observed in the finance and accounting sectors (Perego and Kolk). , 2010; Perego, 2009). Therefore, in order to improve the quality of information on sustainability reports in the context of integration, enterprises should pay attention to the following issues:

Firstly, enterprises need to have a change in awareness about sustainability reporting. Failure to disclose or limit disclosure of non-financial issues according to performance indicators can reduce a company's ability to access capital. Furthermore, businesses that lack accountability regarding sustainability issues will not be able to maximize their competitive advantage, and face risks of losing customers and stakeholder trust.

Secondly, businesses need to focus on data quality, processes and controls to create a meaningful report for stakeholders. At the same time, keep an eye on updates on new regulations, new trends, sustainability context, clarity of information and timeliness of reports to ensure effective communication with stakeholders.

Thirdly, businesses can improve their reporting by clearly disclosing their options for applying GRI reporting standards, as well as by disclosing their management approach to these topics. material is selected. The reports can add specific environmental sustainability indicators, analyze and clarify the impact of sustainability on markets, customers, etc.

Fourthly, strengthen the comparability of information by setting targets and comparing them with this year's targets compared with previous years. In addition, a direct comparison should be made with the set targets and with the regulations of the domestic or regional industry.

Fifthly, the less important and reference parts should be included in the appendix. Regarding the form of presentation, enterprises should convert more data tables into charts to improve the visualization for readers.

Thus, in order to improve the quality of information on sustainability reports in the context of integration, it is necessary to have full awareness of quality on sustainability reports, there should be control processes, strengthen the use of GRI standards to ensure sustainability reporting. Through this, suppliers will ensure that they will conduct a process review, make recommendations and provide assurance for the report, in order to help this business successfully implement its sustainable development goals.

## 5. Conclusion

Based on the framework of the Global Reporting Initiative (GRI), the sustainability report has been published in assurance provider accountability. As can be seen, assurance providers need to strictly comply with auditing principles, show high professionalism in their expertise to provide quality information on reports. Therefore, in order to improve the effectiveness of quality control of information presented in sustainability reports in companies listed on the Vietnamese stock market, assurance suppliers need to focus on managing manage the control process, further strengthen the independence, expertise and supervision of the auditors to make recommendations and provide assurance for the sustainability reporting of enterprises in the current period.

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# FINANCIAL CONTAGION DURING GLOBAL FINANCIAL CRISIS AND COVID–19 CRISIS: EVIDENCE OF DCC-GARCH MODEL

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## Abstract

*The purpose of this paper is to examine the existence of financial contagion from the U.S., Japan and China to Asian emerging markets during the global financial crisis and the Covid-19 pandemic crisis. We employed DCC-EGARCH methodology to estimate time-varying correlation and volatilities of stock markets of countries in sample, using stock daily returns for the period 2005 to 2021. For the heavy-tails associated with financial returns, the standardized multivariate student t-distribution is used. The pair-wise correlations estimated by the DCC model allow for our re-evaluations of the empirical contagion tests proposed by (Forbes and Rigobon, 2002) using t-tests. The empirical results show that the correlation between the U.S. and Japanese markets with emerging Asian countries is quite high, imply the interdependence between these markets during the research period. However, we found significant contagion effects from the US equity market to equity markets in both advanced and emerging economies during the Global financial crisis, whereas during the Covid-19 pandemic period, only 3 out of 10 Asian emerging market had experienced contagion from the US, though high interdependence was still found between the U.S. and others. Our results suggest that contagion effects are not strongly related to the level of global integration. It is also noticed that Asian emerging markets seems to be more affected by the contagion effect from Japan and China over time, implies the higher interconnection of these economies with the economy of China and Japan. These findings in this paper may give some useful information for policymakers, portfolio managers and investors in making decisions.*

*Keywords: Contagion, COVID-19, DCC – EGARCH model, Global Financial Crisis, Stock Market.*

## 1. Introduction

Globalization has played its role in increasing cross-border trade and capital flows by easing the barriers, due to which markets have integrated (De Brouwer,1999, Obadan, 2006). International stock markets, therefore, have become more interconnected and has experienced

large fluctuations over time. The higher co-movement among the stock market implies that these markets are highly interdependent, moving in the same direction with the global economies while the low co-movement shows that there is an opportunity for investors and the diversification opportunities exist. The degree of markets connection, both positive and negative co-movement is a critical input for many policy applications. The knowledge of risk-up dated correlation, known as conditional correlation or time-varying correlation between different markets, helps investors improve portfolio efficiency by minimize the risk of a portfolio containing stocks from different financial markets. Therefore, the stock market integration has attracted a great deal of interest for the researchers to answer for the question of how different financial markets with different conditional volatilities are related to each other.

According to Forbes and Rigobon (2002) and Celik (2012), the co-movements between different financial markets may arise from the contagion or interdependence between these markets. The global financial crisis (2007-2009) rapidly spread across virtually all economies, resulting in sharp declines in stock markets around the world, affecting both advanced and emerging markets. And now, at the beginning of the 2020, the global Covid-19 pandemic has induced a different and more severe version of the contagion phenomenon. Dow Jones Industrial Average (DJIA) and S&P500 indices dropped by 33% and 29%, respectively on March 20, 2020 from December 31, 2019. Japan experienced more than 20% drop from December 2019. The regional financial crises, as well as the crises at global level, have significantly changed the structure of international equity markets by increasing the interdependence of financial markets all over the world. Turn back time to the previous SARS outbreak pandemic in 2003, Bhuyan, *et al.* (2010) conclude that there was an increase in co-integrated relationship and dynamic co-movements in stock markets of the infected countries during the SARS influenza crisis. These cases show that dramatic movements in one stock market can have a powerful impact on markets of very different sizes and structures throughout the world.

Recently, a high level of integration among developed markets has reduced the benefits of portfolio diversification, resulting in the moving investments of investors to emerging markets to take advantage of diversification strategies and produce substantial returns to portfolio. However, all emerging markets are not the same and present different risks and opportunities. For the past 30 years, emerging markets have provided return enhancement and risk diversification opportunities for global equity investors (MSCI, 2019). Within the risk-and-reward framework, investors need to understand and evaluate each of the risks specific to emerging markets. From the investors' viewpoint, it is necessary to evaluate the effect of the turmoil periods on the stock market, gives investors more choices in allocating their funds and allows them to have a better risk management of portfolios containing stocks from emerging markets. An important question is whether this increased co-movement of global financial markets during the turmoil period provides evidence of contagion.

Moreover, the stylized facts of financial time series indicate that volatility fluctuates over time and that return series show evidence of volatility clustering. In order to measure risk using a more realistic approach, it is necessary to use time-varying volatility models. The multivariate GARCH is the most advanced technique which can give a clear picture of the interdependence of financial markets and hence the conditional correlations estimated by MGARCH is more relevant for the tests of contagion.

In the role of the world's largest economy, accounting for almost 22 percent of global output and over a third of stock market capitalization (World Bank Group, 2017), any shocks in the US market have effects far beyond its shores. Because of its size and international linkages, the United States plays a unique role in influencing and shaping global development priorities. At the same time, as one of the massive investors and strategic trading partners of Asia nation, Japanese market is more likely to influence the Asia markets (Nguyen *et al.,* 2020). China is where Covid-19 is first occurred and have played a critical role in the world recently. The Chinese government has a strong effort in the economy recommence during China's 14th Five-Year Plan (FYP) to raise productivity and national income. The Chinese economy, therefore, has the highest annual economic growth rate recently and it has become important spillovers for the rest of the world economy (World Bank Group, 2021). Given the growth in the GDP size, China has played an integral role in the Asian markets as well as the global economy.

The definition of contagion is as a significant increase in cross-market co-movement of asset returns (Dungey *et al*., 2005, Forbes and Rigobon, 2002), this study aims to test the existence of contagion effect among the United States, Japan, China and other Asian emerging markets using DCC-EGARCH models during the Global Financial Crisis and then during the most recent Covid-19 pandemic. The result findings in this paper may provide some practical information for policymakers, portfolio managers and investors in making decisions.

Our results show that the correlation between the U.S. and Japanese markets with emerging Asian countries is quite high, implying the interdependence between these markets during the research period. However, we found that during the 2008 Global Financial Crisis, there is significant contagion effects from the U.S. equity market to equity markets in both advanced and emerging economies, whereas during the Covid-19 pandemic period, only 3 out of 10 Asian emerging market had experienced contagion from the U.S. It is also noticed that Asian emerging markets seems to be more affected by the contagion effect from Japan and China over time, especially impressive increases in correlation between China and Asian countries.

The rest of the paper is structured as follows. The second section provides a review of the literature about the stock market volatilities and correlations as well as the empirical tests for the financial contagion. Methodology is given in Section 3. The fourth section entails the data sources and describes the empirical results of the study. The last section concludes the study.

## 2. Literature review

Following such a huge worldwide impact, the quest for reliable estimates on the contagion effects of COVID–19 pandemic has started to motivate rapidly. Many pieces of research have analyzed the financial market movements giving special reference to the Covid-19 pandemic, 2008 Global financial crisis, 1997 East Asian financial crisis and 1994 Mexican peso-devaluation, which can be found widely in the literature.

Corbet, *et al.* (2020) investigate the contagion effects associated with the Covid-19 pandemic between the main Chinese stock markets and Bitcoin. Using hourly data from 11 March 2019 to 10 March 2020, strong relationships between markets are identified, implied that in times of turmoil period these assets do not act as hedges, or safe havens, but perhaps rather as amplifiers of contagion. Akhtaruzzaman, *et al.* (2021) also considers during the current novel virus crisis how financial contagion occurs through financial and nonfinancial firms between China and G7 countries by VARMA (1,1) DCC-GARCH model. Using data of China and G7 countries, they find that listed firms across these sample countries experienced significant increase in conditional correlations between their stock returns, especially for financial firms. Also using DCC models, Akhtaruzzaman, *et al.* (2019) examines the role of China and the U.S. in transmitting contagion to South Asia. By employing monthly data, they concluded that Chinese and U.S. financial firms transmitted more spillovers than they received during the global financial crisis.Regarding the Global Financial Crisis 2008, Dungey and Gajurel (2014) examined the existence of contagion originating from the US to four largest advanced (France, Germany, Japan and the UK) and emerging markets (Brazil, China, India and the Russia) during the Global financial crisis using a latent factor model. They found significant contagion effects from the US market to these markets, both advanced and emerging markets, in total indices, whereas found less evidence of contagion from the US financial sector to the financial sector of other economies in the sample. Baur (2012) estimates the spread of the 2008 Global financial crisis from the financial sector to the real economy by studying ten sectors in 25 major developed and emerging stock markets. Using weekly prices (Tuesday to Tuesday closing prices) from October 23, 1979 to October 20, 2009, the research showed that the null hypothesis of no contagion is generally rejected in around 70% of all cases, implied strong contagion effects among aggregate stock markets and among financial sector stocks, whereas, the evidence for contagion of the sectors representing the real economy is mixed. Bekaert *et al.* (2011) investigate the transmission of crises to country-industry equity portfolios in 55 countries during the 2008 Global financial crisis. Using a three-factor asset pricing framework, evidences of systematic contagion from US markets and the global financial sector to equity markets in these sample countries were found, but the effects were very small; meanwhile, they found strong evidence of domestic contagion. Based on empirical results, they concluded that contagion was mostly domestic in nature and did not stem systematically from the United States or the global banking sector during the 2007-09 financial crisis.

The most important literature of financial contagion is the study of Dungey *et al.* (2004) provided an empirical framework comparison between the various approaches to test for contagion. These approaches consist of the correlation analysis approach by Forbes and Rigobon (2002); the VAR approach of Favero and Giavazzi (2002), the probability method of Eichengreen *et al.* (1996), and the co-exceedance proposal of Bae *et al.* (2003). Among those approaches, the method of Forbes and Rigobon (2002), which uses the information on all of the shocks in the crisis period to test for contagion, has become the most popular. Forbes and Rigobon (2002) measure stock market co-movements of 28 stock markets and tested for contagion during the 1997 East Asian crises, the 1994 Mexican peso collapse, and the 1987 U.S. stock market crash through the VAR-based strategy. By adjusting the correlation coefficient to correct for bias, they concluded during these three crises there was no contagion, only interdependence among these markets. Baig and Goldfajn (1999) test whether there is existence of contagion in four markets (the equity, sovereign debt, interest rates and exchange rates) between Asian countries (Thailand, Malaysia, Indonesia, Korea, and the Philippines) during the Asia crisis. Comparing correlations between stable and turmoil periods, they presented evidence of contagion in the foreign debt markets. Furthermore, using dummy variable to capture the effects of own-country and cross-border news on these markets, they found the existence of cross-border contagion in two markets (the equity and currency markets). King and Wadhwani (1990) also investigated for the existence of contagion between the US, UK and Japanese stock markets during the turmoil period of stock market crash on October 1987 by constructing a model in which contagion between markets occurs as the outcome of rational attempts to infer information from price changes in other markets.  With hourly stock price data, they found that there is evidence support for the contagion model. Furthermore, the empirical results show that an increase in volatility led to an increase in the magnitude of coefficients.

Most of the past researches have focused on the developed market and found a high level of interconnection among the developed market with little diversification opportunities. Moreover, Covid-19 pandemic recently have massively impacted on the world economy, considering the deepest since the end of World War II ( (Yeyati & Filippini, 2021). Hence, it is worth applying the DCC model to model the dynamic correlation between any of the emerging markets and the U.S. market and Japan and hence re-perform the contagion test in financial markets during Covid-19 pandemic compared with the 2008 Global financial crisis.

## 3. Methodology

In this paper, we use the DCC-EGARCH with Student t-distribution to obtain the dynamic conditional correlations and follow the method of Forbes and Rigobon (2002) to test for financial contagions. Following the method of Forbes and Rigobon (2002), the correlation series are divided into 2 periods which are pre-crisis and post-crisis period and t-tests are used to investigate if there are significant increases in the conditional correlations after a financial crisis.

The analysis of Engle (2002)'s DCC – GARCH model involves two steps: the first is

to estimate the univariate GARCH model, and the second is to measure the conditional correlations varying over time.

The DCC-GARCH model Engle (2002) is given below:

$$H_t = D_t R_t D_t \qquad (1)$$

Where $H_t$ is conditional variance matrix, $D_t = diag\{\sqrt{h_{i,t}}\}$, $R_t$ is time-varying correlation matrix. $D_t$ is the nxn diagonal matrix of the conditional standard deviations derived from the univariate GARCH(1,1) process. In this paper, E-GARCH(1,1) model was proposed by Nelson (1991) is used to capture the asymmetry in the sign of shocks.

$$\log \sigma_t^2 = \omega + \alpha * [|\tfrac{\varepsilon_{t-1}}{\sigma_{t-1}}| - E(\tfrac{\varepsilon_{t-1}}{\sigma_{t-1}})] + \beta \log\sigma_{t-1}^2 + \gamma \tfrac{\varepsilon_{t-1}}{\sigma_{t-1}} \qquad (2)$$

where α, β and $\gamma$ are constant parameters. This model accounts for the leverage effect. It is expected that $\gamma < 0$, a negative return increases volatility by more than a positive return of the same magnitude, where $\gamma$ indicates the presence of a leverage effect. When $\varepsilon_{t-1}$ is positive, i.e. there is "good news", the total contribution to the volatility of innovation is α(1+ $\gamma$)| $\varepsilon_{t-1}$|. In opposite case, when $\varepsilon_{t-1}$ is negative, i.e. there is a "bad news", the total contribution to the volatility of innovation is α(1- $\gamma$)| $\varepsilon_{t-1}$|.

The parameterizations of $R$ have the same requirements as $H$, except that the conditional variances must be unity.

The dynamic correlation matrix $R_t$ is decomposed into:

$$R_t = Q_t^{*-1} Q_t Q_t^{*-1} \qquad (3)$$

$$Q_t = \bar{Q}(1 - \alpha - \beta) + \alpha(\epsilon_{t-1}\epsilon_{t-1}') + \beta Q_{t-1} \text{ with } \epsilon_{i,t} = \tfrac{\varepsilon_{i,t}}{\sqrt{q_{i,t}}} \qquad (4)$$

Where: $\bar{Q} = Cov[\epsilon_t \epsilon_t']$ is the unconditional covariance matrix of the standardized errors $\epsilon_t$

The conditions for the existence of the DCC are that all parameters are positive ($\alpha \geq 0, \beta \geq 0$) and the sum of the two is less than one: $\alpha + \beta < 1$. $Q^*$ is the diagonal matrix with the square root of the diagonal elements of $Q_t$ at the diagonal:

$$Q_t^* = \begin{bmatrix} \sqrt{q_{1,t}} & 0 & \cdots & 0 \\ 0 & \sqrt{q_{2,t}} & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ 0 & \cdots & 0 & \sqrt{q_{k,t}} \end{bmatrix}$$

Hence, $\rho_{ij,t}$ which is *ijth* the element of dynamic conditional correlation matrix, $Rt$ is formally constructed as follows

$$\rho_{ij,t} = \tfrac{q_{ij,t}}{\sqrt{q_{i,t}q_{j,t}}} \qquad (5)$$

$Q^*$ rescales the elements in $Q_t$ to ensure $|\rho_{ij,t}| \leq 1$

In addition, it is well documented that the financial data, particularly those recorded at

daily or higher frequency, show a fat-tailed distribution which cannot be fully modelled by using the Normal distribution, which is the primary and key assumption of many econometric frameworks in finance. In our paper, a multivariate Student's $t$-distribution is used to capture that characterizes of financial time series well.

Using the variance–covariance estimates from this model, we calculate the cross-market correlation coefficients between these markets in the sample during the stable period, turmoil period, and full period.

In the final step, we consider whether there is contagion between these markets in the sample during the Global crisis and Covid-19 pandemic. Contagion is one of the definitions debated most in literature. In this paper, the definition of contagion is based on (Forbes & Rigobon, 2002), expresses a significant rise in the cross-market correlation during the crisis period. It means that if the correlation between two markets are moderated during stable periods and the appearance of a shock to one market leads to a surge in market co-movement, contagion would be generated. According to the method of (Forbes & Rigobon, 2002), we use $t$-tests for a purpose if there is a significant increase in any of these correlation coefficients during the turmoil period, implies the contagion effect. The test hypotheses are expressed:

$$H_0: \rho > \rho^t \text{ (No contagion)}$$

$$H_{1:} \rho < \rho^t \text{ (Contagion)}$$

where $\rho$ and $\rho^t$ are the correlation during the full period and during the turmoil (high volatility) period, respectively. We also have $\rho^s$ is the conditional correlation during the stable period. These conditional correlation series are generated by DCC model. The alternative hypothesis $H_1$ implies a significant increase in the mean of the conditional correlation during a crisis period, meaning that contagion effect exists.

## 4. Data and Summary Statistics

### 4.1. Data

This study used the data sample of some developed and Asian emerging countries including the U.S., Japan, China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Taiwan, Thailand, and Vietnam. We collected the daily data of stock markets for these countries from DataStream for the period from January 2005 to July 2021, with a total of 2754 daily observations. The indices are converted to a daily rate of return follow (6), which are defined as the natural logarithmic returns in two consecutive trading days:

$$r_t = \ln(p_t) - \ln(p_{t-1}) = \ln(\frac{p_t}{p_{t-1}}) \qquad (6)$$

Where $r_t$ is the daily log return, $p_t$ and $p_{t-1}$ are the daily adjusted closing price of each stock indices at time t and t-1.

Due to the different time zone, the US market closes later than the other Asian stock markets; therefore, a shock in the US stock market during day t will not be reflected in the

Asian emerging stock markets until day t+1. Thus, the appropriate pairing is time t-1 for the US and time t for the Asian markets.

The plots for the daily log returns fluctuate around a zero mean (see Figure 1). Each of all series appears to show the signs of ARCH effects in that the amplitude of the returns varies over time.

Volatility clustering – the periods of high volatility alternate periods of low volatility – can be observed (large and small swings tend to cluster, see Figure 1). Abusing the terminology slightly, it could be started that "volatility is autocorrelated". Observing the time series data set of returns, we see that there exists heteroskedasticity in the model. However, we cannot determine whether this is enough to warrant consideration.

**Figure 1: The daily returns of stock indices**
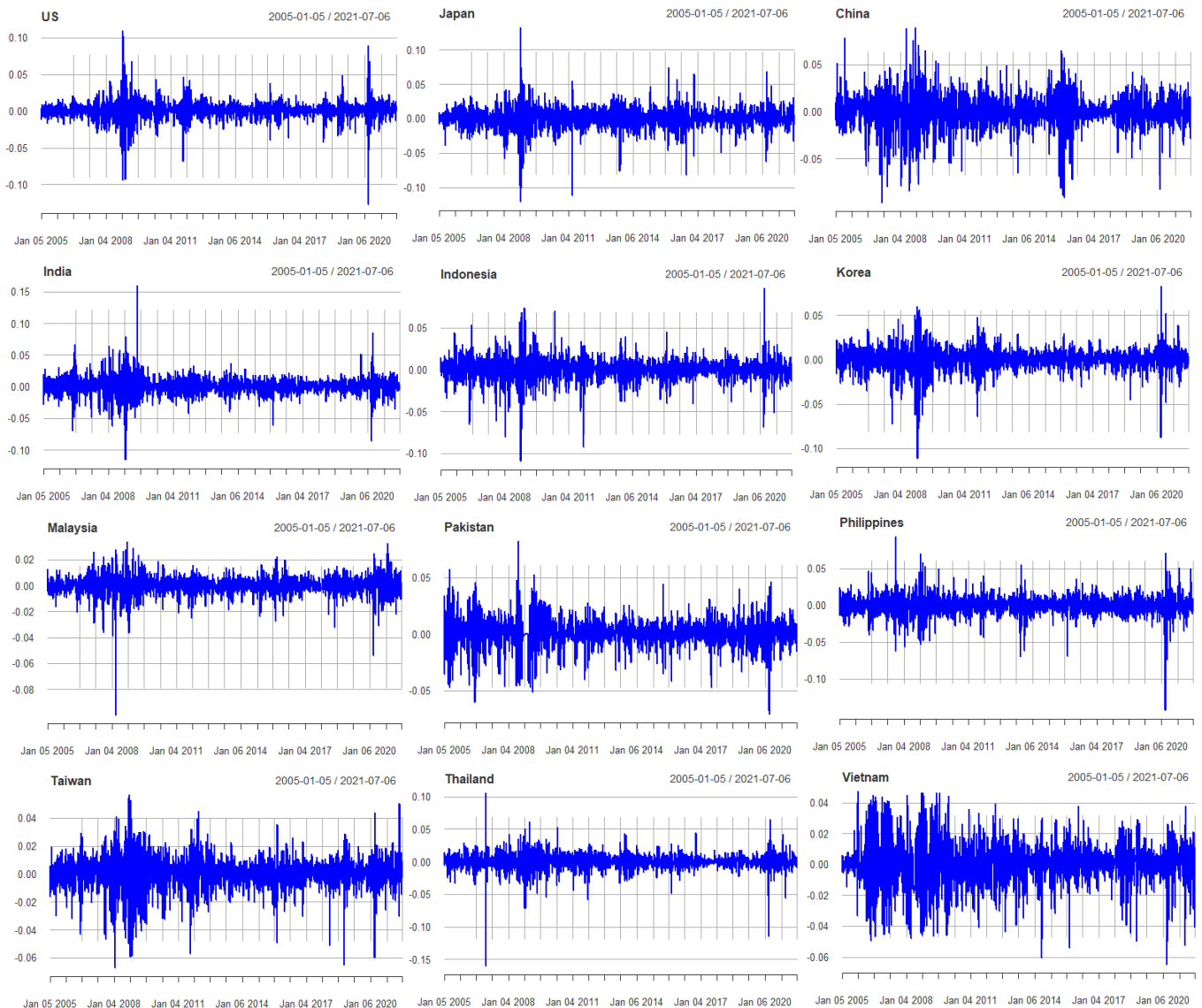


*Source: Datastream*

**Table 1. Descriptive statistics of returns in the full period (from January 1, 2005 through July 6, 2021**

| Country | USA | Japan | China | India | Indonesia | Korea | Malaysia | Pakistan | Philippines | Taiwan | Thailand | Vietnam |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Observations | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 | 2754 |
| Mean | 0.0006 | 0.0003 | 0.0002 | 0.0005 | 0.0003 | 0.0002 | 0.0001 | 0.0005 | 0.0003 | 0.0002 | 0.0001 | 0.0003 |
| Median | 0.001 | 0.000 | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.001 |
| Maximum | 0.110 | 0.132 | 0.089 | 0.160 | 0.097 | 0.083 | 0.034 | 0.083 | 0.094 | 0.057 | 0.106 | 0.047 |
| Minimum | -0.128 | -0.121 | -0.097 | -0.116 | -0.110 | -0.112 | -0.100 | -0.071 | -0.143 | -0.067 | -0.161 | -0.065 |
| Std.Dev. | 0.013 | 0.015 | 0.017 | 0.014 | 0.013 | 0.012 | 0.007 | 0.013 | 0.013 | 0.011 | 0.012 | 0.014 |
| Skewness | -0.522 | -0.544 | -0.519 | 0.115 | -0.762 | -1.008 | -1.523 | -0.407 | -0.815 | -0.721 | -1.407 | -0.326 |
| Kurtosis | 15.837 | 8.739 | 4.309 | 11.787 | 8.787 | 9.242 | 16.075 | 3.601 | 10.361 | 4.476 | 19.527 | 1.876 |
|  | 28955 | 8916.5 | 2259.7 | 15978 | 9143 | 10286 | 30769 | 1567.6 | 12647 | 2543.9 | 44735 | 454.29 |
| Jarque Bera Test | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
|  | 86.73 | 47.526 | 26.526 | 49.537 | 43.603 | 23.915 | 21.866 | 66.873 | 25.673 | 15.816 | 18.956 | 85.493 |
| LB Q-statistics | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.01) | (0.00) | (0.00) | (0.09) | (0.04) | (0.00) |
| ArchTest (p.value) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

*Source: Datastream*

### 4.2. Summary Statistics

Descriptive characteristics for the daily stock index returns are presented in Table 1. Table 1 shows that the average daily returns are positive in full period from 2005 to 2021 but negligibly small compared to the sample standard deviation. The average return of the U.S. stock market (0.0006) is the highest among the selected countries. The average return of the Thailand and Malaysia stock markets are 0.001 which are the lowest returns, compared to other countries. In terms of the daily standard deviation, which represents the risk or volatility of the returns in the stock markets, we see that the standard deviation of the Chinese stock market returns is 0.017, being the highest volatility. In contrast, Malaysian stock market returns has the lowest standard deviation (0.007) among the stock indices.

The returns series display similar statistical properties as far as the third and fourth moments are concerned. More specifically, as skewness of all the return series is negative, which is evidence for overall negative performance, and asymmetry tail extending out to the left and is referred to as "skewed to the left" in given returns. As we know, skewness is a measure of symmetry, which is equal to zero for normal distribution. The kurtosis values are a measure of the fatness of peaked-ness of the tails of the distribution and distribution of data around the mean. Both the assets show evidence of fat tails (leptokurtic), since the kurtosis exceeds 3 (the normal value), implying that the distribution of these returns has a thicker tail than the normal distribution. Therefore, the standard deviation of all markets implies that the "risk" is underestimated when kurtosis is higher and skewness is negative.

We check whether sample data have the skewness and kurtosis matching a normal distribution through the Jarque–Bera test. As a rule, this test is applied before using methods of parametric statistics which require distribution normality, like GARCH models. The non-normal distribution of data is also supported via the Jarque–Bera statistics, which rejects the null hypothesis of normality at 1% significance level. This means used data in our sample departing from normal distribution. In order to deal with this problem, in this paper, Student's-t distributions will be used.

Furthermore, the Ljung-Box (LB) Q statistics for daily stock returns of both assets are highly significant at five-percent level indicate the presence of serial correlations. The p-value of ArchTest (for the Portmanteau Q and the Lagrange Multiplier test statistic) shown in the last row are all zero to both places, resoundingly rejecting the "no ARCH" hypothesis.

**Table 2: Descriptive statistics of returns during Global Financial Crisis (from January 1, 2005 through December 31, 2009)**

| Country | USA | | Japan | | China | | India | | Indonesia | | Korea | | Malaysia | | Pakistan | | Philippines | | Taiwan | | Thailand | | Vietnam | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In |
| Observations | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 | 461 | 391 |
| Mean | 0.0003 | 0.0002 | 0.0006 | -0.0005 | 0.002 | -0.0008 | 0.0015 | 0.0001 | 0.0013 | -0.0007 | 0.0008 | -0.0012 | 0.0003 | -0.0005 | 0.0006 | -0.0002 | 0.0008 | -0.0003 | 0.0004 | -0.001 | -0.0001 | -0.0004 | 0.002 | -0.0016 |
| Median | 0.001 | 0.001 | 0.000 | 0.000 | 0.003 | 0.001 | 0.002 | 0.001 | 0.002 | 0.000 | 0.002 | 0.001 | 0.001 | 0.000 | 0.002 | 0.000 | 0.001 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 | -0.001 |
| Maximum | 0.024 | 0.110 | 0.033 | 0.132 | 0.079 | 0.089 | 0.067 | 0.160 | 0.053 | 0.073 | 0.034 | 0.060 | 0.026 | 0.034 | 0.058 | 0.083 | 0.094 | 0.071 | 0.029 | 0.057 | 0.106 | 0.062 | 0.047 | 0.046 |
| Minimum | -0.030 | -0.095 | -0.039 | -0.121 | -0.097 | -0.085 | -0.070 | -0.116 | -0.065 | -0.110 | -0.072 | -0.112 | -0.036 | -0.100 | -0.060 | -0.051 | -0.062 | -0.057 | -0.047 | -0.067 | -0.161 | -0.072 | -0.050 | -0.048 |
| Std.Dev. | 0.007 | 0.021 | 0.011 | 0.024 | 0.018 | 0.026 | 0.014 | 0.024 | 0.013 | 0.020 | 0.012 | 0.020 | 0.007 | 0.011 | 0.017 | 0.017 | 0.013 | 0.017 | 0.010 | 0.018 | 0.014 | 0.017 | 0.017 | 0.021 |
| Skewness | -0.339 | 0.060 | -0.188 | -0.338 | -0.778 | -0.067 | -0.453 | 0.484 | -0.782 | -0.813 | -0.970 | -0.979 | -0.801 | -1.888 | -0.344 | -0.093 | 0.367 | -0.023 | -0.902 | -0.436 | -2.610 | -0.461 | -0.090 | -0.010 |
| Kurtosis | 1.884 | 4.918 | 0.789 | 5.293 | 4.265 | 1.109 | 3.179 | 5.733 | 4.009 | 4.854 | 4.010 | 4.440 | 4.608 | 15.114 | 0.864 | 2.087 | 5.795 | 1.714 | 3.337 | 1.013 | 46.081 | 1.964 | 0.950 | -0.490 |

*Notes: Pre: Pre-period of Global financial crisis (from January 1, 2005 to August 31, 2007). In: Period during Global financial crisis (from September 1, 2007 to December 31, 2009)*

*Source: Datastream*

**Table 3: Descriptive statistics of returns during Covid-19 pandemic (from January 1, 2013 through July 6, 2020)**

| Country | USA | | Japan | | China | | India | | Indonesia | | Korea | | Malaysia | | Pakistan | | Philippines | | Taiwan | | Thailand | | Vietnam | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In | Pre | In |
| **Observations** | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 | 1132 | 243 |
| **Mean** | 0.0006 | 0.0015 | 0.0005 | 0.0004 | 0.0001 | 0.0002 | 0.0005 | 0.0009 | 0.0003 | -0.0006 | 0.0003 | 0.0012 | 0.0001 | -0.0002 | 0.0006 | 0.0009 | 0.0004 | -0.0012 | 0.0005 | 0.001 | 0.0003 | -0.0002 | 0.0005 | 0.001 |
| **Median** | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.002 | 0.001 | 0.000 | 0.001 | 0.002 | 0.000 | 0.000 | 0.001 | 0.002 |
| **Maximum** | 0.048 | 0.089 | 0.074 | 0.069 | 0.065 | 0.032 | 0.052 | 0.086 | 0.045 | 0.097 | 0.029 | 0.083 | 0.022 | 0.033 | 0.044 | 0.047 | 0.055 | 0.072 | 0.035 | 0.050 | 0.045 | 0.065 | 0.038 | 0.038 |
| **Minimum** | -0.042 | -0.128 | -0.083 | -0.063 | -0.092 | -0.082 | -0.061 | -0.085 | -0.041 | -0.068 | -0.045 | -0.088 | -0.032 | -0.054 | -0.048 | -0.071 | -0.070 | -0.143 | -0.065 | -0.060 | -0.048 | -0.114 | -0.061 | -0.065 |
| **Std.Dev.** | 0.008 | 0.018 | 0.013 | 0.015 | 0.015 | 0.014 | 0.009 | 0.017 | 0.009 | 0.016 | 0.008 | 0.015 | 0.006 | 0.011 | 0.010 | 0.013 | 0.011 | 0.021 | 0.008 | 0.012 | 0.008 | 0.016 | 0.010 | 0.014 |
| **Skewness** | -0.518 | -1.488 | -0.443 | -0.247 | -0.906 | -1.132 | -0.335 | -0.826 | -0.387 | 0.211 | -0.397 | -0.532 | -0.475 | -1.014 | -0.216 | -1.310 | -0.612 | -2.022 | -0.913 | -0.725 | -0.098 | -2.202 | -0.816 | -1.539 |
| **Kurtosis** | 4.281 | 15.151 | 5.020 | 3.815 | 6.391 | 5.232 | 3.772 | 7.850 | 2.756 | 8.064 | 2.277 | 8.718 | 2.808 | 4.648 | 2.195 | 7.116 | 4.705 | 12.903 | 6.812 | 4.967 | 3.640 | 14.692 | 4.019 | 4.775 |

*Notes: Pre:Pre-period of Covid-19 pandemic (from January 1, 2013 to December 31, 2019). In: Period during Covid-19 pandemic (from January 1, 2020 to July 6, 2021).*

*Source: Datastream*

Table 2 provides information about the descriptive statistics in the period of Global Financial Crisis. In the pre-crisis period, it can be clearly seen that mean returns of all markets are positive (except for Thailand). In which, China and Vietnam markets had the highest returns (0.002). Regarding the daily standard deviation, the lowest level belongs to the U.S. and Japan, which are developed markets, implied such markets have lower volatility in returns than others. The higher value in the standard deviation of the emerging markets suggests that such financial markets are more volatile than the developed markets.

The Global Financial Crisis from 2007-2009, stemmed from the collapse of the subprime mortgage market in the U.S. market, had spread throughout the global financial system, including emerging markets. Due to this major shock, 9 of the 10 emerging financial markets in our sample experienced a sharp decrease in mean levels with large negative returns (see Table 2). Specifically, Taiwan and Korea markets had lowest returns (-0.001 and -0.0012, respectively). Associated with decreased returns, the risks in these financial markets, represented by standard deviations, also increase significantly in comparison with the relatively stable period (pre-crisis period). Of which, China has the largest market volatility (0.026). These features raise the question whether there is a financial contagion during a crisis period from the U.S to emerging financial markets. This will be discussed in section 4 by the DCC-GARCH, which is used to test for a financial contagion.

The Global Financial Crisis seems more severely affected the global financial markets, compared to the Covid-19 pandemic. The reason would be that since Covid-19 has been declared by WTO, the country's governments around the world have immediately provided incentives in order to hinder the negative impact of COVID-19 pandemic.  For example, the Federal Reserve stepped in with a broad array of actions to limit the economic damage from the pandemic: near-Zero Interest Rates;  supporting Financial Market Functioning; encouraging Banks to Lend; supporting Households and Consumers; supporting State and Municipal Borrowing; cushioning U.S. Money Markets from International Pressures.

It is noticeable that the selected indices have diversity in returns and volatility during Covid-19 pandemic period (see Table 3). India, Korea, Pakistan experiences a considerable increase in returns, whereas almost all remaining markets witness a dramatical decrease in returns. Four out of ten emerging markets (Indonesia, Malaysia, Philippines, Thailand) suffered negative returns, in which, Indonesia experienced a significant decrease in mean returns, from a positive level (0.0003) to a large negative return (-0.0006). According to(Prasidya, 2020), in 2019, the foreign ownership within the Indonesia capital market was at 44.29 percent and domestic ownership accounted for 55.71 percent. Foreign investors also have made up 36 percent of the total value traded on the Indonesia Stock Exchange while domestic investors made up 64 percent. Amid the prolonged COVID-19 pandemic, the Indonesian stock market has endured a selling spree by foreign investors as unfavorable the global economic and political situations. There are about 20 trillion rupiah of foreign funds

coming out of the Indonesian stock exchange throughout 2020, especially as a result of massive sales in the last 3 months. Another noteworthy statistic in this table is that, all markets showed higher risk with a substantial increase in standard deviation level compared to pre-period of Covid-19. Both skewness and kurtosis have the same feature as aforementioned analysis in the whole period.

## 5. Empirical Results

### 5.1. Primary correlation analysis

Based on the DCC model, we look further insights into the correlation among the U.S. market, Japan, China and each individual emerging market. Figure 2 plots the conditional correlations, extracted from DCC model, of each emerging market with the US market, Japan and China. All emerging markets (except Vietnam and Pakistan for a few short periods in correlation with China) showed a positive correlation at different levels during the period from 2005 to 2021.

**Figure 2: Conditional Correlation among US, Japan, China and Emerging Countries in**
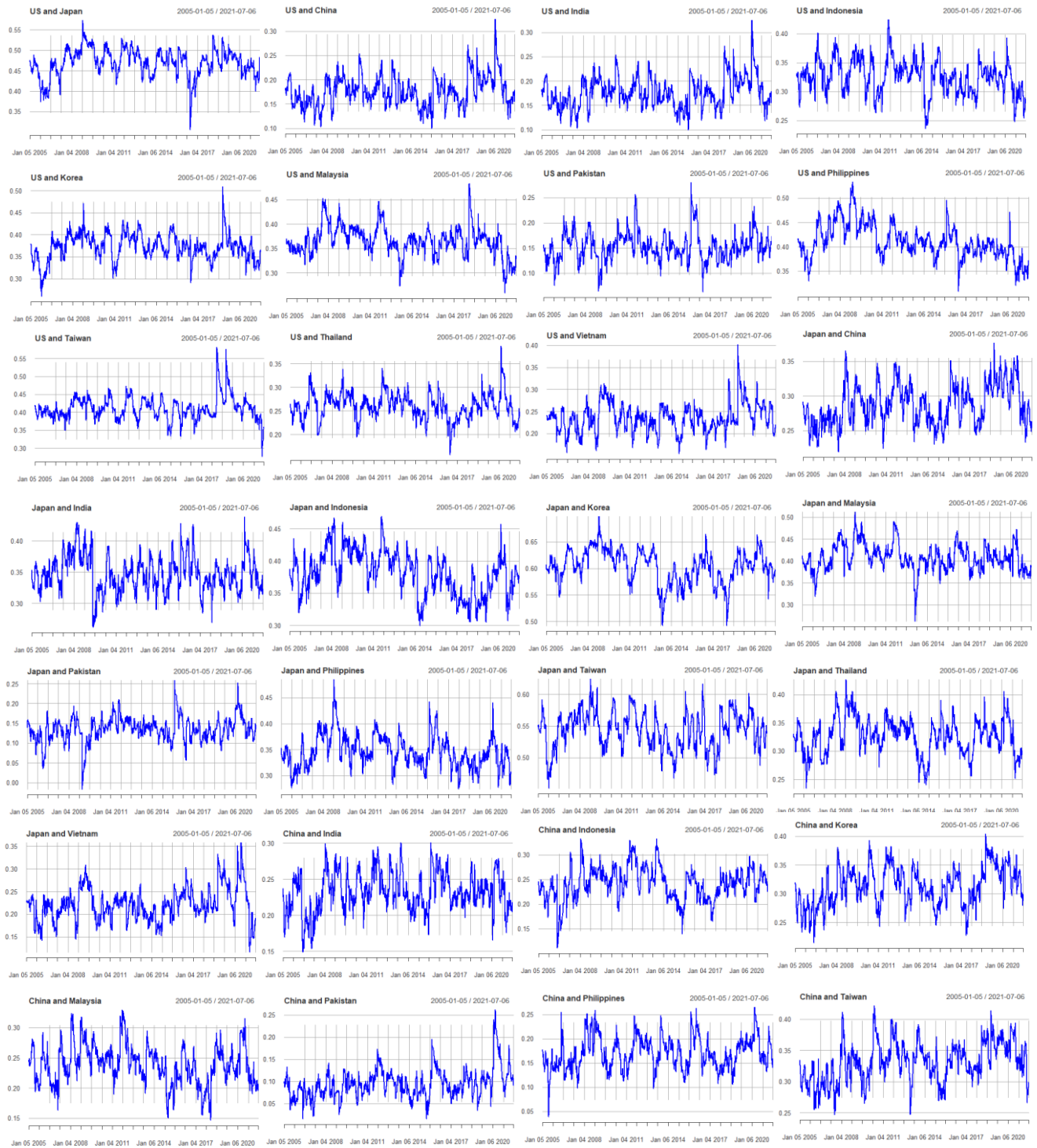
**Asia**
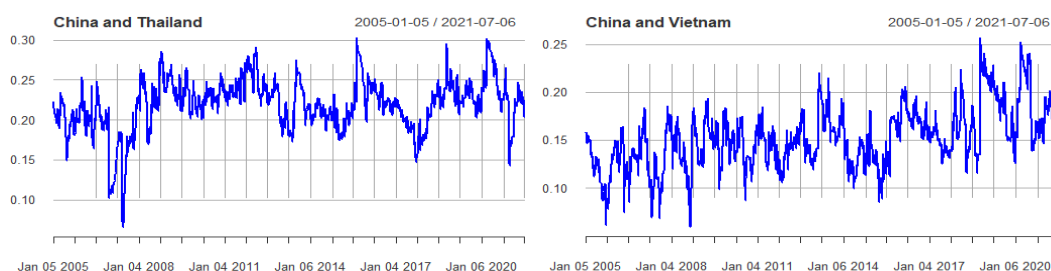


<div align="right"><em>Source: Datastream</em></div>

The estimated conditional correlation coefficients for the full period from 2005 to 2021 are shown in Table 4. Several patterns are immediately apparent.

First, cross-market correlations during the full period are not surprising. The U.S. market is highly correlated with Japan and many of the East Asian economies (Indonesia, Korea, Malaysia, Philippines, Taiwan), and much less correlated with China, Pakistan. Japan also obviously has a significant correlation with other emerging countries with a higher level in compared with the U.S., particularly correlated with Taiwan and Korea due to its role as the Asian central financial market. No matter how the Covid-19 outbreak, the U.S and Japan continue to become the world-renowned international financial centers. The degree of correlation between China and other emerging markets in the GFC was relatively low, especially the correlation with Pakistan. However, the impacts of China on other emerging markets increase in the Covid-19 period.

Second, in one extreme example, among Asian emerging markets, Pakistan is the market with the lowest correlation with the U.S., Japanese, and Chinese markets. There is a significant increase in correlation between China and Pakistan over time. The reason is that China has progressively considered Pakistan as the largest trading partner. Their commercial connection was established since January 1963, the year of first bilateral trade agreement. The bilateral trade was recorded as USD 5.2 billion in 2006 which increased to USD 16 billion in 2015, recording an annual growth of 12.57 percent. Both countries agreed to set a target of raising mutual trade to USD 20 billion in the next 3 years. The China's Belt and Road Initiative project, which will be discussed later, has a substantial role in achieving this target. Thus, relationship between China and Pakistan is not only limited to trade but in diplomacy and strategic partnerships as well (Irshad *et al.,* 2015).

Third, cross-market correlations between China and most of the other countries in the sample significantly increased over time, shows that China's economic position has increasingly affected the remaining markets. This change is especially notable in the Taiwan and Vietnam markets, where the average correlation with Taiwan and Vietnam increases from 0.22 and 0.05 during the Global Financial Crisis period to 0.37 and 0.22 during the Covid-19

pandemic period, respectively. This is quite appropriate as China have recently implemented policies to manage Taiwan and Hong Kong more closely. Moreover, according to the Asian Banker Research, Japan and China have the largest the net International Investment Position (NIIP) (Kazmi, 2020). Since the China's Belt and Road Initiative has been first announced in 2013, the China financial market system has been continually developed, becoming a growing global influence (Voon & Xu, 2020). The Belt and Road Initiative aims to connect Asia, Africa, and Europe along five routes. The Initiative is motivated by China's pressing economic concerns (Cai, 2016) and viewed as the Beijing's effort to increase political dominance over the neighboring countries and to boost China has become the world's fastest growing economic power with an average growth rate of 10% within 30 years (International Monetary Fund, 2013).

**Table 4: Conditional Correlation Coefficients (from January 1, 2005 to July 6, 2021)**

|  | Full period (Global Financial Crisis) | | | Full period (Covid-19 Crisis) | | |
|---|---|---|---|---|---|---|
|  | U.S. | Japan | China | U.S. | Japan | China |
| **U.S.** |  |  |  |  |  |  |
| **Japan** | 0.4649 |  |  | 0.4379 |  |  |
| **China** | 0.1363 | 0.2240 |  | 0.1881 | 0.3029 |  |
| **India** | 0.2764 | 0.3797 | 0.1946 | 0.2667 | 0.3410 | 0.2339 |
| **Indonesia** | 0.3762 | 0.4663 | 0.2021 | 0.2792 | 0.2923 | 0.2221 |
| **Korea** | 0.3722 | 0.6828 | 0.2506 | 0.3511 | 0.5332 | 0.3417 |
| **Malaysia** | 0.4072 | 0.4419 | 0.2679 | 0.3253 | 0.3700 | 0.1906 |
| **Pakistan** | 0.1179 | 0.0740 | 0.0368 | 0.1481 | 0.1510 | 0.1241 |
| **Philippines** | 0.5299 | 0.3858 | 0.1379 | 0.3303 | 0.3056 | 0.1839 |
| **Taiwan** | 0.4011 | 0.5562 | 0.2245 | 0.4104 | 0.5232 | 0.3774 |
| **Thailand** | 0.2695 | 0.3670 | 0.1680 | 0.2421 | 0.2940 | 0.2340 |
| **Vietnam** | 0.2350 | 0.2012 | 0.0533 | 0.2623 | 0.2467 | 0.2284 |

*Source: Datastream*

**Table 5:  The Global Financial Crisis period: Conditional Correlation Coefficients**

| Country | The United State | | | | Japan | | | | China | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stable $\hat{\rho}^S$ | Turmoil $\hat{\rho}^T$ | Test Statistic | Contagion | Stable $\hat{\rho}^S$ | Turmoil $\hat{\rho}^T$ | Test Statistic | Contagion | Stable $\hat{\rho}^S$ | Turmoil $\hat{\rho}^T$ | Test Statistic | Contagion |
| Japan | 0.3685 | 0.5857 | **-182.28** | C | | | | | | | | |
| China | 0.0537 | 0.1992 | **-81.15** | C | 0.1331 | 0.2850 | **-134.35** | C | | | | |
| India | 0.2961 | 0.2631 | | N | 0.3832 | 0.3710 | | N | 0.1188 | 0.3028 | **-104.19** | C |
| Indonesia | 0.3789 | 0.3451 | | N | 0.4157 | 0.4880 | **-62.89** | C | 0.1008 | 0.3055 | **-155.82** | C |
| Korea | 0.3214 | 0.4374 | **-73.10** | C | 0.6146 | 0.7395 | **-121.81** | C | 0.1532 | 0.3658 | **-136.64** | C |
| Malaysia | 0.3627 | 0.4189 | **-37.29** | C | 0.3900 | 0.4956 | **-54.87** | C | 0.1975 | 0.3424 | **-75.88** | C |
| Pakistan | 0.1256 | 0.0016 | | N | 0.0652 | -0.0401 | | N | -0.0057 | -0.0030 | **-3.63** | C |
| Philippines | 0.4425 | 0.5883 | **-78.56** | C | 0.3015 | 0.4917 | **-86.17** | C | 0.0216 | 0.2918 | **-106.56** | C |
| Taiwan | 0.3647 | 0.3974 | **-25.53** | C | 0.5449 | 0.5906 | **-36.47** | C | 0.1576 | 0.3237 | **-122.90** | C |
| Thailand | 0.2532 | 0.3111 | **-53.42** | C | 0.2680 | 0.4807 | **-192.61** | C | 0.0707 | 0.2922 | **-173.20** | C |
| Vietnam | 0.1514 | 0.3067 | **-72.19** | C | 0.1365 | 0.2616 | **-58.45** | C | -0.0159 | 0.0892 | **-46.71** | C |

*Source: Datastream*

Note: *This table reports conditional cross-market correlation coefficients for the United State, Japan, China and each country in the sample. The stable period includes 461 observations, is defined as January 2005, through August 31, 2007. The turmoil period includes 391 observations, is defined as September 1, 2007, through December 31, 2009. The test statistics are for one-sided t-tests examining if the cross-market correlation coefficient during the turmoil period is significantly greater than during the stable period. "C" indicates that the test statistic is greater than the critical value and therefore contagion occurred. "N" indicates that the test statistic was less than or equal to the critical value and therefore no contagion occurred.*

**Table 6: The Covid-19 pandemic period: Conditional Correlation Coefficients**

| Country | The United State | | | | Japan | | | | China | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stable | Turmoil | Test | | Stable | Turmoil | Test | | Stable | Turmoil | Test | |
| | $\hat{\rho}^S$ | $\hat{\rho}^T$ | Statistic | Contagion | $\hat{\rho}^S$ | $\hat{\rho}^T$ | Statistic | Contagion | $\hat{\rho}^S$ | $\hat{\rho}^T$ | Statistic | Contagion |
| Japan | 0.4532 | 0.4690 | **-15.21** | C | | | | | | | | |
| China | 0.1742 | 0.1780 | **-3.17** | C | 0.3086 | 0.3233 | **-12.85** | C | | | | |
| India | 0.2689 | 0.2281 | | N | 0.3312 | 0.3635 | **-50.79** | C | 0.2406 | 0.2176 | | N |
| Indonesia | 0.2928 | 0.2417 | | N | 0.2769 | 0.3303 | **-80.92** | C | 0.1994 | 0.2804 | **-119.42** | C |
| Korea | 0.3700 | 0.2840 | | N | 0.5116 | 0.6045 | **-144.88** | C | 0.3390 | 0.3807 | **-61.11** | C |
| Malaysia | 0.3668 | 0.2209 | | N | 0.3785 | 0.3743 | | N | 0.1765 | 0.2377 | **-91.59** | C |
| Pakistan | 0.1371 | 0.1783 | **-63.64** | C | 0.1369 | 0.2026 | **-104.29** | C | 0.0683 | 0.3281 | **-403.29** | C |
| Philippines | 0.3521 | 0.2486 | | N | 0.3107 | 0.2807 | | N | 0.1708 | 0.2339 | **-95.67** | C |
| Taiwan | 0.4352 | 0.3347 | | N | 0.5140 | 0.5448 | **-48.46** | C | 0.3796 | 0.3792 | | N |
| Thailand | 0.2208 | 0.3097 | **-142.74** | C | 0.2902 | 0.2953 | **-7.90** | C | 0.2187 | 0.3037 | **-145.56** | C |
| Vietnam | 0.2646 | 0.2621 | | N | 0.2413 | 0.2636 | **-30.05** | C | 0.2082 | 0.3077 | **-144.01** | C |

*Source: Datastream*

*Note: This table reports conditional cross-market correlation coefficients for the United State, Japan, China and each country in the sample. The stable period includes 1132 observations, is defined as January 2013, through December 31, 2019. The turmoil period includes 243 observations, is defined as January 1, 2020, through July 7, 2021. The test statistics are for one-sided t-tests examining if the cross-market correlation coefficient during the turmoil period is significantly greater than during the stable period. "C" indicates that the test statistic is greater than the critical value and therefore contagion occurred. "N" indicates that the test statistic was less than or equal to the critical value and therefore no contagion occurred.*

### 5.2. Testing contagion effect between these markets

The estimated conditional correlation coefficients for the stable, turmoil, and full period are shown in Table 5. The critical value for the *t*-test at the five percent level is 1.65, so any test statistic greater than this critical value indicates contagion, while any statistic less than or equal to this value indicates no contagion. Test statistics and results are reported on the right of the table. These tables provide $\hat{\rho}^S$ and $\hat{\rho}^T$ which are the means of the estimated conditional correlations by the DCC model during the stable and turmoil period, respectively, and the test statistic for the null hypothesis (no contagion) against the right-sided alternative one that have contagion. The standard deviation of the conditional correlations during the stable and turmoil periods are not equal to each other for each country so the test statistic is given by the right-sided t-test with unequal variances. The bold statistics indicate that the null hypothesis of no contagion is rejected.

During the relatively stable period before the Global financial crisis occurred, cross-market correlations between the U.S., Japan and others is highly correlated, where as China is much less correlated with all of the East Asian economics, especially with Pakistan and Vietnam at the negative level (-0.0057 and -0.0159, respectively). This is understandable because the U.S. and Japan are the two major financial centers of the world. Until the major shock, caused by Global financial crisis occurred in the U.S., India and Indonesia were slightly affected with slight decrease in mean correlation while the remaining countries were severely affected with significant increase in mean correlation. This pattern is similar with conditional correlation of Japan and China with other emerging markets. For the case of Pakistan, the mean of the conditional correlation impressed dropped after the crisis, this can be explained the Pakistan is the emerging markets which is less related to the US and Japan during the period of financial crisis. It is a positive sign for the Pakistani and international investors to diversify their portfolio. We also cannot find evidence that there is existent contagion from the US to India and Indonesia, though they are closed linked to the U.S. with fairly high correlation. Similarly, 8 out of 10 emerging markets have been found to have contagion from the Japan market. It is impressed that we find the existent contagion from China to all other emerging markets. The financial crisis also showed China's increasingly influential role internationally with remarkable increase in the mean of correlation with others.

The Covid-19 disease was firstly discovered at the end of 2019 in China, can be classified a "black swan" event with three characteristics: big impact, uncountable probability and surprising effect. The Covid-19 pandemic crisis is different from the Global Financial Crisis as this event occurs beyond the economic reasons, but it impacts all countries in the world. Therefore, we re-evaluate the effects of the Covid-19 crisis on several financial markets to several countries, which showing in Table 6. The test statistics given by the t-test in these two tables demonstrate that for 4 out of 10 countries (namely Japan, China, Pakistan, Thailand) the t-test rejects the null hypothesis of no contagion of the Covid-19 pandemic from

the U.S. markets at the 1% significance level. Other remaining markets also experienced high correlation with the U.S, but there is not significant increase during crisis period. Meanwhile, Asia emerging countries are more affected by Japan and China over time with 8 out of 10 markets have evidence of contagion from these markets. This can be explained by these following reasons. A program of economic policies, so-called Abenomics, was introduced by Japanese Prime Minister Shinzo Abe in 2013. The program was based on three pillars: monetary easing, fiscal stimulus and structural reforms, in order to break the vicious cycle of low economic growth and deflation of Japanese economy. Japan recently has promoted investment abroad, through development aid programs, in order to tighten ties with countries in the region and the world. In 2016, Prime Minister Shinzo Abe advocated building a "free and open Indo-Pacific" (FOIP). By establishing trans-border connectivity corridors, FOIP is designed to connect the Asian and African continents, as well as the Indian and Pacific Oceans. The overall focus of FOIP is on fostering maritime capacity-building and funding regional interconnectivity projects like the East-West Economic Corridor and the Maritime ASEAN Economic Corridor.

Among emerging countries, Taiwan has the largest correlation with China with 37% in mean conditional level. This is also consistent with the above analysis as China increasingly establishes political policies aimed at managing Taiwan more closely. The reform programs and economic policies of Japan and China have contributed to increasing their influence over countries in the region and around the world. In an extreme example, Pakistan is the special case that the financial market of this country was only severely hit by the Covid-19 crisis due to the spread of bad news from China in comparison with others (increased to 32.8% during the turmoil period from merely under 1% in pre-crisis period in the mean of conditional correlation).

In summary, it appears that the Global financial crisis is described to have more significant effect of the US markets on other developed markets (Japan) and Asian emerging markets in comparison with in the Covid-19 pandemic, though the interdependence between the US and others is still high in both two crisis events. Meanwhile, over time, Japan and China has remarkably increased their effected on other emerging markets in the areas.

## 6. Conclusion

Due to the integration of markets, the shocks originating in one market are more quickly transmitted to other markets, increasing the risk of contagion. This study is to explain the short-run linkages of the emerging financial markets with the US, Japan, China markets based on the pattern of the analysis of the contagion effects of two most recent crisis. DCC model was applied to examine the volatilities and conditional correlations among emerging financial markets during the Global financial crisis and the Covid-19 pandemic period. The standardized multivariate t-distribution was used to capture the well-known heavy-tails associated with financial assets. There are 10 emerging markets in Asia, the U.S. market and Japan being considered. The performances of the DCC model allow us to perform the

contagion test by the method of Forbes and Rigobon (2002) using t-tests. Based on the result of model, we can see that the US and Japanese markets are highly correlated with Asian emerging markets over the entire study period from 2005 to 2021, refers to strong real linkages between the US and Japanese with these markets. This is understandable when the US and Japan are the two largest economies in the world. In terms of contagion, the results showed that the Global financial crises badly hit almost all emerging markets, whereas during the Covid-19 pandemic crisis period, we found that the contagion occurs from the US to only four markets (China, Japan, Pakistan, Thailand). Moreover, the research results also indicate a significant increase in this conditional correlation coefficient between China with others emerging markets. By the *t*-tests result, it means that the contagion between China and remaining countries in Asia has existed, implying the growing influence of the Chinese market on the rest of the region over time.

Evaluating if contagion occurs is important for several reasons. Fundamental modern portfolio theory of Markowitz (1952) and Grubel (1968) suggests the investors find less integrated markets optimal for risk-adjusted returns by diversifying the portfolio. When the internationalization of financial markets offers investors chances to trade in financial markets of different countries, the results are very important as guidance to investors who consider emerging stock markets with the idea of minimizing the volatility of their portfolio's returns. Finally, these results are also important for policymakers to understand the dynamic relationship of their domestic markets with its trading partners in order to take advantage of globalization and foster their financial markets and economics stability and sustainably.

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# GOVERNMENT CONTRACTS AND TRADE CREDIT:
# THE MEDIATING ROLE OF FINANCIAL AND INSTITUTIONAL CONSTRAINTS

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## Abstract

*This paper studies the effect of government contracts on trade credit by using a cross-country firm-level data from the Enterprise Surveys of the World Bank with 10,200 observations. We apply the instrumental variable to take into account the endogeneity problem caused by the simultaneous relationship between government contracts and trade credit. Our empirical results show that government contracts have negative effects on trade credit. These effects become more pronounced when firms have higher bargaining power, more severe financial and institutional constraints. Our results are robust for alternative measure of financial and institutional constraints. These findings suggest important policy implication that contracting with governments helps firms to reduce the dependence on trade credit, especially for the firms with high bargaining power, financial and institutional constraints.*

***Keywords****: Government contract; trade credit; bargaining power; financial constraints.*

## 1. Introduction

There has been a growing literature on public procurement and its effects on business environment. The current research shows that firms with a government contracts are more conservative (Hui et al., 2012), tend to be less likely to evade tax (Huang et al., 2016), invest less in corporate social responsibility (Habib et al., 2015), and mobile equity capital at a cheaper cost (Dhaliwal et al., 2016). However, the linkage between public contracts and firms' financing decisions is still ambiguous. Suppliers offer trade credit to allow their customers delay payment (Huyghebaert, 2006). According to an ICC (2017) survey, trade credit accounts for about 80% of trade. The prevalence of trade credit calls for a need to study the key drivers of trade credit. In this paper, we investigate the nexus between a firm with public procurement and its usage of trade credit in a cross-country context.

In theory, the connection between public procurement and firm's usage of trade credit is debatable. On the one side, firms with public procurement tend to demand less trade credit due to their low risks in operation, good financial performance, and capabilities to approach source of low-cost capital (Dhaliwal et al., 2016). On the other side, government contractors may demand more trade credit due to the fact that firms with government contracts have more litigation risk (Rainey & Bozeman, 2000) and tend to invest less in physical and intellectual

assets through years (Cohen & Malloy, 2016), which affect their financing costs. Moreover, supplying firms are more likely to provide trade credit to firms with government contracts. Indeed, supplying firms evaluate their clients' creditworthiness and default risk before offering trade credit (Petersen & Rajan, 1997). In this domain, the low risks in operation, good financial performance, and strong credibility place government contractors a good position to receive more trade credit.

To answer our research question, we use a cross-sectional data obtained from the Enterprise Surveys of the World Bank with 10.200 observations, covering 45 countries for the period 2007 to 2010. Taking into account the endogeneity due to the reverse causality by using a sector-location average as an instrumental variable, we show a negative connection between government contractors and trade credit. The results imply that government contractors use less trade credit compared to firms without government contracts. These effects become more evident when firms have higher bargaining power or suffer more severe financial constraints. Our results are robust for alternative measure of financial constraints.

Our contributions include three folds. First, our study adds to the growing literature on the determinants of trade credit as a vital method of short-term financing. Previous papers indicate that customer and supplier firm-associated features drive a firm's use of trade credit. Incremental to previous researches, our paper points out that the customer's type is a pivotal driving force of firms' use of trade credit. Second, previous studies document that the good quality of the relationship between firms and their customers enhance firms' financial performance (Patatoukas, 2012; Payne & Frow, 2005). We develop this finding by showing that the relationship with governmental customers plays a role in shaping the firms' financing strategies. Third, given the heterogeneity of firms across countries, this paper extends Xu & Dao (2020) by examining the nexus between government contractors and trade credit in a broad set of cross-country firm-level data. Fourth, we investigate the mediating role of bargaining power and financial constraint on the effect of government contractors and trade credit.

The rest of the paper is organized as follows. Section 2 reviews the literature. Section 3 describes our methodology. We provide the results and discussion in Section 4. Section 5 presents our conclusions.

## 2. Literature review and hypothesis development

### 2.1. Trade credit

Trade credit is a payment arrangment between a buyer and a supplier in which the seller allows the buyer to pay for the goods or services at a later scheduled date. Huyghebaert (2006) defines trade credit as buyer's deferment of payment to their suppliers. If the buyer makes the payment after delivery, the seller extends credit to the buyer (Ng et al., 1999). From the accounting perspective, trade credit is a source of account payable for the buyer, while it is a kind of investment of the seller through account receivable (Long et al., 1993). Approximately 80 to 90 percent of trade flows in the world is based on trade finance which includes trade credit and insurance/guarantees (WTO). In particular, in the US, nearly one

third of total financial liabilities is identified as trade credit (Fontaine & Zhao, 2021). In the study of Levine et al. (2018) which covers 3,500 firms across 34 countries, trade credit represents 25% of the average firm's total debt liabilities. Trade credit is an imperative source of short-term financing for a firm to guarantee normal operations to extend its turnover and to develop its business (Xu & Dao, 2020).

Researchers have investigated thoroughly determinants of trade credit. Long et al. (1993) reviewed a number of papers that explain reasons why using trade credit based on traditional financial models. For example, Schwartz (1974) develops a financial-based theory that firms with low-cost borrowing will extend credit to firms that bear higher costs charged by financial intermediaries, while a tax-based model given by Brick & Fung (1984) suggests that firms in relatively high tax brackets gain by offering trade credit to firms in lower tax brackets. In the model based on information costs, Smith (1987) finds that sellers offer credit terms to the buyers because they have advantages against financial institutions in identifying prospective defaults of customers.

Another perspective to discover why firms use trade credit is to examine effects of transaction-specific investments and transactions costs. Trade credit occurs when informational asymmetries between buyers and sellers appear, when transactions costs are high, and when sellers have a high level of specialized investment (Ng et al., 1999). Industry-specific is one of the factors considered by firms to make investments. Compared with firms buying services, those buying goods and making significant investment on tangible inputs have greater reliance on trade credit (Fabbri & Menichini, 2010). Additionally, price discrimination is also deemed as one of the important determinants of trade credit (Petersen & Rajan, 1997; Ng et al., 1999; Huyghebaert, 2006). As credit terms are usually offered differently to buyers depending on their credit quality, trade credit decreases the effective price to low-quality borrowers. Creditworthy customers will find trade credit overprice and repay it as soon as possible, while risky customers having limited access to other sources of financing find it favorable to borrow. Among the reasons for using trade credit, Huyghebaert (2006) emphasizes that the main reason is to overcome financial constraints. Firms with difficulties of borrowing from financial institutions are opted to trade credit (Petersen & Rajan, 1997).

Overall, determinants of credit terms to a firm not only stem from customer's demand but also from supplier's willingness to grant trade credit (Xu & Dao, 2020). On the customer side, the existing literature reveals that the use of trade credit can be determined by firms' access to credit from financial institutions, asset maturity, asset liquidity, and customer firms' investment opportunities (Petersen & Rajan, 1997; Xu & Dao, 2020). On the supply side, transaction costs, price discrimination, and relationship-specific investments are reasons why supplier firms provide trade credits (Petersen & Rajan, 1997; Dass et al., 2015; Xu & Dao, 2020).

### 2.2. Government contract

In terms of government contracts, government procurement of goods and services is usually related to a huge amount compared to GDP. Indeed, the value of government contracts account for 15-20% of GDP of a certain country (WTO, 2014), and even higher in the developed countries (Flammer, 2018). Based on the pricing of contracts, government contracts have been categorized in two different types which are "cost-plus" and "fixed-priced" contracts. In which, the former one is preferred because of the complexity of public procurement (Bajari & Tadelis, 2001).

According to Flammer (2018), trust is the most important factor of purchasing decision. Following this, the trust between suppliers and buyers - the governments - are affected by numerous determinants such as pre-existing relationship between two parties and the signal of trustworthiness (Aguilera et al., 2012). Besides, governments tend to choose contractors with high credit rating (Burke et al., 2015). Apart from economic reasons, political connection is significant important for firms in order receive signature from governments. Brown & Huang (2020) pointed out that the firms with higher number of meetings with government bodies tend to receive more government contract. Flammer (2018) concluded that corporate social responsibility (CSR) is significant determinant of trustworthiness, thus, firms with huge number of CSR activities tend to receive more contracts from governments. In other words, firms with high reputation, well operations, and large size are more likely to sign successfully contracts with governments. On the other hand, contractors' behaviors are influenced positively by governments by signing the government contracts. For example, government contractors, generally, do not avoid taxes (Huang et al., 2016) and obey the accounting practices (Hui et al., 2012). Additionally, government contractors tend to keep demand from customers more stable than firms without government contracts (Cao et al., 2013). In terms of CSR, although CSR is the important factor of purchasing decisions of government, firm with government body as a customer can reduce investment on CSR compared to other enterprises (McWilliams & Siegel, 2001).

Government contracts bring both advantage and disadvantage along to contractors. Regarding to benefits, government contractors presented better performances (Nakanishi, 2020) and had lower risk level of payment (Dhaliwal et al., 2016). In addition, coopetition is facilitated between firms operating in an industry by the intervention of government contracts (Nakanishi, 2020). Finally, firms with government contracts are easier to get access to numerous funding sources in order to mitigate the financial constraints (Al-Thaqeb & Harper, 2016). On the other hand, despite of benefits, government contracts have many downsides. For example, high level of corruption and litigation risk are pointed out by Rainey & Bozeman (2000). Josephson et al. (2019) concluded that reducing competitiveness and rising operating cost are two main problems that firms are expected to deal with when contracting with governments.

Overall, researchers of this field have focused on not only characteristics of contractors, pros and cons of government contracts but also the linkage between government contracts and the use of trade credit (Xu & Dao, 2020).

### 2.3. Relationship between government contract on trade credit

The impact of government contract on trade credit is far from reaching a consensus. On the one hand, government contractor is less likely to use trade credit as a source of finance. This is due to their lower levels of operational risk, higher firm performance, and great ability to raise internal funds (Xu & Dao, 2020). The government has a lower probability of going bankrupt than other customers, and usually has a long-term contract with one supplier. In addition, in some cases, the type of contract is cost-plus government contracts in which operational risks are transferred to the government than the government contractor. All of these bring benefits to the government contractor with low levels of operational risk. Furthermore, other advantages gained from government contract are valuable knowledge from organizational learning and relationships with other parties, which improve the performance of government contractor (Anderson & Lee, 2016). Government contractors also have greater credibility than other firms (Al-Thaqeb & Harper, 2016; Xu & Dao, 2020), and have easy access to other sources (Dhaliwal et al., 2016). On the other hand, some argue that government contractors use a higher level of trade credit. Taking advantage of lower operational risk, better firm performance, and higher credibility, government contractors are likely to be granted more trade credit compared with other firms. Firms with political ties have low disclosure of information in order to avoid scrutiny (Decker, 2011). Thus, government contractors will be imposed higher interest rates by financial institutions (Bliss & Gul, 2012; Liedong & Rajwani, 2018), which in turn making trade credit worthwhile for these firms (Petersen & Rajan, 1997).

The divergence above can be attributed to differences among studies in sources of data, econometric methods, and selected countries. Xu & Dao (2020) examines US listed firms and find a negative impact of government contract on trade credit. Similarly, Houston et al. (2014)  use hand-collected data from US firms and find that cost of bank loans is significantly lower for government contractors, which can make trade credit less favorable. However, this may not be the results found in developing countries. In emerging and developing countries, access to finance and cost of debt are major financial obstacles to firms (Beck & Demirguc-Kunt, 2006). Liedong and Rajwani (2018) collect surveys from firms in Ghana and Bliss and Gul (2012) investigate listed Malaysian firms; and their results show that politically connected firms are charged higher interest rates by financial institutions. As a result, these firms tend to find other sources of finance with lower cost, and trade credit can be an alternative. There is also exciting evidence that political ties are more predominant in countries with a high level of corruption, and political leaders in these countries may directly involve in lending process of raising funds to connected firms (Faccio, 2006; Fisman, 2001). Political connections are really helpful when government authorities can directly intervene in

bank lending, which occurs in many developing countries (Beck et al., 2006; Dinc, 2005; La Porta et al., 2002).

In this line of discussion, we raise the following hypotheses:

**H1a:** Government contractors is positively associated with the use of trade credit.

**H1b:** Government contractors is negatively associated with the use of trade credit.

### 2.4. The mediating role of bargaining power, financial and institutional constraints on the relationship between government contracts and trade credit

Concerning bargaining power, Mateut & Chevapatrakul (2018) concluded that buyers with higher bargaining power are excepted to receive more trade credit. Fabbri & Klapper (2016) supported this conclusion by pointing out that suppliers with lower bargaining power generally provide longer trade credit to their customers. However, Mateut & Chevapatrakul (2018) also pointed out that the larger credit amount taken by firms, the more difficult for these firms to use bargaining power to access more trade credit from their suppliers.

There are numerous ways to measures bargaining power. According to Uchida (2006), the bargaining power in a loan is determined by three proxies which are lender's competition, the degree of informational asymmetry between two parties, and borrowers' performances. Besides, this power can be measured by size of firm. Indeed, larger firms are expected to have more bargaining powers compared to small firms (Cho et al., 2019). In terms of suppliers, a larger firm has competitive advantage because of economies of scale, brand (Spekman, 1988), and relationship with raw materials providers (Pfeffer & Salancik, 2003) . Therefore, bigger suppliers have power over their buyers. In contrast, larger buyers tend to have more power over their suppliers (Cho et al., 2019). In consistency with Cho et al. (2019), Mateut & Chevapatrakul (2018) chose size to measure bargaining power when examining the relationship between trade credit and bargaining power. Therefore, SMEs are expected to have lower bargaining power compared to the larger firms.

Regarding linkage between government contract and size of firms, Xu & Dao (2020) concluded that governments tend to choose larger firms as contractors. Based on the calculation proposed by Cho et al. (2019) and Mateut & Chevapatrakul (2018), firms with high bargaining power are likely receive more government contracts. In sum, bargaining power of firms, which is presented by size of firms, influence abilities of firms to contract with governments and to obtain more trade credit. Based on our discussion, we propose the following hypothesis:

**H2a:** The effect of government contractors on trade credit is stronger for firms with higher bargaining power.

The use of trade credit links directly to the financial constraints of customers (Wilner, 2000; Xu & Dao, 2020). Specially, firms that witness weak financial reports and have limited access to bank loans consider trade credit as a crucial source of fund (Mateut & Chevapatrakul, 2018). Hoang et al. (2019) agreed with this conclusion by pointing out that the

optimal trade credit level is sensitive with financial constraints of firms. In other words, firms with higher financial constraints have lower optimal trade credit level than that of firms without any constraints. A reason explaining firms find it difficult to obtain bank loans is asymmetric information (Biais & Gollier, 1997). However, the asymmetric information between two parties can be mitigated by the trustworthiness built up by contracting with government (Flammer, 2018). Additionally, financial constraints limit the access to extension trade credit of firms (Atanasova, 2007) and the probability receiving government contracts because government prefer contractors with strong financial performance (Berrios, 2006). Based on our discussion, we propose the following hypothesis:

**H2b:** The effect of government contractors on trade credit is stronger for firms with financial-credit constraints.

Another focus of our paper is to examine changes in the effect of government contract on trade credit when firms face institutional constraints. The literature has highlighted the quality of institutions as a main driving force of long-term economic development (Rodríguez-Pose, 2013). Rodríguez-Pose (2013) posits that institutional arrangements are the true factors that hinder the development of a region by interfering with other drivers of economic development. Auriol et al. (2016) and Baldi et al. (2016) investigate the effect of rent-seeking and corruption on public procurement. Firms pay bribes in exchange for receiving government contract. Hoekman (1998) indicates that international institution enhances government procurement by raising transparency and accountability. Moreover, without corruption, firms with high productivity tend to obtain more government contracts. However, the corruption, which is a determinant of institutional constraints, has changed the role of productivity of firms. In a corruption country, productivity firms tend to be excluded from parties of governments (Vendrell-Herrero et al., 2020). To the best of our knowledge, researchers tend to refer corruption (Kurer, 1993) and tax (Fisman & Svensson, 2007; Le Thanh Ha et al., 2021) as the signal of institutional constraints , thus, this paper contribute to the literature by adding the effect of two kinds of institutional constraints which are political and license dimension to firms.

Regarding trade credit, Cull et al. (2009) contend that institutional bias toward state-owned enterprises opens the doors to the use of trade credit among private firms. Amoako et al. (2020) reveal that in weak institutions, personal trust and cultural norm improve the enforcement of trade credit contracts. Indeed, Acemoglu & Verdier (1998) showed that in an unstable country, the government's actions are the crucial risks to investors. Thus, firms in this market find it hard to obtain any trade credit. The previous discussions lead to our proposal that institutional constraints may create more burdens for business operations and therefore lower firms' comparative advantage compared to their competitors, reducing their probability of obtaining government contract. We thus propose the following hypothesis:

**H2c:** The effect of government contract on trade credit becomes stronger if there are institutional constraints.

## 3. Research methodology

### *3.1. Variables*

Our study employed cross-sectional data obtained from the Enterprise Surveys of the World Bank. To clean the data, we drop missing observations. Then, we winsorized all continuous variables at $1^{st}$ and $99^{th}$ percentile levels of their distribution to mitigate the problem that our results could be driven by outliers. In this way, we replace the values less than the $1^{st}$ percentile by the $1^{st}$ percentile, and so do we for the $99^{st}$ percentile. We retained the data of manufacturing firms, as this sector matches the trade theory. The number of observations is approximately 10,200, covering 45 countries for the period 2007 to 2010. Only in this period, there is a question of trade credit received by firms. **Error! Reference source not found.** reports the lists of countries, and no country is dominant in our sample.

*Dependent variable: TC*

$TC$ is the share of total purchases paid after shipment by firms. This captures a payable account or a trade credit received by firm. The average share of trade credit is 59%.

*Independent variable: GC*

$GC$ is the dummy variable that takes the value of 1 if a firm is a government contractor and otherwise. 16% of firms in our sample are government contractors.

*Control variables:*

We based on the rich literature on the determinants of trade credit (Petersen & Rajan, 1997; Hoefele et al., 2016; Xu & Dao, 2020) to incorporate variables to control other effects on trade credit. *Size* is the number of full-time employees and represents the bargaining power. We expected that the larger the firm, the more likely it would be to enjoy trade credit extensions from suppliers. *LnSale* is the log of the ratio of total sales to full-time employees, which captures labor productivity. Higher profitability shows a firm's observable greater credit quality. Hence, highly productive firms are more likely to receive trade credit than their less-productive counterparts.

*LnAge* and *LnManager* are, respectively, a firm's number of years of establishment and CEO's experience in their current industries. We computed firm age by subtracting the year of the survey from the year of the establishment of the firm. Young firms have weak relationship with their suppliers and obtain less trade credit. Meanwhile, CEO's experiences were used to reflect his network in the present industry. We predicted that firms with experienced managers would be more likely to demand more trade credit term than those with less experienced managers, as such managers make use of their networks and have better negotiation skills. As there existed situation where a firm's age was less than one year old or a firm's CEO was smaller than one year's experience, we added 1 to the actual number of years before taking the natural logarithm.

We also add variables to control the impacts of innovation and external linkages on firms' trade credit usage. Innovation is a dummy variable that takes the value of 1 if a firm

introduces a new product or new process, and 0 otherwise. This variable reflected the extent of innovation. More innovative firms are more likely to enjoy trade credit. External linkage was captured by whether a firm had a connection (*Connection*) through the internet and/or website or firm's tendency toward the global market, including exporting intensity (*Exportshare*), import decision (*Import*), foreign ownership (*Foreign*), foreign technology (*Foreigntech*), or an international certificate (*Certification*). As importers tend to receive trade credit extension from their suppliers than non-importers (Demir & Jaorcik, 2018), we expect a positive effect of *Import* on trade credit usage. Similarly, exporting firms perform better and have higher credibility and therefore gain more trade credit. The rest of international tendency variables are forecasted to have positive relationship with trade credit as they signal good creditworthiness. The statistical descriptions of the included variables are shown in *Table1*.

In

**Table***2*, we report a comparison of variables between government contractors and non-government contractors. It can be seen that firm characteristics are heterogeneous along the government contract, except for the export share and foreign ownership. The share of trade credit in government contractors is lower than non-government contractors. Firms with government contracts have higher productivity, larger firm size, older firm age and higher manager experience, and involve more toward the foreign market, including more import, higher international certification, and foreign technology. Finally, government contractors suffer more financial constraints.

**Table 1: Statistical summary**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| TC | 10,261 | 0.59 | 0.39 | 0 | 1 |
| GC | 10,261 | 0.16 | 0.36 | 0 | 1 |
| LnSale | 10,261 | 14.15 | 3.11 | 7.38 | 21.01 |
| LnSize | 10,261 | 3.68 | 1.42 | 1.50 | 7.50 |
| LnAge | 10,261 | 2.80 | 0.82 | 0.69 | 4.61 |
| LnManager | 10,261 | 2.90 | 0.66 | 0.69 | 3.97 |
| Innovation | 10,261 | 0.34 | 0.47 | 0 | 1 |
| Exportshare | 10,261 | 0.15 | 0.29 | 0 | 1 |
| Import | 10,261 | 0.64 | 0.48 | 0 | 1 |
| Foreign | 10,261 | 0.14 | 0.34 | 0 | 1 |
| Certification | 10,261 | 0.25 | 0.43 | 0 | 1 |
| Connection | 10,261 | 0.52 | 0.50 | 0 | 1 |
| Foreigntech | 10,261 | 0.14 | 0.35 | 0 | 1 |
| FinObstacle | 10,261 | 0.27 | 0.44 | 0 | 1 |

*(Source: Authors' calculation)*

**Table 2: Government contractors vs non-government contractors**

| Variable | GC=0 | | | GC=1 | | | Difference | p-value |
|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | | |
| TC | 8,646 | 0.59 | 0.39 | 1,615 | 0.58 | 0.37 | -0.02 | 0.06 |
| LnSale | 8,646 | 14.12 | 3.13 | 1,615 | 14.30 | 3.03 | 0.04 | 0.00 |
| LnSize | 8,646 | 3.64 | 1.42 | 1,615 | 3.94 | 1.40 | 0.06 | 0.00 |
| LnAge | 8,646 | 2.77 | 0.81 | 1,615 | 2.97 | 0.82 | 0.02 | 0.00 |
| LnManager | 8,646 | 2.88 | 0.66 | 1,615 | 2.99 | 0.64 | 0.01 | 0.18 |
| Innovation | 8,646 | 0.31 | 0.46 | 1,615 | 0.49 | 0.50 | 0.04 | 0.00 |
| Exportshare | 8,646 | 0.15 | 0.30 | 1,615 | 0.10 | 0.21 | 0.13 | 0.00 |
| Import | 8,646 | 0.62 | 0.49 | 1,615 | 0.78 | 0.42 | 0.08 | 0.00 |
| Foreign | 8,646 | 0.14 | 0.34 | 1,615 | 0.14 | 0.34 | 0.11 | 0.00 |
| Certification | 8,646 | 0.23 | 0.42 | 1,615 | 0.33 | 0.47 | 0.10 | 0.00 |
| Connection | 8,646 | 0.49 | 0.50 | 1,615 | 0.66 | 0.47 | 0.08 | 0.00 |
| Foreigntech | 8,646 | 0.14 | 0.34 | 1,615 | 0.20 | 0.40 | 0.07 | 0.00 |
| FinObstacle | 8,646 | 0.26 | 0.44 | 1,615 | 0.30 | 0.46 | -0.06 | 0.00 |

*(Source: Authors' calculation)*

### 3.2. Model specification

The benchmark model is specified as follows:

$$TC_{ijk} = \beta_0 + \beta_1 Gc_{ijk} + \beta_2 CONTROL_{ijk} + v_j + \gamma_k + \lambda_t + \varepsilon_{ijk} \tag{1}$$

where subscript $i, j, k,$ and $t$ denote firm, country, sector, and year, respectively. $v_j, \gamma_k,$ and $\lambda_t$ are, in turn, country, sector, and year fixed effects. $TC_i$ is the trade credit received by firm $i$. $Gc_{ijk}$ is a government contractor, while $CONTROL_{ijk}$ is a set of control variables. $\varepsilon_{ijk}$ is an error term. The country and sector fixed effects $v_j$ and $\gamma_k$ were used to reflect the unobservable factors specific to countries and sectors, respectively. In addition, as the data in our sample was collected in different years, the year fixed effects $\lambda_t$ were used to capture the macroeconomic variables of the world economy, which change over time and affect all firms. Standard errors are clustered by sector-country-location.

In our model, there is a simultaneity between trade credit and government contract that caused our results to be biased. So far, we have argued that government contractors affect the use of trade credit. When firms receive more trade credit from their suppliers, they tend to offer trade credit term to their customers – the government customers. In this vein, firms implement a matching maturity strategy between contract terms of receivables and payables (Demirgüç-Kunt & Maksimovic, 1999; Fabbri & Klapper, 2016). To deal with the estimation bias caused by the endogeneity problem, we rely on Fisman & Love (2003) to apply the sector-location average approach. In particular, we separate government contractor operating in the $j$-th country at the $k$-th location ($Gc_{ijk}$) into two components:

$$Gc_{ijk} = GC_{ijk} + GC_{jk} \quad (2)$$

where $GC_{ijk}$ refers to an idiosyncratic element and $GC_{jk}$ is the average number of government contractors that is common to all firms in the $j$-th industry at the $k$-th location. We assume that the sector-province-country average government contract is independent of using trade credit. We then use the sector-province-country average as our instrument. Our model with the instrumental variable can be expressed as follows:

$$TC_i = \beta_0 + \beta_1 GC_i^{IV} + \beta_2 CONTROL_i + v_j + \gamma_k + \lambda_t + \varepsilon_i \quad (3)$$

where $GC_i^{IV}$ is the fitted value from the first-stage regression where government contract is regressed on location-province-sector government contract average and other control variables.

We first tested the association between government contract and trade credit without controlling for the endogeneity bias. We then apply the sector-location average method to fix the endogeneity bias. We also re-regress the equation (3) with sub-sample by size and financial constraints to examine the role of bargaining power and self-ration constraints.

## 4. Results and discussion

This section presents the estimation results. *Table 3* illustrates the benchmark results without controlling endogeneity problem. It shows a negative relationship between trade credit and government contract. This result is aligned with Xu & Dao (2020) who find that government contractors demand less trade credit because of the following reasons: lower level of operational risk because of shifting risk from the contractor to the government, firms' better performance due to increase in knowledge, and lower cost of borrowing from other sources. Having a contract with government reduces the probability of receiving trade credit by 0.04%.

As the endogeneity problem leads to biased estimation. From now, we report the estimation results with controlling endogeneity issue. In fact, we fix this endogeneity bias by employing the sector-location average of government contract as an instrument variable. *Table 4* reports the benchmark results with controlling endogeneity problem with two-stage regression. It shows that the negative relationship between government contract and trade credit becomes more pronounced. In particular, the probability of receiving trade credit

decreases nearly twice compared to the case without controlling endogeneity bias. This result supports the hypothesis H1b.

Regarding control variables in *Table4*, the coefficients of the variable *LnSale* are statistically significant, suggesting that the higher the company's productivity is, the more trade credit they are granted. With a 1% growth in firm's peformance, a firm's probability of being extended to credit terms increase by 2%. For a given liquidity, a higher productivity leads to a higher production which is associated with a higher production cost, requiring an increase in trade credit (Bougheas et al., 2009). Similarly, if the firm size, which is measured by a number of full-time employees, increases by 1%, the percentage of share of total purchase after shipment goes up by 4%. This is consistent with findings of Petersen & Rajan (1997) which show that larger firms have higher credit quality so they can take more trade credit extensions from suppliers.

The orientation toward the foreign market plays a critical role in driving the usage of trade credit. Indeed, firms that have importing activities, are owned by foreign investors, and have foreign certificate, tend to receive more trade credit. Global sourcing contains higher risks than domestic purchases. Trade credit lessens commercial risks of late shipping or wrong delivery since the importers can check the goods quality before making payment (Ng et al., 1999). This result is also consistent with Demir & Javorcik (2018) as importers tend to receive more trade credit extension from their suppliers than non-importers. International certificates reveal high quality products, while foreign ownership support firms to connect with a wider network for seeking potential investment. These factors enhance firms' reputation. If the product sold is certified, product risk and asymmetric information should be lower. When products are sold with a warranty, the buyer can return the good without incurring in extra costs, if the quality of the good does not meets the contract requirement. These illustrate firms having a good sign of creditworthiness, which in turn, increasing the probability of receiving more trade credit from suppliers. Once the information for creditworthiness is available for general, firms can obtain credit from a broader set of suppliers and increase the level of trade credit (Fisman & Raturi, 2004).

**Table 3: Benchmark results without controlling endogeneity problem**

| VARIABLES | (1)<br>TC |
|---|---|
| GC | -0.04*** |
| | (0.009) |
| LnSale | 0.02*** |
| | (0.003) |
| LnSize | 0.04*** |
| | (0.003) |
| LnAge | -0.00 |
| | (0.005) |
| LnManager | 0.01 |
| | (0.006) |
| Innovation | 0.01 |
| | (0.010) |
| Exportshare | 0.03 |
| | (0.017) |
| Import | 0.02* |
| | (0.009) |
| Foreign | 0.02** |
| | (0.011) |
| Certification | 0.02 |
| | (0.010) |
| Connection | -0.00 |
| | (0.009) |
| Foreigntech | 0.01 |
| | (0.010) |
| Constant | -0.58*** |
| | (0.105) |
| | |
| Observations | 10,261 |
| R-squared | 0.229 |

Robust standard errors in
parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

*(Source: Authors' calculation)*

**Table 4: Benchmark results with controlling endogeneity problem: Two-stage regression**

| VARIABLES | (1)<br>first stage<br>GC | (2)<br>second stage<br>TC |
|---|---|---|
| $GC^{IV}$ | 0.97*** | |
| | (0.017) | |
| GC | | -0.07*** |
| LnSale | 0.00 | 0.02*** |
| | (0.002) | (0.003) |
| LnSize | 0.01*** | 0.04*** |
| | (0.003) | (0.003) |
| LnAge | 0.01** | -0.00 |
| | (0.005) | (0.005) |
| LnManager | 0.00 | 0.01 |
| | (0.005) | (0.006) |
| Innovation | 0.05*** | 0.01 |
| | (0.011) | (0.010) |
| Exportshare | -0.09*** | 0.02 |
| | (0.011) | (0.017) |
| Import | 0.02** | 0.02* |
| | (0.007) | (0.009) |
| Foreign | -0.03*** | 0.02* |
| | (0.010) | (0.011) |
| Certification | 0.03*** | 0.02* |
| | (0.009) | (0.010) |
| Connection | 0.03*** | 0.00 |
| | (0.008) | (0.009) |
| Foreigntech | 0.03*** | 0.01 |
| | (0.010) | (0.010) |
| | | (0.023) |
| Constant | -0.09** | -0.55*** |
| | (0.042) | (0.117) |
| | | |
| Observations | 10,261 | 10,261 |
| R-squared | 0.278 | 0.228 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*(Source: Authors' calculation)*

We next regress the data in the sub-sample by size and report the result in *Table 5*. According to the Enterprise Surveys conducted by the World Bank, a firm is defined as small if they have less than 19 employees, a medium company if they have from 20 to 99 employees, a large company has more than 100 employees. While having a government contract decreases the use of trade credit for both SMEs and large-sized firms, these effects become more prominent in large-sized firms. This confirms the hypothesis H2a. Government contractors can enjoy easy access to other sources of financing since they can provide credibility and certification for government contracts (Al-Thaqeb & Harper, 2016). Larger firms also have better access to conventional forms of financing such as bank loans as they tend to have a high level of creditworthiness (Petersen & Rajan, 1997). Another explanation for the lower demand of trade credit by government contractors is that they can raise other sources of fund with lower cost (Dhaliwal et al., 2016). Thanks to lower levels of risk and better firm performance, investors can see the stability of internal cash flows generated by firms with government contracts (Xu & Dao, 2020).

**Table 5: Regression results with subsample by size**

|  | (1) | (2) |
|---|---|---|
|  | SMEs | Large-sized firms |
| VARIABLES | TC | TC |
| GC | -0.07** | -0.09** |
|  | (0.027) | (0.041) |
| LnSale | 0.03*** | 0.02** |
|  | (0.003) | (0.006) |
| LnSize | 0.06*** | 0.01 |
|  | (0.005) | (0.007) |
| LnAge | -0.01 | 0.00 |
|  | (0.006) | (0.009) |
| LnManager | 0.01 | 0.01 |
|  | (0.008) | (0.011) |
| Innovation | 0.02 | -0.01 |
|  | (0.012) | (0.020) |
| Exportshare | 0.02 | 0.02 |
|  | (0.023) | (0.022) |
| Import | 0.01 | 0.03 |
|  | (0.010) | (0.019) |
| Foreign | 0.04** | 0.02 |
|  | (0.017) | (0.014) |
| Certification | 0.01 | 0.03** |

|  | (0.013) | (0.015) |
|---|---|---|
| Connection | -0.00 | -0.01 |
|  | (0.010) | (0.018) |
| Foreigntech | 0.01 | 0.01 |
|  | (0.013) | (0.015) |
| Constant | -0.59*** | 0.02 |
|  | (0.067) | (0.194) |
|  |  |  |
| Observations | 7,541 | 2,720 |
| R-squared | 0.217 | 0.191 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Second stage is reported

*(Source: Authors' calculation)*

Furthermore, we examine the mediating role of financial constraints on the effect of government contracts on trade credit. Jappelli (1990) underscored the perception of discouraged borrowers. This concept is reinforced by a vast empirical literature to support the use of answers to survey questions to realize the financially-constrained firms rather than using firm characteristics (Minetti et al., 2019; Nucci et al., 2020). Based on this research stream, we employ the information in the survey in which the self-evaluation of financial constraint is addressed in one question. Firms are asked to report the level of difficulty they confront when accessing to source of finance. We re-classify the answers on a 5-point Likert scale into three groups: no obstacle, modest obstacle (consisting of minor or moderate obstacles), and severe obstacles (including major and very severe obstacles). We denote financial unconstraint if the firm states the first two classifications and financial constraint if the firm suffers the last one.

We regress the equation (3) in each sub-sample by self-ration and portray the result in *Table6*. It is clear that the effect of government contract on the use of trade credit is particularly strong in financially-constrained firms than in financially-unconstrained ones. The possible explanation may be as follows. Firms may get bank loan rejection due to the weak financial reports. Government contracts can mitigate this asymmetric information and enhance the firm capabilities to receive funds from financial institutions (Flammer, 2018). Moreover, firms having relationship with governments have better access to loans (Claessens et al., 2008; Fan et al., 2008) and enjoy more favorable access to equity markets (Boubakri et al., 2012; Francis et al., 2009).

Up to now, we build the financial constraints based on the firm's self-evaluation about its level of the financial obstacle. We extend by combining the self-evaluation with the information about the clarification of why a firm has no credit lines or loans from financial institution. Indeed, we construct a new financial constraint such that a firm confronts severe

obstacles and has no loans from a financial institution because it did not submit for a loan due to one or more of the following reasons hindering it from doing so: too complex procedures (Johnson et al., 1996), low competitive interest rate (Frangos et al., 2012; Schwartz, 1974) or expectation that the loan submission would be denied because of financial constraints (Mateut & Chevapatrakul, 2018). In our sample, only 20% of firms confront these new financial constraints compared to 27% in our benchmark financial constraints. The new estimation results reported in *Table7* are aligned with our main findings. Those results support the hypothesis H2b.

**Table 6: Regression results with subsample by financial constraints**

|  | (1) | (2) |
|---|---|---|
|  | No financial constraints | Financial constraints |
| VARIABLES | TC | TC |
|  |  |  |
| GC | -0.06** | -0.09** |
|  | (0.028) | (0.038) |
| LnSale | 0.02*** | 0.02*** |
|  | (0.004) | (0.005) |
| LnSize | 0.04*** | 0.04*** |
|  | (0.004) | (0.007) |
| LnAge | -0.01 | 0.00 |
|  | (0.006) | (0.010) |
| LnManager | 0.01 | 0.01 |
|  | (0.007) | (0.012) |
| Innovation | 0.01 | 0.02 |
|  | (0.012) | (0.021) |
| Exportshare | 0.04** | -0.03 |
|  | (0.018) | (0.034) |
| Import | 0.02** | 0.01 |
|  | (0.011) | (0.016) |
| Foreign | 0.02* | -0.00 |
|  | (0.012) | (0.023) |
| Certification | 0.02 | 0.01 |
|  | (0.011) | (0.018) |
| Connection | -0.01 | 0.04** |
|  | (0.010) | (0.016) |
| Foreigntech | 0.01 | 0.00 |
|  | (0.011) | (0.021) |
| Constant | -0.51*** | -0.36*** |

|  | (0.062) | (0.108) |
|---|---|---|
| Observations | 7,513 | 2,748 |
| R-squared | 0.204 | 0.291 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The second stage is reported only. Second stage is reported

*(Source: Authors' calculation)*

**Table 7: Regression results with subsample by alternative measure of financial constraints**

|  | (1) | (2) |
|---|---|---|
|  | No financial constraints | Financial constraints |
| VARIABLES | TC | TC |
| GC | -0.07*** | -0.10* |
|  | (0.025) | (0.053) |
| LnSale | 0.02*** | 0.03*** |
|  | (0.004) | (0.007) |
| LnSize | 0.04*** | 0.04*** |
|  | (0.003) | (0.009) |
| LnAge | -0.01 | -0.00 |
|  | (0.006) | (0.012) |
| LnManager | 0.01 | 0.01 |
|  | (0.007) | (0.014) |
| Innovation | 0.02** | -0.03 |
|  | (0.011) | (0.026) |
| Exportshare | 0.02 | 0.02 |
|  | (0.018) | (0.038) |
| Import | 0.02* | 0.02 |
|  | (0.010) | (0.019) |
| Foreign | 0.02** | -0.00 |
|  | (0.011) | (0.028) |
| Certification | 0.01 | 0.04 |
|  | (0.010) | (0.025) |
| Connection | -0.01 | 0.02 |
|  | (0.010) | (0.019) |

| | | |
|---|---|---|
| Foreigntech | 0.01 | 0.02 |
| | (0.010) | (0.028) |
| Constant | -0.61*** | -0.79*** |
| | (0.101) | (0.209) |
| | | |
| Observations | 8,161 | 2,100 |
| R-squared | 0.213 | 0.242 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The second stage is reported only.

*(Source: Authors' calculation)*

In the following analysis, we investigate the effects of specific kinds of institutional constraints. In this paper, we define an institutional constraint based on a firm's self-assessment of the degree of obstacles influencing its business operations. We used four types of constraint: corruption, political instability, tax administration, and business licensing. In each type of constraint, we classify a firm as confronting that specific constraint if the firm stated it as a major or very severe obstacle, and a firm as not confronting that constraint if the firm stated it as a minor or moderate obstacle, or no obstacle at all.

We re-regress each sub-sample of institutional constraint. The results are reported in

**Table***8*. This analysis is essential in examining the moderating effects of the level of constraint on an association between government contract and trade credit. The results indicate that the impacts of government contract on trade credit are stronger if firms recognize corruption, political instability, tax administration, and business licensing as the major or severe obstacles for their current operation of business. Our empirical results support our previous prediction of the negative effect of institutional constraints by emphasizing the fact that a higher severity level of institutional constraint leads to extra challenges for firm operations. Specifically, in the corruption context, having government contracts reduces probability of obtaining trade credit to 12%. Weaker institutions may cause greater institutional inefficiencies, as well as additional licenses, regulations, and barriers to obtain trade credit. Indeed, Jovanovic (1982) showed that being contractor with governments is a determinant of firms with economic efficiency. In a corruption context, Vendrell-Herrero et al. (2020) concluded that this is not a credible signal. Therefore, contractors of governments tend to receive less trade credits from business partners.

**Table 8: Regression results with subsample by institutional constraints**

| VARIABLES | (1) Corruption No TC | (2) Corruption Yes TC | (3) Political No TC | (4) Political Yes TC | (5) Tax No TC | (6) Tax Yes TC | (7) License No TC | (8) License Yes TC |
|---|---|---|---|---|---|---|---|---|
| GC | -0.03 | -0.12*** | -0.07** | -0.08** | -0.05** | -0.13*** | -0.07*** | -0.09** |
|  | (0.032) | (0.032) | (0.028) | (0.037) | (0.026) | (0.043) | (0.027) | (0.045) |
| LnSale | 0.03*** | 0.02*** | 0.03*** | 0.02*** | 0.03*** | 0.02*** | 0.02*** | 0.02*** |
|  | (0.004) | (0.004) | (0.004) | (0.005) | (0.004) | (0.005) | (0.004) | (0.006) |
| LnSize | 0.04*** | 0.04*** | 0.05*** | 0.03*** | 0.05*** | 0.03*** | 0.04*** | 0.04*** |
|  | (0.004) | (0.005) | (0.004) | (0.006) | (0.004) | (0.006) | (0.004) | (0.008) |
| LnAge | -0.01 | -0.00 | -0.01** | 0.02** | -0.01 | 0.01 | -0.00 | -0.01 |
|  | (0.006) | (0.009) | (0.006) | (0.009) | (0.006) | (0.010) | (0.006) | (0.012) |
| LnManager | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | -0.00 | 0.01 | 0.01 |
|  | (0.008) | (0.010) | (0.007) | (0.011) | (0.007) | (0.012) | (0.007) | (0.013) |
| Innovation | 0.01 | 0.02 | 0.00 | 0.04* | 0.01 | 0.03 | 0.01 | 0.04 |
|  | (0.013) | (0.016) | (0.012) | (0.020) | (0.011) | (0.024) | (0.011) | (0.031) |
| Exportshare | 0.04* | -0.01 | 0.02 | 0.03 | 0.03 | -0.01 | 0.03* | -0.07* |
|  | (0.020) | (0.027) | (0.018) | (0.032) | (0.019) | (0.031) | (0.018) | (0.042) |
| Import | 0.02 | 0.02 | 0.02* | 0.01 | 0.02 | 0.02 | 0.02* | 0.01 |
|  | (0.012) | (0.014) | (0.011) | (0.015) | (0.011) | (0.016) | (0.010) | (0.019) |
| Foreign | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 | 0.04 | 0.02 | 0.03 |
|  | (0.013) | (0.019) | (0.013) | (0.024) | (0.012) | (0.023) | (0.012) | (0.026) |
| Certification | 0.02 | 0.00 | 0.02* | 0.00 | 0.02 | 0.01 | 0.01 | 0.03 |
|  | (0.013) | (0.015) | (0.011) | (0.017) | (0.011) | (0.019) | (0.011) | (0.019) |
| Connection | -0.01 | 0.01 | -0.01 | 0.02 | -0.01 | 0.03 | -0.01 | 0.04* |
|  | (0.012) | (0.014) | (0.011) | (0.015) | (0.010) | (0.017) | (0.010) | (0.021) |
| Foreigntech | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | -0.00 |
|  | (0.012) | (0.016) | (0.011) | (0.019) | (0.011) | (0.018) | (0.011) | (0.022) |
| Constant | -0.74*** | -0.40*** | -0.23 | 0.35*** | -0.58*** | -0.17* | -0.52*** | -0.40** |
|  | (0.086) | (0.089) | (0.196) | (0.081) | (0.063) | (0.096) | (0.065) | (0.168) |
| Observations | 6,371 | 3,890 | 7,147 | 3,114 | 7,701 | 2,560 | 8,517 | 1,744 |
| R-squared | 0.209 | 0.271 | 0.217 | 0.274 | 0.221 | 0.283 | 0.218 | 0.316 |

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Second stage is reported

*(Source: Authors' calculation)*

## 5. Conclusion

In this paper, we examine whether the public procurement affects firms' use of trade credit as a type of short-term financing. We use a rich data from World Bank Enterprises Survey with 10,200 observations, covering 45 countries for the period 2007 to 2010. Our empirical results show that government contractors have a negative effect on the level of trade credit. These effects are particularly strong when firms have higher bargaining power and more severe financial and instutional constraints. These findings suggest that contracts with the government affect firms' short-term financing decisions. Our study generalizes the negative relationship found in a developed country by Xu & Dao (2020) to a broader context of cross-country data and different constraints facing firms.

One drawback of our paper is that we do not distinctly investigate whether firms have contracts with local or central authorities. The effects of each kind of government body may be diverse. We leave this drawback to future study that could distinguish the difference of trade credit for firms with contracts with local and central authorities. Another drawback of our paper is that our paper uses a cross-sectional data so we cannot control the factors that change over time and affect each country. The use of panel data helps to fix this problem. Last, our paper makes a comparison for the use of trade credit between all government contractors and non-contractors, but without taking into account the duration of the relationship between the firms and the government customers. It calls for a future research to reveal whether the length of government customer supplier relationship matters.

The finding suggests some policy and managerial implications. Regarding policy implications, in the context of tight monetary policy, trade credit plays an important role in absorbing the effect of a credit contraction (Choi & Kim, 2005). During this period, instead of increasing public procurement which causes a negative effect on the use of trade credit, governments should have policies that can improve business environment to boost enterprises' productivity and attract foreign investments, leading to a probability of a higher use of trade credit increasing liquidity in the market. Moreover, governments should have special mechanism supporting their contractors who are dealing with financial constraints and institutional constraints, so they can increase opportunities of gaining trade credit. In terms of managerial implications, government contractors, especially large-size firms, can utilize more on their relationship with governments to take more trade credit in order to reduce transaction costs.

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**Appendix:** List of countries

| | Country | Percent | | Country | Percent |
|---|---|---|---|---|---|
| 1 | Afghanistan (2008) | 0.97 | 24 | Indonesia (2009) | 8.64 |
| 2 | Albania (2007) | 0.55 | 25 | Jamaica (2010) | 0.72 |
| 3 | Angola (2010) | 0.99 | 26 | Madagascar (2009) | 1.61 |
| 4 | Argentina (2010) | 5.94 | 27 | Mali (2007) | 0.2 |
| 5 | Bolivia (2010) | 0.59 | 28 | Mali (2010) | 0.4 |
| 6 | Botswana (2010) | 0.7 | 29 | Mauritius (2009) | 0.97 |
| 7 | Brazil (2009) | 7.42 | 30 | Mexico (2010) | 9.3 |
| 8 | Bulgaria (2007) | 4.49 | 31 | Mozambique (2007) | 0.07 |
| 9 | Burkina Faso (2009) | 0.68 | 32 | Nepal (2009) | 1.27 |
| 10 | Cameroon (2009) | 0.98 | 33 | Nicaragua (2010) | 1.04 |
| 11 | Chile (2010) | 6.07 | 34 | Panama (2010) | 0.54 |
| 12 | Colombia (2010) | 5.7 | 35 | Paraguay (2010) | 0.84 |
| 13 | Costarica (2010) | 2.15 | 36 | Peru (2010) | 6.08 |
| 14 | Croatia (2007) | 2.64 | 37 | Philippines (2009) | 5.83 |
| 15 | Côte d'Ivoire (2009) | 1.27 | 38 | Senegal (2007) | 0.17 |
| 16 | DRC (2010) | 0.83 | 39 | South Africa (2007) | 1.27 |
| 17 | Dominican Republic (2010) | 0.91 | 40 | Trinidad and Tobago (2010) | 0.92 |
| 18 | Ecuador (2010) | 1.03 | 41 | Uruguay (2010) | 2.3 |
| 19 | El Salvador (2010) | 0.89 | 42 | Venezuela (2010) | 0.5 |
| 20 | Fiji (2009) | 0.19 | 43 | Vietnam (2009) | 6.73 |
| 21 | Ghana (2007) | 0.41 | 44 | Yemen (2010) | 1.62 |
| 22 | Guatemala (2010) | 2.31 | 45 | Zambia (2007) | 0.3 |
| 23 | Honduras (2010) | 0.99 | | | |

*(Source: Enterprise Surveys of the World Bank)*

# ECONOMIC SANCTIONS AND GLOBAL BANKING FLOWS: THE MODERATING ROLES OF FINANCIAL MARKET PROPERTIES AND INSTITUTIONAL QUALITY

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## Abstract

*This paper investigates the effects of economic sanctions (ES) on global banking flows (GBF) using 4,022 pairs of 207 countries during the period 1995-2018. We use a structural gravity model combined with the rich Global Sanction DataBase introduced by Felbermayr et al. (2020, 2021). ES include various forms of sanction, including arms, trade, financial, travel, and other sanctions, whereas GBF reflect cross-border lending. Our empirical results show a negative association between ES and GBF. The heterogeneous effects of ES on GBF depend on the types of sanctions. Furthermore, both properties of financial markets and the institutional quality of the target country play a decisive role in moderating the ES-GBF nexus. Specifically, the consequences of ES become more severe when target countries feature a high level of financial market development, more open financial markets, poor credit information sharing, a more competitive banking market, and a high degree of financial openness, while better institutional quality limits the adverse impact of sanctions.*

***Key words****: Global sanctions; global banking flows; financial development; bank competition, credit sharing information, institutional quality.*

**JEL code**: F21, G21, O16, C33

## 1. Introduction

Economic sanctions (ES) are being used increasingly, particularly smart sanctions rather than conventional sanctions. Nations, individually or under the pressure of international organizations, often impose sanctions to pursue a broad set of foreign policy objectives. Sanctions are employed to improve human rights, terminate internal battles, hamper the proliferation of weapons of mass destruction, and punish countries that finance terrorists. Although economic coercion is a frequently used policy instrument, research has shown that it generally has little impact on the economic environment in target countries (Hufbauer et al., 2009; Shin et al., 2016; Peksen, 2019). Economic coercion rarely achieves its intended goals and may have severe humanitarian consequences in the sanctioned countries. Conventional sanctions may worsen human rights and erode democratic freedom (Peksen & Drury, 2010;

Oechslin, 2014), lead to political instability (Allen, 2008; Escribà-Folch & Wright, 2010), and impair public health and humanitarian security (Peksen, 2011; Allen & Lektzian, 2013). The international community has shifted toward the use of targeted and smart sanctions, including financial sanctions, travel restrictions, arms embargoes, and asset freezes, that reduce the inadvertent humanitarian impact. In addition, scholars believe that sanctions should be used as a means of persuasion instead of punishment (Drezner, 2011).

In general, ES can be defined as a range of actions or specific interventions imposed by one country (a sanctioning country or sender country) on another country (a sanctioned country or target country). According to Escribà-Folch (2010), sanctioning states can be a typical country (e.g., the United States), a coalition of countries (e.g., the European Union), or international organizations (e.g., the United Nations), whose purpose is to punish, constrain, or seek changes in a specific policy or behavior on the part of the sanctioned party. As revealed by Escribà-Folch (2010) and Felbermayr et al. (2020), there are various forms of ES, including trade restrictions (i.e., partial or total embargoes), financial or economic blockades (i.e., asset freezes), and travel bans that are triggered by a wide variety of economic, political, and environmental policies or serve multiple purposes (proactive, punitive or demonstrative).

The recent success of financial sanctions imposed on Iran highlights the role of links to banks (Arnold, 2016). Financial sanctions depend on the structure of the Western-dominated global banking system to carry out and shape global standards and practices. During the period 2012-2014, Iran's economy performed poorly and was completely extracted from the global financial system. This situation forced Iran to come back to the negotiating table and agree to reduce nuclear weapons in exchange for sanction relief; this suggests that the effects of sanctions can be transmitted through global banking connections. The current literature has mainly focused on the financial effects of sanctions on target countries, yet research on the global banking externalities of sanctions is scant. The purpose of this paper is to fill this gap by examining the effects of (targeted) ES on cross-border banking flows.

Specially, we use data on bilateral cross-border bank claims from the Bank for International Settlements' (BIS) locational banking statistics (LBS) as global banking flows (GBF), while information on sanctions is collected from the Global Sanctions DataBase (GSBD). After controlling for gravity factors, country-, year-, and pair-fixed effects, we find that imposing sanctions reduces cross-border lending (i.e., retrenchment). Among the economic sanctions, travel bans have the highest magnitude effect. We next examine the moderating roles of financial market properties and institutional quality on the relationships between sanctions and cross-border linkages. The effects of global sanctions on global banking flows become more pronounced for countries featuring a low degree of financial market development and weak institutional systems. Our results are robust for alternative measures of bank networks and when the potential endogeneity of global sanction is controlled.

We contribute to the literature in at least three ways. First, our paper is, to our best knowledge, the first to investigate the ES-GBF nexus using the structural gravity model combining dyad country-pair data. Given that cross-border bank linkages between countries and the benefits obtained from the global banking network are among the bases for the application of economic sanctions, it is essential to examine the impacts of ES on bilateral banking flows as a way of evaluating the success of ES. Second, this paper augments the literature by developing theoretically and examining empirically the moderating roles of the financial market properties and institutional quality of the target country. Third, our paper is, to our best knowledge, the first to address endogeneity in the sanction model. These contributions are expected to give vital insights to economists and policymakers in addressing the consequences of ES on various issues related to the world economy, especially the process of reforming the international banking network.

The rest of this paper unfolds in five sections. In the next section, we discuss the theoretical background, establishing the link between sanctions and cross-border banking flows. In the third section, we describe the variables and the methodological approach. The results from the empirical analysis are reported in the fourth section. In the conclusion, we discuss future research and the policy implications of our findings.

## 2. Literature Review and Hypothesis Development

The focus of this study is the effect of global sanctions on patterns of cross-border banking flows. We first review the drivers of these flows.

### 2.1. Determinants of Cross-border Banking Flows

It is vital to concentrate on this issue using a gravity model that captures the factors that push and pull cross-border banking flows as a conditioning background. Gravity methods are used in the study of portfolio decisions and banking behavior in international financial markets. Using a theoretical model based on research into the determinants of portfolio choice, Okawa and Van Wincoop (2012) show that a gravity framework can be applied to equity portfolios and high-risk securities. This fundamental framework is then employed to explain the results in Lane and Milesi-Ferretti (2017), who studied International Financial Integration from 1970 to 2015, with a focus on the effect of recent financial distress. In the same vein, Claessens (2017) provides a theoretical interpretation of recent financial developments.

Lane and Milesi-Ferretti (2017) point out that global assets increased relative to global GDP between 1970 and 2007. They identify three genres of assets: portfolios of equities and bonds, foreign direct investment (FDI), and bank assets. A risk and return approach is most suitable for analyzing the first form of finance and is developed by Okawa and Van Wincoop (2012), whereas the other two are best interpreted using trade-related theories. However, the methods used to study portfolio behavior and banking are interdependent because they involve liquid transactions that may be influenced by default risks, capital value risks, and exchange rate volatility. Lane and Milesi-Ferretti (2017) indicate that the growth in the ratio

of international assets to GDP has slowed since 2008. This ratio captures not only a movement of relative output growth to emerging countries that have less income elasticity for global assets but also reflects increasing uncertainty after the period of financial turmoil. Moreover, regulatory reforms since the crisis have hampered the expansion of bank lending, and this has led to a decrease in international bank assets relative to global GDP. This decrease partially explains why cross-border banking activity between developed countries is decreasing as a share of global GDP. Gabrieli and Labonne (2018) highlight a considerable fall in cross-border banking activity, using European Union data on individual banks. They show that country risk, as well as risk premium related to defaults, have cut interbank lending within the EU and even more so to non-member countries. Meanwhile, Demiralp et al. (2017) indicate that negative interest rates seem to boost lending by banks in the Eurozone, without strong bias against non-member states.

### 2.2. Economic Sanctions and Cross-border Banking Flows

The portfolio approach concentrates on the trade-off between asset risk and return, and it may not be wholly applicable to bank lending; note that this does not mean that risks are not critical in such lending. Some of the risks are represented in borrowing costs that can be measured, while others are represented in risk premia that are difficult to measure. Various indicators can be used to capture particular risks. Regarding political risks, Bremus and Fratzscher (2015) and Emter et al. (2019) use the World Governance Indicator constructed by the World Bank to study global lending to host nations. Concerning the business environment and the strength of the legal framework, Buch and Lipponer (2007) and Niepmann (2015) employ the Financial Freedom Index as a proxy for the risks perceived by the lenders. Legal frameworks have changed through the years and are linked to regional or international frameworks. For example, the European Union created a unified market for financial activities to boost international banking. Papaioannou (2009) indicates that European integration stimulated cross-border banking flows between member countries. Meanwhile, the relative power of domestic and international regulations may vary. Cerutti and Claessens (2017) partially attribute the sharp reduction in direct foreign lending to shifts in this relative power.

In line with this research, foreign policies, such as ES, generate political risks (McDowell, 2020) or external shocks (Hatipoglu & Peksen, 2018) that potentially sever cross-border banking flows. Countries' foreign policy may affect the attractiveness of their currencies for international transactions and thereby influence global lending in that currency (Takáts & Temesvary, 2020). McDowell (2020) indicates that financial sanctions by the US reduce the use of the US dollar as they lead to political risks from the expected cost of using the dollar. ES can also be treated as external shocks that generate currency crises (Peksen & Son, 2015) or banking crises (Hatipoglu & Peksen, 2018) that then curtail international banking flows (Cerutti, 2015; Cerutti et al., 2015). Peksen and Son (2015) posit that economic coercion harms the economy and induces political risk akin to speculative attacks by currency traders. Meanwhile, Hatipoglu and Peksen (2018) argue that ES impose pressure on the

banking sector by amplifying the severity of domestic economic issues, and therefore, destabilizing the financial stability of target nations. Based on the above arguments, we proposed the following hypothesis:

**H1a:** Economic sanctions negatively affect cross-border banking flows.

**H1b:** Targeted sanctions negatively affect cross-border banking flows more than do conventional sanctions.

### 2.3. The moderating role of financial market properties and institutional quality

Other factors that affect the nexus between ES and global banking are financial market development and institutional quality. Claessens (2017) indicates that if countries reach certain macroeconomic, economic, and financial levels, their global banking flows are larger. Müller and Uhde (2013) use competitive pressure as a proxy for the development of the capital market. They show that banks located in a more competitive market are likely to employ cross-border strategies to achieve higher profits or hedge potential losses. Also, the gap in the regulatory framework between source and host countries enhances lending from strictly regulated markets to less regulated emerging countries. In this paper, we argue that the target countries with the highly developed financial market are more likely become dependent upon the international financial market. As showed by Hufbauer et al. (2009) and Whang (2010), both economic and financial ties affect the impacts of ES. The more dependent on the financial and economic ties, the more critical pressures on the target countries are created. As a consequence, the more developed financial market, implying a closer connection to international financial market may causes the target country to expose to a more severe consequence of ES.

Institutions refer to the conventional practices, relationships or organizations in a society. Institutions in developing countries are different from those in developed countries in terms of role, value, and the cost of managing the behavior of economic players (Laffont & Meleu, 2001). Concerning institutional quality, Papaioannou (2009) pinpoints the role of initial levels of institutional quality and institutional developments. In particular, the key explanation of the shortage of international financial flows in developing and less developed countries is institutional underdevelopment. On the other hand, Burlone (2002) and Peksen (2019) contend that low institutional quality reduces the effectiveness of economic sanctions. The lack of efficient state institutions constrains a government's ability to collect the national budget and therefore prompts it to lean on external foreign funds. As a consequence, when countries with poor institutional quality are confronted by sanctions in the form of cuts in aid or other economic limitations, their governments have greater difficulty in providing economic incentives to their backers, including the top military and entrepreneurial elites. In addition, poor institutions limit the ability of governments to use suppression to control increasing domestic conflict and hostility after the imposition of sanctions.

Based on the above discussion, we propose the following hypotheses:

**H2**: The negative effects of ES on global banking flows (GBF) become greater with a high level of financial market development, poor credit information sharing, a more competitive banking market, and a high degree of financial openness in the target countries.

**H3**: The negative effects of ES on cross-border banking flows become greater if there is a poor institutional system in the target countries.

## 3. Methodology

We specify the following model to investigate the impact of ES on global banking linkages:

$$GBF_{ijt} = \beta_0 + \beta_1 ES_{ij,t-1} + \beta_2 CONTROL_{ij,t-1} + v_t + \lambda_i + \gamma_j + \alpha_{ij} + \varepsilon_{ijt,} (1)$$

in which subscripts $i, j$ and $t$ denote country $i$, country $j$, and year $t$, respectively. $v_t$, $\lambda_i$, $\gamma_j$, and $\alpha_{ij}$ respectively denote year, source-country-fixed, host-country-fixed, and pair-fixed effects. $GBL_{ijt}$ are bilateral cross-border bank claims in country $i$ and $j$ in year $t$ that are obtained from LBS. All bilateral sanctions of country $i$ to country $j$ in year $t$ are captured by the key variable, $ES_{ijt}$, which was first introduced by Felbermayr et al. (2020, 2021). The new dataset on global sanctions permits us to classify ES into various genres (i.e., trade versus financial sanctions) and only consider effective sanctions (i.e., excluding threats). In this article, $Sanction_{ijt}$ is a dummy variable that takes a value of 1 if there are any sanctions between $i$ and $j$, and 0 otherwise. The specific genres of global sanctions, including arms (*Sanct_Arm*), military (*Sanct_Military*), trade (*Sanct_Trade*), financial (*Sanct_Finance*), travel (*Sanct_Travel*), and other (*Sanct_Other*) are also considered for the analysis. *CONTROL* consists of a set of control variables, including GDP per capita, and other common gravity variables that capture weighted distance (*D*), common religion (*comrelig*), common colonizer post-1945 (*comcol*), common official language (*comlang_off*), and same regional trade agreements (*rta*). While GDP is taken from the World Bank database, the gravity variables are obtained from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

This paper first regresses global banking flows in year $t$, $GBF_{ijt}$, on global sanctions in year *t-1*, $ES_{i,t-1}$, with a set of other control variables and full of fixed effects. We expect that ES negatively impact international banking networks and their effects depend on the types of sanction. Moreover, we contend that the effects of ES change between sanctioned states, conditional on the properties of financial markets and institutions and the political-institutional environment in the target countries. We examine our belief by adding the interaction between ES and variables capturing the properties of financial markets and institutions and political-institutional environment in the target countries[1].

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[1] We will discuss these variables in detail in the next section.

## 4. Data and Empirical Results

### 4.1. Data Description

Figure 1 displays the average size of ES and GBF over time. As presented in this figure, bank claims show a slight increase during the period 1995-2011 before declining substantially. By contrast, the ES series increases dramatically and reaches a peak in 2014 before decreasing slightly. Furthermore, there are opposite trends between the GBF series and the ES series before and after 2011. In particular, the historical data shows that there are procyclical relations between the dynamics of the bilateral cross-border bank claims and ES in the pre-2011 period, whereas an expansion of ES seemingly leads to a significant reduction in GBF in the post-2011 period.

We also plot the average size of ES and GBF series for sender and target countries in Figures 2 and 3, respectively. We exploit the association between the two series by sorting countries based on the decreasing trend in GBF. Bilateral economic sanctions and bilateral GBF are shown in 3,331 pairs of 207 developing and developed countries[2]. Figure 2 reveals that the countries that most often apply ES to other countries also have the greatest volume of bank claims. Left panel of Figure 2 presents the procyclical association between the distribution of average banking flows and sanctions for sanctioning states. Right panel of Figure 2 demonstrates the distribution of mean ES and GBF for sanctioned states.

**Figure 1: Distribution of average ES and GBF over year**
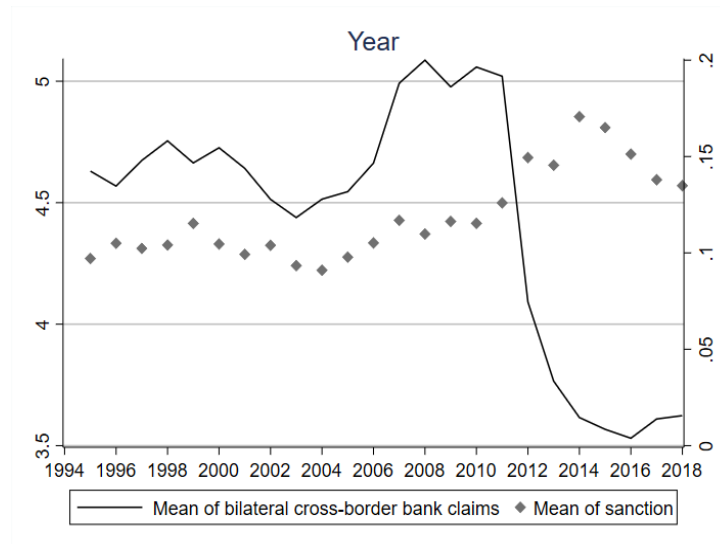


*Note:* The mean value of bank claims is on the left-right scale, and the mean value of sanction is on the right-hand scale.

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[2] For detailed information on these countries, please see Table A.2 in Appendix.

**Figure 2: Distribution of average ES and GBF over countries**
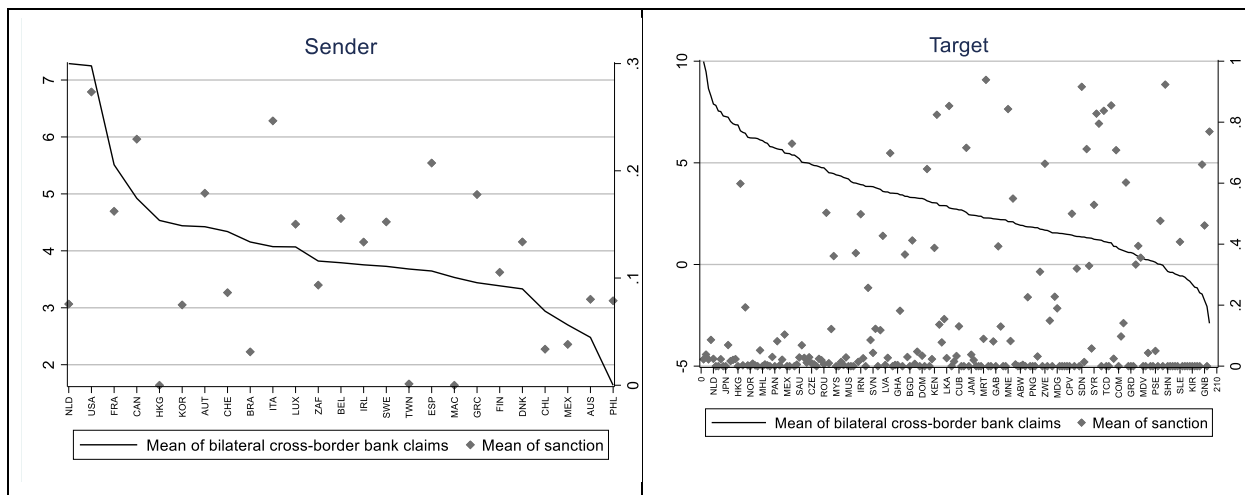


*Note:* The mean value of bank claims is on the left-right scale, and the mean value of sanction is on the right-hand scale.

The statistical description is outlined in Table 1. In our sample, roughly 13% of countries are encountered sanctions in any form imposed by other countries.

**Table 1: Statistical summary**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| LnC | 34,390 | 4.37 | 3.31 | -6.91 | 13.98 |
| ES | 43,051 | 0.13 | 0.34 | 0 | 1 |
| ES_Arms | 43,051 | 0.07 | 0.25 | 0 | 1 |
| ES_Trade | 43,051 | 0.04 | 0.19 | 0 | 1 |
| ES_Financial | 43,051 | 0.09 | 0.28 | 0 | 1 |
| ES_Travel | 43,051 | 0.06 | 0.23 | 0 | 1 |
| ES_Other | 43,051 | 0.01 | 0.12 | 0 | 1 |
| $LnGDP_i$ | 43,051 | 3.62 | 0.63 | 1.03 | 4.78 |
| $LnGDP_j$ | 43,051 | 1.77 | 1.58 | -2.73 | 4.78 |
| D | 43,051 | 8.54 | 0.90 | 4.95 | 9.89 |
| comlang_off | 43,051 | 0.17 | 0.38 | 0 | 1 |
| comcol | 43,051 | 0.01 | 0.08 | 0 | 1 |
| comrelig | 43,051 | 0.21 | 0.26 | 0 | 0.96 |
| rta | 43,051 | 0.33 | 0.47 | 0 | 1 |

*Source: Author's calculation*

### 4.2. Results

*4.2.1. Baseline resutls*

The main baseline results of equation (1) are reported in

Table **2**, which represents the impact of cross-border ES in year (*t-1*) on cross-border bank claims in year *t*. In all models, this study clusters standard errors on country-pairs and considers both country and year fixed effects. *ES* is the dummy variable taking a value of 1 for the presence of any type of sanction. Column 1 of

*Table* **2** represents estimation results in the model that incorporate all gravity variables, while we include the country-pair fixed effects and report them in Column 2. As revealed by Poelhekke (2015) and Doan et al. (2021), globalization trends or historically established country ties may result in the correlation between GBF and ES; thus, considering the dyad fixed-effects can help us address this problem. Our results indicate that *ES* have negative signs as expected, and these variables are statistically significant. The results suggest that there is an adverse impact of ES on cross-border banking capital flows in the target country. ES reduce international lending by 18% or 19% when taking the country-pair-fixed effects into account. Our findings are consistent with Hatipoglu and Peksen (2018), who show that ES leads to a banking crisis by preventing the target country from approaching the international capital market.

Other control variables also show the expected signs in addition to ES. In particular, our paper also shows the positive and remarkable effects of *GDP_i* and *GDP_j*, suggesting that a greater size of home and host country's GDP makes it more straightforward for home countries either to make decisions or find destinations to make their investment abroad. This finding is aligned with Doan et al. (2021). The importance of gravity variables, namely common language (*comlang_off*), common colonizer (*comcol*), common religion (*comrelig*), and bilateral distance (*D*), are also indicated in this paper. While there is a positive association between *comlang_off, comcol* and *GBL,* the physical distance between sender and target countries makes international banking flows harder. The findings suggest that the risk of investment failure diminishes with proximity and shared commons, thus encouraging countries to make investments abroad, especially banking investments (Petersen & Rajan, 2002). The greater efficiency in monitoring and collecting soft information stems from the physical proximity between home and host countries.

**Table 2: Baseline results**

| VARIABLES | (1) LnC | (2) LnC |
|---|---|---|
| ES | -0.18** | -0.19** |
|  | (0.079) | (0.081) |
| LnGDP$_i$ | 0.77*** | 0.78*** |
|  | (0.078) | (0.079) |
| LnGDP$_j$ | 0.42*** | 0.43*** |
|  | (0.133) | (0.133) |
| D | -1.49*** |  |
|  | (0.056) |  |
| comlang_off | 0.59*** |  |
|  | (0.113) |  |
| comcol | 0.09 |  |

|  |  |  |
|---|---|---|
|  | (0.322) |  |
| comrelig | 0.78*** |  |
|  | (0.224) |  |
| rta | -0.02 | -0.03 |
|  | (0.074) | (0.078) |
| Constant | 12.81*** | 1.25** |
|  | (0.699) | (0.534) |
|  |  |  |
| Observations | 31,443 | 31,443 |
| R-squared | 0.715 | 0.090 |
| Number of pair | 2,814 | 2,814 |
| Pair FE | NO | YES |
| Country FE | YES | YES |
| Year FE | YES | YES |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In the following analysis, we investigate the differential effects of ES on international banking flows conditional on sanction types and outline the results in *Table 3*. Some important messages should be highlighted. First, the effects of ES on cross-border banking flows are heterogeneous in terms of the types of sanction. All types of sanction dampen bank lending, except for the effect of arms sanctions. Second, the effects of trade embargos and travel restrictions are greater than those of financial sanctions. Third, smart sanctions, like travel restrictions, have a greater effect on cross-border lending than conventional sanctions, such as trade embargos. These findings can be explained by the fact that the cost of doing business overseas for multinational firms may increase due to the different types of ES. These findings have important policy implications. In order to block the target country from accessing global financial markets, sanctioning countries should lean toward trade or travel bans. Between the two, travel restrictions should be used to hinder lending from sender to the target countries.

**Table 3: Effects of different types of sanction of cross-border bank linkages**

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
|  | Trade | Financial | Travel | Arms | Other |
| VARIABLES | LnC | LnC | LnC | LnC | LnC |
|  |  |  |  |  |  |
| ES | -0.36*** | -0.18** | -0.45*** | -0.06 | -0.29** |
|  | (0.105) | (0.086) | (0.120) | (0.114) | (0.144) |
| LnGDP$_i$ | 0.76*** | 0.77*** | 0.76*** | 0.77*** | 0.77*** |
|  | (0.078) | (0.078) | (0.078) | (0.078) | (0.078) |
| LnGDP$_j$ | 0.42*** | 0.42*** | 0.43*** | 0.43*** | 0.43*** |
|  | (0.133) | (0.133) | (0.132) | (0.133) | (0.133) |
| D | -1.49*** | -1.49*** | -1.50*** | -1.49*** | -1.49*** |
|  | (0.056) | (0.056) | (0.056) | (0.056) | (0.056) |
| comlang_off | 0.59*** | 0.59*** | 0.59*** | 0.59*** | 0.59*** |
|  | (0.113) | (0.112) | (0.113) | (0.112) | (0.112) |

| | | | | | |
|---|---|---|---|---|---|
| comcol | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| | (0.322) | (0.322) | (0.323) | (0.321) | (0.321) |
| comrelig | 0.77*** | 0.78*** | 0.77*** | 0.78*** | 0.78*** |
| | (0.224) | (0.224) | (0.224) | (0.224) | (0.223) |
| rta | -0.02 | -0.02 | -0.02 | -0.02 | -0.02 |
| | (0.074) | (0.074) | (0.073) | (0.074) | (0.074) |
| Constant | 12.88*** | 12.82*** | 13.00*** | 12.74*** | 12.74*** |
| | (0.700) | (0.698) | (0.706) | (0.698) | (0.693) |
| | | | | | |
| Observations | 31,443 | 31,443 | 31,443 | 31,443 | 31,443 |
| Number of pair | 2,814 | 2,814 | 2,814 | 2,814 | 2,814 |
| Pair FE | NO | NO | NO | NO | NO |
| Country FE | YES | YES | YES | YES | YES |
| Year FE | YES | YES | YES | YES | YES |
| R2 | 0.716 | 0.716 | 0.716 | 0.716 | 0.716 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

### 4.2.2. Moderating roles of financial market properties and institutional quality

We investigate the mediating role of variables capturing the properties of financial markets as well as the quality of institutions in target countries on the relationship between GBF and ES. To perform this investigation, we add interactions between variables capturing this information and ES and include the country-pair fixed-effects in all analyses.

### 4.2.2.1. The moderating role of financial market properties

In this section, we examine the moderating role of financial market properties in three dimensions: the level of financial market development, the level of credit information sharing, and the degree of integration into the global financial markets.

We first consider the mediating role of financial market development in the target country. We use the Financial Development Index Database (FDID) developed by the IMF. This index reflects how developed financial institutions and financial markets are regarding their depth, access, and efficiency. Financial institutions consist of banks, insurance firms, mutuals and pension funds, whereas financial markets consist of bond and stock markets. The IMF defines financial development as a mixture of depth (market size and liquidity), access (ability of individuals and firms to access financial services), and efficiency (ability of institutions to offer financial services at low cost, and the degree of activity in capital markets). In this paper, *FID*, *FIA*, and *FIE* represent the depth, access, and efficiency of financial institutions, and *FMD*, *FMA*, and *FME* denote the depth, access, and efficiency of financial markets, respectively. Each group of indicators is then aggregated into *FI* and *FM*. The most aggregated index is *FD*. All the indices are normalized to 1 and the higher the index, the more developed are the financial institutions and financial markets.

We add interactions between these financial development variables and ES in equation (1) and then outline the estimation results in Table 4. Table 4 suggests that a higher degree of financial development in general and of financial markets in particular has the consequence of making ES more severe.

**Table 4: Interaction between economic sanctions and financial market development**

| VARIABLES | (1) FD LnC | (2) FI LnC | (3) FM LnC |
|---|---|---|---|
| $LnGDP_i$ | 0.77*** | 0.74*** | 0.82*** |
| | (0.079) | (0.082) | (0.079) |
| $LnGDP_j$ | 0.37*** | 0.39*** | 0.37*** |
| | (0.136) | (0.136) | (0.136) |
| rta | -0.03 | -0.03 | -0.01 |
| | (0.080) | (0.079) | (0.080) |
| ES | 0.01 | -0.00 | -0.07 |
| | (0.137) | (0.174) | (0.108) |
| $FD_j$ | 1.70*** | 0.84** | 0.96*** |
| | (0.345) | (0.344) | (0.214) |
| $ES*FD_j$ | -0.72* | -0.55 | -0.57* |
| | (0.369) | (0.428) | (0.308) |
| Constant | 0.82 | 1.13** | 1.10** |
| | (0.550) | (0.560) | (0.542) |
| | | | |
| Observations | 30,078 | 30,078 | 30,078 |
| R-squared | 0.098 | 0.095 | 0.097 |
| Number of pair | 2,638 | 2,638 | 2,638 |
| Pair FE | YES | YES | YES |
| Country FE | YES | YES | YES |
| Year FE | YES | YES | YES |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*Note:* FD: Financial development; FI: Financial institution development; FM: Financial market development.

### 4.2.2.2. The moderating roles of institutional quality

In this analysis, we contend that informational asymmetries may stem from weak and poor institutional systems in target countries. The impact of ES is possibly larger in countries characterized by opaque ways of doing business. To examine our belief, we follow Kaufmann et al. (2011) and use the Worldwide Governance Indicators (WGI) that constructs aggregate indicators of six broad dimensions of governance, including voice and accountability (VA), political stability and absence of violence/terrorism (PV), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), and control of corruption (CC). The six aggregate indicators are based on over 30 underlying data sources reporting the perceptions of governance of a large number of survey respondents and expert assessments worldwide. A higher value of the WGI value implies better or stronger governance performance. Detailed descriptions of these components can be found in Kaufmann et al. (2011). To examine the moderating role of institutional quality, we incorporate interactions of these components and ES. Table 5 sets out the main estimation results. Almost all interactions are statistically significant and have positive signs as expected. These findings suggest that the consequences of ES are less severe for countries featuring better institutional quality.

**Table 5: Interaction between economic sanction and institutional quality**

| VARIABLES | (1) VA LnC | (2) PV LnC | (3) GE LnC | (4) RQ LnC | (5) RL LnC | (6) CC LnC |
|---|---|---|---|---|---|---|
| LnGDP$_i$ | 0.75*** | 0.77*** | 0.73*** | 0.75*** | 0.75*** | 0.75*** |
| | (0.079) | (0.079) | (0.080) | (0.080) | (0.079) | (0.079) |
| LnGDP$_j$ | 0.49*** | 0.48*** | 0.51*** | 0.50*** | 0.49*** | 0.50*** |
| | (0.140) | (0.139) | (0.140) | (0.140) | (0.140) | (0.139) |
| rta | -0.03 | -0.03 | -0.04 | -0.03 | -0.03 | -0.04 |
| | (0.076) | (0.076) | (0.076) | (0.076) | (0.076) | (0.076) |
| ES | -0.90*** | -1.09*** | 0.27 | -0.55** | -0.88*** | -0.72*** |
| | (0.215) | (0.254) | (0.423) | (0.238) | (0.281) | (0.230) |
| Insti | 1.51 | 1.61 | 0.87 | 0.60 | 1.29 | -0.51 |
| | (1.112) | (1.073) | (0.921) | (0.816) | (1.149) | (0.974) |
| ES*Insti | 5.13*** | 3.58*** | -2.23 | 1.93* | 4.37*** | 3.31** |
| | (1.397) | (0.940) | (2.091) | (1.162) | (1.686) | (1.334) |
| Constant | 0.83 | 0.69 | 0.79 | 0.86 | 0.81 | 1.08* |
| | (0.565) | (0.592) | (0.583) | (0.578) | (0.576) | (0.566) |
| | | | | | | |
| Observations | 27,447 | 27,464 | 27,456 | 27,458 | 27,464 | 27,461 |
| R-squared | 0.072 | 0.073 | 0.071 | 0.071 | 0.072 | 0.071 |
| Number of pair | 2,754 | 2,758 | 2,757 | 2,757 | 2,758 | 2,758 |
| Pair FE | YES | YES | YES | YES | YES | YES |
| Country FE | YES | YES | YES | YES | YES | YES |
| Year FE | YES | YES | YES | YES | YES | YES |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*Note:* Six broad dimensions consist of Voice and Accountability (VA), Political Stability and Absence of Violence/Terrorism (PV), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Control of Corruption (CC).

## 5. Conclusions and policy implications

This article investigated the effects of global economic sanctions on global banking flows by employing 4,022 pairs of 207 countries during the period 1995-2018. By using the structural gravity model combining with the rich database of the GSDB, we indicated that there is a negative relationship between ES and global banking flows. Moreover, the differential effects of sanctions on international banking investments depend on the types of sanction. To shed more light on the mechanisms behind this finding, we augmented the model by adding the interactions between bilateral global sanctions and variables capturing the properties of financial markets as well as the quality of institutional systems. The empirical results show that the consequences of ES became more severe when target countries feature a high level of financial market development, more open financial markets, a more competitive banking market, poor credit information sharing, a low degree of bank competition, and high financial openness, while a better institutional quality attenuates the adverse impact of sanctions.

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# IMPACT OF DIVIDEND POLICY ON SHARE PRICE VOLATILITY OF THE VIETNAM BANKING SECTOR IN THE CONTEXT OF FINANCIAL INTEGRATION

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**Abstract**

*This study examines the impact of dividend policy on share price volatility in the Vietnam banking sector in the context of financial integration. Empirical study on the sample of 13 commercial banks listed on the stock exchange showed that dividend policy had significant effects on the share price movement. Both cash dividend and stock dividend payment showed a significantly positive impact on price volatility. Dividend yield and share price moved in the opposite direction. Issuing regulation on Basel II had a positive impact on the stock price movement, yet no joint significant effect with dividend policy was found. The presence of institutional foreign ownership in the banking sector produced the calming effect on the stock market. Findings of this study emphasized the relevance of dividend policy, and the prudence of expanding the foreign ownership in the banking sector to meet the capital adequacy rate in Basel II and III.*

***Keywords:*** *dividend policy, dividend yield, price volatility, banking sector, Vietnam.*

## 1. Introduction

Theoretical foundation of the dividend policy developed by Miller & Modigliani (1961) proved the irrelevance of the dividend policy to the firm value under the perfect capital market and rational investors. However, such ideal assumptions are violated in reality; the dividend policy has been expected to affect the firm value. Lintner (1956), Gordon & Shapiro (1956), Gordon (1959) stated that in information asymmetry and uncertainties, today income (through dividend distribution) outweighs future income since current cash flow is less risky than expected future cash flow. Hence, shareholders prefer a higher dividend payment because of "a bird in the hand is worth over two in the bush". The signaling hypothesis developed in the study of John & Williams (1985), Miller & Rock (1985) expressed the signal function of dividend announcement in the stock market. An increase in dividend distribution acts as a good signal, which leads to the positive reaction of the stock price and vice versa. Bhattacharya (1979) affirmed the dividend payout function as a signal of a company's financial health. It provides to the market the expectation of insiders about a higher future cash flow.

Violating assumption about no interest conflict between insiders (managers) and outsiders (shareholders) leads to the relevance of the agency theory in studies on the dividend policy. Because of the separation between ownership and control, managers may use shareholders' resources to maximize their own utility instead of maximizing the shareholders' wealth (Jensen & Meckling, 1976). Hence, shareholders prefer large dividend payment, since cash-disbursement reduces the cash flows available to managers. Other speaking, firms with higher dividend payment can enjoy higher market position by reducing agency cost of equity. Another violation of M&M assumptions is the heterogeneity of tax effect. The tax clientele theory, developed by the study of Brennan (1970); Litzenberger & Ramaswamy (1979); Stulz (1990); Brennan & Thakor (1990) suggested that investors prefer capital gains rather than dividends because of the less favorable tax treatment for dividend income. Therefore, the investors' preference for dividend payment is not homogenous, leading to the various reactions of the market to the dividend announcement.

Empirical studies on dividend policy have witnessed a prolong debate about the reaction of the market to different model of dividend payment. Supporting evidence for the irrelevance of dividend policy was found in the study of Black & Scholes (1974), Miller & Scholes (1978, 1982), Allen & Rachim (1996), Rashid & Rahman (2008), Chen et al. (2002), Adefila et al. (2004), Uddin & Chowdhurry (2005), Illaboya & Aggreh (2013), Jakata & Nyamungnre (2015). In contrast, a buck study showed the effects of dividend policy on firm value. The very first study developed by Baskin (1989) found the influence of dividends on stock volatility of 2,344 US firms for the period 1967-1986. Fama & French (1998) reported the positive relationship between a firm's value and its dividend, since dividends convey positive information about value. Hussainey et al. (2011) found the negative relationship between the payout ratio and price movement in the UK security market. Other studies on the developing countries found significant relationship between dividend policy and stock price volatility including Yilmaz & Gulay (2006), Nazir et al. (2012), Joshi (2012), Zakaria et al. (2012), Masum (2014), Kadioglu et al. (2015), Gautam (2017), Budagaga (2017), Ozo & Arun (2019). The mixture of empirical evidences results in a need for more exploratory studies in different contexts.

This paper addresses the question of market responses to the dividend policy through an investigation of the impact of dividend policy on the stock price volatility of the Vietnam banking sector in the context of Basel II enactment. Our study enriches the extant literature on dividend policy with three key points. First, our study examines the reaction of the market to the dividend policy of banks in a bank-based financial market. Previous studies mostly elaborate on the market reaction to dividend policy of non-bank companies. Less attention has been paid to the banking sector, especially in less developed countries, where banks play the major role in stabilizing the financial market. Vietnamese financial market is dominated by debt, and the largest capital suppliers for firms are banks (Nguyen & Bui, 2019). The

capitalization of Vietnam's banking sector is about 30%; and bank stocks are considered as the pillar stocks of the Vietnamese Stock Exchange (VCBS, 2021).

Another reason stems from the current situation of Vietnam banking sector. The State Bank of Vietnam (SBV) issued the Circular No.41/2016/TT-NHNN planning the new CAR at 8% from 2020, then in the Circular No.22/2019/TT-NHNN this rate became 9%. This movement showed the outrageous attempt of the Vietnam banking system to follow the global standards under Basel II and Basel III. According to Nguyen et al. (2021), the mean of the optimal capital adequacy ratios of Vietnam commercial banks is 19.03%, higher than stipulated level at 9% of SBV. The authors also suggested the approach to reach this level, such as increasing the Tier I capital by adding capital through issuing shares, reducing cash dividend payment, or keeping the earnings. However, Fitch Ratings (2019) showed Vietnam banks will continue to face challenges in raising external capital, especially the limitation of foreign-ownership at 30%, which constraint the equity flows from oversea investors and makes the banks more dependable on capital issuance in the shallow local market.

The pressure on Vietnam banking sector in meeting the CAR of Basel II and Basel III provides an interesting setting to examine the market response to the dividend policy. Theoretically, insiders, instead of cash distribution, can use stock dividends as an unorthodox method of dividend payment. The optimal trading range hypothesis (Lev, 1969) reported that managers pay stock dividend to maintain stock price in an industry norm range. Cash substitution hypothesis stated stock dividends would act as a substitute for cash distribution (Lakonishok & Lev, 1987; Baker & Phillips, 1993). However, the direct interview with managers of 500 firms listed on the NSE of India found lesser supportive evidence for the cash substitution and preferred trading range hypothesis (Baker & Kapoor, 2015). Instead, that study showed firm support the retained earnings, liquidity and signaling hypothesis. Findings of prior studies support the positive reaction of the market to cash dividend yet a call for stock dividend payment still exists. For example, Crawford et al. (2007) required revisiting the signaling theory of stock dividend since the assumption of debt covenant constraint and statutory requirements could be independent of stock distribution method.

We organize the paper into 5 parts. We present the rationale of the research topic in Introduction. Then moving to Literature Review and Hypothesis Development. The third part is about Data and Methodology. Following is Results and Discussion. The last is Conclusion with managerial implications.

## 2. Literature Review and Hypothesis Development

Departing from the prior studies on the relationship between dividend policy and stock price volatility, we construct the hypothesis about the impact of dividend policy on stock price volatility of the Vietnam baking sector in financial integration. We considered the enactment of Basel II of SBV in 2016 as the exogenous variable. We also include the institutional foreign ownership in the model because the limitation of foreign ownership in

Vietnam banking sector (30%) reduces the ability to raise external equity from oversea investors, and put more burden on banks in increasing nominal share capital (Fitch Ratings, 2019).

## 2.1. The impact of dividend policy on stock price volatility

Stock price volatility reflects the movement in stock price during a course of time, and is used to measure the unforeseen changes in stock prices. From investors' viewpoint, stock volatility is an indicator of the exposed risk level. Stock price volatility is the systematic risk faced by stockholders (Guo, 2002). It depends on the uncertainty of firm's future cash flow and discounted rate. Dividend policy, which strongly correlates to future cash flow and cost of capital, is expected to make a profound impact on stock price volatility.

The study of Baskin (1989) is one of the most influential investigation on the impact of dividend policy on share price volatility. This study proposed four models which connect dividends to share price risk, including the duration effect, the rate of return effect, the arbitrage realization effect and the information effect. The duration effect predicts that the price of high dividend yield stocks is less volatile than the low ones, since high dividend yield implies more near-term cash flow, leading to the less sensitivity to the fluctuation in discount rate and a lower price volatility. The rate of return effect predicts the negative correlation between dividend yield and price volatility based on the pecking order theory of capital structure (Myers & Majluf, 1984). Myer & Majluf (1984) stated that managers follow a hierarchy when selecting sources of finance. Managers choose equity financing as a last resort due to the highest cost of information asymmetry for new share issuance. Dividend yield and payout ratio can be considered as proxies for future growth opportunities. Firms with high yield and high payout ratio convey to the market that they are lacking of promising investment, which could cause higher volatility. Regarding arbitrage realization effect, because of the inefficiency of the financial market, the higher the dividend yield, the greater such arbitrage profit. However, Adrian (2004) argued that this proposal depends on uncertainty about dividend policy. The last effect refers to the signaling function of dividend. Managers can use dividend yield to adjust share price volatility. The dividend content theory also emphasized that dividend payment transmits the confidence of insiders about future cash flows. However, other indicators such as leverage, size, sales growth can provide a signal to the market, and the information effect of dividend policy might be negligible in total

In case of Vietnam banking sector, we proposed dividend yield to have a negative impact on stock price volatility due to three reasons. *First*, the Vietnamese stock market is frontier and no significant evidence for supporting three forms of EMH could be found (Xuan Anh et al. 2016). Manh et al. (2017) found the abnormal return around the announcement of dividend and reported the inefficiency of the Vietnamese stock market. *Second*, the banking sector in Vietnam is in the rapidly growing stage, which requires an enormous amount of internal equity capital. The dispersion in the Vietnam baking sector is rather wide (Fitch Ratings, 2019). *Third*, dividend policy is a reliable indicator of financial health in Vietnam, where the dividend policy is less stable and weaker investor protection (Nguyen & Bui, 2019).

*H1 – There is the significantly negative relationship between dividend yield and stock price volatility in the Vietnam banking sector.*

**2.2. Different impact of cash dividend and stock dividend on stock price volality**

In this study, we classify the impact of cash dividend and stock dividend on stock price volatility. Prior studies paid acute attention to cash dividend since cash disbursement is the way to distribute free cash flow to shareholders. There is a cash outflow from assets in place regarding to cash dividend while they consider stock dividend as accounting distribution selection. Stock dividends do not make direct influence on cash flow, which would lead to no impact on stock prices (Wang et al. 2013). However, abnormal returns around stock dividend announcement have been reported in previous researchers. In the following with the Retained Earnings Hypothesis, stock dividends can make effects on the share price since managers can send a signal about their confidence in the firm's ability to make future cash distribution (Rankine & Stice, 1997). The study of Bechmann & Raaballe (2007) conducted on the Copenhagen Stock Exchange (CSE) found that firms, who pay stock dividends, financed its growth by debts and retained earnings, yet able to afford cash dividend permanently. Stock dividend also acts as a substitute for cash distribution (Lakonishok & Lev, 1987; Baker & Phillips, 1993). Baker & Phillips (1993) found that 40.8% of the managers use stock dividends to temporary substitute for cash dividend. That means stock dividend can influence the changes in market share price. However, how stock dividend effects on the share price volatility is questionable. The Retained Earnings Hypothesis (REH) stated that the stock distribution enables the market to identify firms whose managers are optimistic about their firm's future earnings. This signal could be controversy as the managers have to incur the costs as lacking ability to pay cash dividend. Crawford et al. (2007) emphasized the importance of research context when testing the significance of REH in stock dividend. Theoretically, two potential sources of constraints on a firm's ability to pay cash dividends are contractual restrictions in the debt covenant and statutory restriction imposed by the firm's state of incorporation. These assumptions seem to be much relevant to the current situation of the Vietnam banking sector due to the pressure of increasing internal equity capital to meet the CAR in Basel II, and the requirement of debt restructuring. Bessler & Nohel (2000) expressed the difference in the content of dividend policy made by banks and non-bank organizations. Legal regulation may affect the propensity of paying dividends of banks, for example, the capital adequacy requirements implemented by banks after the credit-crunch (Asharf et al., 2016). Therefore, banks with high dividend ratios signal the market, and the market reacts significantly to the dividend payment. The impact of cash dividend payment on stock volatility differs from that of stock dividend. We made the hypothesis about the impact of cash dividend and stock dividend as follows:

*H2 – There is the significant impact of dividend payout ratio on price volatility of listed commercial banks in Vietnam.*

*H3 – The impact of cash payout ratio on price volatility of listed commercial banks in Vietnam differs significantly from that of stock payout ratio.*

## 2.3. The impact of external factor and institutional foreign ownership on stock price volatility

We also investigated the impact of Basel II enactment and institutional foreign ownership on stock price volatility of listed banks in Vietnam. We tested the moderating effect of Basel II enactment and institutional foreign ownership with dividend policy on stock price volatility. Through including dummy variable Basel II in the model, we want to examine the impact of the regulatory change on the price movement of Vietnam's bank stock price. World Bank (Global Financial Development Report 2019/2020) stated that significant weaknesses in the regulatory and supervisory system were the main reason for major reform effort in the banking industry after the global financial crisis of 2007-2009. The lack of capital regulation led to the situation that banks did not have equity capital enough to weather the crisis. Minimum Capital requirements play an important role since it allows banks to sustain unexpected losses, offset the incentive of moral hazard, increase the likelihood of survival during periods of financial turmoil. Capital requirement also an important tool for monitoring banks. When properly implemented, capital requirements incentive banks to improve their risk management. Empirical evidence reported that, in countries where supervision and regulation are costlier, the role of capital in systemic stability is stronger. Basel I was the first international initiative to define and regulate capital. In 2004, a revised capital framework, Basel II, replaced Basel I, is built on three pillars: (i) minimum capital requirements; (ii) supervisory oversight on behalf of national regulators; (iii) stronger market discipline as information disclosure on capital, risk exposure, and risk assessment processes. In this context, approaching the three pillars of Basel II is highly recommended for Vietnam's banking sector to be prudence and competitive in the global banking system (Vo, 2018a, Vo & Nguyen 2018b). Empirical studies reported the positive impact of bank capital adequacy on profitability in Vietnam (Batten & Vo, 2019; Dang, 2019; Do & Vu, 2019; Nguyen, 2020). Hence, adopting Basel II could signal positively to the market about risk management and sustainable performance of commercial banks, contributing to the market stability. However, Basel II seems to be far reaching for small private commercial banks; and big banks continue the race to Basel III after Basel II. This occurence would make bank managers cut cash dividend or pay dividend in stocks to retain internal sources of finance. Therefore, we hypothesized that the enactment of Basel in Vietnam's banking sector contributes significantly to the stock price volatility; and the impact of payout ratio on the stock volatility before and after Basel II adoption is significantly different.

*H4- The enactment of Basel II makes a significant impact on the stock price volatility in Vietnam banking sector.*

*H5 – The impact of dividend policy on stock price volatility of Vietnam banking sector is significantly different under Basel II enactment.*

Regarding to the impact of Institutional Foreign Ownership, Ciner & Karagozoglu (2007) stated that the participation of foreign will reduce the asymmetric information in emerging markets; hence, it is expected that higher foreign ownership contributes to the stock market stabilization. Rhee & Wang (2009) showed that the transaction of foreign investors causes some issue for stock market, such as high volatility, greater asymmetric information, and inactive trading. This problem becomes severe in emerging markets since the trading of foreign investors can be a pattern for domestic ones. Empirical evidences found negative relationship between foreign ownership and stock volatility, such as Li et al. (2011), Chen et al. (2013), Chiang & Chan (2019), Vo (2015), Phan & Tran (2019), Truc et al. (2020). In particular, Vo (2016) suggested that institutional investor ownership stabilizes the stock return volatility, and this effect is greater in firms paying dividends. Even though this study does not classify the effect of foreign investors from domestic ones, it affirms that block ownership is an important proxy for stock volatility in small emerging market with highly dominated by institutions.

In case of the Vietnam banking sector, the banks in Vietnam are small compared with foreign banks (Batten & Vo, 2019). Institutional foreign investors, characterized by professional and strong capital, can bring benefits to the Vietnam banks such as dynamic corporate governance, more transparency, and higher equity capital. The stock price becomes less fluctuated since total risk is reduced. Thus, we hypothesized that institutional foreign ownership will positively contribute to the stock market stabilization.

*H6 – The institutional foreign ownership positively contributes to the stock price stabilization.*

## 3. Data and Methodology

Data for this study are collected from the consolidated financial statements, annual reports, and resolutions of General Meeting of Shareholders of 13 commercial banks listed on the stock exchange in Vietnam in a course of 10 years, from 2010 to 2020. We selected commercial banks listed until 2017 to ensure sufficient data for dividend policy and stock price volatility.

- **Dependent variable: Price_Std:**

To measure the stock price volatility of a particular bank, we constructed dependent variable Price_Std as the following equation:

$$Price\_Std_{it} = \sigma(Monthly\ Price_i)$$

Most of the previous study on the relationship between dividend policy and stock dividend adopted the method of Parkison (1980) to measure the stock price volatility. Some studies used the coefficient of covariation for stock price volatility. Iradoost et al. (2013) measured price volatility using short-term and long-term indicator. Long-term price volatility equals to the ratio between standard deviation of stock price and mean value of stock price in a particular year. Similarly, Anh & Nhi (2016) used this ratio as a proxy for the stock price

volatility in Vietnam. Husainey et al. (2011) showed extreme values could influence that standard deviation. However, using Highest Price and Lowest Price to measure the volatility could lead to loss of information and overestimation of volatility. Therefore, we adopted the above equation to measure price volatility in the Vietnam banking sector. We observed the daily stock price of a particular bank was rather stable in a month; thus, we used monthly stock price.

- **Explanatory variables:**

**Cash_ratio**: This variable measures the cash dividend payout ratio of a particular bank.

**Stock_ratio**: This variable measures the stock dividend payout ratio of a particular bank.

We got the information about Cash_ratio and Stock_ratio from the resolutions of General Meeting of Shareholders. The data were aggregated annually.

**DY_gen**: This variable measures the Dividend Yield of a particular bank in general. The fomula for DY_gen is:

$$DY\_gen_{it} = \frac{Dividend_{it}\ (in\ cash\ and\ in\ stocks)}{Average\ Market\ Share\ price_{it}}$$

Basel 2: This is a contextual variable, referring to the impact of the enactment of Basel II on the Vietnam banking sector. Basel 2 is a dummy variable, in which:

$$Basel\ 2 = \begin{cases} 0\ for\ year\ prior\ 2016 \\ 1\ for\ year\ from\ 2016\ to\ 2020 \end{cases}$$

Inst_Foreign_Own: this variable measures the ownership of foreign institutions. The value is extracted from the annual reports of the listed banks.

- **Control variables:**

Generally, previous studies on the impact of dividend policy on stock price volatily control the SIZE, LEVERAGE, EARNINGS of a firm. In this study, due to the distinct features of the Vietnam banks, we used ln(EQUITY) for SIZE, LER for leverage, and EPS for EARNINGS. The expected impacts of control variables on the stock volatility are in line with findings of previous studies[3].

The baseline model to examine the impact of dividend policy on the stock price volatility of listed banks in Vietnam:

$$Price\_Std_{it} = \beta_0 + \beta_1 * Cash\_ratio_{it} + \beta_2 * Div\_ratio_{it} + \beta_3 * DY\_gen_{it} + \varepsilon_t\ (1)$$

In the second model, we include Basel 2, Inst_Foreign_Own, and the Interaction term of Basel 2 and Cash_ratio. The formula of the model 2 is:

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[3] Based on the findings of previous studies, we hypothesized that banks with stronger equity have lower stock volatility. Leverage is an indicator of risk, so the higher the leverage, the higher price volatility. Alternatively, Ler moves positively with stock price fluctuation. EPS reflects the net income for common shareholders. Therefore, the higher EPS, the less risky the stock. So we expected that EPS showed negative relationship with stock price volatility.

$$Price\_Std_{it} = \beta_0 + \beta_1 * Cash_{ratio_{it}} + \beta_2 * Div_{ratio_{it}} + \beta_3 * DY\_gen_{it} + \beta_4 *$$
$$Basel\ 2 + \beta_5 * Basel2 * Cash\_ratio_{it} + \beta_6 * Ins\_foreign\_own_{it} + \varepsilon_{it}\ (2)$$

In the third model, we control for EQUITY, LEVERAGE, and EPS. The full equation is as follow:

$$Price\_Std_{it} = \beta_0 + \beta_1 * Cash_{ratio_{it}} + \beta_2 * Div_{ratio_{it}} + \beta_3 * DY_{gen_{it}} + \beta_4 *$$
$$Basel\ 2 + \beta_5 * Basel2 * Cash\_ratio_{it} + \beta_6 * Inst\_foreign\_own_{it} + \beta_7 *$$
$$\ln(EQUITY)_{it} + \beta_8 * LER_{it} + \beta_9 * EPS_{it} + \varepsilon_{it}\ (3)$$

Descrptive summary of variables in the above models is presented in table 1:

**Table 1. Descriptive summary of variables in the empirical models**

| Variable | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|
| **Dependent variable** | | | | |
| **Price_Std** | 1.84311 | 1.92040 | 0.13963 | 10.85482 |
| **Explanatory variables** | | | | |
| **Cash_ratio** | 0.048673 | 0.062723 | 0 | 0.32 |
| **Stock_ratio** | 0.0403686 | 0.084583 | 0 | 0.41923 |
| **DY_gen** | 0.0719833 | 0.0854067 | 0 | 0.423654 |
| **Inst_foreign_own** | 0.1843069 | 0.1348717 | 0 | 0.7148 |
| **Control variables** | | | | |
| **Ler** | 0.9198424 | 0.0360756 | 0.6564691 | 1.02200 |
| **ln(Equity)** | 9.360883 | 0.7683835 | 7.506592 | 10.60212 |
| **EPS** | 1,898.874 | 1,575.777 | -4,577.611 | 9,112.764 |

*(Source: Authors' calculation)*

Table 1 reported descriptive statistics for variables in the empirical models. The standard deviation of stock price in the Vietnam banking industry is 1,843.11 VND on average. The maximum price movement is 10,854.82 VND and the minimum one is merely 139.63 VND. The average ratio of cash disbursement is 4.8673%. Some banks do not pay the cash dividend while other banks pay high cash dividend. The maximum value of cash dividend ratio is 32%. The average stock dividend ratio is 4.03686% yet the maximum ratio reaches 41.923%. The general dividend yield (DY) of bank stocks is 7.19833%; however, some banks have a top level of DY, leading the maximum DY is at 42.3654%. The ownership of foreign investors takes 18.43% on average, yet the dispersion is wide. The maximum institutional foreign ownership is 71.48%, which belongs to a private commercial bank. Instead, some State-owned banks showed no foreign ownership or a small proportion because

of the regulation of Vietnam Government on the state ownership domination in the banking-finance-insurance industry.

## 4. Results and Discussion

The Pearson correlation matrix of the variables in the models is presented in Table 2. Price_Std negatively correlated with DY_gen (-0.1708), similar to the study of Baskin (1989) which was -0.643; Husainey et al. (2011) at -0.2853; Phan & Tran (2019) at -0.04; Truc et al. (2020) at -0.17. The correlation coefficient between Stock_ratio and DY_gen is 0.5024, significant at 1%, which raises the question of multicolinearity in the regression model. According to Drury (2008), when the correlation coefficient between two explanatory variables is from 0.7, multicollinearity exists. Therefore, no need to worry about the potential violation of the regression model assumptions. However, we postestimate the VIF to affirm the empirical results.

### Table 2. Correlation analysis

| | Price_Std | Cash_ratio | Stock_ratio | DY_gen | Ler | lnEquity | Inst_foreign_own | EPS | Basel2 |
|---|---|---|---|---|---|---|---|---|---|
| **Price_Std** | 1 | | | | | | | | |
| **Cash_ratio** | 0.0639 | 1 | | | | | | | |
| **Stock_ratio** | 0.1039 | -0.2348*** | 1 | | | | | | |
| **DY_gen** | -0.1708* | 0.5317*** | 0.5024*** | 1 | | | | | |
| **Ler** | 0.0875 | -0.2542*** | -0.018 | -0.2638*** | 1 | | | | |
| **lnEquity** | 0.5377** | 0.1301 | 0.0429 | -0.1485 | 0.094 | 1 | | | |
| **Inst_foreign_own** | 0.0426 | 0.0656 | 0.2508** | 0.1999 | -0.2565*** | -0.0514 | 1 | | |
| **EPS** | 0.5367*** | 0.1187 | 0.2536*** | 0.0917 | -0.0462 | 0.3423*** | 0.1705 | 1 | |
| **Basel2** | 0.4093*** | -0.4319*** | 0.1181 | -0.3790*** | 0.1476 | 0.3826*** | 0.1177 | 0.2713*** | 1 |

*(Source: Authors' calculation)*

**Notes:** (*) significant at 10%; (**) significant at 5%; (***) significant at 1%

According to Wooldrige (2010), Pooled OLS regression is relevant for a different sample in each period of time while fixed effects or random effects are employed in case of the same sample[4]. Therefore, we also employed FEM and REM to estimate the baseline

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[4] The Pooled OLS regression for the baseline model has no problem of multicollinearity (Mean VIF = 2.81), yet the problem of heteroskedasticity (Chi2(1) = 19.49, p-value = 0.0000). We generated the new dependent variable Price_Std_1 = log (Price_Std) and estimated the baseline model. The new model does not violate the assumption of multivariate OLS regression. On average, the dividend policy of banks listed on the stock exchange of Vietnam can explained 30.76% the price volatility of the banks. The impacts of exploratory variables on the dependent variable are in line with the results of both FEM and REM. The result of the baseline regression model is follow:

| Variable | Coef. | Std.Err. | t | p-value |
|---|---|---|---|---|
| **Cash_ratio** | 15.05012 | 6.637876 | 2.27 | 0.043 |

model (The model 1). The Hausman test for model selection indicated that REM is more reasonable than FEM (Chi2(3) = 2.17, p-value = 0.5373). However, we discovered the problem of heteroskedasticity (Modified Wald test for groupwise heteroskedasticity in POOL regression model reported the Chi2 (13) = 194.67 and p-value = 0.0000). We employed the robust regression to deal with the problem of variance difference. The Wooldridge test reported that there is no first-order autocorrelation in the model: $F(1,12) = 0.086$, p = 0.774.

The result of the baseline model was reported in the following table:

**Table 3. The regression result of the model (1)**

**Dependent variable: Price_Std**

|              | Normal estimation | Robust estimation |
|--------------|-------------------|-------------------|
| **Variable** | **Coef.**         | **Robust Coef.**  |
| **Cash_ratio** | 19.1163         | 19.1164           |
|              | (4.10)**          | (2.78)**          |
| **Stock_ratio** | 15.7542        | 15.7542           |
|              | (4.95)***         | (3.65)**          |
| **DY_gen**   | -18.9369          | -18.9369          |
|              | (-4.86)***        | (-2.52)*          |
| **_cons**    | 1.6527            | 1.6527            |
|              | (5.88)***         | (5.73)***         |
| **Model summary** | Wald chi2(3)=26.90 | Wald chi2(3)=23.02 |
|              | p-value = 0.0000  | p-value =0.0000   |

**Notes:** (*) significant at 10%; (**) significant at 5%; (***) significant at 1%; t-statistics is in parentheses.

**Table 4. The regression result of the model (1)**

**Dependent variable: Price_Std_1 = log (Price_Std)**

| Variable | Normal estimation | Robust estimation | POOL estimation |
|----------|-------------------|-------------------|-----------------|
|          | **Coef.**         | **Robust Coef.**  | **OLS Coef.**   |
| **Cash_ratio** | 9.0184      | 9.0184            | 11.3037         |
|          | (4.02)***         | (3.03)***         | (5.79)***       |
| **Stock_ratio** | 7.4783     | 7.4783            | 8.5095          |

| | | | | |
|----------|-----------|-----------|------|-------|
| Stock_ratio | 13.96532 | 4.654685 | 3.00 | 0.011 |
| DY_gen   | -15.90595 | 7.693464 | -2.07 | 0.061 |
| _cons    | 1.668485  | 0.1686953 | 9.89 | 0.000 |
| F (3,100) = 14.81; Prob > F =0.0000; R-squared = 0.3076; Adjusted R-squared =0.2868 | | | | |

| | | | |
|---|---|---|---|
| | (4.97)*** | (4.65)*** | (6.03)*** |
| **DY_gen** | -8.4216 | -8.4216 | -10.1428 |
| | (-4.48)*** | (-2.83)** | (-6.30)*** |
| **_cons** | 0.1040 | 0.1040 | 0.0206 |
| | (0.482) | (0.568) | (0.19) |
| **Model summary** | Wald chi2(3)=25.28 | Wald chi2(3)=46.60 | F(3,100)=14.81 |
| | p-value =0.0000 | p-value =0.0000 | p-value =0.0000 |

**Notes:** (*) significant at 10%; (**) significant at 5%; (***) significant at 1%; t-statistics is in parentheses.

The regression results are presented in Table 3 and Table 4. The reason for log transformation of the dependent variable was in the En-note of this paper. After Log transformation, the dependent variable followed the normal distribution and the effect sign does not change. The only difference is the magnitude of the parameters. Based on the result shown in Table 4, Table 5, and Table 6, payout ratio and stock price volatility of the listed banks have positive relationship, significant at p-value <1%. That means the market showed vehement reaction to the dividend policy of listed banks in Vietnam. The higher the dividend paid, the more volatile the stock price is. This finding is consistent with the study of Baskin (1989) on the relationship between payout ratio and stock volatility, Inradoost et al. (2013), Anh & Nhi (2016), Vo (2014), Ajayi & Seyingbo (2015); yet inconsistent with Allen & Rachim (1996) and Hussainey et al. (2011). In Vietnam context, Dinh & Nguyen (2016), Truc et al. (2020), Nguyen et al. (2020) reported a negative relationship, Phan & Tran (2019) found no significant effect.

Both Cash dividend payout ratio and Stock dividend payout ratio showed a positive effect to the stock price volatility. There is statistical evidence to conclude that the cash payout ratio made a stronger impact on the stock price volatility than stock dividend ratio does. In Pooled OLS regression of the baseline model, the Beta coefficient difference test between Cash_ratio and Div_ratio showed F(1,100)=3.83 with p-value = 0.0532 <10%. However, no statistical evidence supporting the different effect between cash dividend and stock dividend was found in REM (Chi2(1) = 1.12; p-value = 0.2909).

Regarding to the effect of Dividend Yield, the empirical results reported the negative impact of DY_gen on the stock volatility of listed banks in the three models, significant at p-value < 1%. We found the similar result with the study of Baskin (1989), Hashemijoo et al. (2012), Hussainey et al. (2011), Al Masum (2014), Vo (2014), To et al. (2020), Phan & Tran (2019); yet different from the finding of Nazir et al. (2011), Khan et al. (2011), Joshi (2012); Dinh & Nguyen (2016); Neelanjana & Hassan (2019).

**Table 5. The regression result of the model (2)**

**Dependent variable: Price_Std_1 = log (Price_Std)**

| Variable | Normal estimation | Robust estimation | POOL estimation |
|---|---|---|---|
| | Coef. | Robust Coef. | OLS Coef. |
| **Cash_ratio** | 10.1435 | 10.1435 | 11.0123 |
| | (3.94)*** | (3.28)*** | (4.41)*** |
| **Stock_ratio** | 6.3594 | 6.3594 | 6.6745 |
| | (4.08)*** | (6.11)*** | (4.55)*** |
| **DY_gen** | -7.2904 | -7.2904 | -8.3759 |
| | (-3.65)** | (-4.35)*** | (-4.76)*** |
| **Basel2** | 0.7013 | 0.7013 | 0.6419 |
| | (3.25)*** | (3.41)*** | (2.87)*** |
| **Cash_Basel2** | 0.8508 | 0.8508 | 2.1920 |
| | (0.795) | (0.859) | (0.510) |
| **Inst_foreign_own** | -0.6939 | -0.6939 | -0.8095 |
| | (-0.81) | (-0.67) | (-1.15) |
| **_cons** | -0.2436 | -0.2436 | -0.2006 |
| | (-1.02) | (-1.04) | (-1.00) |
| **Model summary** | Wald Chi2(6)=45.64 | Wald Chi2(6)=91.10 | F(6,77)=10.85 |
| | p-value =0.0000 | p-value = 0.0000 | p-value =0.0000 |

**Notes:** (*) significant at 10%; (**) significant at 5%; (***) significant at 1%; t-statistics is in parentheses.

Table 5 and Table 6 showed that Basel enactment made significantly positive impact on the stock price volatility. The stock price movement became enlarged after issuing Circular No. 41/2016-TT-NHNN of State Bank of Vietnam. Basel II adoption in the Vietnam banking sector acts as the regulatory factor; therefore, the stock market participants show strong their robust response. The enactment of Basel II could cause more riskiness for bank stockholders since the pressure of meeting three pillars of Basel II and approaching to Basel III criteria would lead small commercial banks to the road map of Merger and Acquisition, and the big banks must comply with global standards of disclosure, operations, and risk management. No joint effect between the enactment of Basel II and the dividend policy of bank stock volatility was reported statistically. Interaction term Cash_Basel showed no significant impact on stock volatility. This could confirm that the market considers the dividend policy and the enactment of Basel II separately. The former belongs to internal factors, whereas the latter plays the role of external force.

**Table 6. The regression result of the model (3)**

**Dependent variable: Price_Std_1 = log (Price_Std)**

| | Normal estimation | Robust estimation | POOL estimation |
|---|---|---|---|
| **Variable** | **Coef.** | **Robust Coef.** | **OLS Coef.** |
| **Cash_ratio** | 8.004 | 8.004 | 7.8561 |
| | (3.07)*** | (2.74)*** | (3.04)*** |
| **Stock_ratio** | 5.0335 | 5.0334 | 4.9196 |
| | (3.14)*** | (4.49)*** | (3.22)*** |
| **DY_gen** | -6.0438 | -6.0438 | -6.2436 |
| | (-2.94)*** | (-3.53)*** | (-3.31)*** |
| **Basel2** | 0.50365 | 0.5036 | 0.4543 |
| | (2.26)** | (2.27)** | (2.02)** |
| **Cash_Basel2** | 1.1409 | 1.1409 | 1.9095 |
| | (0.35) | (0.27) | (0.57) |
| **Inst_foreign_own** | -1.0803 | -1.0803 | -1.2122 |
| | (-1.40) | (-1.36) | (-1.74)* |
| **lnEquity** | 0.2555 | 0.2555 | 0.2585 |
| | (1.68)* | (2.95)*** | (1.92)* |
| **EPS** | 0.00013 | 0.00012 | 0.2578 |
| | (1.56) | (2.07)** | (1.66) |
| **Ler** | -1.1472 | -1.1472 | -1.1370 |
| | (0.50) | (-0.90) | (-0.51) |
| **_cons** | -1.6543 | -1.6543 | -1.6374 |
| | (-0.60) | (-0.89) | (-0.64) |
| **Model summary** | Wald Chi2(9)=64.00 | Wald Chi2(9)=123.29 | F(9,74)=9.25 |
| | p-value = 0.0000 | p-value = 0.0000 | p-value =0.0000 |

**Notes:** (*) significant at 10%; (**) significant at 5%; (***) significant at 1%; t-statistic is in parentheses.

Regarding to the effect of institutional foreign ownership, except for the negative impact at p-value <10% in the Pooled OLS model, Inst_foreign_own did not make any influence on the stock volatility in the Vietnam banking sector. This result is inconsistent with the findings of Vo (2015) and Truc et al. (2020), yet similar to the study of Phan & Tran (2019). Even though the insignificant impact, we could see the negative sign of the coefficients. This raises the question of different research context could produce different empirical results. In our study on the listed commercial banks in Vietnam, no significant effect was reported since the banking and finance sector in Vietnam is under strict control of Vietnam Government, especially the participation of block foreign ownership. Four leading banks in Vietnam are State-Owned Banks. Even though integrating into the global finance system and adopting the global standards are essential for the Vietnam commercial banks, Vietnam government needs to be prudent when expanding the room for foreign ownership in the banking and finance industry.

## Table 7. Hypothesis testing summary

| Statement | Expected sign/result | Empirical result |
|---|---|---|
| H1-There is the significantly negative relationship between dividend yield and stock price volatility in the Vietnam banking sector. | − | Confirmed |
| H2-There exists the significant impact of dividend payout ratio on price volatility of listed commercial banks in Vietnam. | +/− | +<br>Confirmed |
| H3-The impact of cash payout ratio on price volatility of listed commercial banks in Vietnam significantly differs from that of stock payout ratio. | $\beta_1 \neq \beta_2$ | No significant in FEM<br>Confirmed in OLS |
| H4-The enactment of Basel II makes a significant impact on the stock price volatily in Vietnam banking sector. | +/− | +<br>Confirmed |
| H5-The impact of dividend policy on stock price volatility of Vietnam banking sector is significantly different under Basel II enactment. | +/− | No significant |
| H6-The institutional foreign owernship positively contribute to the stock price stabilization. | +/− | −<br>Only OLS |

Table 7 summarized the hypothesis testing results. Except for H5, we found statistically significant evidences supporting our hypothesis. Dividend policy is an important indicator to measure the value and evaluate the risk of Vietnam listed banks. This finding supports the relevance of dividend policy to a firm value theory in less developed countries and in banking sector. The positive impact of dividend payout ratio on the stock volatility showed that the market is sensitive to the dividend policy of commercial banks. We could observe the signal effect of dividend policy in the Vietnam banking sector, since volatility is not only a measure of risk, but also reflects important news about firms (Kanniainen, 2007). The insignificant impact of EPS on stock volatility, together with the significant effect of the dividend policy, shows that bank stockholders in Vietnam prefer dividend over the accounting profit, which is consistent with the conclusion of Masum (2014) in the study on banks listed on Dhaka Stock Exchange. Previous studies on the effect of dividend policy on stock price volatility in Vietnam reported the negative relationship between dividend payout and the volatility. However, we found the positive impact. That means the stock price fluctuation moves in line with the dividend payout ratio. This result could be explained through three arguments. First is because commercial bank stocks are riskier than the market, which makes

investors react strongly to dividend information. Listed banks dominate the Vietnam financial system, which is characterized as a bank-based system. Therefore, bank stocks, through its approximately 30% capitalization, make a profound impact on the stock market index. Second, the banking sector in Vietnam is in the growing stage, which allows investors to get capital gains through arbitrage or using the arrival date information effect. Third, the market understands the current pressure of the Vietnam banking sector and increases the required rate of return on bank stocks. The dispersion of equity in the Vietnam banking sector is enlarged after the adoption of Basel II. Leading State-Owned Banks, who already meet the CAR requirement, make pressure on the small private banks in the road map to Basel II and Basel III. The stock dividend payment of small private banks, often together with new share issuance, is the signal of low equity and the lack of cash flow.

## 5. Conclusion

This study examines the effects of dividend policy on stock volatility in the listed banks on the stock exchange of Vietnam. The sample comprises 13 listed commercial banks in the period from 2010 to 2020. We found the significant effect of dividend ratio, both in cash and in stocks, and dividend yield on bank stock volatility. The enactment of Basel II in the Vietnam banking sector made by SBV resulted in higher volatility of bank stock price. We find merely the stabilizing effect of foreign ownership in the banking sector in Pooled OLS regression. Our findings, once again, confirmed the relevance of the dividend theory in the banking sector, and connected dividend policy with the contextual factor. The results can contribute some implications to stakeholders. The powerful reaction of investors to dividend policy of listed banks is a signal of high information asymmetry and risk averse preference of Vietnamese investors toward bank stocks. It also shows the lack of means for monitoring bank performance in Vietnam. Therefore, financial managers of commercial banks need to disclosure more information about the financial health of banks, the plan to raise external equity, and how banks can afford the future cash flow for shareholders. For policy makers, especially SBV, the benefits and drawbacks of Basel II adoption should be considered objectively. SBV needs to build the mechanism to assist small private commercial banks on the road to Basel II and Basel III, as well as ensure the competitive environment for all commercial banks. Previous scholars suggested the expansion of foreign ownership in the stock market. However, we recommended the prudence in increasing foreign ownership in the banking and finance industry of Vietnam.

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# ACCESS TO FORMAL CREDIT OF AGRICULTURAL COOPERATIVES IN VIETNAM: OBSTACLES AND INTERNATIONAL LESSONS

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## Abstract

*Vietnam has about 14.816 active agricultural cooperatives, making for 65.23% of all cooperatives in the country. Agricultural cooperatives play an unchangeable economic and social role. However, despite their importance, most Vietnamese agricultural cooperatives are small sized, and only 2% of them have access to formal credit, which hindering enormously their development. Combining literature review and in-depth interview methods, the paper identified major factors obstructing the access, which were lack of collateral, loan characteristics, lack of skills and training, as well as long processing time of loan application. Root causes of the factors were deeply analysed, and ones related to the unique characteristics of Vietnamese agricultural cooperatives were newly discovered. These root causes and successfull international practices in selected European countries and in Israeli were considered to provide suitable implications for Vietnam. The results and implications of this paper is expected to be a base for further researches to confirm and construct more detailed solutions so that Vietnamese agricultural cooperatives can have easier access to formal credit to develop as the leading economic field of our country.*

***Keywords:*** *Access to formal credit, Agricultural cooperatives, Vietnam.*

## 1. Introduction

### 1.1. Agricultural cooperatives: definition, characteristics and roles in the economy

*Agricultural cooperatives definition and characteristics*

According to the Article 3, Vietnamese Cooperative Law (2012), "Cooperative is a collective economic organization, co-ownership with legal entity, and is established voluntarily by at least 07 members and mutually cooperate and assist in the production, sales and job creation to meet the general needs of all members, on the basis of self-control, self-responsiblity, equality and democracy in management of the cooperative". Cooperatives are democratically managed by the "one member, one vote" rule, which means members share equal voting rights regardless of the amount of capital they put into the enterprise.

The cooperatives operate according to principles, which are guidelines for action. According to International Cooperative Alliance, these principles are: voluntary and open Membership; democractic member control; member economic participation; autonomy and

independence; education, training and information; cooperation among cooperatives and concern for community.

According to Vietnam Cooperative Alliance's annual report (2020), there were about 22.715 active cooperatives (see Table 1). Among them, agricultural cooperatives accounted for the largest number of cooperatives in Vietnam, with 14.816 cooperatives, equivalent to 65, 23%. Agricultural cooperatives operate in the field of agriculture, raising, aquaculture, forestry, salt making, as well as provinding agricultural services such as irrigation, input supply, plant protection, field protection, land preparation, technical transferring, marketing, etc. The percentage of agricultural cooperatives also has an increasing trend when it had the highest increasing rate from 2018 to 2019, which account for 8,1%.

**Table 1. Active cooperatives in Vietnam by operating field**

| Cooperatives by field | Number of cooperatives | Percentage | 2019/ 2018 |
|---|---|---|---|
| Agricultural | 14.816 | 65,23% | + 8,1% |
| Industrial | 2.036 | 8,96% | + 5% |
| Commercial and service | 1.802 | 7,93% | + 4,8% |
| Transport | 1.336 | 5,88% | + 5,2% |
| Construction | 746 | 3,28% | + 4,7% |
| People's Credit Funds | 1.183 | 5,21% | + 0% |
| Environmental | 494 | 2,17% | + 5,1% |
| Other | 300 | 1,32% | + 4,6% |
| **Total** | **22.715** | **100%** | |

*Source: Vietnam Cooperative Alliance's annual report (2020)*

The size and operational efficiency of agricultural cooperatives have also gradually improved. By 2019, the total charter capital of agricultural cooperative reached over 14 trillion VND, with an average of 903 million VND per coopeartive. This figure shown an increase of 70 million VND per cooperative over the year of 2008. Total assests of Vietnamese agricultural cooperatives reached 17 trillion VND, equivalent to an increase of 2 trillion VND compared to 2018. On average, each cooperative possessed total assets of 1,1 billion VND.

*Agricultural cooperatives' role in Vietnam*

The increasing number of newly formed agricultural cooperatives  has proved their crucial roles both in members life and in various macro aspects.

According to the General Stastistics Office, the individual and household economic sector contributes to 30% of GDP, generating about 1.620.400 billion in 2018. Household and individual ecnomic contributes greatly to GDP partly thanks to 6 million people participating

in cooperatives. Cooperatives provide inputs (plants, livestock, pesticides, etc.), intermediary stage (transferring, guidance, training, technical advice) and the output (purchase of agricultural products) for more than 6 million households and individuals. Therefore, members can reduce their investment and cost while increasing competitiveness of product to prevent traders from forcing prices.

Agricultural cooperatives also help provide high quality agrifood products to domestic and international markets. There are more and more agricultural cooperatives associated with value chain  possessing key products, or so-called one commune one product OCOP. Moreover, in 2019, the Vietnam Cooperative Alliance continued to build up 63 cooperatives in netchain in 62 provinces and cities in Vietnam. These cooperative operates mainly in fields of growing vegetables and fruits, rice cultivation, aquaculture, processing coffee, pepper and cashew, etc. with the application of high tecnhnology, food hygiene and safety standards to ensure farmers long-term contracts for comsumption both domestically and internationally.

### 1.2. Agricultural cooperatives' access to formal credit in Vietnam

Although playing important economic and social roles, the scale of agricultural cooperatives in Vietnam is small and highly scattered. Although their total assets have increased for the last years, the average number of total assets (equivalent to 1,1 billion VND per cooperative) is still drastically lower than that in other sectors. About 70% of farms operate on less than 0.5 hectare, and only 8% nationally have more than 2 hactare (World Bank, 2019). Consequently, they are forced to find external capital resources to develop their business.

There are various sources for agricultural cooperatives to obtain credit, which can be divided into formal credit, semi-formal credit and informal ones. The three principal sources of formal credit are the Vietnam Bank for Agricultural and Rural Development (VBARD), Vietnam for Social Policies (VBSP), People's Cooperative Funds. Interest rates on loans given by these financial institutions are regulated by the Governement at low levels to grant access to finance for the agricultural and rural development. Besides, agricultual cooperatives can also access to formal credit in commercial banks. The semi-formal sector is mainly composed of microfinance organizations. Whereas, informal finance includes loans taken out froom friends or family members, rotating savings and credit associations, credit provided by input suppliers. Out of all sources of credit, main sources of credit for a household or farmer's primary loans are formal one, which accounted for 62% of all loans. Informal credit accounted for 20% and other sources (including se-mi formal credit sources) made for 17.5% (International Food Policy Research Insitute, 2020).

Although farmers mainly depends on formal credit sources to enjoy low interest rate and favourable policies, their access to formal credit sources is far from satisfactory. According to date from the State Bank of Vietnam, the proportion of bank lending to agricultural sector accounted for only 18%-19% of capital needed by the sector, equivalent to 886 trillion VND n 2016. World Bank (2019) also stated that only one third of cooperatives

had access to credit, with an average loan size of 100-500 million VND. The loan size from 15-20 billion VND is far from the reach of cooperatives and very few cooperatives involved in value chains can obtain. And specifically agricultural cooperatives have to deal with more competition to obtain capital in comparision with other fields due to their unique characteristics. The World Bank Enterpise Survey in 2015 diclosed agribusinesses had the highest percentages of firms identifying access to finance as a major constraint compared to other sectors like manufacturing or service. Sharing similar findings, investment growth in agricultural sector lags compared to other sectors according to a report by the Institute of Policy and Strategy for Agriculture and Rural Development in 2016.

The figure of one-third having access to formal credit has dictated the current difficulties of agricultural cooperatives, in growing their business. With the main incentives to connect people and take advantages of the collective economy, lack of capital hinders agricultural cooperatives to realize their missions. Without neccessary capital, agricultural cooperatives cannot develop production scale, product research and development as well as signing high value contracts. There were many cases of agricultural cooperatives refusing high value contracts due to low production capacity, and they were gradually excluded from domestic and international supply chains.

Realizing the importance for agricultural cooperatives to have access to formal credit, the paper was conducted to analyse deeply factors obstructing the access of agricultural cooperatives to formal credit in Vietnam, as well as to consider over implications for granting better access after elabourating on root causes and international sucessfull practices. The paper was carried out to answer 03 research questions (RQ) as following.

RQ1: What are factors obstructing access of agricultural cooperatives to formal credit in Vietnam?

RQ2: What are international successful practices of granting access to formal credit for agricultural cooperatives?

RQ3: What are implications for granting access to formal credit for agricultural cooperatives in Vietnam?

## 2. Literature review

A literature review was conducted to give a thorough understanding of current research state on access to formal credit of agricultural cooperatives. Aiming to finding answers to research questions, the literature review paid a special focus on factors obstructing access to formal credit of agricultural cooperatives, as well as international successful practices on the issue. Findings were served as a base for confirming or developing the current research.

## *2.1. Researches on factors obstructing access of agricultural cooperatives to formal credit in Vietnam*

Researches on formal credit in the agriculture shared a same view on the fact that agricultural cooperatives were struggling on finding access to formal credit in Vietnam. Factors obstructing the access were investigated in various specific operating fields of agricultural cooperatives.

Lack of collateral is one of major factors obstructing the access to formal credit of agricultural cooperatives in Vietnam (Do Xuan Luan, 2020; Tran Trong Nam, 2015; Vuong Quoc Duy, 2012). In Vietnam, agricultural cooperatives could borrow money from many sources like banks, especially Vietnam Bank for Agricultural and Rural Development, Vietnam Bank for Social Policies or People's Credit Fund. However, most of these credit institutions require borrowers to have collateral against the loan because collateral helps ensure a risk avoidance of loans disabused. Among type of collateral, land use certificates appears to have much influence on access to formal credit.

Apart from collateral, the amount of total assets also affects the decision of credit instittutions to lend agricultural cooperatives or not (Tran Trong Nam, 2015; Le Minh Chau, 2012; Nguyen Phuong Le and Nguyen Mau Dung, 2011). Among households require for loans from credit institutions, medium scaled households received the higher opportunity to receive ones because they have relatively stable economic conditions, which is a solid basis for households to be able to access large loans from banks. Nguyen Phuong Le and Nguyen Mau Dung (2011) emphasized that households with average economic conditions are more confident in production and business in comparision with small ones, which made them more trustworthy to get the loans.

Besides, there were other determinants belong to agricultural cooperatives figured out like farmers lack of skills and training (Vuong Quoc Duy, 2012); age, educational level of household head (Do Xuan Luan, 2020; Le Minh Chau, 2012); farmers lack of information (Nguyen Phuong Le and Nguyen Mau Dung, 2011). Do Xuan Luan (2020) in a research on motivation and barriers to access to formal credit of primarry cinnamon producers in Northwestern Vietnam also investigate the lack of bank account holding, inconvenient access to roads, weak chain linkage and limited organic farming.

Determinants belong to credit institutions were also investigated in several researches. Long processing times of loans applications hinders cooperatives from lending capitals (Ta Nhat Linh, 2019; Vuong Quoc Duy 2012). Although lending from commercial banks need high value collateral, they have a more simple and fast procedure in comparison with lending from Vietnam Bank for Social Policies or People's Credit Fund. Nguyen Phuong Le and Nguyen Mau Dung (2011) emphasized that interest rate, loan value and period were also factors affecting the access to formal credit of household in the suburd of Hanoi. Most of farmer surveyed expressed their hesitation to borrow capital due to high interest rate. Credit institutions mainly provide short and medium term loans with the loan amount from 10

million to 20 million VND per time. Most of the households believed the loan amount is ranging from small to high, however they argued that the lending period of all credit institutions is short, making it difficult for them to turn over capital.

Although the struggling of farmers for formal credit to develop their business is visible, there is surprisingly small number of scientific research on the topic. Consequently, there is a lack of a systematic analysis of factors hindering access to formal credit of agricultural cooperatives in Vietnam. Reviewed researches show aggreement on several major factors, however root factors should be more closely investigated to figure out appropriate solutions.

### 2.2. Researches on application of international successful practices in Vietnam cases

No research on application of international successful practices in increasing access to formal credit of cooperatives in Vietnam was founded, specifically the access of agricultural cooperatives. However, the issue was generally discussed in a research conducted by Phan Quoc Dong et al. (2015). The research investigated 03 lending models of Root Capital, E+Co and GroFin for small and medium size enterprises in Africa. Not only lending capital, these models provided borrowers with consulting services to support businesses to improve business management capacity to ensure successful loan projects . The loan was realized no based on collateral value but on the future contract and commitment to a supply chain, for example sales contract from businesses like Starbuck, Mark & Spencer or The Body Shop, etc. These models also aimed at enterprises with environment- friendly to ensure a sustainable development. This practical experience can be studied to apply in lending activitie for small and medium sized enterprises in Vietnam, specifically agricultural cooperatives that finding business opportunities and financial management toward sustainable development. However, although cooperatives are enterprises, they have unique characteristics that require more researches on their cases, not on enterprises in general. Therefore, more researches on international successful practices on improving access to formal credit should be conducted with the emphasis on countries that achieve development in the agriculture and somehow share similar collective economy like Vietnam.

### 3. Research methodology

To answer the research questions, the paper combined literature review and in-depth interview methods. Literature review has increasingly recognized as a reliable evidence-based review model in management research (Cassell et al., 2006). Combining two methods help confirming knowledge on previous work while figuring out new data. The combination of two methods also helps the data become more trustworthy due to cross – check.

As for literature review method, keywords were used both in Vietnamese and English and inserted into data bases for relevant articles. To ensure the data credibility, only trustworthy sources are used. Data for this paper came from both international and Vietnamese sources. As for international one, Sciencedirect, Emerald, Proquest, Google Scholar, International Cooperative Alliance were used. And for Vietnamese sources, reports

from relevant organizations such as National Library of Vietnam, Ministry of Agriculture, Ministry of Planning and Investment, Vietnam Cooperatives Alliance, State Bank of Vietnam, General Statistics Officers and relevent business associations. Titles and abstracts were screened base on inclusion and exclusion criteria, paying priority for the agricultural related issues for most suitable articles. Articles remaining from title and abstract screening were carefully analysed for eligibility. Research methodology, results and references were mostly paid attention. Case studies, factors influencing or framework for analysing factors influencing were figured out and grouped. Findings in the literature review were also used as a base to construct semi-structured questionaires for in-depth interview step.

As for in – depth interview method, different agricultural cooperatives were chosen on purpose to ensure the variety of samples till the sample reach the saturation level. Based on the literature review, a semi-constructed questionaire was prepared to gather information on their current access to formal credit and factors hindering the access if any. Because the current research focused on difficulties of agricultural cooperatives in obtaining formal credit to develop their operations, not that of cooperative members, the interviewees are leaders of agricultural cooperatives. To ensure a diversified sample, interviewed agricultural cooperatives were operating in various fields from primary production, processing to agricultural service. They are also different from member number, total assets, educational level of directors, etc. Due to constraints of time, effort and finance of the research, the number of interviewed agricultural cooperatives were five. However, the repetition of answers among agricultural cooperatives has cross – checked and validated findings. Part of the findings were also cross-checked by findings of previous researches. Information of interviewed cooperatives was shown in Table 2.

**Table 2. In – depth interviewed agricultural cooperatives**

| No | Cooperatives | Operating field | Members | Address |
|----|----|----|----|----|
| 1 | A | Essential oil production | 10 | Bac Kan |
| 2 | B | Seed supply | 10 | Hung Yen |
| 3 | C | Tea production and process | 26 | Hung Yen |
| 4 | D | Sachi production and process | 15 | Ha Noi |
| 5 | E | Vegetables growing | 1.200 | Ha Noi |

*Source: by author*

## 4. Research findings

### 4.1. Current state of financing agriculltural cooperatives in Vietnam

Agricultural cooperatives in Vietnam face a huge need for outside financing due to their small charter capital (See Figure 1). It could be seen that transport cooperatives had the

highest average charter capital with about 6 billion VND per cooperative, following by People's Credit Fund with 2 billion VND per fund. Whereas, agricultural cooperatives and environmental cooperatives shared the loweset position with only 0,5 billion VND per cooperative, 12 times smaller than that of transport cooperatives, and more than 3 times smaller than that of the average of total charter of cooperatives in Vietnam, which reached about 1.69 billion per cooperative. The financial figures have proven difficulties that agricultural cooperatives are facing because agricultural business is higghly effort and capital consuming. Agricultural cooperatives require a huge amount of capital to invest in neccessary resources for production and proccessing like seeds, materials, machines, land, etc. to fullfill rigorous standards on food hygiene and safety.

**Figure 1. Vietnam cooperatives' charter capital by field in 31/12/2019 (billion VND)**
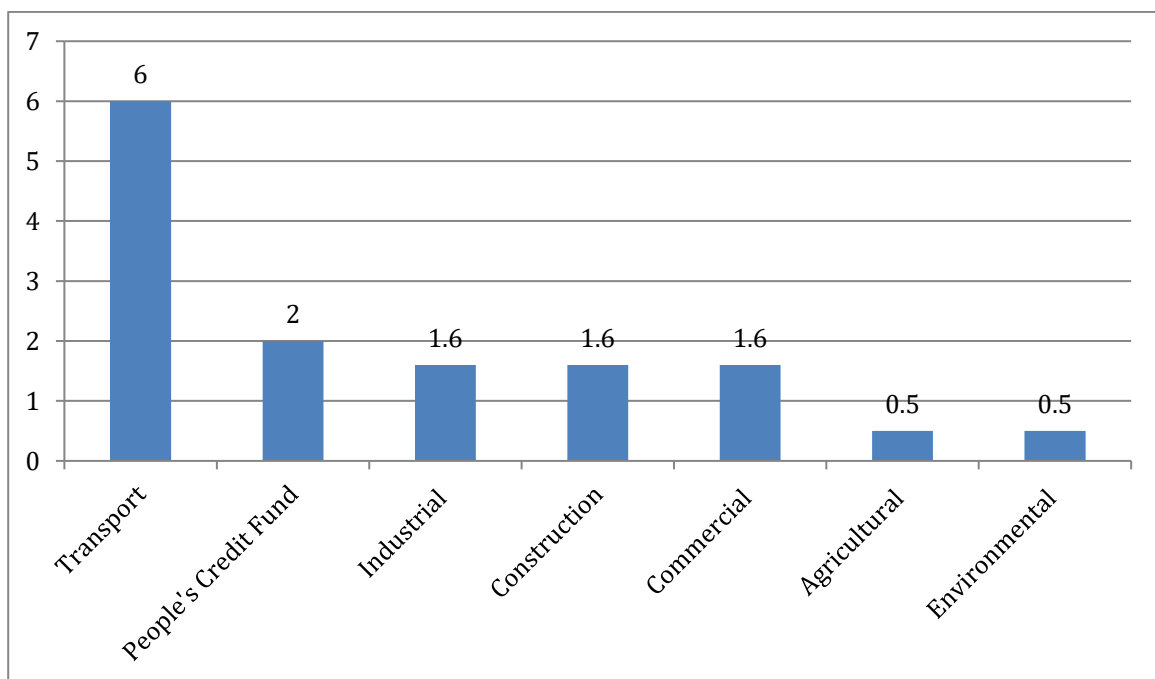


*Source: Vietnam Cooperative Alliance's annual report (2020)*

Agricultural cooperatives have various sources to obtain loans, including formal, semi-formal and informal sources (see Table 3). In formal source, they could obtain loans from commercial banks. Although commercial banks are increasingly willing to lend money in the agricultural business, there are specific credit institutions aiming at lending money for agricultural cooperatives like Vietnam Bank for Agricultural and Rural Development, Vietnam Bank for Social Policies and People's Credit Funds. Besides, to widen access to formal credit, Central Fund for Cooperatives Development belong to Vietnam Cooperatives Alliance was established in 2009. Currently, there are also 55 local Funds for Cooperatives Development in various provinces, direcly work with cooperatives to promote establishing new cooperatives, encouraging cooperatives to invest in techonological and technical innovations, product innovation and market expansion. In the period of 2003-2018, loan

volumn to the collective economic sector reached for 69.147 billion VND with an average of 4.610 billion VND per year. The figure increased drasmatically from 910 billion VND in 2003 to 6.269 billion VND in 2018, accounting for 6.9 times higher (Phuc Khang, 2019). For cooperative loans, according to the State Bank of Vietnam, VBARD plays an important role when its outstanding loans increased gradually from 1.377 billion VND in 2017 to 1.483 billion VND in 2018. By the end of the first quarter of 2019, the total outstanding loans for cooperatives of Agribank was 1.505 billion VND, with an increase of 21 billion VND compared to the end of 2018. The average outstanding loan for a cooperative was 3.5 billion VND.

**Table 3. Credit sources for agricultural cooperatives**

| | Formal source | | | | Semi formal source | Informal source |
|---|---|---|---|---|---|---|
| | **VBARD** | **FCD** | **PCF** | **VBSP** | | |
| **Loan size** | Large | Small to large | Small to large | Small | Small | Small to large |
| **Loan term** | Short tem | Short term | Short term | Long term | Short term | Depending on the relationship between lenders and borrowers |
| **Collateral** | Yes | Yes | Yes | No collateral for group-based only | No callateral | Depending on the relationship between lenders and borrowers |

*Source: by author*

### 4.2. Factors influencing access to formal credit of agricultural cooperatives in Vietnam

The literature review showed that although access to formal credit of agricultural cooperatives attracted dicussions widely in various newspapers, there was a lack of systematically scientific researches on factors influencing. Therefore, information on the issue was scattered, which hindered reseachers from analysing root causes. When conducting literature review and in-depth interview, the paper was striving for gathering thorough primary and secondary information. The combination of literature review and in-depth interview helped ensure the reliability of data thanks to cross-check.

The paper confirmed factors obstructing that were figured out in previous reseaches. However, out of various factors, there were major factors that were strongly emphasized by

interviewed agricultural cooperatives. These factors were: 1) lack of collateral, especially certificate of land, 2) characteristics of the loan: interest rate, loan amount, loan period; 3) lack of skills and training; 4) long processing times of loan application. These factors were mentioned in all 05 interviewed cooperatives regardless of their size, the age, educational level of cooperative directors or their social network.

*Lack of collateral* was always mentioned as the pain point to grant access to formal credit for agricultural cooperatives. Specifically, in the period of 2013 – 2016, outstanding loans to cooperatives under Decree 55/ND – CP reached about 3.200 billion VND, of which only 70 billion VND was granted as unsecured loans, accounting for 2.18% [Phuc Khang, 2019]. Although Decree 116/2018/ND-CP dated September 7 2018 amending and supplementing a number of articles of Decree 55/2015/ND-CP addressed that: "(i) Cooperatives and Cooperative Union are loaded by credit institutions without collateral, up to a maximum of 01 billion to 03 billion VND; (ii) Cooperatives that sign supply and consumption contracts with organizations and individuals directly engaged in agricultural production are considered for loans by credit institutions without collateral up to 70% - 80% of the value of the contracts", it was difficult to be realized. All interviewed cooperatives stated that most of credit institution prefer to grant loans with collateral to avoid risk.

*Characteristics of the loan* was also a strongly emphasized hindering factor, including interest rate, loan amount and loan period. Agricultural cooperatives assessed that interest rate of VBARD, FCD and PCF were still too high to their capacity. VBSP's interest rate was assessed as at medium level. Credit institution mainly provides the loan amount from small ones of 10 million to 20 million VND per time to large ones with value of billion VND. VBARD was considered to grant large loan size against FCD, PCF and especially VBSP. However, agricultural cooperatives argued that these loans were mostly short term ones, making it difficult for them to turn over capital.

*Lack of skills and training* was reffered to management skills of cooperatives directors and professional skills of their employees. Due to the lack, agricultural cooperatives leaders could not express their strategy, operating or financial plan, recognizing risks, etc. There were also cases when cooperative employees did not know how to write financial statements, which hindered them from fulfilling documents required for loan appraisal.

*Long processing time of loan application* also hindered cooperatives from lending capitals. According to interviewed agricultural cooperatives, although lending from commercial banks need high value collateral, they have a more simple and fast procedure in comparison with lending from VBSP or PCF. Although the loan appraisal processing time was regulated from 07 to 10 working days, counting from the date agricultural cooperatives submit the complete loan applications, processing time was practically longer due to the completation of loan applications.

The paper figured out similar obstacles for access to formal credit of agricultural cooperatives. It also figured out root causes of obstacles, among them some root causes were

unique to the characteristics of Vietnamese agricultural cooperatives and were new findings over previous researches. These new root causes of factors obstructing access to formal credit were identified during in-depth interview and emphasized in italics (see Table 4).

**Table 4. Root causes of major factors influencing**

| Factors | Root causes |
|---|---|
| **Lack of collateral** (especially land use certificate) | - *no possession of an official head office* <br> - *low evaluation of agricultural land* <br> - risk managment policies of credit institutions <br> - lending officials' mortgage appraisal capability |
| **Loan characteristics** | - charter capital of FCD, PCF, VBSP is low <br> - turnning over neccecity |
| **Lack of skills and training** | - lack of training programs suitable for coopertives <br> - *cooperatives leaders possess more agricultural techniques than managerial skills* <br> - *farmers' experience-based working habits* <br> - *cultural factor* <br> - *unique structure of cooperatives* |
| **Long processing time of loan application** | - cooperative's ability to prepare loan application documents <br> - loan procedures <br> - credit official's ability in loan appraising |

*Source: author's own compilation*

The root causes of difficulties in granting access to formal credit of agricultural cooperatives in Vietnam came from both credit institutions and agricultural cooperatives themselves. Root causes from credit institutions may be named their risk management policies, lending officials' mortgage appraisal capability, low charter of FCD, PCF and VBSP, complicated loan procedures. Root causes from agricultural cooperatives similar to previous researches were confirmed like lack of training programs suitable for cooperatives or cooperative's ability to prepare loan application document. Besides, new root causes were identified and analyzed for the lack of collaterals, as well as lack of skills and training.

Root causes for lack of collateral in case of Vietnamese agricultural cooperatives were no possession of an official head office and low evaluation of agricultural land. Despite their different size and region, all 05 agricultural cooperatives stated these causes for not possessing collaterals for borrowing money. Most of cooperatives do not have an official head office, mainly rented or borrowed. Even when buying land for headquarters, they are not

granted a land use certificate, and it cannot be considered as a collateral for a loan. In addition, due to current landing policies, the evaluation of agricultural land that a cooperative possesses if any is drastically low compared to market price, making for approximately from 200 million to 300 million per hectare. The low evaluation of agricultural land caused cooperatives difficulties in fulfilling requirements for formal credit application or if they applied, they could only receive loans of low value.

Lack of skills and training was reffered to management skills of agricultural cooperatives leaders and professional skills of their employees. In the short term perspective, lack of skills and training hindered cooperative leaders from well preparing appropriate lending application documents. But lack of skills and training would be more serious when it was assessed by credit institutions as a sign for poor performance and low credit trustworthiness in the long term perspective, which consequently led to difficult access to formal credit. Analyzing in – depth interview identified root causes for the lack. The first cause was the fact that most cooperative leaders possess more agricultural techniques than managerial skills. The agricultural cooperative leaders frequently had background in agricultural technician or even no specific background. Out of 5 interviewed agricultural cooperatives, only one cooperative leader attended formal management programs. For the cooperative and its members to coordinate and operate effectively, knowledge on agricultural production is not enough. Another cause for the lack of skills and training of both cooperative leaders and members was recognized as farmers' experience-based working habits. The agricultural sector had the longest history in comparison with other sectors like manufacturing and service. The long history brought many experiences like cultivating or processing techniques that were proved right for many generations, which made farmers see no need to change. Moreover, a cultural factor like regional race made farmers less open to new knowledge led by trainers from other regions were mentioned in 3 out of 5 agricultural cooperatives, causing the failure of training programs if they were not appropriately constructed. The lack of skills and training was also enforced by unique organization of cooperatives. With the launch of Cooperative Law in 2012, cooperative organization was regulated similar to other company types. According to Article 29, Chapter IV of Cooperative Law, a cooperative structure is composed of general meeting of members, board of directors, general manager (or chief executive manager), and supervisory board or supervisory member. However, the organizational practice was still new to both cooperative leaders and members. The power hierarchy therefore was not clear in cooperatives, making it difficult for leaders in requiring members to participate in training programs systematically.

### 4.3. International successful practices of granting access to formal credit for agricultural cooperatives

*Granting agricultural credit in selected European countries*

Jasson K.H. et al. (2013) studied that European credit regulations are typically general, with no specific regulations for the agricultural credit market, however several countries

support agricultural credit in various forms. Apart from principal loans offered by the governement, other types of supports were provided in form of subsidised interest rates with the principal financed in the open market, payback guarantees and investment allowances in Finland, Netherlands, Greece, Germany, Poland and Italy variously. These types of government support were highly evaluated by customers in the countries when their relative importance was ranged from 25% to 100% important to business.

In a risk assessment, the study also figured out major determining factors, including economic performance and situation of the farmer. Surveyed European countries emphasized the role of cash flow-based lending over asset-based lending, especially when extending a loan. Asset-based lending means the credit decision is made based on the availability and quality of collateral, whereas cash flow-based lending is based on estimated farm business profit. Most of surveyed countries set more priority to cash flow - based lending than asset-based like Sweeden, Finland, Netherlands, Germany, Slovakia. Only Poland is appraising loan application based more on asset-based than cash flow-based lending. The study results were also confirmed by Enjolras and Madies (2019) when they did a research on the determinants of loan acceptance with a case study of French farms and emphasized that the feasibility of investment project would affect the loan acceptance decision.

*Credit improvements to develop agricultural cooperatives in Israel*

Israel is famous for innovation in various fields, including the agriculture. Israel's agriculture is agriculture of cooperatives, with cooperative structure accounting for about 80% of agricultural production and services. The overcome of financial crises to develop agricultrual cooperatives in Israel was a successful model to follow. Gadi Rosenthal and Hadas Eiges (2014) in their study investigated the reasons for Israeli success.

The first among them were government support through invetments in agricultural activities, tax reductions, subsidies and lenient credit terms. They also had to elabourate a clear long tem policy concerning agricultural development and support to ensure stable growth against short tem disturbances.

The second success factor was mutual guarantee system to increase financial leverage for cooperatives and to help them maintain stability when markets are volatile. Because most Israeli land is state-owned, agricultural cooperatives did not have land use rights to serve as collateral. Mutual guarantee where all members of one's own settlement and member of the national movement acted as guarantors for the particular member's loan and they had the responsibility to repay the member's debt in case of default.

The third reason was promoting mergers and vertical integration of agricultural cooperatives benefit related in a supply chain. It helped increase barganining power when minimizing risk for farmers, strengthening the relationship between production and market needs.

### 4.4. *Implications for improving access to formal credit of agricultural cooperatives in Vietnam*

Considering over root causes of factors hindering access to formal credit of agricultural cooperatives in Vietnam and analysing successful intertional practices, the paper provided major implications related to collateral issue, training programs and cooperative cooperation promotion.

*Reducing the burden on collateral issue*

The dilemna when agricultural cooperatives do not possess valuable assets to serve as collateral and credit institutions cannot provide loans without ensuring guarantee against default will not be solved if governement and credit institutions do not elabourate on various alternatives. Loan volumne should be classified into different groups with different collateral/mortgage methods flexibly applied, ranging from no collateral/mortgage/guarantee to with collateral/mortgage/guarantee with give percentage among them. The lending in the agriculture may be mostly based on cashflow as in the case of selected European countries where high percent of farmers have access to formal credit. Mutual guarantee as in the case of Israel is also a good practice to be considered about because Israel and Vietnam agribusiness have many similarities, especially on the case of no possession of land use rights.

However, to realize various alternatives for collateral, it is neccessary for Vietnamese credit institutions to standardize these alternatives' loan criteria before formally applying them, as well as to train their credit officials carefully because the results of loan application at the time depend on their appraisal ability.

*Constructing appropriate training programs for improving performance of agricultural cooperatives*

As analysed earlier, agricultural cooperatives leaders and members have knowledge and skills mostly on agricultural techniques, when they are lack of various managerial skills and professional knowlege other than agricultural ones. Therefore to improving performance of agricultural cooperatives, much more training programs are needed both on managerial and technical skills. However, programs and training methods should be more noticeable to apply suitable with the farmers' experience-based working habits, unique power hierarchy and cultural factors to ensure the training effectiveness.

*Promoting cooperations among cooperatives to reduce capital burden*

Agricultural cooperatives could in fact support themselves before thinking about borrowing capital from credit institutions. The benefit - related cooperatives in a supply chain can coordinate with each other to reduce operating costs, and therefore reduce running capital. Local cooperatives alliance should promote the coordination more deeply by serving as an information collector and connecting suitable cooperatives, solving issues that come along with the coordination.

## 5. Conclusion

Vietnam has about 14.816 active agricultural cooperatives, making for 65.23% of all cooperative in the country by 2020. Agricultural cooperatives play an unchangeable role with their contribution to the GDP, creating jobs, providing high quality agrifood products to domestic and international markets, as well as ensure the food security in Vietnam. Despite their importance, the size of agriculture cooperatives is small with only 0,5 billion VND of charter capital per cooperative, which forced them to find outside credit for operating and investment. Combining literature review and in-depth interview methods, the paper figured out that most of Vietnamese agricultural cooperatives were struggling for access to formal credit. It also identified factors hindering the access, which were lack of collateral, loan characteristics, lack of skills and training, as well as long processing time of loan application. Root causes of factors hindering the formal credit access were also analysed. Besides findings that confirm previous researches like risk management policies, lending officials' mortgage appraisal capability, complicated loan procedures or cooperative's ability to prepare appropriate application documents, root causes due to unique characteristics of Vietnamese agricultural cooperatives were also identified. They were no possession of an official head office, low evaluation of agricultural land, inadequate skills of cooperative leaders and members, farmers' experience-based working habits, cultural factor and unique structure of cooperatives. These root causes were mainly invisible but hindered the performance of agricultural cooperatives, and consequently their access to formal credit. After recognizing current obstacles for access to formal credit of agricultural cooperatives in Vietnam, successfull international practices in selected European countries and in Israeli were considered. Findings served as benchmarks to provide suitable implications for Vietnam.

Despite its findings, the research has a weak point that should be improved in future researches. Due to constraints of time, effort and finance, the number of interviewed cooperatives was limited. Athough as a qualitative research, the findings were confirmed by previous researches, as well as by the repetition and cross-check of data among interviewed cooperatives, the probability of missing factors obstructing and their root causes were available. Therefore, results and implications of this paper is expected to be a base for further researches with a larger sample to confirm and construct more detailed solutions for improving access to formal credit of agricultural cooperatives in Vietnam.

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# THE USE OF LIFE - CYCLE COSTING MANAGEMENT:  A SURVEY IN VIETNAMESE MECHANICAL MANUFACTURING ENTERPRISES

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## Abstract

*The purpose of this study is to explore the application of cost management accounting practices in the product life - cycle in Vietnamese mechanical manufacturing enterprises (VMMEs). The sample was collected from a survey of senior executives, chief accountants and workshop foremans of 79 VMMEs from December 2020 to April 2021. From the results, the article gives some recommendations that promote businesses to apply these practices effectively, in accordance with the management requirements of businesses and the development of mechanical industry in the context of international economic integration.*

***Keywords:*** *Cost management accounting practices, Life-cycle costing, Target costing, Kaizen costing, Standard costing.*

## 1. Introduction

In recent years, the change of production conditions, the development of science and technology, the economic environment, the level of production organization and management... have significantly affected cost management accounting practices that businesses are applying. They often have to implement measures to improve production processes and continuously review and adjust standard costs. The application of traditional cost management accounting practices is no longer suitable. In order to control and save production costs effectively, enterprises need to consider total life – cost management. In particular, the market is always fluctuated, consumer tastes change rapidly, product life cycle is shortened, production technology is becoming more modern, the proportion of direct labour costs  in total product costs is significantly reduced. An effective cost management method must allow businesses not only to produce new products that meet customers' needs at the best cost, but also to provide active support to reduce cost of  current products, thereby increasing profit for businesses.

Since the 1980s, the Life-cycle costing management (LCC), which is characterized by a combination of two techniques: Target costing and Kaizen costing, was applied first in Japanese automobile engineering enterprises and then spread to developed countries in Western European. This model has been proven to bring great benefits in cost management in a number of highly automated manufacturing industries. However, due to objective and subjective reasons, such as the difference in production levels, the implementation of this model in developing countries (including Vietnam) is facing many difficulties.

Through a relatively comprehensive survey with the survey object of 79 mechanical manufacturing enterprises under the Vietnam Association of Mechanical Industry (VAMI), the study will answer 2 questions: *(1) To what extent are VMMEs applying the Life-cycle costing management (LLC)?; (2) How are managers of VMMEs aware of LLC as the administrative support tool?* The research results will be the basis for the author to propose some recommendations, that promote VMMEs in particular and manufacturing enterprises in Vietnam in general to apply cost management accounting practices in lifecycle of products effectively.

The layout of the article is as follows: section two discusses about product life cycle and literature review about the application of Life-cycle costing management in businesses. Characteristics of mechanical products and the ability to apply Life-cycle costing management in VMMEs are presented in section three. The research methodology is discribed in section four. Section five presents the results of the research. Finally, the conclusions along with the implications of the study is discussed in section six respectively.

## 2. Product life cycle and literature review about applying Life-cycle costing management in businesses

### *2.1. Product life cycle*

The term **product life cycle** (the life cycle of product*)* is an important concept that used by Management and Marketing professionals as a factor in deciding when it is appropriate to increase advertising, reduce prices, expand to new markets, or redesign packaging… It refers to the length of time a product is introduced to consumers into the market until it is removed from the shelves.

 *Based on the characteristics of the market, competitors, marketing strategy and profitability...,* Marketing researchers have divided the product life cycle into 4 stages: introduction, growth, maturity, and decline.

*From the perspective of a work*, based on cost characteristics and cost management requirements, Management accounting researchers have divided the life cycle of product into 3 phases: Research, design and development; Mass production; After - sales servive or abandonment.

In general, there is not much difference in the division of stages in the product life cycle from the viewpoint of Marketing and Management accounting researchers, but only the separation of the mass production into 2 stages: growth and maturity. Research, design and development stage from the standpoint of management accounting corresponds to the stage of introduction in Marketing. Corresponding to After - sales servive or abandonment in Management Accounting is the decline period. Table 1 shows the product life cycle stages and the different marketing characteristics that accompany and identify them:

**Table 1. Features of Product life cycle stages**

| Identify features | Stages | | |
|---|---|---|---|
| | Research, design and development | Mass production | After - sales servive or abandonment |
| Sales | Low, increasing slowly | High | Low |
| Investment Cost | Very high (due to initial marketing, advertising, distribution and so on) | High (but lower than Research, design and development stage) | Low |
| Competiton | Low or no competiton | Higher and higher | Low |
| Advertising | Very high | High | Low |
| Profit | Low | High | Low |

*(Source: Author's synthesis)*

### 2.2. Literature review about applying Life-cycle costing management in businesses

When defining Life-cycle costing management, there are two approaches:

*The first approach is to estimate total cost of the product over its life cycle*, including: initial capital costs, maintenance costs, operating costs and the asset's residual value at the end of its life. Managers make decisions based on information about cost estimates, cash flow analysis, expected profit and loss... However, it is difficult to estimate the cost for the entire product life cycle. It depends on expert opinion rather than statistics.

*The second approach is to combine cost management accounting practices in each stage of the product life cycle to control cost*s. This is also the approach of this study. As mentioned at the beginning of the article, in the context of increasingly modern technology, the proportion of direct labour costs in total product costs has decreased significantly. In enterprises where the production process is divided into several highly independent stages, it is relatively difficult to distinguish direct costs from indirect costs. Meanwhile, managers are constantly looking for solutions to reduce costs because they realize that in a market economy "*price-led costing rather than cost-led pricing"* (Mike Tayles, 2011). To gain a competitive advantage, manufacturers must reduce costs relative to their competitors or continuously create new products that are significantly different. On the other hand, in the product life cycle stages, cost characteristics and cost management requirements vary widely. To achieve cost management goals in the short term and long term, managers must choose effective cost management techniques. The application of standard cost in traditional management accounting is no longer appropriate and needs to be specifically considered in each stage of the product life cycle (Hiromoto, 1988; Kaplan, 1990). This is also the main idea of Life - cycle costing management (LCC) in business.

LCC is not a new independent management accounting technique. It is a combined application cost management accouting practices in each stage of the product life cycle. This

topic has been discussed in both theoretical and empirical studies. According to Sani and Allahverdizadeh (2012), the popular cost management techniques of management accounting include: Costing systems that follow of cost; Overhead cost allocation methods; Budgeting; Target costing; Kaizen costing; Standard costing and Variance Analysis. However, in the context of research on the combination of cost management practices in product life cycle, the popular approach that has received the consensus of many scholars all over the world is the combination of 3 techniques: target costing, Kaizen costing and standard costing.

Up to 80% of product lifecycle costs is identified as incurred in the research, design and development satge (Asiedu & Gu 1998; Drury 2012). Therefore, cost management tends to be most effectively exercised during the introduction phase and not during the growth and maturity phases, when the product design and process have been determined and costs have been committed (Emblemsvåg 2003).  This viewpoint is significantly different from the traditional cost management perspective, which focuses on controlling costs in the mass production stage, when most costs are fixed and difficult to adjust. In another aspect, Monden & Hamada (1991), Tanaka, Takao (1993), De Zoysa and Herath (2007)... argued that, in the market economy, not many enterprises can set selling price, which is determined by the market. Businesses want to win the competition, their products must be sold at the price the market accepts. Cost is calculated based on 2 fixed factors: target selling price determined by the market and target profit of the owners. Therefore, enterprises tend to switch the method of determining prices from the approach "*cost-led pricing*" *to* "*price-led costing*". With this approach, right in the first stage of the product life cycle - the research, design and development stage, it is recommended that businesses should apply target costing to determine the target cost and propose to managers solutions to save costs so that design costs do not exceed cost in plan (Tanaka, Takao (1993); Robin Cooper & Regine Slagmuler (1997); Burrows, G., Chanhall (2012)....). Once the design and the production process have been agreed, the production mass phase can begin. Kaizen costing is recommended to be used to manage the efficiency of this phase. This includes a continuous process of reducing costs without reducing the quality of service in order to retain a competitive advantage. Kaizen costing is a management rather than an estimation technique, because it is applied throughout the life cycle of a project in order to improve processes and reduce costs. This method fits in well with life cycle project management, ensuring that initial cost estimates are maintained. Especially, in enterprises that have mass production, that is manufacturing of the same standardized product lines for a prolonged period of time. It uses automation or assembly lines to facilitate the high volume production of similar products. It is essential to continuously improve production processes, improve efficiency and cut unnecessary waste in all phases of the production process. And when enterprises apply the Kaizen costing but can not cut costs anymore, it is a sign of ending the life cycle of the old product and should start other new product (Sulaiman, 2005).

Agreeing with the above views, Sani and Allahverdizadeh (2012) also said that the target costing ensures that the product is designed in such a way that the enterprises can sell the product at the acceptable market price and still achieve the desired profit. Kaizen costing focuses on reducing costs in the mass production, for both new and current products to improve the quality of products and services. In the authors' view, in the decline stage, after the cost - reducing efforts in the previous stages, the production process has been continuously improved, the cost of product may have reached at the lowest level. Therefore, it is appropriate to apply standard costing. Research by author Nguyen Thanh Huyen (2017) at Vietnamese ceramic tile manufacturers also makes a similar proposal, which is to apply the target costing at the research, design and development satge.  standard costing and Kaizen costing should be flexibly combined in the mass production phase.

From the literature review, the author found that the core idea of Life-cycle costing management is the combination of applying 3 methods of cost management accounting: Target costing, Kaizen costing and Standard costing. The model can be summarized as the following figure:

**Figure 1. Life-cycle costing management**
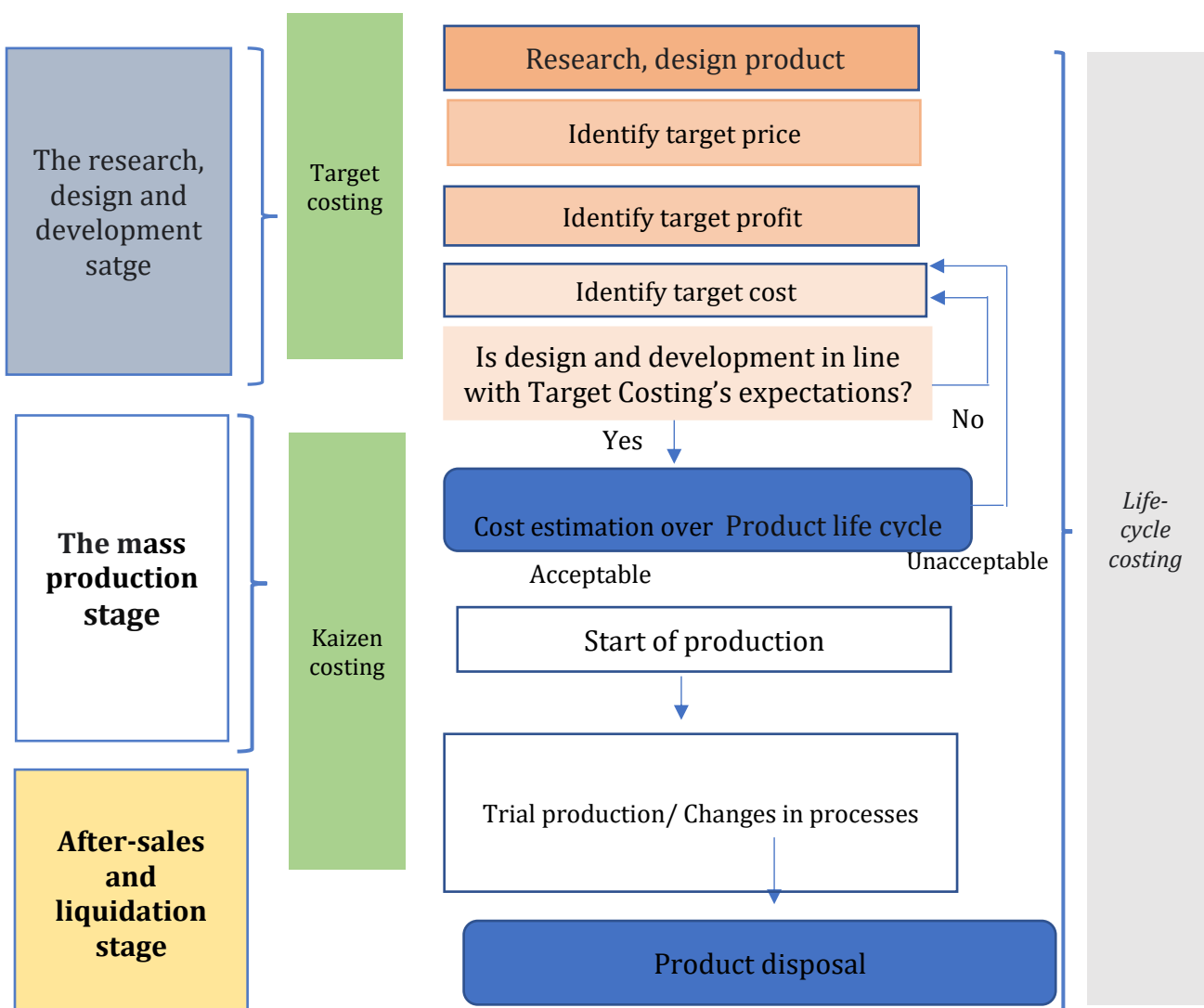


*(Source: Sani and Allahverdizadeh (2012) with adjustment)*

### 3. Characteristics of mechanical products and the ability to apply life-cycle costing management in Vietnamese mechanical manufacturing enterprises

There are many reasons why it is necessary to apply cost management accounting practices in over product life cycle in MMES. According to the author's research, some features of mechanical products that affect the application of this model are:

*Firstly, the characteristics of the production process*: In mechanical enterprises, the production process always includes two parallel processes: the design process and the manufacturing process. The design process is finished in a separate department (Technical/Design Department). After designing, enterprises conduct trial production before putting into mass production. The organization of trial production at the workshop aims to achieve two purposes: (1) Help the research and design department to evaluate and promptly handle and overcome technical problems and errors; (2) Help the cost Management Department to control the cost of the product as plan. After meeting the technical and cost requirements, the product is put into mass production.

*Secondly, the manufacturing process of mechanical products includes many stages*, products are assembled from many small parts, diverse and replaceable materials depending on the application of the product in different fields. That creates more possibilities for mechanical products to perform the value analysis process to change technology, search for replacement materials, parts, etc… to reduce costs but still ensure functionality and increase value.

*Thirdly, mechanical products are a highly standardized,* with little difference in many countries all over the world. Therefore, the larger-scale mass production will help enterprises to gain advantages in production costs due to the initial costs related to researching and designing and fixed costs that allocate for unit will decrease.

*Fourthly is the features of the market*. Currently, foreign enterprises (from Japan, Korea, etc.) have invested in Vietnam in the form of 100% foreign owned companies, joint ventures and associates mainly operate in the fields of mechanics and electronics. They have attracted a lot of Vietnamese workersand and indirectly trained Vietnamese mechanical manufacturers to provide assembly details for their products. In such conditions, VMMEs always face pressure to reduce prices to be competitive. According to the author's survey, for each product, especially products that spare parts for the automobile, motorcycle and electrical and electronic equipment manufacturing industries, All VMMEs must have a plan to reduce prices annual as committed (about 5% - 8%/year).

The above features set requirements for VMMEs to improve their competitiveness, they have tried to compete on price: that is, they have tried to provide goods at prices that compare favourably with those of their competitors. To do this success- fully over time, they must also compete on costs: lower prices can only normally be sustained by lower costs. A strategic commitment to competitive pricing must there- fore be accompanied by a strategic commitment to managing the cost base. They need to pay special attention to reducing costs on a regular and continuous basis right from the research, design and development satge and

throughout the mass production process. The combination of cost management practices associated with each stage in the product life cycle is the modern cost management model that will bring many practical, long-term and sustainable benefits to businesses. In the current context, VMMEs have participated in the global supply chain and cooperated with partners from Japan, South Korea, etc., that are leading countries and achieved a lot of success in applying these modern cost management. With the experience in the process of implementing modern cost management accounting practices, they will directly train managers, engineers, technical workers to  become the factors that promote quickly implement of the morden cost management practices in VMMEs.

## 4. Research methodology

As analyzing above, controlling cost is mainly concentrated in the two first stages of the product life cycle. When the product has entered the decline, the enterprise's goal will put more emphasis on the implementation of after-sales services, warranties, inventory handling, liquidation of fixed assets, etc. The more termination of production, the more be implemented as soon as possible for businesses. Therefore, the objective of the study is to investigate the actual application of cost management accounting practices that VMMEs are applying in the research, design, product development and mass production stages.

In order to achive research goals, the author has designed the questionnaire with 3 parts to collect information at the survey units:

- ✓ Part 1: Information about respondents (Name, gender, position, seniority...).
- ✓ Part 2: Surveying the level application Life-cycle costing management in VMMEs.
- ✓ Part3: Determining managers of VMMEs aware of Life-cycle costing management as the administrative support tool.

Survey questions in Part 1 are short forms of answers. Part 2 and 3 of the questionnaire is a table of 17 measurement questions that are built on literature reviewing published studies on the same topic by some authors such as Sani and Allahverdizadeh (2012) and Nguyen Thanh Huyen (2017). In addition, the author has also adjusted it to suit the reality of VMMEs based on feedback from group discussions with 8 experts, of which 3 are lecturers of universities, 5 experts are chief accountants/financial directors of mechanical manufacturing enterprises in Hanoi: Truong Hai Automobile Company (THACO), Vietnam engine and agricultural machinery Corporation – JSC (VEAM), Export Mechanical Tools Joint Stock Company (EMTC), Dong Anh Electrical Equipment Corporation (EEMC) and Vietnam Automobile Industry Corporation (Vinamotor). These are the businesses that the author chooses for in-depth research because the author have directly exposed to the actual survey and has the unlimited permission of the units. Before that, in order to have an orientation and an overview of the research problem, the author conducted in-depth interviews with 5 senior managers of these 5 enterprises, expecially pay attention to understanding their perceptions of cost management accounting practices in the product life cycle.

According to data published by the Ministry of Industry and Trade, by the end of 2020, there are about 3,100 VMMEs which are distributed in all three regions of the North, Central and South (including domestic and FDI). The survey of all these enterprises is beyond the author's ability because the sample size is too large, the level of management organization, production organization ... of enterprises is not uniform. Over 90% of the 3,100 enterprises are collective production establishments, small and micro-sized private enterprises, with total business capital not exceeding 20 billion VNĐ, total annual revenue is not more than 50 billion VND. Only over 100 enterprises have more than 100 employees. In order to ensure that the survey results are feasible, the data can be collected transparently and reliably, we limited the survey sample to the members of the Vietnam Association of Mechanical Industry (VAMI). According to published data from the General Statistics Office, in the period from 2016 to 2020, the production value of the sector accounts for nearly 75% of the total production value of the mechanical industry. All these enterprises are of medium and large scale, representing the key mechanical manufacturing sub-sectors of Vietnam.

In order to ensure that the respondents have relatively sufficient knowledge to answer the survey questions, the authors selected potential respondents as 3 key people related to cost management activities in enterprises: senior executives, chief accountants/ Head of Accounting Department and workshop foremans. During 5 months of survey from December 2020 to April 2021, we contacted the enterprises of the Vietnam Association of Mechanical Industry (VAMI) and directly sent the survey questionnaires to the survey subjects via email using the googledocs tool. A total of 79/146 enterprises belonging to VAMI agreed to participate in the survey and had professional support within their capacity, ready to provide necessary documents during the author's research.

After collecting information from the businesses, the author synthesized data on Excel and Microsoft Office software, then used simple statistical analysis tools, combined with numerical data description absolute, relative numbers for data analysis according to research objectives.

## 5. Results of data analysis and discussion

### 5.1. Describe the research sample

Information about respondents of research samples is as follows:

**Table 2. Information about respondents**

| Items | Frequency | Ratio | Percentage of accumulative |
|---|---|---|---|
| **Sex** | | | |
| *Male* | 53 | 67.08% | 67.08% |
| *Female* | 26 | 32.92% | 100% |
| **Postion** | | | |
| *Senior executives* | 22 | 27.84% | 27.84% |

| | | | |
|---|---|---|---|
| *Chief accountants/ Finance Director* | 37 | 46.83% | 74.67% |
| *Workshop foremans* | 20 | 25.33% | 100% |
| **Experience** | | | |
| *Less than 5 years* | 12 | 15.25% | 16.41% |
| *5 to 10 years* | 26 | 32.82% | 49.23% |
| *More than 10 years* | 41 | 46.90% | 100% |

*Source: Authors' calculation*

**Classification enterprises is as follows:**
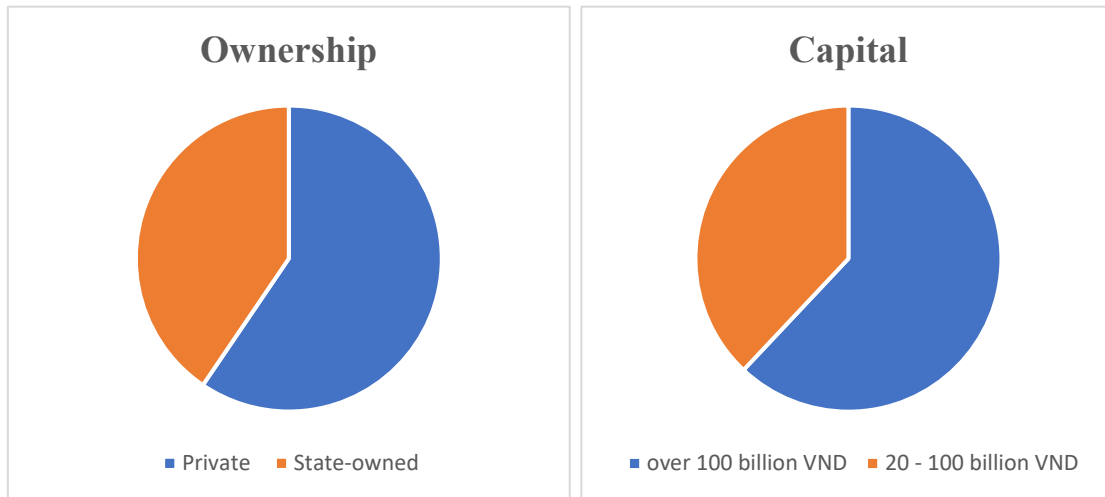


*Source: Author's analysis*

### 5.2. Applying life-cycle costing management in the research, design and development satge

According to the survey results, there are 65/79 enterprises (82.27%) have applied target costing in the research, design and development stage. Only 14 enterprises (17.73%) still use standard costing of traditional accounting. Businesses that have applied target costing in the first stage of the life cycle product said that they have planed on the expected selling price right from the time they have hade an idea and designed product. The basis for enterprises to identify target selling prices is based on the selling price of their similar products or of similar products' price of competitors. 44 enterprises (67.69%) agrued that they have combined these two information to set up selling price for new products. Usually, the expected selling price is developed and proposed by the Marketing department (Sales Department) based on the results of the basis of researching the market and competitors. After that, the target selling price is offered for other departments (design, engineering, accounting...) to discuss. From the expected selling price and target profit, the businesses will identify the target price and start the trial production process.

Next, the author did in-depth research at enterprises that applied target costing in the research, design and development stage. They showed that if the trial production process does not meet the target cost, there are two options offered: Businesses either have to increase their selling price or reduce their target profit. 74.68% (59 enterprises) supposed that they have chosen to reduce their target profit. However, this is only a short-term correction. And they

have expected to continue saving costs in the mass production stage, when the product is mass-produced to achieve the initial target profit.

The statistical data described in Table 3 shows that the Marketing Department (Sales Department) and the Accounting Department are the 2 departments that have played the most important roles in setting the target selling price for new products (Means are 4,388 and 4,380 respectively). Next is the Research and Design department, the technical Tepartment, the Material planning department, the Human resources department and Other departments have less of a role to play in formulating the expected selling price for the new product.

**Table 3. Departments involved in formulating target selling prices for new products**

| | Number of samples (N) | Minimum | Maximum | Mean | Std. Deviation | Rank |
|---|---|---|---|---|---|---|
| 1. Marketing (Sales) | 79 | 3.0 | 5.0 | 4.395 | .5904 | 1 |
| 2. Research and Design | 79 | 3.0 | 5.0 | 4.380 | .5508 | 3 |
| 3. Technical | 79 | 2.0 | 5.0 | 3.447 | .9558 | 4 |
| 4. Accounting | 79 | 3.0 | 5.0 | 4.388 | .5030 | 2 |
| 5. Material planning | 79 | 1.0 | 5.0 | 2.571 | 1.0784 | 7 |
| 6. Human resources | 79 | 1.0 | 4.0 | 2.813 | 1.2670 | 6 |
| 7. Others | 79 | 1.0 | 4.0 | 2.940 | 1.2060 | 5 |

*(Source: Authors' calculation)*

### 5.3. Applying life-cycle costing management in the mass production stage

Only 5 enterprises in the survey sample (6.32%) responded that they have applied Kaizen costing in the mass production phase. Others agrued that they have controlled cost through Standard costing and Budget costing of traditional accounting. However, this result is very inconsistent with the author's survey in these enterprises. Currently, competitive pressure is one of the biggest problems that VMMEs have had to face. They compete with not only FDI but also domestic enterprises. To win the competition, managers must pay attention to reducing and saving costs. According to the survey results, 100% enterprises carry out a review of the standard cost system every once 3 months or 6 months. Based on information related to the actual production cost level of the previous period, information comparing the difference between the actual standard cost and the estimated cost in budget, information on technical improvements of production department and price fluctuations of input factors (raw materials, wages, etc.), the managers will make a decision to adjust the standard cost of the planning period. And the general trend is that the standard cost of the next period must be adjusted down compared to the previous period. According to the survey results at 3 companies: VEAM, EMTC, EEMC, of the three production cost elements, the cost reduction mainly focuses on direct material costs. Direct labor costs and overheads are virtually impossible to decrease. This is explained by the leaders of these units as follow: Reducing

direct material costs can be done easily through improving the production process, adjusting the standard direct material cost, reaching an agreement with suppliers…. Meanwhile, direct labor costs are directly related to the company's salary policy, and the overheads are related to other products, so it is difficult to affect these two standards cost.

The statistical data described in Table 4 shows that the Planning department plays the most important role in monitoring and evaluating the implementation of the cost reduction plan, followed by the Technical supervision department at the workshop and Accounting department. This is explained as follows: the Planning is the department that sets and adjusts the standards, so the monitoring and evaluation of the implementation of the standard costs will be mainly undertaken by them. The main task of the accounting department is to rely on accounting documents, collect actual costs incurred, make cost reports and calculate actual costs and then send reports to the planning department for evaluating the cost reduction plan.

**Table 4. Departments involved in Monitoring and evaluating the the cost reduction plan**

| | Number of samples (N) | Minimum | Maximum | Mean | Std. Deviation | Rank |
|---|---|---|---|---|---|---|
| 1. Marketing (Sales) | 79 | 2 | 5 | 4.03 | 1.279 | 3 |
| 2. Technical | 79 | 1 | 5 | 3.31 | 1.338 | 4 |
| 3. Planning department | 79 | 2 | 5 | 4.21 | .986 | 1 |
| 4. Accounting | 79 | 2 | 5 | 4.08 | 1.002 | 2 |

*(Source: Authors' calculation)*

According to the author, there is a problem related to the perception of cost management accounting practices that enterprises are applying. With the above survey results, it can be seen the fact that enterprises have applied the Kaizen costing to control costs in the mass production phase, but they have thought that they are applying Standard costing and control costs through budgeting.

### 5.4. Determining managers of VMMEs aware of Life-cycle costing management

The results of the survey and general assessment of enterprises on the application of cost management accounting that have applied: 23/79 enterprises (29.11%) agured that the cost management accounting model is completely appropriate suitable and bring many benefits to enterprises; 49 enterprises (62.00%) rate the benefits that the model brings to enterprises at a normal level. The rest (7 enterprises, less than 10%) supposed that the current model hardly brings few benefits to enterprises.

Table 5 is the statistical results describing the assessment of managers about the benefits of 3 management accounting practices have been applied. According to this result, standard costing is assessed to bring the most benefits to enterprises (Mean = 4.3733), followed by Target costing (Mean = 3.9352). The benefit of Kaizen costing is only assessed at an average level (mean = 2.7167).

**Table 5. Assessment of benefits of cost management accounting practices**

|  | Number of samples (N) | Minimum | Maximum | Mean | Std. Deviation | Rank |
|---|---|---|---|---|---|---|
| Target costing | 79 | 2 | 5 | 3.9352 | 1.1622 | 2 |
| Kaizen costing | 79 | 1 | 5 | 2.7167 | 1.7724 | 3 |
| Standard costing | 79 | 1 | 5 | 4.3733 | 1.1826 | 1 |

*(Source: Authors' calculation)*

The data from Table 6 below shows that managers have self-assessed cost effectiveness at all 3 stages in the product life cycle. The average score on the Likert scale for each period ranges from 3.333 to 3.4086/5. Managers self-assess that their cost management activities are most effective during the mass production phase, followed by the research, design, and development phase, and finally the After - sales servive or abandonment phase.

**Table 6. Descriptive statistical results to evaluate the effectiveness of cost management activities in the product life cycle**

| **Stage** | Number of samples (N) | Minimum | Maximum | Mean | Std. Deviation | Rank |
|---|---|---|---|---|---|---|
| Research, design and development | 79 | 1 | 5 | 3.3978 | 1.1622 | 2 |
| Mass production; | 79 | 2 | 5 | 3.4086 | 1.1724 | 1 |
| After-sales and liquidation | 79 | 1 | 5 | 3.3333 | 1.1826 | 3 |

*(Source: Authors' calculation)*

## 6. Conclusion

The study has clarified 2 issues: (1) The level of applying Life-cycle costing management with the connotation of the combination of Target costing and Kaizen costing in VMMEs? (2) How are managers in VMMEs aware of Life-cycle costing management as a support tool for enterprise management.

*Firstly, about the degree of application of life-cycle costing management*: It is generally assessed that the VMMEs which have participated in the survey have implemented cost management according to the product life cycle, specifically combining two modern cost management practices: Target costing and Kaizen costing. However, the application of these two methods is still limited and at different levels. Especially the application of Kaizen costing at mass production phase is not clear, even confused in the perception of the applicable cost management practices. There are a few reasons, but the most important reason

is that the awareness and qualifications of accountants and managers about these practices are still vague. Target costing is more clearly understood and  appreciated so applying is more clearly.

*Secondly, the assessment of the managers of VMMEs about the role of life-cycle costing management* as a support tool for enterprise managemen gives positive results. Over 90% of enterprises in the survey sample rated the benefits that the model brings at normal level or higher. This proves that enterprises are aware of the role and importance and urgency of applying this model in enterprises, especially in the context of increasing competitive pressure that enterprises face. This result further shows the need for solutions to promote the effective application and application of the life cycle costing management at VMMEs in particular and manufacturing enterprises in Vietnam in general.

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# THEME 4

# FINANCIAL TECHNOLOGY
# AND OTHER RELATING ISSUES

# FACTORS AFFECTING CONSUMERS' SATISFACTION
# WHEN USING E-WALLETS: EMPIRICAL EVIDENCE FROM HANOI

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**Abstract**

*In the digital world, online payment is in great demand because of the additional features it provides, followed by a significant growth in online payment methods, including e-wallets. The objective of this study was to examine the characteristics and elements that affect e-wallet users' overall satisfaction in Hanoi, Vietnam, with 175 surveys collected in Hanoi. Each of the five major factors affecting user satisfaction has been detailed, starting with the least important and working toward the most important, including "Means", "Reliability", "Service Capacity", "responsiveness" and "empathy".*

***Keywords:*** *consumers' satisfaction, financial technology, Fintech, e-wallet*

## 1. Introduction

In recent years, the field of Fintech has seen significant development. The constant reports of Fintech's coverage are reported across the globe. In the forecast provided by PitchBook, total value transaction in 2020 is estimated to reach $5.3 trillion, which is $1.2 trillion more than in 2019. Furthermore, the e-payment segment's revenue also exhibited notable growth. In 2020, the e-payment segment is expected to bring in $1.4 trillion in revenue, which is predicted to rise to $4.6 trillion by 2026, resulting in a CAGR of 26.93% (*Business of Apps, BIS Research, Mordor Intelligence, Statista*). An e-wallet application will have 1.31 billion users by 2023 according to eMarketer.

Fintech News Singapore estimates the number of Fintech startups in Vietnam increased by over 178% between 2017 and 2020, from 44 to 118 firms. Since payment service providers make up the majority of Fintech startups (31%). According to figures released in October of 2020, Vietnam has 39 licensed e-wallet service providers, with the top 5 providers being MoMo, Zalo Pay, Moca, Payo, and ViettelPay. It is predicted that competition between e-wallets will rise in the near future, which will lead to an increase in expectations and requirements from users, which will in turn require the services of e-wallet providers to work harder to enhance the products, services, and business strategy to gain new customers.

Based on the above reasons, authors has decided to examine the topic "Factors affecting consumers' satisfaction when using e-wallets: empirical evidence in Hanoi,

Vietnam" and has drawn some practical conclusions that are particularly beneficial for e-wallet providers, so that Vietnam can foster a long-term e-wallet market.

In search of insights about consumers in Hanoi, the data collection used in Hanoi was conducted in the spatial and time dimensions with the form of a questionnaire, which began on May 1st, 2021 and ended on May 30th, 2021.

The project is expected to make a significant contribution in two distinct areas. Research can contribute to the theoretical framework of electronic wallet service quality. Additionally, the study will offer guidance on how to go about future research. Concretely, the research topic will advise businesses providing e-wallets on ways to improve their products and services in order to improve customer satisfaction.

The research paper continues with the next part, which consists of five sections: section two provides overview of research on variables affecting consumer e-wallet satisfaction and a theoretical foundation on those findings. Section three introduces research design and methods. Section four reveals research results. The fifth section summarizes recent research findings and the policy implications. The conclusion is in the final section.

## 2. Literature reviews

### 2.1. Theoretical researches

Clause 6, Article 3, Circular 39/2014/TT-NHNN on Guidance on intermediary payment services referred "A service that offers customers an electronic account with their own identity which is created by service providers on things (such as electronic chip cards, mobile phone sims, and computers) is referred to as an e-wallet service, that make use of information carriers to allow for the storage of monetary value that is guaranteed by the amount deposited in a customer's payment account at the bank, which is transferred to the payment guarantee account of the e-wallet service provider, where it is then used as a means of payment without using money.

Parrasurman, Zeithama, and Berry (1985) pioneer to research and develop a model to measure service quality based on customers' perspectives, utilizing 10 different factors, including (1) factors measuring customer Reliability, (2) Approach, (3) Responsiveness, (4) Politeness, (5) Service competence, (6) Credibility, (7) Customer understanding, (8) Information, and (9) Safety and (10) Visible means. This measure has comprehensively covered most aspects of the service, however, the model is quite complex and some parameters are not discriminatory. Therefore, Parrasurman, Zeithama, and Berry (1988) developed the old model into the SERVQUAL model. It is used to measure service perception through five factors, including (1) Trustworthiness (showing that an organization is able to complete the service as expected from the first time); (2) Responsiveness (staff members' expressing their willingness to provide efficient and timely service); (3) Service capacity (demonstrating professional qualifications and dedication); (4) Empathy (worrying about each

customer and thinking about what each customer might want or need); (5) Visible means (expressing through outside of infrustructure, equipment and service staff).

SERVPERF is one of the well-known SERVQUAL variant variations. SERVPERF was developed by Craig and Taylor (1992). Customer satisfaction is measured in the SERVQUAL scale as follows: The service quality is a difference of perceived value and expected value. At the same time, service quality is equal to customer perception on the SERVPERF scale. SERVPERF employs the same 22-question set as SERVQUAL, but excluding all the questions related to expectations. According to Cronin and Taylor (1992), the SERVQUAL model is easy to cause a lot of confusion between customer satisfaction and attitude. SERVPERF model (Cronin and Taylor, 1992) was used to quantify customer service, demonstrating that the form and functionality of the questionnaire is easier on respondents because it's short, time-saving, and avoids errors. However, this model does not reflect the relationship between satisfaction of users and provided service quality. Although the SERVPERF model has some advantages, SERVQUAL is still prioritized to use in articles discussing customer satisfaction.

Parrasumman, Zeithaml, and Malhotra (2002, 2005) developed the E-S-QUAL model specifically to measure e-service quality. This model was first developed in 2000 and was improved upon in 2002 after researches were done on online customer satisfaction with service quality. Based on the adjustment of SERVQUL, Zeithaml (2000) proposed seven new factors to describe E-S-QUALITY. Then, Parrasurama, Zeithaml, and Malhotra (2005) studied the quality of traditional service using earlier researches on quality of traditional service, and thus created E-S-QUAL and E-recS-QUAL. In particular, Zeithual (2002) mentioned that elements of SERVQUAL could also be used for measuring e-service quality, but in order to properly do so, a number of variables would need to be adjusted and supplemented. E-recS-QUAL and E-S-QUAL use the following seven values to measure quality: (1) Efficiency, (2) Confidentiality, (3) System Availability, (4) Completeness, (5) Responsiveness, (6) Contacts, and (7) Compensation. There are first four elements are main factors with 22 observed variables. The remaining three factors are the variables that restore the quality of online services when issues arise, including 11 observed variables, creating E-recS-QUAL model.

In terms of the relationship between consumers' satisfaction and service quality, Zeithal and Bitner (2000) find that overall satisfaction includes quality of the product, quality of the service, price, personal and situational factors. Similarly, Curry and Sinclair (2002) show that if the quality of provided products or services meet the expectation of customers, they are satisfied and vice versa.

It means that customers' satisfaction and service quality are two different concepts, but there is a "causal" relationship between the two. As a result, service quality is the primary factor that affects customer satisfaction. These two concepts are consistently linked together because the quality of services is correlated with providing service, and customers'

satisfaction is the evaluation of those services after they've been used. Even if services quality is improved, customers will not be completely satisfied if they do not meet their needs. In short, in meeting customer needs, quality of service plays a critical role.

**Figure 1: Summary of product service quality assessment models**



| 1985 | 1988 | 1992 | 2005 | 2015 |
|------|------|------|------|------|
| • Service quality model - 10 factors | • SERVQUAL - 5 factors | • SERVPERF - 5 factors | • E-S-QUAL - 4 factors<br>• E-recS-QUAL - 3 factors | • M-S-QUAL includes:<br>• 5 factors evaluating invisible service and products<br>• 4 factors evaluating visible service and products |
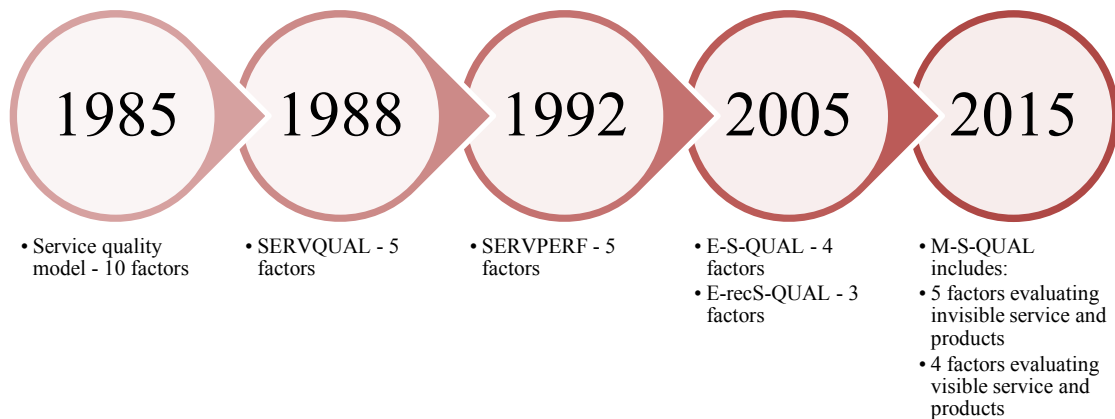
*Source: Compiled by the author*

Bachelet (1995) argues that customer satisfaction is an emotional response customers have in response to their experience with a product or service. Also, according to Olivia, Oliver and Bearden (1995), it will show the satisfaction of customers because of the difference in the value of products and services they receive as compared to the values of products and services they have previously received. Meanwhile, Tse and Wilton (1988) show that the customers' response to the disparity between what they want and what they feel after using the products or services is the satisfaction. According to Oliver (1997), customer satisfaction is defined as the way customers respond to satisfaction of their desires.

Similarly, Zeithaml and Bitner (2000) agree that the satisfaction of customers is their evaluation through a product or service which meets their desire and demand. This definition proposed by Zeithaml and Bitner (2000) has turned the abstract concept of "customers' satisfaction" into something that is measurable based on the products or services.

According to Kotler (2001), sustomers' satisfaction is more clearly defined as the degree to which the sensory state of a customer changes after comparing their expectations and actual outcomes from product or service consumption. It means that customer's satisfaction is measured by comparing his or her expectations before and after buying the product or service. Therefore, satisfaction is divided into three levels:

(1) Customers will feel unhappy if they receive less results than their expectations.

(2) Customers will feel happy if the received results are as expected.

(3) Customers will feel very happy if they receive more value than they expect.

A satisfied customer will return to use the service, as well as utilizing even more of it (Bitner & Hubbert, 1994). Therefore, service providers aim to meet the desires of their customers. To ensure operational efficiency, businesses should conduct studies to measure

customers' satisfaction, coming up with efficient solutions to improve their competitive advantage. However, there are a lot of proposed opinions related to the level of customers' satisfaction (Oliver, 1997).

The service quality has an important impact on the satisfaction of customers (Cronin and Taylor, 1992; Spreng and Mackono, 1996). It means that improving service quality is critical to improve customers' satisfaction. However, the service quality that customer needs is the most suitable quality instead of the best quality (Curry and Sinclair, 2002). Therefore, the focus is on the relationship between service quality and the satisfaction of customers to find new methods to improve service quality.

## 2.2. Empirical researches

Dong-Hee Shin (2009) searches for a suitable research model of users' acceptance for e-wallets. The author uses a UTAUT model (The unified theory of acceptance and use of technology) with four variables: perceived security, trust, social influence, and self-efficacy, which were derived from 296 observations collected in the US from August to December in 2008. According to the research, consumers' attitudes and intentions to use e-wallets are affected by their perceptions of security and trust. However, the author also shows that the sample size is too small for generalizability. In addition, due to the shortcomings of data collection, these findings can only be applied to the US market. The research of Nidhi et al. (2017) also uses the UTAUT model and find a positive correlation between consumer satisfaction and perceived quality. Customer perception has a large impact on any new technology's success or failure (Thulani, 2011; Rowland and Shrauger, 2013). Another benefit of e-wallets is that they allow consumers to enhance their experience, so consumers should feel satisfied. Additionally, Singh, Srivastava, and Sinha (2017) confirm that preference and satisfaction are positively correlated. It means that if consumers satisfy with the benefits of e-wallets, they will use all of the wallet's services and increase usage over time. The research also mentions the argument of Karnouskos and Fokus (2004) that the e-wallet system offers financial services with a low cost, leading to the satisfaction of customers and motivating them to use the e-wallet for their all services. The UTAUT model is used with the additional variable of "Hedonism" to analyze 204 observations collected from consumers in the north of India. Furthermore, the study has shown some limitations. First, the research is conducted based on information from users of electronic wallets, which means the results cannot be extrapolated to other mobile applications. Then, the study's data is limited to 204 samples of males, which is difficult to represent the opinions of the Indian citizens.

Nidhi et al. (2020) conduct a study in which they observed 206 samples to examine the impact of the most important factors on the satisfaction and acceptance of e-wallet users in India. This research is analyzed based on the UTAUT2 model, along with additional variables: "enhancement", "pressure use", and "social influence" to examine the impact of these variables on the satisfaction, leading to the proposal of using e-wallet service. According to the findings, "ease of using", "usefullness", "perceived risk", and "customers'

attitudes" have a significant impact on customers' intention of using e-wallets, which has an influence on the satisfaction and proposal of using e-wallets. In which, the "usefullness" has the highest effect. There is a similar opinion between research of Shin (2009) and Singha et al. (2020). They agree that the "attitude" is one of crucial elements in the users' satisfaction. Besides, Singha et al. (2020) also show that the increasing stress has a negative impact on users' satisfaction. However, the study also has some shortcomings. Similar to research of Singh et al. (2017), the sample size is far too small for the Indian population. In addition, the data is collected in a specific short time period, which does not demonstrate changes in psychology of the user when the number of people using the e-wallet increase.

Ashwarya et al. (2020) also agree with the results of Shin (2009) when they show the "security perception" is the biggest influential factor on service quality of e-wallet. Kapoor, Sindwani, and Goel (2020) integrate, classify and analyze a huge number of theoretical and empirical researches in e-wallet from 01/2018 to 01/2020. The findings are that though numerous studies on e-wallets have been published over the decade, the number of in-depth studies on the topic of the service quality of e-wallets remains relatively small. Additionally, authors have proposed 10 factors to help evaluate the quality of e-wallet services based on previous studies by using a Fuzzy TOPSIS method. They include (1) Convenience, (2) reliability, (3) personalization, (4) favorable conditions, (5) perceived security, (6) aesthetics, (7) trust, (8) enjoyment, (9) feedback, (10) usefulness. In which, the "perceived security" is the most influential factor. Finally, the study also mention potential drawbacks such as non-English researches, untranslated studies were excluded from the study.

Nguyen (2018) compare the service quality of three types of e-wallets in Vietnam, including Momo, Zalopay, and Airpay, demonstrating each factor in the e-SERVQUAL scale, including: 1) Efficiency, (2) Commitment, (3) Credibility, (4) Confidentiality, (5) Feedback, (6) Compensation, and (7) Appropriate and meaningful in evaluating the quality of e-wallet services. Simultaneously, the author suggests future research directions to assist managers in overcoming service quality issues. Furthermore, due to time constraints, the study has limitations. First, while the study compares and evaluates the three types of e-wallets with the highest market share in the Vietnamese market, the proportion of Airpay users is insignificant when compared to Momo and Zalopay. Second, because the research object is limited to Momo, Zalopay, and Airpay users, the solutions provided will be limited and not general. Finally, because of the small sample size, it is less representative.

Nguyen et al. (2020) conduct a study with 276 observed samples and use TAM and UTAUT models to determine the factors influencing the intention to continue using mobile wallets. The findings are similar to those of Singha et al. (2020), which finds that mobile applications of high quality and familiarity have a significant influence on "perception of ease of use" (PEOU) and "feeling useful" (PU), and that PEOU and PU are positively associated with satisfaction and have a positive effect on the intention to continue using them. However, the study has some limitations. To begin, some factors, such as "quality of service," "expected

performance," and other social influences, have an impact on the intention to continue using e-wallets but are not discussed extensively in this study. Furthermore, the "benefit" factor needs to be researched further because customers may have different motivations for using e-wallets, such as discounts, refunds, or accompanied gifts.

Dang (2020) use the typical SERVQUAL model of Parasuraman, Zeithaml, and Berry (1988) to determine the factors influencing customer satisfaction when using e-wallets in Vietnam. According to the research findings, all five observed variables are significant for the dependent variable of "satisfaction" and are listed in descending order: (1) Empathy, (2) Assurance, (3) Trust, (4) Feedback, and (5) Tangibility. Dang (2020) has developed detailed solutions for each factor to assist businesses in improving customer satisfaction.

## 2.3. Research gaps

Reviewing theoretical and empirical studies reveals topics about e-wallets in general, as well as topics about users' satisfaction with e-wallets in specific, have attracted the attention of researchers. These researches have contributed to the development of a theoretical system of e-wallet services. However, while the research scope of the majority of topics is usually the entire country, the number of topics chosen for the scope of a specific province or city, particularly Hanoi, is still limited. This can help researches to be more general, but it is difficult to provide a detailed look at local people's e-wallet usage. As a result, the topic "Factors affecting consumers' satisfaction when using e-wallets: empirical evidence in Hanoi, Vietnam" is investigated to identify the factors that affect consumers' satisfaction when using e-wallets in Hanoi, resulting in the most accurate understanding and a reasonable solution.

## 2.4. Hypotheses

The following five hypotheses deal with relationships between the satisfaction and using e-wallets:

**Reliability:** measures the level of performance of the proposed services, which expresses through how well the provider executes the promised service contents and time without errors, as well as positively solves problems of customers when using the service (Parasuraman et al., 1988). When considering the impact of "reliability," positive results can be found in terms of "satisfaction" (Parasuraman et al., 1988; Nguyen, 2018; Dang, 2020), which leads to the first hypothesis:

**H1:** The "Reliability" factor has a positive influence on "Satisfaction.

**Responsiveness:** assessing a company's ability to respond on time and respond quickly to problems, how effective they are in handling customer issues, and being ready to help customers when they have problems (Parasuraman et al., 1988). "Responsiveness" could be called as "Commitment to implementation" (Yang and Tsai, 2014), "Level of commitment to implementation" (Nguyen, 2018), "Feedback" (Dang, 2020) and was shown to have a positive effect on "Satisfaction". Besides, Yang and Tsai (2014) show that "Commitment to

implementation" has a largest impact on the satisfaction of users, which leads to the second hypothesis:

**H2:** Factor "Responsiveness" has a positive influence on "Satisfaction.

**Service capacity:** providing service in a professional and efficient manner to create trust and peace of mind for customers. "Service capacity" or "Guarantee" (Dang, 2020) has been found to positively contribute to "satisfaction" (Parasuraman et al., 1988; Dang Ngoc Bien, 2020), resulting to the third hypothesis:

**H3:** The "Service capacity" factor has a positive influence on customer satisfaction.

**Empathy**: measures the ability to care, sympathize, care and treat customers thoughtfully from the service provider's side (Parasuraman et al., 1988). In a study done by Parasuraman et al. (1988) and Dang (2020), "empathy" or "sympathy" was shown to have a positive effect on the "satisfaction". Besides, Dang (2020) also points out that "Sympathy" has the greatest influence on users' satisfaction, leading to the fourth hypothesis:

**H4:** Factor "Empathy" has a positive effect on "Satisfaction".

**Means:** measures the level of attractiveness and moderness of equipment and electronic means in service of the e-wallet system. It is proven that "Means" has a positive impact on the "Satisfaction (Parasuraman et al., 1988), which leads to the fifth hypothesis:

**H5:** Factor "Means" has a positive effect on "Satisfaction".

## 3. Methodology

### 3.1. Research framework

The research process took place according to the following steps in the Figure 2.

The study uses the combination between qualitative and quantitative methods. The former is typically used for reviewing previous studies, developing a theoretical framework, and building a measurement scale for a particular subject at the first stage. The quantitative study was conducted after data from the qualitative study was completed to test the research hypotheses. In order to measure the relationship between the independent variable and the explanatory variables, the data collection is conducted through the survey. This study collected 224 observations, of which 175 were found to be valid. After cleansing, the data was passed on to SPSS 20 for further processing and analyzing. The figure illustrates specific testing steps.

**Figure 2 : The research process**
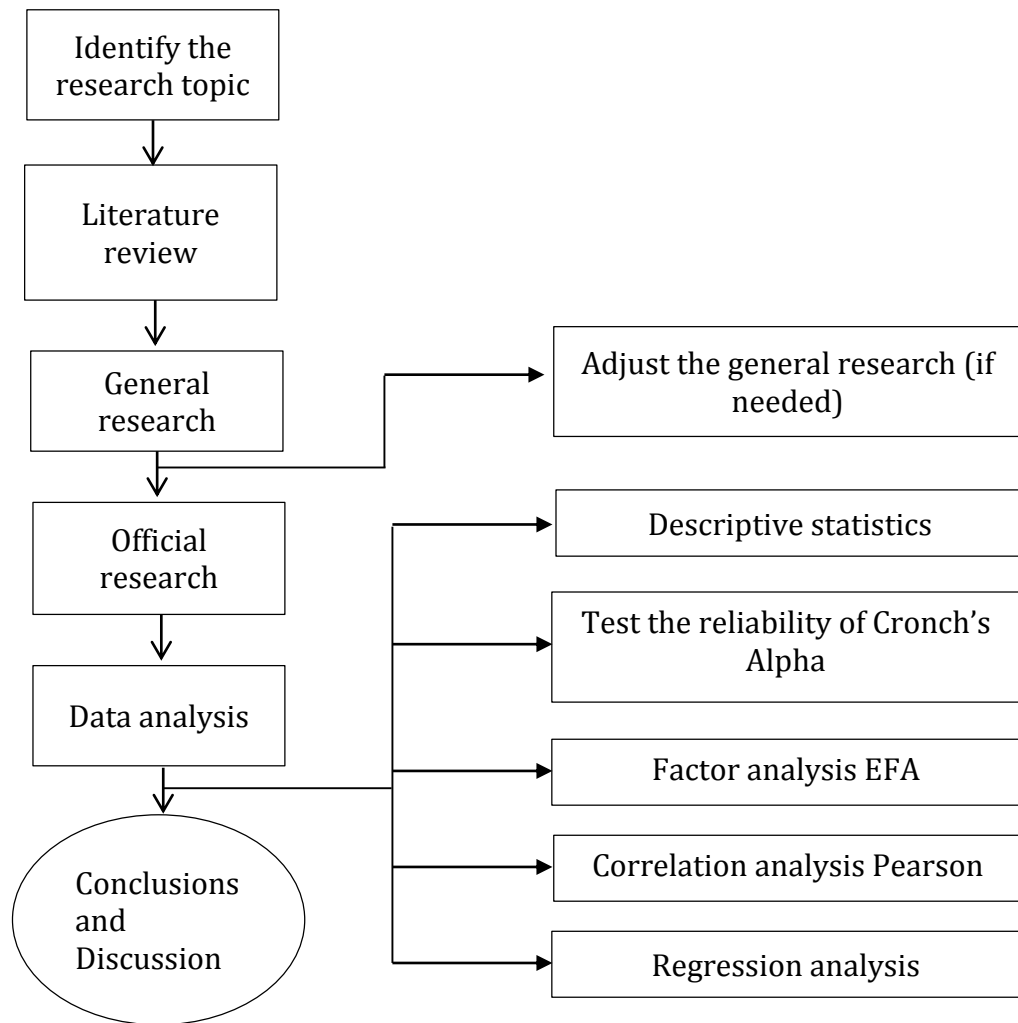


## 3.2. Research model, sample collection

### 3.2.1. Research model

The proposed model includes 5 factors affecting customer satisfaction as follows:

**Figure 3: The research model**
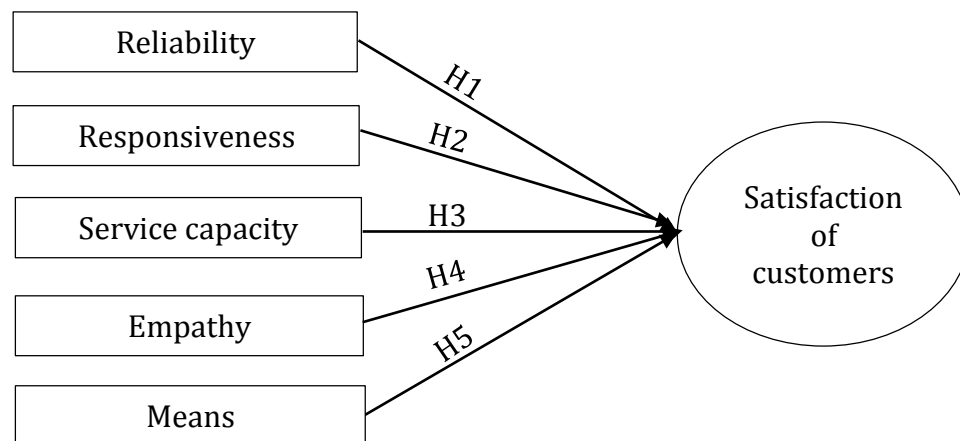
Based on previous studies and the suitability of the research object, authors propose to use the SERVQUAL model and combine references to similar models in this topic to research factors affecting consumers' satisfaction when using e-wallets in Hanoi. SERVQUAL is one of the most common scales that has been used by many researchers to measure topics related to customers' satisfaction and other similar models have also been developed and supplemented from the SERVQUAL model.

*3.2.2. Sample collection*

In order to collect information, questionnaires and surveys are used. The questionnaire for each factor has been constructed based on the proposed model and hypotheses. The Likert scale is used with five level of satisfaction, including (1) Totally disagree; (2) Disagree; (3) Normal; (4) Agree; (5) Totally Agree Only. We implemented a pilot test, which includes two steps. The first step is called *pretest* including six (06) volunteers. We asked for volunteers to answer questionnaire face-to-face to collect feedback. However, the data and feedback was collected in this step was not processed by SPSS because the target is adjusting the questionnaire. Then, the questionnaires which were fine-tuned in the first step were delivered to a group of 40 volunteers in the second step to conduct an online pilot test via email. The final adjusted questionnaires after the pilot test were delivered online via the Internet, forums, and social networking sites to collect data. This method can make the survey available to many diverse respondents, including potential consumers using e-wallets.

**4. Results analysis**

*4.1. Descriptive statistics*

**Table 1: Demographic characteristics of survey participants**

| Contents | Respondents | % |
|---|---|---|
| **1. Gender** | | |
| Male | 16 | 9.14 |
| Female | 159 | 90.86 |
| **2. Age** | | |
| Less than 18 years old | 4 | 2.29 |
| 18 – 24 years old | 99 | 56.57 |
| 25 – 39 years old | 42 | 24 |
| Over 40 years old | 30 | 17.14 |
| **3. Education level** | | |
| Secondary school | 1 | 0.57 |
| High school | 11 | 6.29 |

| Contents | Respondents | % |
|---|---|---|
| Working while studying | 2 | 1.14 |
| College | 11 | 6.29 |
| Undergraduate | 138 | 78.86 |
| Post-graduate | 12 | 6.86 |
| **4.  Occupation** | | |
| Pupil | 4 | 2.29 |
| Student | 76 | 43.43 |
| Employee | 95 | 54.29 |
| **5.  Average income** | | |
| Less than 5,000,000 dong | 77 | 44 |
| 5,000,000 – less than 10,000,000 dong | 50 | 28.57 |
| 10,000,000 – less than 20,000,000 dong | 31 | 17.71 |
| 20,000,000 – less than 35,000,000 dong | 10 | 5.71 |
| 35,000,000 – 50,000,000 dong | 5 | 2.86 |
| Over 50,000,000 dong | 2 | 1.14 |

To ensure adequate data analysis (EFA), the sample is collected based on the standard base of 5:1 of Bollen (1989). It means that at least 5 observations must be made for each measurement variable, and the number of observations should not be less of 100. The survey includes total of 24 observed variables (questions use the Likert scale), leading to a minimum sample size of 24*5 = 120. Besides, the regression analysis also requires a minimum sample size of 8*n + 50, where n is the number of explanatory variables (Tabachnick và Fidell, 1996). The minimum sample size is therefore 8*5 + 50 = 90. In this study, 224 responedents were collected, of which 49 answers were invalid because of missing data, and 175 answers were accepted. The demographics of those participating in the survey are shown in Table 1.

In regards to gender, almost all (90.86%) of the participants were female, which amounts to approximately 159 participants, and approximately 9.14% of the participants were male (approximately 16 participants). The survey participants' ages range from ages 18 to 25, making up 56.57% of the total respondents (99 respondents). Meanwhile, the number of people in the age group of 25 to 40 is 42, making up 24% of the population. E-wallets have a

high demand among young people, who have easier access to them than other age groups. In terms of education level, the university graduates represent 78.86% of the total population (138 people). This group is especially skilled at learning and adopting new technologies. On the basis of occupation, there are 76 students, or 43.43% of the participants, while working people comprise the remaining 54.29% of the respondents (95 people). In terms of average income, those with the income of less than 5 million VND per month are 77 people, which accounts for 44%. While 1.14% of the Vietnamese population has income per month of VND 50,000,000 and above, this fact also demonstrates that e-wallets attract people of different economic levels.

### *The actual use of e-wallets among consumers in Hanoi capital*

Over a decade ago, e-wallets started to appear in Vietnam, but it was until 2014 that they became popular and received the interest and using. One-third of survey respondents said they had used an e-wallet less than one year.

The frequency of using e-wallets in a month ranges from 1 to 8 times, accounting for 52%. However, the number of consumers transacting with e-wallets more than 12 times per month is significantly high, accounting for 28.6% of transactions. It means that many consumers have formed the habit of using e-wallets in their daily activities.

Data from the survey indicates that 24% of users use e-wallets based on promotional codes or discounts. Understanding this mindset, many e-wallets such as Momo, Airpay, and ZaloPay always have great promotions for customers like Christmas and Lunar New Year. Prominent campaigns during the Lunar New Year 2021 include Momo's Lucky Draw, which demonstrates the custom of shaking hexagrams in order to gain cash and vouchers along with a greatly-valued prize; or the Zalo's Great Red Coin campaign, which illustrates the process of spinning the zodiac's wheel in order to receive a large prize. Lucky with rewards is having money and getting to play. These activities are responsible for drawing in a large number of new users as well as keeping users who have already used the service.

Additional findings from the survey show the most popular e-wallets, along with their main purpose of using. 42% of all e-wallet users engage in online payment. This is because the developing e-commerce has led to the development of e-wallets, which act as payment intermediaries for e-commerce transactions.

In addition, 68.6% of users stated that they will still use the current number of e-wallets in the near future. A significant 49.1% of users said they would use e-wallets more frequently in the future, while a smaller 47.4% of users claimed the same frequency for using e-wallets in the present.

*4.2. Results analysis*

*4.2.1. Test the reliability coefficient of the scale (Cronbach's Alpha)*

The Cronbach's Alpha coefficient of the variables reached values from 0.833 to 0.906, which is greater than 0.6, so the scale meets the requirements of reliability and is the basis for performing "Factor Analysis" – EFA.

**Table 2: Results of the reliability coefficient of the scale (Cronbach's Alpha)**

| No | Factors | Initial observed variables | Remaining observed variables | Cronbach's Alpha |
|----|---------|----------------------------|------------------------------|------------------|
| 1 | Reliability (TC) | 4 | 4 | 0.833 |
| 2 | Responsibility (DU) | 4 | 4 | 0.858 |
| 3 | Service capacity (PV) | 6 | 6 | 0.906 |
| 4 | Empathy (DC) | 4 | 4 | 0.890 |
| 5 | Means (PT) | 5 | 5 | 0.877 |
| 6 | Satisfaction (HL) | 3 | 3 | 0.906 |
| **Total** | | | **26** | |

*4.2.2. Factor analysis (EFA)*

**Factor analysis (EFA) with the independent variable**

In the first time, 23 observed variables were used in the EFA analysis for the independent variable. The results produced KMO of 0.866, but PV6 and PT3 were not used because the discriminant value is not guaranteed. This is because the difference in discriminant load coefficient is less than 0.3. Therefore, the remainder of 21 observed variables still remain in the analysis.

In the second time, the KMO results for the independent variable were 0.841. Factor analysis can be accepted as long as the research data set is $0{,}5 \leq 0{,}841 \leq 1$. Sig Bartlett's test scores at 0.000 which is less than 0.05, so the factor analysis is appropriate. The Eigenvalue value equals to 1.770 which is higher than 1 and five factors are extracted to represent 73.511% of the observed variables' total variance. This result is higher than 50%, meaning that EFA model is appropriate. The rotation matrix reveals that 23 observed variables have been assigned to five factors and all observed variables have Factor Loading coefficients are higher than 0.5.

**Factor analysis EFA for dependent variable**

When the value of KMO shows $0.5 < KMO = 0.754 < 1$, the factor analysis is accepted with the research dataset. Sig Bartlett's test scores at 0, which is less than 0.05. It means that factor analysis is appropriate. The Eigenvalue value equals to 2.555 which is

higher than 1. We can extract a single factor which demonstrates the best information summary. This total extracted variance reaches 85.152% which is higher than 50%, leading to a propriate EFA model. All observed variables in this study have Factor Loading coefficient of above 0.5.

**Table 3: Factors are redefined after EFA analysis**

| No | Factors | Observed variables | Number of variables | Excluding |
|----|---------|--------------------|--------------------|-----------|
| 1 | TC | TC1, TC2, TC3, TC4 | 4 | Independent |
| 2 | DU | DU1, DU2, DU3, DU4 | 4 | Independent |
| 3 | PV | PV1, PV2, PV3, PV4, PV5 | 5 | Independent |
| 4 | DC | DC1, DC2, DC3, DC4 | 4 | Independent |
| 5 | PT | PT1, PT2, PT4, PT5 | 4 | Independent |
| 6 | HL | HL1, HL2, HL3 | 3 | Dependent |
| Total of independent observed variables: 21 | | | | |
| Total of dependent observed variables: 3 | | | | |

*4.2.3. Correlation analysis Pearson*

**Table 4: Correlation coefficient Pearson**

| | | HL | TC | DU | PV | DC | PT |
|----|----|-----|-----|-----|-----|-----|-----|
| **HL** | **Pearson coef.** | 1 | 0.572 | 0.527 | 0.565 | 0.499 | 0.600 |
| | **Sig. (2-tailed)** | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | **N** | 175 | 175 | 175 | 175 | 175 | 175 |

Sig Pearson correlations of the independent variables TC, DU, PV, DC, PT with the dependent variable HL have the value of less than 0.05, proving that these independent variables have a linear relationship with the dependent variable. PT with r coefficient of 0.600, which has the strongest correlation with HL, while DC with r coefficient of 0.499, which means the weakest correlation with HL.

The Pearson correlation of the independent variables, specifically time constraints, duration, resources, deadlines, and pressures, with the dependent variable. This illustrates that the variables we've included in this model are related linearly to the dependent variable. The PT that has a correlation coefficient of 0.600 with HL has the strongest relationship, while the DC that has a correlation coefficient of 0.499 has the weakest relationship.

*4.2.4. Regression analysis*

The adjusted R-squared value is 0.654, expressing that the independent variables in the model have an impact of 65.4% on the changes of the dependent variable. The remaining 34.6% of the change in the dependent variable can be attributed to factors outside the model and random errors. There is no first-order series correlation because the Durbin-Watson coefficient is equal to 1.553, which is located in the range of 1.5 to 2.5.

**Table 5: Summary of the model**

| R | $R^2$ | Adjusted $R^2$ | Estimated SE | Durbin-Watson |
|---|---|---|---|---|
| 0.815 | 0.664 | 0.654 | 0.48966 | 1.553 |

**Table 6: ANOVA**

| | Sum of squares | df | Average squared | F | Sig. |
|---|---|---|---|---|---|
| Regression | 80.019 | 5 | 16.004 | 66.747 | 0.000 |
| Error term | 40.521 | 169 | 0.240 | | |
| Total | 120.540 | 174 | | | |

The Significance of the F-test is equal to 0.000 which is less than 0.05, which means that the multiple linear regression model is consistent with the data and is therefore useful.

**Table 7: Regression analysis**

| | Non-standardized regression coefficients | | Standardized regression coefficients | t | Sig. | Multicollinearity statistics | |
|---|---|---|---|---|---|---|---|
| | B | SE | Beta | | | Tolerance | VIF |
| Contant | -0.932 | 0.271 | | -3.432 | 0.001 | | |
| TC | 0.298 | 0.056 | 0.270 | 5.356 | 0.000 | 0.783 | 1.277 |
| DU | 0.198 | 0.056 | 0.183 | 3.560 | 0.000 | 0.751 | 1.331 |
| PV | 0.278 | 0.054 | 0.259 | 5.149 | 0.000 | 0.787 | 1.271 |
| DC | 0.155 | 0.044 | 0.179 | 3.552 | 0.000 | 0.784 | 1.276 |
| PT | 0.298 | 0.051 | 0.296 | 5.793 | 0.000 | 0.763 | 1.310 |

The Significance of T-test of regressed coefficients are less than 0.05, indicating that they are significant in explaining the dependent variable. There is no multicollinearity because the VIF coefficients of the independent variables are all less than 2.

All of the regression coefficients are greater than zero, the independent variables in the regression analysis therefore have the positive effect on the dependent variable. Based on the size of the normalized regression coefficient - Beta, the following independent variables have the greatest influence on the dependent variable HL including PT (0.296) > TC (0.270) > PV (0.259) > DU (0.183) > DC (0.179). This is how the regression equation is rewritten:

$$HL = 0{,}296{*}PT + 0{,}270{*}TC + 0{,}259{*}PV + 0{,}183{*}DU + 0{,}179{*}DC$$

*4.2.5. Conclusion on factors influencing consumers' satisfaction when using e-wallets*

The results of the regression show that all five proposed independent variables have an effect on the dependent variable – "Satisfaction". In which case, "Means" factor is the most influential factor on the satisfaction of e-wallet users in Hanoi, followed by "Reliability", "Service capacity", "Responsiveness", and "Empathy" in descending order.

**Table 8: Results of testing the hypotheses**

| Hypothesis | Explanation | Beta | Sig. | Results |
|---|---|---|---|---|
| H1 | Factor "Reliability" has a positive impact on "Satisfaction" | 0.270 | 0.000 | Accept |
| H2 | Factor "Responsiveness" has a positive impact on "Satisfaction" | 0.183 | 0.000 | Accept |
| H3 | Factor "Service capacity" has a positive impact on "Satisfaction" | 0.259 | 0.000 | Accept |
| H4 | Factor "Empathy" has a positive impact on "Satisfaction" | 0.179 | 0.000 | Accept |
| H5 | Factor "Means" has a positive impact on "Satisfaction" | 0.296 | 0.000 | Accept |

## 5. Discussion and recommendation

### 5.1. Discussions

The study's findings indicate that the factors (1) Means, (2) Reliability, (3) Service capacity, (4) Responsiveness, and (5) Empathy all have an impact on the level of service satisfaction and have been sorted in descending order of magnitude.

**"Means"** has the greatest influence on users' satisfaction (Beta = 0.296), indicating that users place a high interest in the modernity of electronic equipment and facilities in the e-wallet system. This can be seen in the socioeconomic characteristics of today's customers in

Hanoi. The application's usefulness for modern needs is the first consideration that users have when experiencing new technology. The characteristics of young population structure and strong interest in new technology applications, in particular, have contributed to the e-wallet market's explosive growth in Hanoi in recent years.

**"Reliability"** is another critical factor influencing satisfaction (Beta = 0.270). Despite initial concerns about security, e-wallets gradually gained customer trust as e-wallet service providers launched super applications with stable operating effectiveness and high security thanks to technologies such as international card number encryption - Tokenizatión, two-factor authentication - 2FA, or biometric authentication.

**"Service capacity"** comes in third place, demonstrating e-wallet providers' ability to provide services professionally and effectively, which has a significant impact on user satisfaction (Beta = 0.259). As new applications enter the user's ecosystem, simplifying procedures and increasing interoperability between applications become increasingly important. The integration of applications will reduce the amount of time and effort required to transfer money back and forth.

**"Responsiveness"** has a minor impact on satisfaction (Beta = 0.183). This factor assesses the ability to provide services quickly and on time, to handle problems effectively, to be available to assist customers when they have problems, and to respond to customer requests effectively. The factor's low Beta coefficient can be explained by the application's stability, which has limited problems during the transaction process, so customers have little need to contact the general board. Simultaneously, users do not pay much attention to task notifications from the application, so they have little impact on satisfaction.

**"Empathy"** is the factor with the least influence on satisfaction (Beta = 0.179). This factor assesses the service provider's ability to care, sympathize, care for, and treat customers thoughtfully. The stable operation of the application, similar to the "Responsiveness" factor, has helped customers limit problems during the transaction process, so customers have less need to contact the switchboard, making this factor less important.

*5.2. Recommendations*

With a population of over 96 million people, the current rate of access to financial and banking services in Vietnam is 45.8 million, accounting for approximately 63 % of the population with bank accounts and access to at least one financial service. As a result, there is still a lot of room for e-wallet service providers to grow. However, in order to develop sustainably and remain in the competition, each business must improve in areas such as human resources, application systems, and information security in order to increase user satisfaction and loyalty to the service. Businesses can also learn from the world's most successful e-wallet models, such as AliPay, Wechat Pay, and PayPal.

**Recommendations for "Reliability"**. To improve customers' belief, e-wallets must strengthen relationship with many banks, particularly large banks. Furthermore, service

providers must establish security standards in order to effectively and strictly handle customer information. The issue of information security is one of the most frequently discussed and concerned issues, and it has a significant impact on users' trust. Momo and ZaloPay, the electronic wallets with the largest market shares in the Vietnamese market today, have all received the prestigious security certification called PCI DSS. In terms of authorities, policies and regulations must be considered and adjusted in a reasonable and strict manner by the regulatory agency in order to effectively manage e-wallet service providers and protect the interests of users. of customers

**Recommendations for "Means"**. Technology is a highly volatile market that changes by the hour. To keep up with the latest trends and technologies, businesses must constantly improve and update their e-wallet applications. This not only helps e-wallets compete, but it also improves users' experience. In particular, super app is one of the solutions to increase users' convenience that has received a lot of attention in the last two years. Super app is a platform for multi-service integration. As a result, users can experience and use a variety of utilities on the same application, thereby saving phone space. Super apps such as Grab, Zalo, and Shopee are common examples.

**Recommendations for "Service capacity"**. Businesses must also strengthen their collaboration with banks in order to diversify their partners and enable the linking of e-wallets. Because an e-wallet acts as a payment intermediary, a "bridge" between customers and banks, limiting the number of linked banks is inconvenient for customers. Furthermore, due to the fact that electronic wallets are becoming more popular, one of the most important tasks for businesses is to maintain a stable, secure, and efficient system. Businesses must keep up to date on the cybersecurity situation in the country and around the world in order to find solutions and best prepare for potential risks. Management agencies must also check the quality of the enterprise's system on a regular basis. Furthermore, to establish an effective security program, the state and businesses must coordinate and exchange information on high-tech crime cases.

**Recommendations for "Responsiveness"**. E-wallet service providers must focus on improving the quality of feedback from customer service staff and developing an appropriate customer care process. The support team, in particular, must respond quickly and accurately to customer problems. Businesses that provide online customer support must conduct research and issue appropriate notifications on the application platform to ensure customers are aware of important information without causing problems.

**Recommendations for "Empathy".** Businesses must understand their customers' needs, such as which services they frequently use, which interfaces they prefer, and which activities they enjoy, and then develop campaigns, appropriate products, and services to meet those needs. This can boost customer engagement, make them feel understood, and help customers and e-wallet services connect. Businesses can use surveys to assess the quality of

e-wallets or create a point-based system. Furthermore, implementing after-service customer care enables businesses to stay close to each customer group and increase service loyalty.

## 6. Conclusions

The first goal is to identify and analyze the factors influencing e-wallet users' satisfaction in Hanoi. The research findings revealed 21 observed variables out of 5 factors that influence the level of e-wallet users' satisfaction in Hanoi. "Means", "Reliability", "Service capacity", "Responsiveness", and "Empathy" are the factors listed in descending order of influence. The second goal is to propose solutions to increase user satisfaction. Based on five factors affecting satisfaction, the research has made detailed recommendations for both e-wallet service providers and regulatory agencies.

The study has contributed both theoretically and practically by achieving the research objectives. Theoretically, the study's observed variables and factors can serve as a useful reference source for future research on the quality of e-wallet services. Empirically, the topic's recommendations are reference solutions for managers of e-wallet service providers. At the same time, these are state management agency proposals.

Aside from the contributions, the study has a number of limitations that must be addressed. To begin, the study of convenient sampling in Hanoi city should have a low representativeness of the sample and low generalizability. Second, due to time and resource constraints, the observation sample size is limited (175 observations), affecting the topic's generalizability. Finally, because the author has not directly contacted and discussed the recommendations with the managers of the e-wallet service providers, some of the recommendations made are not exhaustive.

To overcome the limitations of this study, future studies should increase the sample size and use a random sampling method to increase the topic's generalizability. Furthermore, future research should consult with experts and business managers who provide e-wallets in order to improve the research model and make recommendations that are most relevant to the needs of businesses.

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# FACTORS AFFECTING THE SWITCHING INTENTION TO MOBILE PAYMENT SYSTEMS IN VIETNAM

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## Abstract

*The rapid and dynamic growths of Fintech services and IT systems have brought numerous advantages to the payments industry. Regarding the mobile payment sector, these enormous innovations, particularly the unconstrained time and place services, have been broadly recognized by academics and practitioners. The time and location independence privileges offer customers a faster, safer, and more manageable payment experience than traditional methods. Compared to other payment methods, using mobile payment, customers can make financial transactions quickly and comfortably, despite the payment amounts. However, before accepting innovation technology, users must decide to continue paying by the current method or switching to one of its substitutes. This study presents a conceptual model combined with the technology acceptance model (TAM) and Push-Pull-Mooring (PPM) framework to identify the main determinants that affect customers' switching intention from cash payment to mobile payment in Vietnam. The results show that alternative attractiveness is the most impact pull factor, followed by mobility. Regarding push factors, low satisfaction and inconvenience of cash payment greatly influence both perceived ease of use and perceived usefulness. Regarding mooring effects, personal innovativeness has a significant impact on perceived usefulness, perceived ease of use, and switching intention, whereas perceived risk has a negative influence, and the effect of mobile payment knowledge is not confirmed. Finally, the relationships between the variables are influenced only by habit, while the impact of switching cost is not found.*

*Keywords: Mobile Payment, Intention to Switch, Push-Pull-Mooring framework, TAM*

## 1. Introduction

Computers and mobile phones are now not luxuries anymore, but necessities and afforded for most people. Customers have been given numerous opportunities to switch from one IT product to its alternatives by the IT innovation explosions. The rapid and dynamic growths of Fintech services and IT systems have brought numerous accessible payment

services. Especially the mobile payment innovations with enormous advantages that academics and practitioners have acknowledged. Facing many options, users must decide to switch to new technology with many advantages and risks or stay with the incumbent payment method. According to the Statistic report (https://www.statista.com), 42.66 million Vietnamese will use the smartphone in 2022. The explosive growth of the mobile phone industry is a motivation for the development of mobile payment systems. However, cash is still king in Vietnam, with 90% receiving the payments in cash, and Cash on Delivery (COD) is the most accepted common payment method accounting for 78% in e-commerce (Vietnam e-commerce report in 2020). Although many studies on mobile payment investigated factors that influence the adoption of mobile payment, there is no research focusing on the impacts of switching from the incumbent payment method to mobile payment. In Vietnam, cash is the most popular payment method. These theoretical and practical aspects motivated the researcher to understand the factor affecting the switching intention from cash payment to mobile payment.

## 2. Literature Review

### 2.1. Mobile Payment and Current Status of Payment in Vietnam

Mobile payment relates to any payment that uses a mobile device to initiate, actively confirm a payment transaction for goods, services, bills (Au & Kauffman, 2008). Besides, the usage fields of mobile payment are not limited from online transactions as m-commerce, e-commerce to offline at the cash desk, stores, or restaurants (Turowski et al., 2013). The mobile payment systems can be classified into two categories, namely remote and proximity.

In 2020, Vietnam had nearly 210 million payment transactions, money transfers via mobile devices, which increased 61% in transaction value compared to 2019. According to the latest report conducted by the State Bank of Vietnam (SBV), in the first quarter of 2021, the number of mobile phone transactions reached over 156.2 million transactions with VND 8.1 trillion (US$355.3 million), rising 28.4% in value. Moreover, transaction value in the mobile payments segment of Vietnam is estimated to reach $26.4 billion by 2025 from $11.6 billion in 2020. In Vietnam, mobile payments are available through both Remote and Proximity mobile payments, including QR and Point-of-Sale via Magnetic Secure Transmission (MST) technology provided by Samsung pay. According to the State Bank of Vietnam statistics, in 2020, most major banks in Vietnam have provided payment solutions via QR code for a mobile banking application. In addition, 25 non-bank financial institutions are involved in providing mobile payment services with typical applications. However, cash is still king with 90% of users (State Bank of Vietnam). Although most Vietnamese have a bank account, cash withdrawal from ATMs machine reaches 86.81% of the total domestic card transaction value (State Bank of Vietnam). Cash on Delivery is also preferred over other payment methods like bank transfer and credit cards for online shopping (Vietnam e-commerce report, 2020).

### 2.2. *User IT/IS switching behavior*

In recent years, IT companies are continually improving and innovating their products to roll out new products with more convenient features. This leads to a large number of consumers switching from one IT product to another. The IT user switching has some similarities with the physical movement of people when users make the decision or have the intention of migration between service providers or firms. However, IT switching behavior has some different characteristics from other products and services. Firstly, thanks to the rapid IT innovations, users have various options with increasing and changing functions, they can make an IT switching between products or services efficiently and freely. Users can experience a new IT choice of a competing IT effortlessly with only one click to download and install for switching (Bhattacherjee et al., 2012). Secondly, discontinuing using previous IT products or services is not essential because users can use both the old and new IT altogether for a period of time to evaluate the new IT or enduringly (Keaveney et al., 1995). In that case, IT switching behavior refers to the complete or partial replacement in using former IT services with a substitute that serves similar needs (Bhattacherjee et al., 2012). In the context of this research, IT switching behavior involves the user making the decisions or having the intention to wholly or partially replace cash payment with mobile payment and the predictors that affect this decision.

### 2.3. *Technology Acceptance Model (TAM)*

Introduced by Davis (1989), the technology acceptance model (TAM) has been the favorite one for studying the IT adoption behavior and is considered to have a strong influence on the development of technology acceptance and adoption. Davis (1989) developed TAM to determine the factors influencing users' intention to use new technology and explain users' behaviors. Two key factors were proposed in the TAM model, namely perceived ease of use and perceived usefulness. Lee (2011) pointed out that technology acceptance and switching are different. In comparison, technology acceptance is just the act of using technology to perform a specific task, while switching concerns the tendency or intention to change from one method to another. Therefore, Lee (2011) modified the original TAM model to explain the intention to switch from offline to online. Similarly, in this study, "intention to use" was modified as "intention to switch". This study adapted this modified TAM to study switching intention from cash payment to mobile payment.

### 2.4. *The Push-Pull-Mooring (PPM) Framework*

PPM framework was developed based on the "Law of Migration" of Ravenstein (1885), which illustrates the impact of push and pull effects on human migration from one place to another (Lee, 1966). Bansal et al. (2005) suggested that the PPM framework can also be applied to research individuals' switching behavior in the marketing field, shifting from one provider to another. PPM model has been modified and applied in widely different fields of studies from the service industry (Keaveney, 1995) to credit cards (Burnham et al., 2003) and mobile telecommunication services (Kim et al., 2004).

## 3. Methodologies

### 3.1. Push Factors

The push effects are the reason customers tend to leave the incumbent service providers. Similarly, in this study, push factors illustrate the disadvantages of cash payment, such as low satisfaction and inconvenience.

#### 3.1.1. Low Satisfaction at Cash Payment

Satisfaction is a positive factor that influences the repurchase intention or revisits or recommendation of customers, which is the negative of switching intention (Chang et al., 2014). The switching intention of unsatisfied customers is more significant than satisfied customers because the dissolution of a relationship is high when satisfaction is low (Burnham et al., 2003; Kim et al., 2004). Hence, we believe that when customers hold low satisfaction with the cash payment, they will feel the low level of perceived usefulness and perceived ease of use that motivate the switch to mobile payment.

H1a: Low satisfaction at cash payment positively influences on perceived usefulness.

H1b: Low satisfaction at cash payment positively influences on perceived ease of use.

#### 3.1.2. Inconvenience of Cash Payment

Cash is one of the oldest modes of payment. With cash payment, users must carry an amount of cash in the wallet and suffer uncomfortable feelings, such as worrying about losing their wallet or limiting spending what they have on hand or just a "thick" or "heavy" wallet. In terms of payment speed, cash is lower than credit cards or mobile payments. With mobile payment, customers can make the financial transaction very simple for the goods or services at anytime from anywhere, save time and reduce personal risk (Zhou, 2011). Moreover, Keaveney (1995) and Lai et al. (2012) pointed out inconvenience is a negative factor that pushes customers away from the existing service provider, leading to the following hypotheses.

H2a: Inconvenience of cash payment positively influences on perceived usefulness.

H2b: Inconvenience of cash payment positively influences on perceived ease of use.

### 3.2. Pull Factors

Pull factors are positive factors of the alternatives that motivate consumers to switch since a substitute has some advantages over the incumbent. In this research, pull factors indicate attractive forces that invite consumers to switch to mobile payment. They show the advantage of mobile payment that is measured through alternative attractiveness and mobility.

#### 3.2.1. Alternative Attractiveness

The alternative attractiveness is the satisfaction of customers on the competing alternatives service provider in the marketplace that they intend to switch to. It means that users expect the product or service of the alternative provider is better than the existing provider. Keaveney (1995) argued that consumers would switch to a new service provider if

they recognize new suppliers are better or more trustworthy or pleasant, even the price of the new service provider is higher. The advantages of mobile payment, such as speed, mobility, availability, conveniences, and reducing personal risk, are more dominant than other payment methods (Teo et al., 2015). Furthermore, mobile payment service providers offer promotions to consumers with high-value gifts or reductions on the total bill. Thus, we have:

H3a: Alternative attractiveness positively influences on perceived usefulness.

H3b: Alternative attractiveness positively influences on perceived ease of use.

### 3.2.2. Mobility

Mobility is the key advantage of mobile payment. Mobility means that users can access ubiquitous services regardless of time and place (Au & Kauffman, 2008). In respect of mobile payment, mobility is explained as the ability of customers to access and make financial transactions anywhere and anytime without intermediaries through their mobile devices (Dahlberg et al., 2003). Mobile payment allows users to make payments for goods, services, and bills flexibly and with more freedom and value than traditional payment methods. Moreover, the significant positive relationships among mobility, perceived usefulness, and perceived ease of use were confirmed in previous studies (Dahlberg et al., 2003) and Tran et al., (2018)). Hence, we develop the following hypothesis.

H4a: Mobility positively influences on perceived usefulness.

H4b: Mobility positively influences on perceived ease of use.

### 3.3. Mooring Effects

Mooring effects include cultural values perceived that play an essential role in staying decisions in their current location or move to a new place (Bansal et al., 2005). Furthermore, mooring effects contain the social elements and the personal factors that facilitate or hinder consumers' stay with the incumbent service provider or switch to an alternative service provider (Chang, 2014). In this study, mooring factors are shown through personal innovativeness, mobile payment knowledge, perceived risk.

### 3.3.1. Mobile Payment Knowledge

Users often face an inherent risk when switching to a new IT service because the outcomes are generally unidentified as well as evaluating a service before contracting is difficult (Sharma et al., 2000). Users who have a broad knowledge of the products or services or types of providers in the marketplace will have better skills to evaluate alternatives, thereby reducing risks and easily moving from one provider to another. In the current study, we assume that consumers have mobile payment knowledge, so mobile payment would be a good option to replace cash payment. Kim et al. (2010), mobile payment knowledge has a more significant effect on perceived ease of use. Users with significant mobile payment knowledge can use expertly mobile payment that is useful in their lives and work.

Thus, we have:

H5a: Mobile payment knowledge positively influences on perceived usefulness.

H5b: Mobile payment knowledge positively influences on perceived ease of use.

### 3.3.2. Personal Innovativeness

According to Chang et al. (2014), personal innovativeness toward information technology is defined as the degree to which an individual is willing to try out the new information systems and technologies. Rogers (1983) claims that personal innovativeness is the degree of an individual actively explores new information systems and technologies. The great positive effect of personal innovativeness on the acceptance of new technologies is recognized in many previous studies (Agarwal et al., 1998; Tran et al., 2018). In switching research marketing, individuals with high personal innovativeness are willing to take uncertain results and risk of alternatives if the substitutes are better than the incumbent product or service (Lopez, 2006). The highly innovative persons who usually enjoy experimenting with new products or services may be open to switching to a new IT. Therefore, we hypothesize:

H6a: Personal innovativeness positively influences on perceived usefulness.

H6b: Personal innovativeness positively influences on perceived ease of use.

### 3.3.3. Perceived Risk

Perceived risk is the subjective expectation of losses or sacrifice related to purchasing or usage, and it is the main barrier that inhibits consumers from making a purchase (Zhou, 2011). Similar to the other payment services, the security of transactions and issues related to uncertainty and risk are important factors when consumers evaluate and consider accepting mobile payments. Like other payment services, private financial information such as identity, confidential data required to transmit and store in the mobile payment process can be stolen by hackers to access and conduct unauthorized monetary transactions. Therefore, we hypothesize:

H7a: Perceived risk positively influences on perceived usefulness.

H7b: Perceived risk positively influences on perceived ease of use.

### 3.4. Perceived Ease of Use, Perceived Usefulness, Intention to Switch

The user's behavioral intentions in the TAM model are driven by perceived ease of use and perceived usefulness. While perceived ease of use is the degree to which a person believes that using a particular system would be free of effort, perceived usefulness refers to the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). According to the modified TAM model (Lee, 2011), we develop the following hypothesis:

H8: Perceived ease of use positively influences on the perceived usefulness.

H9: Perceived ease of use positively influences on switching intention to mobile payment in Vietnam

H10: Perceived usefulness positively influences on switching intention to mobile payment in Vietnam.

### 3.5. Moderator Effects

As of moderating effect, the customer characteristics influent to intention to use. However, there still exists a gap in the context of e-commerce literature. We hence suggested the following hypotheses:

### 3.5.1. Switching Cost

Consumers will consider the costs and benefits of switching when they switch from purchasing the current product or service to another. The switching cost is the main negative factor because people only switch when the benefits outweigh the costs (Lee et al., 2001). The costs of switching from cash payment to mobile payment are both the economic costs, including the actual mobile equipment costs, transaction costs, and access fees (Wu, 2005), and non-monetary costs as time and effort, emotional and psychological cost, unfamiliarity, uncertainty and learning costs (Han et al., 2011). According to IFC (2020), Cash on Delivery (COD) is the most common payment method in Vietnam (83%) in the E-commerce field, and cash is the king because the advantage of this method payment is cost-free. In this research, switching cost has a moderating effect on customers' decision to switch from cash payment to mobile payment.

H11: Switching cost will moderate the relationships between the variables.

### 3.5.2. Habit

Limayem et al. (2007) argued that a person who has been using a particular IT product or service for some time is led to continuing to use it automatically and without thinking. When habits are established, any switch behavior would require more effort, time, and costs to process and evaluate information about new products or services as well as alternative providers. In this study, payment habit means cash is mostly used to pay for purchasing services or products, and COD is chosen to pay for online transactions. Clearly, the intention to switch from cash payment to mobile payment can be moderated by habit. Thus, we hypothesize:

H12: Habit will moderate the relationships between the variables.

A conceptual framework for the paper is developed, including 17 hypotheses are formulated to address the research problems and objectives as shown in Figure 1.

The questionnaire was redrawn and modified from literature to match the switching to mobile payment context in Table.1. A seven-point Likert scale from 1 to 7 corresponding to strongly disagree to strongly agree was applied for all constructs. The questionnaire was translated into Vietnamese and used the back-to-back technique to survey in Vietnam. In addition, the Vietnamese version has the same meanings as the original to ensure the consistency of the English and Vietnamese questionnaires.

**Figure 1. Research Model**



Figure 1. Research Model
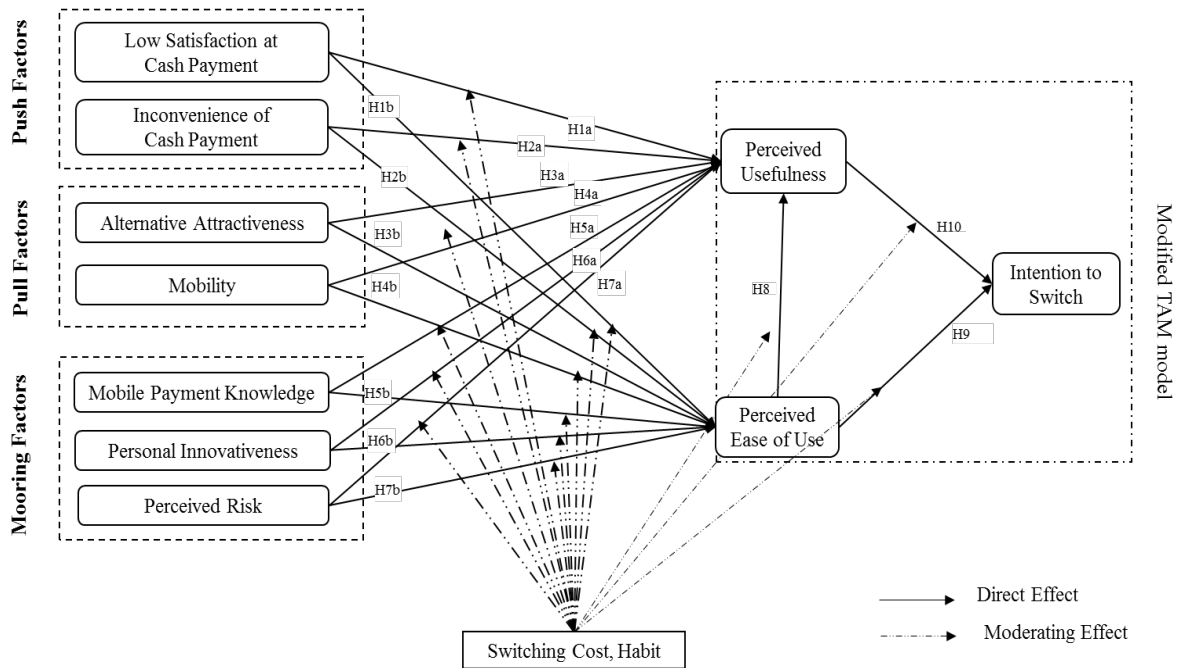
**Table.1. Measurement Items in the Model**

| Factor | Item source | Factor | Item source |
|---|---|---|---|
| Low satisfaction at cash payment | Oliver & Swan (1989) | Perceived risk | Brown et al. (2003) and Tan & Teo (2000) |
| Inconvenience of cash payment | Verhoef (2001). | Habit | Limayem (2007), Venkatesh (2012) |
| Attractive alternatives | Kim (2006), Bansal et al., (2005) | Switching cost | Zhang et al., (2008) |
| Personal innovativeness | Goldsmith et al., (1991), Agarwal et al., (1998) | Perceived usefulness | Davis (1989) and Venkatesh et al., (2000) |
| Mobility | Huang et al., (2007). | Perceived ease of use | Davis (1989) and Venkatesh et al., (2000) |
| Mobile payment knowledge | Sharma et al., (2000). | Intention to switch | Davis (1989), Lee (2011). |

In this study, an online survey applying Google Docs was conducted to target randomly selected Vietnamese from April to July 2019. Among the 420 questionnaires distributed, 406 questionnaires were chosen to analyze after removing 14 negative ones.

**4. Data Analysis and Results**

All of the constructs in this study were examined in terms of reliability, convergent validity, discriminant validity, and Latent variable interaction via SPSS 22 and AMOS 21. Reliability was evaluated with the composite reliability values. Convergent validity shows the extent to that the measure of a construct. Convergent validity can be evaluated using three criteria suggested by Fornell et al. (1981): all indicator factor loadings should be significant

and exceed 0.70, construct reliabilities should exceed 0.80, and average variance extracted (AVE) by each construct should exceed the variance due to measurement errors for that construct. AVE should exceed 0.5 (Fornell et al., 1981). Principal Components Analysis with Varimax rotation was first conducted to extract five factors. The latent variable interaction was used to test the effect of the Moderator in the research. The results show that all items fit their respective factors quite well.

## 4.1 Demographic Analysis

Table 2 illustrates the characteristics of respondents. Most of the responses were generated by males, which occupied 63.05% of our sample size, whereas females accounted for around 36.95%. Regarding age, respondents under 35 years old dominated (62.07%). The respondents are mainly distributed under 10 million per month (76.60%) in terms of income. In addition, most respondents are a student (31.287%) and office worker (30.79%).

**Table 2. Sample Demographics**

| Demographic | Category | Count | % | Demographic | Category | Count | % |
|---|---|---|---|---|---|---|---|
| Gender | Male | 256 | 63.05 | Age | Under 25 | 92 | 22.66 |
| | Female | 150 | 36.95 | | 26-35 | 160 | 39.41 |
| Career | Student | 127 | 31.28 | | 36-45 | 79 | 19.46 |
| | Office worker | 125 | 30.79 | | Over 45 | 75 | 18.47 |
| | Self-employed | 73 | 17.98 | Monthly Income (Million VND) | Under 5 | 166 | 40.89 |
| | Housewife | 61 | 15.02 | | 5-10 | 145 | 35.71 |
| | Others | 20 | 4.93 | | 10-15 | 47 | 11.58 |
| | | | | | Over 15 | 48 | 11.82 |

## 4.2. Measurement Model Assessment

### 4.2.1. Reliability and Validity

**Table 3. Results of Cronbach's Alpha Check**

| Construct name | Variable | Cronbach's α | Construct name | Variable | Cronbach's α |
|---|---|---|---|---|---|
| Low Satisfaction at Cash Payment | LS | 0.894 | Inconvenience of Cash Payment | IC | 0.855 |
| Attractive Alternatives | AL | 0.822 | Mobility | MB | 0.899 |
| Mobile Payment Knowledge | KN | 0.796 | Personal Innovativeness | IN | 0.913 |
| Perceived Risk | RI | 0.837 | Switching Cost | CO | 0.953 |
| Habit | HA | 0.913 | Perceived Usefulness | PU | 0.859 |
| Perceived Ease of Use | PE | 0.866 | Intention to Switch | IS | 0.873 |

Cronbach's alpha was applied to check the internal consistency and reliability of the items. Cronbach's Alpha test results (Table 3) show the value in all cases (0.796 ~ 0.913) over 0.7, implying that the data are reliable. The Exploratory Factor Analysis (EFA) was

performed, which divided factors into 12 components. All items were well loaded with factor loading of more than 0.5.

*4.2.2 Measurement Model Assessment*

Confirmatory Factor Analysis (CFA) was assessed to check the reliability and construct validity. As the CFA results, the seven model-fit measures were satisfactory which is good evidence for the validity of the model ($\chi2$ = 871.752; df = 584; $\chi2$/df = 1.493; CFI = 0.967; NFI = 0.908; IFI = 0.968; RMSEA = 0.035). According to Table 3, the average variance extracted (AVE) for all cases (0.501~ 0.785) were higher than 0.5 and all CR value also exceeded 0.7 (0.801~0.916). These values showed strong evidence of convergent validity (Fornell et al., 1981). To test the discriminant validity of the constructs, we compared the square root AVE of each construct with the correlation coefficients. The correlation matrix in Table 4 illustrates that the highest value of correlation coefficient (0.644) is smaller than the lowest values of square root AVE (0.708) indicating the evidence of the discriminant validity (Fornell et al., 1981).

**Table 4. Convergent Validity and Correlation Matrix of Latent Constructs**

|    | CR | AVE | AL | MB | LS | PE | IN | IC | KN | PU | IS | RI |
|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| **AL** | 0.824 | 0.610 | **0.781** | | | | | | | | | |
| **MB** | 0.900 | 0.693 | 0.426 | **0.832** | | | | | | | | |
| **LS** | 0.896 | 0.682 | 0.452 | 0.506 | **0.826** | | | | | | | |
| **PE** | 0.873 | 0.633 | 0.524 | 0.502 | 0.541 | **0.796** | | | | | | |
| **IN** | 0.916 | 0.785 | 0.161 | 0.228 | 0.250 | 0.333 | **0.886** | | | | | |
| **IC** | 0.857 | 0.599 | 0.573 | 0.593 | 0.554 | 0.562 | 0.185 | **0.774** | | | | |
| **KN** | 0.801 | 0.501 | 0.254 | 0.357 | 0.463 | 0.355 | 0.178 | 0.387 | **0.708** | | | |
| **PU** | 0.861 | 0.609 | 0.601 | 0.567 | 0.587 | 0.644 | 0.310 | 0.600 | 0.403 | **0.780** | | |
| **IS** | 0.875 | 0.637 | 0.577 | 0.643 | 0.558 | 0.546 | 0.195 | 0.665 | 0.490 | 0.632 | **0.798** | |
| **RI** | 0.838 | 0.633 | -0.186 | -0.217 | -0.194 | -0.261 | 0.040 | -0.184 | -0.190 | -0.299 | -0.287 | **0.795** |

*4.3. Structural Model Analysis*

Structural equations modeling (SEM) was used to examine the hypotheses of the proposed model. The model fitting indices of the constructs model ($\chi2$ = 973.189; df = 591; $\chi2$/df = 1.647; CFI = 0.957; NFI = 0.897; IFI = 0.957; RMSEA = 0.040) met the appropriate levels. Inspection of the path coefficients was assessed to check the research hypotheses. Table 5 and Figure 2 show the results of the tests of the hypotheses, with fifteen of the seventeen hypotheses were adopted and two hypotheses were rejected. Regarding explanatory power, the model explained 65.0% of the variation in perceived usefulness, 50.4% of the variation in perceived ease of use. Moreover, the switching intention from cash payment to mobile payment was explained by 49.4% of the variance in the model. To summarize, Figure 2 presents the estimation results.

**Table 5. Results of Estimated Structural Coefficients**

| Hypotheses | Path | Std. Weights | S.E. | C.R. | P | Results | R² |
|---|---|---|---|---|---|---|---|
| H1a | LS → PU | .155 | .043 | 2.794 | .005 | Supported | |
| H2a | IC→PU | .128 | .059 | 2.013 | .044 | Supported | |
| H3a | AL→PUS | .256 | .051 | 4.531 | *** | Supported | |
| H4a | MB→PU | .171 | .044 | 3.206 | .001 | Supported | 0.650 |
| H5a | KN→PU | .079 | .056 | 1.620 | .105 | Not Supported | |
| H6a | IN→PU | .099 | .034 | 2.403 | .016 | Supported | |
| H7a | RI→PU | -.116 | .043 | -2.714 | .007 | Supported | |
| H1b | LS→PE | .187 | .060 | 3.112 | .002 | Supported | |
| H2b | IC→PE | .196 | .083 | 2.817 | .005 | Supported | |
| H3b | AL→PE | .218 | .070 | 3.641 | *** | Supported | |
| H4b | MB→PE | .122 | .061 | 2.088 | .037 | Supported | 0.504 |
| H5b | KN→PE | .046 | .079 | .855 | .392 | Not Supported | |
| H6b | IN→PE | .183 | .047 | 4.138 | *** | Supported | |
| H7b | RI→PE | -.124 | .059 | -2.669 | .008 | Supported | |
| H8 | PE→PU | .173 | .046 | 2.932 | .003 | Supported | |
| H9 | PE→IS | .213 | .063 | 3.372 | *** | Supported | 0.494 |
| H10 | PU→IS | .546 | .086 | 8.157 | *** | Supported | |

**Figure 2. The Result of Hypothesis Test**
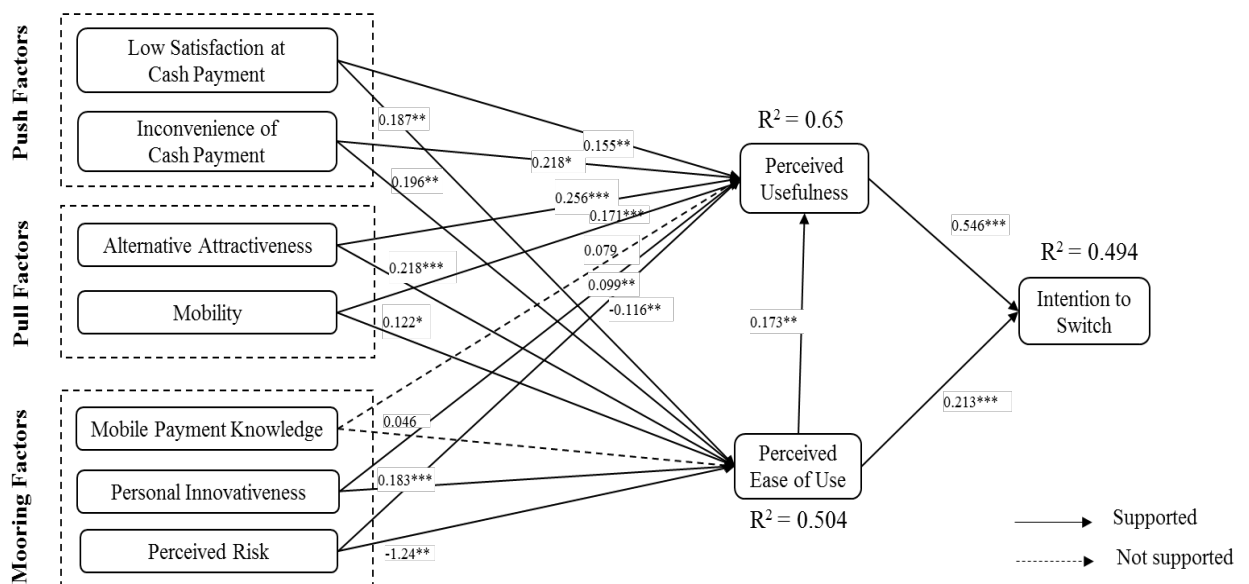


### 4.4. The Test of The Moderating Effect

A pairwise parameter comparison was analyzed to test the hypothesis regarding the moderation of switching cost and habit. To do so, respondents were divided into low switching cost group (Group A) with an average point less than or equal to 4 with 101 persons, the remaining 305 persons categorized in Group B with high switching cost.

Similarly, the high habit group (Group C) contained 122 respondents with an average point over 4, and 294 respondents belonged to the low habit group (Group D). To verify the difference between groups, pairwise parameter comparisons were conducted by computing the critical ratios for differences between parameters (Z-statistics) that were confirmed with statistical significance level DBP ±1.96. As the data analysis result, there is no difference between the low and high switching cost groups, thus, rejecting hypothesis 11.

As shown in Table 6, the relationship between the inconvenience of cash payment and perceived usefulness is affected by the difference test statistic -2.216** between the low and high habit groups. By contrast, it was found that the high habit group is more sensitive to the different test statistic 3.551*** in the effect of perceived ease of use on perceived usefulness. In addition, the effect of mobile payment knowledge on perceived ease of use was more significant in group C than group D, and the different test statistics are -2.484**. However, it was found that group D was more sensitive to the different test statistic 2.114** in the effect of personal innovativeness on perceived ease of use. Finally, the relationship between perceived ease of use and switching intention is affected by the difference test statistic -2.194** between group C and group D.

**Table 6. Testing for Moderator Effect of Habit**

| Hypotheses | Path | Standardized Estimate | | Critical Ratio for Differences Between Parameters | Result |
|:---:|:---:|:---:|:---:|:---:|:---:|
| | | Group C (112) | Group D (294) | | |
| H2a | IC→PU | 0.430** | 0.072 | -2.216** | Difference |
| H5b | KN→PE | 0.487** | -0.001 | -2.484** | Difference |
| H6b | IN→PE | 0.080 | 0.275*** | 2.114** | Difference |
| H8 | PE→PU | -0.438* | 0.223*** | 3.551*** | Difference |
| H10 | PE→IS | 0.446*** | 0.147 | -2.194** | Difference |
| | | | | *** p < 0.001, ** p < 0.01, * p < 0.05 level of significance | |

## 5. Discussions

Regarding pull factors, the alternative attractiveness has the greatest impact on both perceived ease of use and perceived usefulness and indirectly affects customers' intention to switch from cash payment to mobile payment in Vietnam. It can be explained that consumers expect to have a good financial transaction based on the advantages of mobile payments. Besides, the attractiveness of mobile payment is climbed because mobile payment is introduced on social media by the Vietnamese government in order to aim the electronic payment goal by 2020. Regarding mobility, the results also illustrate that mobility played a crucial role in predicting switching intention to mobile payment. Previous studies have emphasized the role of mobility in previous studies about the adoption of mobile payment (Liu & Tai, 2016; Kim et al., 2010; Daştan et al., 2016; Tran et al., 2018). Mobility is the

main advantage of mobile payment. With a smartphone, customers can make financial transactions anywhere, anytime, which is impossible for cash payments.

Regarding push factors, the inconvenience and low satisfaction of cash payment are the reasons for pushing users to switch from cash to mobile payment. The inconvenience of cash is carrying money in the wallet and limiting spending, the risk of getting stolen, and slow speed. The introduction of innovative payment methods, especially mobile payment with many benefits and conveniences, is the reason for the rising dissatisfaction of customers with cash payment. The role of push effects on switching intention was found similar results in several previous works (Keaveney, 1995; Lai et al., 2012).

With respect to the mooring effect, the results show that personal innovativeness has the greatest positive impact on both perceived usefulness and perceived ease of use, whereas the perceived risk was confirmed to have a negative effect. Nevertheless, the impact of mobile payment knowledge was not found. It can be explained that individuals with high innovation often quickly recognize potential benefits and like to experience new technologies such as mobile payment. As for perceived risk, the finding of the negative impact of perceived risk is consistent with previous mobile payment acceptance studies (Pham & Ho, 2015, Lu et al., 2011). Users worry about the safety of their private financial information during the mobile payment process, as well as the chance of being swindled in the Internet environment. Risk and security are always the top concern of consumers for financial transactions. Finally, related to mobile payment knowledge, although product understanding will help customers use easily, experience confidently, and avoid risks. A usage, privacy and security policy, usefulness of mobile payment is introduced via promotional campaigns that increase the mobile payment knowledge of Vietnamese. What is more? The mobile payment process is simple, fast, and is step-by-step guided with specific illustrations via demo video. Thus, mobile payment is not a very difficult task and can be performed by many people.

Regarding the moderation test, while the moderating effect of habit was also confirmed, the impact of switching cost was not found. In Vietnam, most people have a habit use cash payment. Although most people have bank accounts, cash withdrawals from ATMs machine are Vietnam's most popular payment activity. For shopping online, 75% of customers choose COD for payment. If users have a strong habit of using the incumbent product or service, it will become a significant barrier that inhibits consumer switching. Ye & Potter (2007) have emphasized the role of the habit as a moderator in the acceptance switching of individual information technologies. Nevertheless, the switching cost would not moderate the relationship in the model. This can be explained by the fact that almost all Vietnam users have already owned a smartphone; thus, the cost of purchasing mobile devices for mobile payment purposes is almost zero. Concerning non-monetary costs, the mobile payment process is fast and straightforward. Hence the customers spend less effort to learn how to use it easily.

## 6. Conclusions

This research aims to explore the determinants that affect switching from cash payment to mobile payment in Vietnam. To achieve this goal, a research model was combined from the modified TAM model with the PPM framework, which is the favorite model in the switching field. The relationships of variables in the proposed model were assessed and further validated the moderating impacts on relationships, including switching cost and habit.

The main contributions of this research are: The results of empirical analysis show that both perceived usefulness and perceived ease of use are most affected by alternative attractiveness, which also indirectly influences the switching intention. Mobility and low satisfaction at cash payment are significant predictors of perceived ease of use, followed by the inconvenience of cash payment, personal innovativeness. In addition, the results also point out that inconvenience and low satisfaction at cash payment are the significant determinants that influence perceived usefulness, followed by personal innovativeness, mobility. However, perceived risk has a negative effect, and the influence of mobile payment knowledge is not confirmed. Moreover, the results imply that switching intention from cash payment to mobile payment in Vietnam is more directly impacted by the perceived usefulness than perceived ease of use.

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# FACTORS AFFECTING THE BEHAVIOR OF USING E-WALLETS IN HANOI: A COMPARATIVE STUDY OF MOMO AND MOCA E-WALLETS

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## Abstract

*Momo and Moca e-wallets are considered to be the two most commonly used in big cities in Vietnam. Six factors that affect users' behavior of using e-wallets: Security and Privacy, Performance Expectancy, Ease of Use, Social Influence, Behavioral Intention, Experience. Comparative study of Performance Expectancy factors affecting the behavior of using Momo and Moca e-wallets. The degree of influence on the behavior of using Momo and Moca e-wallets is different. The research results will be useful for administrators to increase the use of e-wallets soon.*

***Keywords:*** *E–Wallets, Actual Behaviour, Hanoi.*

## 1. Introduction

In 2008, when the e-commerce market requires suitable payment tools, e-wallets are expected to help buyers and sellers quickly connected. An e-wallet is a virtual wallet that stores payment card information on a computer or mobile device, to facilitate not only online purchases but also payments at retail points (Tolety, 2018). In the context of the complicated situation of the Covid-19 epidemic, non-cash payment methods are increasingly developing and gradually becoming a habit of many Vietnamese people, especially in big cities like Hanoi. Accordingly, the trend of using e-wallets in payment is continuously spreading, positively contributing to moving Vietnam towards a cashless economy-oriented by the Government.

Among the types of e-wallets in Vietnam today, Momo and Moca are the most popular. With the strength of convenience and rich ecosystem, Momo e-wallet is quickly connected by banks. Currently, MoMo is a direct affiliate partner of 20 banks, with more than 100 utilities integrated on Momo e-wallet. Based on popularity, from subscriber data and market share, Momo is currently the e-wallet with the largest and the most popular market share in Vietnam. Momo is most commonly used to recharge phones, transfer money, and pay recurring bills. Moca used to the needs of technology car payments, phone recharges, money transfers, and food delivery. Moca e-wallet on Grab app is the latest form of electronic payment wallet designed for Grab users in Vietnam. It is a cooperation between Grab and Moca - one of the leading mobile payment applications in Vietnam. Currently, the services of money transfer, phone top-up, in-store payment, bill payment have been integrated into Moca e-wallet to enhance utility services for users.

Both Momo and Moca e-wallets provide the same utilities to users, but there is a significant difference in market share in big cities like Hanoi. One of the most important reasons for this is the acceptance and habit of using e-wallets. Therefore, it is necessary to learn and evaluate the factors affecting the user's behavior of using e-wallets. This study aims to understand the difference in factors affecting the behavior of Momo e-wallet users and factors affecting the behavior of Moca e-wallet users based on the acceptance and use of technology - UTAUT model (Venkatesh et al., 2003). The research results can help administrators determine the appropriate impact direction to promote the trend of using e-wallets shortly.

## 2. Literature review and theoretical framework

E-wallet is a technological innovation in the consumer payment process. Personal reactions to technology use directly affect individuals' intention to use, which in turn affects actual use. Therefore, the integrated use and technology acceptance model - UTAUT (Venkatesh et al., 2012) is used as the theoretical basis for this study. UTAUT is the combination of theories from rational action theory, technology acceptance model, planned behavior theory, innovation spillover theory, and social cognitive theory. This model has been used to test different technologies and online payment instruments (Williams et al., 2011; Junadi & Sfenrianto, 2015; Slade et al., 2015).

In the 4.0 technology revolution, all areas of the economy and society become digitized, and online payment inevitably develops due to convenience and ease of use. E-wallets are provided for storing cryptocurrencies and paying for online purchases (Ajmera & Bhatt, 2020). The study of user intent and behavior towards e-wallets is very necessary for e-wallet providers to expand market share and retain customers (Venkatesh et al., 2012). Using the model ATAUT, Shankar & Datta (2018) proposes and evaluates the influence of ease of use, perceived usefulness, perceived reliability, social influence, and individual innovation on usage electronic wallet. Chandra & Kumar (2018) demonstrated that perceived usefulness, ease of use, social influence, and trust bias have influenced behavioral intentions to use mobile banking services. Factors influencing e-wallet usage behavior include not only consumer factors (perceived usefulness, ease of use, and perceived reliability) but also influence by external factors (social influences, facilitation, and lifestyle compatibility) to enhance user intent. Therefore, this study focuses on examining the influence of factors (Security and privacy; Expected usefulness, Ease of use, Social influence, Experience, intention to use) on the actual behavior of using Momo and Moca e-wallets in Ha Noi and then comparing them.

### 2.1. Security and Privacy

Security is the restriction of the potential for misuse of resources and assets. Confidentiality is ensured by authentication, information verification, and data security (Chen, 2008). For electronic wallets, security is the level of security when using the wallet to pay through mobile applications (Donald & Rémy, 2012). Customers using e-wallets have the

right to keep their information and transactions confidential (Chen, 2008). All information must be kept intact, not allowing access and not using personal information for other purposes. It requires the technology system to be secure. Safety and security will positively affect behavioral intentions (Donald & Rémy, 2012). When users feel that the provider is reliable and safe, they will trust the mobile payment method, and increase their intention to use this method (Liu & Tai, 2016).

*Hypothesis H1: Security and Privacy have a positive influence on the behavior of using Momo and Moca e-wallets.*

### 2.2. Performance Expectancy

When adopting a technology, users expect its use to be helpful in their work (Venkatesh et al., 2003). That is the user's perception of the system's functionality and efficiency. If they believe that new technology helps them do a better job, they are likely to adopt it more (Liébana-Cabanillas et al., 2014). Usefulness is the degree to which a person believes that using a particular system will enhance their job performance" (Davis, 1989). Digital infrastructure contributed to the information delivery system, thereby enhancing the effect of the performance expectancy of the system on intention to use technology. Performance expectancy has been shown that it has a positive effect on the intention to use electronic payments under uncertain conditions (Liu & Tai, 2016). For digital wallets, expected usefulness is the degree to which the user will improve their job performance. Consumers believe that using e-wallets will bring them many benefits in payment. Previous studies have demonstrated expected usefulness to be a strong predictor of the behavioral intention of e-wallet users (Intarot & Beokhaimook, 2018).

*Hypothesis H2: Performance Expectancy has a positive effect on Momo and Moca e-wallet usage.*

### 2.3. Ease of use

Some technology applications that are easier to use are more acceptable to users (Davis, 1989). The easy application of technology makes e-wallets a widely used payment method. Empirical studies have demonstrated that ease of use is an important factor influencing acceptance and behavioral intention to a technology (Chawla & Joshi, 2020). The experience of using an e-wallet application is reported as easy to use by many consumers (Hamid et al., 2016). The perceived level of comfort and ease in using technology leads to an enjoyable experience. According to Chau & Ngai (2010), Abbad (2013), comfortable feeling when using will lead to customer's intention to use

*Hypothesis H3: Ease of use has a positive influence on the behavior of using Momo and Moca e-wallets.*

### 2.4. Social influence

Social factors are intrinsic to the subjective culture of the reference group, and specific interpersonal agreements have been made in specific social situations (Thompson et al.,

1991). In the UTAUT model, an individual find that significant others around them believe that they should use new technology (Venkatesh et al., 2012; Junadi & Sfenrianto, 2015). In payment via e-wallet, the degree to which members have close relationships in society (friends, family, colleagues, ...) influences the intention and behavior of using payment services. Payment via e-wallets in the early stages of using technology when there is not enough experience and trust. At the same time, the continuous development of technology and communication also makes technology users more and more influenced by the community (Nguyen et al., 2014; Han, 2020).

*Hypothesis H4: Social factors have positive influence on the behavior of using Momo and Moca e-wallets.*

### 2.5. Experience

The role of experience was empirically tested using the analysis of Davis (1989). Những trải nghiệm của người dùng tạo ra những phản ứng chủ quan riêng. Hành vi tương lai sẽ được xác định bởi những kinh nghiệm trước đó. The experience reflects the opportunity to use a target technology and is often run by the time since an individual first used the technology (Venkatesh et al., 2012). Many studies have suggested that experience highlights the influence of factors such as ease of use (Davis, 1989; Szajna, 1996), perceived usefulness (Taylor & Todd, 1995), behavioral intention (Karahanna et al., 1999; Venkatesh et al., 2012). Purnama et al.(2021) shows that transaction experience affects e-wallet user satisfaction.

*Hypothesis H5: Experience has a positive effect on the behavior of using Momo and Moca e-wallets.*

### 2.6. Behavioral Intention

Attitude-to-behavior modeling is a key model for understanding human behavioral predictors for potential technology acceptance or rejection (Wijayanthi, 2019). The intention is the user's willingness to use, including the intention to use, the usage plan, and the prediction of the use of the electronic wallet (Venkatesh et al., 2003). The higher the consumer intention, the higher the actual behavior (Ajzen & Fishbein, 1975). Nikou and Economides (2017) studied cognitive and user-interface feedback to predict the relationship between intention-to-use behavior of e-wallets to discover a positive effect of behavior intention to use e-wallets.

*Hypothesis H6: Behavioral intention has a positive influence on the behavior of using Momo and Moca e-wallets.*

### 2.7. Actual Behavior

The actual behavior of using e-wallets in payment is a dependent variable in the research model (Legris et al., 2003) because the use of information systems is considered as a indicator of success in technology application (Al-Gahtani, 2001; Davis, 1989). To examine the actual behavior of using e-wallets, previous studies have analyzed aspects such as

frequency of use (Kim & Gyo, 2008; Jiajun & Carl, 2005; Mohamed & Tarek, 2013), comfort comfortable and active when using e-wallets (Al-Gahtani, 2001).

The purpose of this study is to examine whether the online payment method via e-wallet is accepted by consumers with the two most popular e-wallets today, Momo and Moca. Therefore, this study compares which is more acceptable to users of e-wallets, and which factors influence the difference in usage behavior between these two types of e-wallets. Research is developed from theoretical research models of technology user behavior. Based on the application of the technology acceptance model and the unified use of UTAUT in the study of user behavior for e-wallets, the factors that are considered and evaluated are the Level of Security and Privacy; Usefulness, Ease of Use, Social Influence, Experience, Intention to Use.

The proposed theoretical model is as follows:

**Figure 1. Proposed research model**
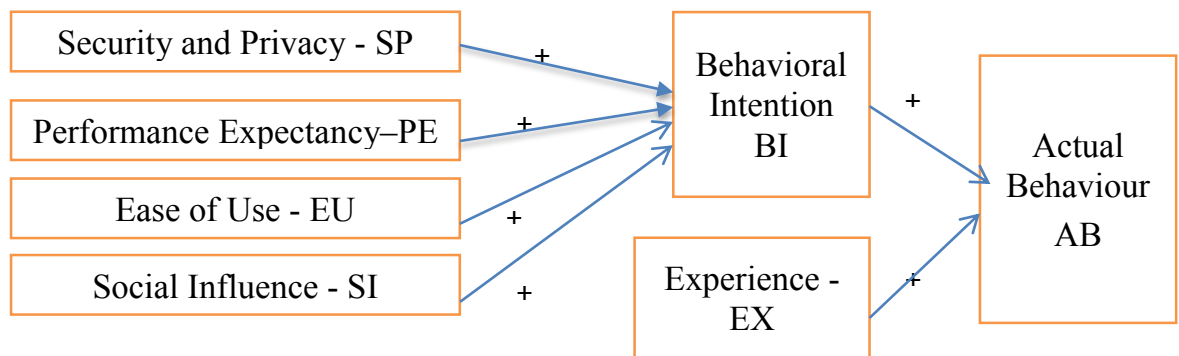


*Source: Recommendation of the authors.*

## 3. Methods

Qualitative research methods are used to identify influencing factors, develop research hypotheses, propose research models, determine the source and content of the scales in the proposed model. The quantitative research method was carried out to quantify observed variables, measure, analyze and explain the relationship of factors affecting the behavior of using Momo and Moca e-wallets.

To collect primary data for the research, the authors conducted a survey of 500 e-wallet users in Hanoi city during the period from June 7 to 11. The pilot study was conducted from June 7 to 11 with a research sample of 50 users of Momo e-wallet and 50 users of Moca e-wallet according to a pre-designed questionnaire to adjust the questions in the questionnaire. survey to suit the respondents, and evaluate the reliability of the scales. The questionnaire was built based on previous studies on the factors affecting the intention and behavior of using e-wallets. The sampling method in experimental research is convenience sampling. The questionnaire was sent directly via the internet to respondents in the contact list of the authors using Momo or Moca e-wallets. The sampling process stops when 50 valid votes are reached. Collected data shows that the proposed scales are reliable in quantitative analysis.

Because the study population is too large, the sampling survey method is more suitable in this study. The official study was conducted from June 21 to June 27 with the required research sample of 98 Momo e-wallet users and 98 Moca e-wallet users (excluding those surveyed in the trial study). This is the minimum number of the sample for regression analysis, using the sampling formula n>= 50 + 8p, where n is the sample size, p is the number of independent variables (Tabenick & Fidell, 2007). The survey was broadcast live and sent over the internet in the form of Google Forms. Selected respondents are those who have used Momo or Moca e-wallets in payment. The results obtained 106 valid answer sheets in the Momo wallet user behavior survey and 106 valid answer votes in the Moca wallet user behavior survey.

The obtained data are processed by SPSS 25.0 software through the following steps: descriptive statistics, reliability assessment of the scale, exploratory factor analysis (EFA), correlation coefficient analysis, and regression.

## 4. Results and Discussion

### 4.1. Regression analysis of factors affecting the behavior of using MoMo wallets

**Evaluation of the reliability of the scale**

The results of testing the reliability of the scale by Cronbach's Alpha show that the scales of the factors affecting the behavior of using Momo wallet has a confidence level greater than 0.6 with a total correlation coefficient greater than 0.3. All scales satisfy the conditions for EFA exploratory factor analysis.

**Table 1. Results of evaluating the reliability of the scale of factors affecting the behavior of using MoMo wallets**

| No. | Variable name | Symbol | Number of observed variables | Cronbach's Alpha coefficient Cronbach's Alpha | Coefficient of correlation of the smallest variable |
|-----|---------------|--------|------------------------------|-----------------------------------------------|-----------------------------------------------------|
| 1 | Security and Privacy | SP | 4 | .746 | .465 |
| 2 | Performance Expectancy | PE | 4 | .766 | .470 |
| 3 | Ease of Use | EU | 4 | .781 | .525 |
| 4 | Social Influence | SI | 4 | .790 | .563 |
| 5 | Behavioral Intention | BI | 3 | .874 | .692 |
| 6 | Experience | EX | 4 | .879 | .716 |
| 7 | Actual Behavior | AB | 3 | .748 | .326 |

*Source: Result of processing survey data using SPSS software*

**Results of factor analysis examination explore independent variables affecting Behavioral Intention**

**Table 2. Result of factor analysis to discover independent variables affecting BI**

|  | Component | | | |
|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 |
| PE4 | .826 | | | |
| PE3 | .786 | | | |
| PE2 | .720 | | | |
| PE1 | .630 | | | |
| SP1 | | .836 | | |
| SP4 | | .755 | | |
| SP2 | | .690 | | |
| SP3 | | .636 | | |
| EU4 | | | .830 | |
| EU2 | | | .826 | |
| EU3 | | | .754 | |
| EU1 | | | .732 | |
| SI1 | | | | .888 |
| SI3 | | | | .849 |
| SI2 | | | | .778 |
| SI4 | | | | .742 |

*Source: Result of processing survey data using SPSS software.*

Factor analysis affecting intention to use Momo e-wallet was performed with Principle Component extraction, Varimax rotation for dependent observable variable. The analysis results show that the coefficient KMO = 0.630 (condition > 0.5); The significance level and the Barlett test = 0.000 (condition < 0.05) show that the EFA analysis is appropriate. Total variance extracted is 65,107% > 50%; and factor loading factors are all greater than 0.5, so they are satisfactory. The official scale of factors affecting the intention to use Momo e-wallet after EFA processing includes 16 observed variables as proposed.

Independent factor analysis BI and EX influence on the behavior of using MoMo e-wallet is done with Principle Component extraction, Varimax rotation for dependent observable variable. The analysis results show that the coefficient KMO = 0.695; The significance level and the Barlett test = 0.000 show that the EFA analysis is appropriate. The total variance extracted is 76.597% > 50%; and factor loading factors are all greater than 0.5,

so they are satisfactory. The official scale of factors affecting the intention to use MoMo e-wallet after EFA processing includes 7 observed variables as proposed.

**Table 3. Result of exploratory factor analysis BI and EX**

|  | Component | |
|---|---|---|
|  | 1 | 2 |
| EX4 | .887 |  |
| EX3 | .863 |  |
| EX1 | .844 |  |
| EX2 | .828 |  |
| BI1 |  | .911 |
| BI2 |  | .909 |
| BI3 |  | .851 |

*Source: Result of processing survey data using SPSS software*

**Regression analysis results**

The regression result of factors affecting intention to use e-wallet is 0.696 for adjusted R square, showing that the factors SP, PE, EU, SI explain 71.5% of the change in intention to use Momo e-wallet. The Durbin-Watson coefficient is 2.081, in the range from 1.5 to 2.5, so there is no first order series autocorrelation. ANOVA test result is Sig = 0.000 < 0.05, showing that the regression model evaluating the influence of SP, PE, EU, and SI on BI is appropriate. VIF coefficients are all less than 2, so there is no multicollinearity between components that do not appear in the research model.

**Table 4. Regression analysis results of factors affecting intention to use Momo e-wallet**

| Coefficients[a] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|  | B | SE | Beta | | | Tolerance | VIF |
| 1   (Constant) | .645 | .139 |  | 3.581 | .000 |  |  |
| SP | .104 | .013 | .103 | 4.032 | .000 | .860 | 1.163 |
| PE | .214 | .039 | .258 | 3.541 | .000 | .830 | 1.205 |
| EU | .196 | .021 | .191 | 4.987 | .000 | .942 | 1.062 |
| SI | .126 | .016 | .173 | 5.913 | .000 | .998 | 1.002 |
| a. Dependent Variable: BI | | | | | | | |

R Square = 0.715

Adjusted R Square = 0.696    Durbin-Watson= 2.081

F = 85,603      Sig. = 0.000

*Source: Result of processing survey data using SPSS software.*

Regression results of factors affecting the behavior of using e-wallets for the adjusted R squared of 0.570 show that BI and EX factors explain 57% of the change in usage behavior MoMo e-wallet. Watson Durbin- coefficient is 1,943 should not occur autocorrelation superlative chain. ANOVA test results Sig = 0.000 < 0.05, showing that the regression model evaluating the influence of BI and EX on AB is appropriate. VIF coefficients less than 2 imply no multicollinearity between components exists in the research model.

**Table 5. Results of regression analysis of factors affecting behavior of using MoMo**

| | **Coefficients$^a$** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
| Model | | B | SE | Beta | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | .430 | .282 | | 4.122 | .000 | | |
| | EX | .203 | .146 | .153 | 5.035 | .000 | .974 | 1.027 |
| | BI | .272 | .132 | .117 | 5.002 | .000 | .974 | 1.027 |
| a. Dependent Variable: AB | | | | | | | | |
| R Square = 0.775  Adjusted R Square = 0.570   Durbin-Watson= 1.943  F = 75.511      Sig. = 0.000 | | | | | | | | |

*Source: Result of processing survey data using SPSS software*

### *4.2. Regression analysis of factors affecting the behavior of using MoCa wallets*

**Evaluation of the reliability of the scale**

The results of testing the reliability of the scale by Cronbach's Alpha show that the scales of the factors affecting the behavior of using Moca e- wallet all satisfy the conditions for EFA discovery factor analysis.

**Table 6. Results of evaluating the reliability of the scale of factors affecting the behavior of using MoCa wallets**

| No. | Variable name | Symbol | Number of observed variables | Cronbach's Alpha coefficient | The correlation coefficient of the smallest total variable |
|---|---|---|---|---|---|
| 1 | Security and Privacy | SP | 4 | .662 | .307 |
| 2 | Expectancy Performance | PE | 4 | .782 | .496 |
| 3 | Ease of Use | EU | 4 | .833 | .644 |
| 4 | Social Influence | SI | 4 | .729 | .424 |
| 5 | Behavioral Intention | BI | 3 | .714 | .505 |
| 6 | Experience | EX | 4 | .815 | .619 |
| 7 | Actual Behaviour | AB | 3 | .690 | .445 |

*(Source: Result of processing survey data using SPSS software)*

**Result of factor analysis to discover independent variable affecting Behavioral Intention**

**Table 7. Result of factor analysis to discover independent variable affecting BI**

| | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| PE4 | .830 | | | |
| PE1 | .777 | | | |
| PE3 | .744 | | | |
| PE2 | .697 | | | |
| EU1 | | .822 | | |
| EU2 | | .822 | | |
| EU4 | | .812 | | |
| EU3 | | .780 | | |
| SI4 | | | .811 | |
| SI3 | | | .738 | |
| SI1 | | | .698 | |

| | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| SI2 | | | .674 | |
| SP2 | | | | .810 |
| SP4 | | | | .789 |
| SP1 | | | | .645 |
| SP3 | | | | .621 |

*Source: Result of processing survey data using SPSS software*

Analysis factors influencing the intention to use Moca e-wallet is performed with Principle Component extraction, Varimax rotation for dependent observable variable. The analysis results show that the coefficient KMO = 0.737; The significance level and the Barlett test = 0.000 show that the EFA analysis is appropriate. The total variance extracted is 60.416% > 50%; and factor loading factors are all greater than 0.5, so they are satisfactory. The official scale of factors affecting the intention to use Moca e-wallet after EFA processing includes 16 observed variables as proposed.

**Table 8. Result of exploratory factor analysis BI and EX**

| | Component | |
|---|---|---|
| | 1 | 2 |
| EX1 | .810 | |
| EX2 | .804 | |
| EX4 | .795 | |
| EX3 | .791 | |
| BI2 | | .808 |
| BI1 | | .801 |
| BI3 | | .779 |

*Source: Result of processing survey data using SPSS software*

Analysis BI and EX independent factor affecting the behavior of using MoCa e-wallet is done with Principle Component extraction, Varimax rotation for dependent observable variable. The analysis results show that the coefficient KMO = .740; The significance level and the Barlett test = 0.000 show that the EFA analysis is appropriate. The total variance extracted is 65.029% > 50%; and factor loading factors are all greater than 0.5, so they are satisfactory. The official scale of factors affecting intention to use Moca e-wallet after EFA processing includes 7 observed variables as proposed.

### Regression analysis results

Results of factors affecting intention to use e-wallet for R adjusted square is 0.638, showing that the factors SP, PE, EU, SI explain 63.8% of the change in intention to use Moca e-wallet. The Durbin-Watson coefficient is 1.863, so there is no first order series autocorrelation. ANOVA test results Sig = 0.000 < 0.05, showing that the regression model evaluating the influence of SP, PE, EU, and SI on BI is appropriate. VIF coefficients are all less than 2, so there is no multicollinearity between components that do not appear in the research model.

**Table 9. Regression analysis results of factors affecting intention to use MoCa e-wallet**

| Coefficients[a] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
| Model | | B | SE | Beta | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | .547 | .197 | | 4.826 | .000 | | |
| | SP | .027 | .011 | .104 | 3.201 | .000 | .805 | 1.242 |
| | PE | .234 | .029 | .298 | 5.809 | .000 | .793 | 1.261 |
| | EU | .185 | .019 | .187 | 4.854 | .000 | .923 | 1.083 |
| | SI | .133 | .012 | .124 | 3.233 | .000 | .919 | 1.088 |
| a. Dependent Variable: BI | | | | | | | | |
| R Square= 0.796<br>Adjusted R Square= 0.638    Durbin-Watson = 1.863<br>F = 75.409     Sig. = 0.000 | | | | | | | | |

*Source: Result of processing survey data using SPSS software.*

Regression results of factors affecting the behavior of using Moca e-wallet give an adjusted R squared value of 0.740, showing that BI and EX factors explain 74% of the change in behavior vi using MoCa e-wallet. Watson isDurbin- coefficient 1.768 should not occur autocorrelation superlative chain. ANOVA test results Sig = 0.000 < 0.05, showing that the regression model evaluating the influence of BI and EX on AB is appropriate. VIF coefficients are all less than 2, so there is no multicollinearity between components that do not appear in the research model.

**Table 10. Results of regression analysis of factors affecting behavior of using MoCa**

| | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| Model | | B | SE | Beta | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | .303 | .262 | | 5.154 | .000 | | |
| | EX | .022 | .043 | .125 | 5.508 | .000 | .984 | 1.017 |
| | BI | .276 | .051 | .166 | 7.271 | .000 | .984 | 1.017 |
| | a. Dependent Variable: AB | | | | | | | |
| | R Square = 0.745<br>Adjusted R Square = 0.740   Durbin-Watson = 1,768<br>F = 75.25     Sig. = 0.000 | | | | | | | |

*Source: Result of processing survey data using SPSS software*

### 4.3. Discuss comparison with other study

Results analyzed survey data showed that factors Security and Privacy, Performance expectancy, Ease of Use, Social Influence, Behavioral Intention, Experience affect behavior using electronic wallet MoMo and MoCa. In which, Performance Expectancy factor has the biggest influence, followed by Ease of Use, Social Influence, Security and Privacy which has a positive influence on intention to use MoMo and MoCa e-wallets. This result is consistent with previous studies of Liu, GS, & Tai, PT (2016); Liébana-Cabanillas et al (2014); Chau & Ngai (2010), Abbad (2013); Nguyen et al. (2014); Han (2020). Intention to use has a positive influence on the actual usage behavior of e-wallets, and experience also positively affects the actual behavior of using e-wallets.

However, the degree of influence of factors on the behavior of using Momo e-wallet and Moca e-wallet is different. The regression coefficients of the influencing factors are shown in the regression equation below.

For the behavior of using Momo e-wallet:

$$BI = 0.649 + 0.103SP + 0.258PE + 0.191EU + 0.173SI + E_1$$

$$AB = 0.430 + 0.157EX + 0.117BI + E_2$$

For the behavior of using Moca e-wallet:

$$BI = 0.547 + 0.104SP + 0.298PE + 0.187EU + 0.114SI + E_3$$

$$AB = 0.303 + 0.125EX + 0.166BI + E_4$$

Performance Expectancy affects the behavior of using Moca e-wallets more than Momo e-wallets. Meanwhile, Ease of Use, Social Influence have more influence on the behavior of using Momo e-wallet.

## 5. Conclusion

This study proposes a general model to study the factors affecting the use of electronic wallets based on the acceptance and unified technology model UTAUT. From there, determine the difference in factors affecting the behavior of Momo e-wallet users and factors affecting the behavior of Moca e-wallet users. The results show that Security and Privacy, Performance Expectancy, Ease of Use, Social Influence, Behavioral Intention, Experience all positively affect the behavior of using e-wallets. The factor that has the most influence on user behavior is Performance Expectancy, but the influence on Momo e-wallet usage is lower than that of Moca e-wallet. Momo e-wallet is currently the most used and most popular e-wallet. One reason that can be explained from the research results is the influence of Ease of Use, Social Influence instead of the influence of Performance Expectancy and Security and Privacy. This result contributes to providing the basis for solutions to further promote the use of e-wallets in Hanoi in the coming time.

Despite the contributions, this study is not without limitations. The findings and implications were drawn from a cross-sectional study design. Therefore, a longitudinal study is needed to clarify the effects of time variation. This study uses a simple random sampling method to obtain respondents, which may have a different effect than another sampling method. The behavior of e-wallet users is not only influenced by the factors studied, but also by many other situational factors. Future research should be integrated more structures into the model or implement in different contexts, to have a more complex and general understanding of wallet adoption and usage.

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# DIGITAL BANKING DEVELOPMENT AT VIETNAM'S COMMERCIAL BANKS

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## Abstract

*Digital transformation is an inevitable trend of the economy in the current context of industrial revolution 4.0 (IR 4.0). Along with the development of IR 4.0, Vietnam's commercial banks have implemented and achieved certain successes in digital transformation and modern information technology (IT) application in their activities. There is an increase in the number of commercial banks that have identified the siginificance of "digital banking" and started to establish strategies to develop the model of "digital banking"; This paper aims to discuss the current situation of digital bank development at Vietnam's commercial banks, thereby proposes some solutions to develop digital banking at Vietnam'scommercial banks in the context of smart production and creative economy.*

*Keywords: Digital banking, commercial banks, Vietnam.*

## 1. Introduction

Industrial revolution 4.0 along with the sharp development of information technology (IT) industry have impacted all areas of life, socio-economic and also transformed the production method of economic industry in general and commercial banks in particular. As a result, there are appearance of online transaction, virtual payment, digitalization, automation, intelligence and the optimization of communication channels with customers in the direction of omnichannel (an approach to market, sell, and serve customers in a way that creates integrated experiences, no matter where, when, and what channel the customer is using), especially, digital banking has become an imminent development trend for banks worldwide. The participation of Vietnam in the world economy is increasing, thus the development of bank services based on IT and digital bankingis inevitable. Especially, the pandemic Covid-19 has tremendously changed the perception and habits of a part of Vietnamese people about transaction on digital platform. Vietnam is considered to be a market with high potential and opportunities for digital banking development with the population of 98,2 million people, of which 70% are young adult, 73% own smartphones with 135 million mobile subscribers, 65 million people are Internet users, accounts for 66% of the population. In addition, the Prime Minister issued Decision No. 654/QD-TTg, dated May 19, 2020 approving the National E-commerce Development Master Plan for the 2021-2025 period. The plan has specific goals that need to be achieved by 2025: 55% of the population will participate in online shopping with the purchase value of goods and services reaching an average of 600 USD/person/year; cashless payment in e-commerce will reach 50%, of which parment made through intermediary payment

service providers accounts for 80%, etc. Nevertheless,developing and bringing effectiveness to digital bankingatVietnam's commercial banksis a significant challenge which require the coordination of commercial banks, the State bank and the Government.

Stemming from the aforementioned reasons, this paper aims to analyse and assess the development state of digital banking at Vietnam's commercial banks, thereby propose some solutions to promote the development of digital banking atVietnam's commercial banksto digitalise, automatise, intelligentise, and optimize communication channels with customer in the direction of homogeneous multi-channels.

## 2. Research method

In this paper, the authors use multi-methodoly for the research including qualitative and quantitative methods.

### 2.1. Qualitaive method

Documentary research: The authors collect and study secondary data to have objectively and multidimensionally reflection on digital banking development at Vietnam's commercial banks. In addition, authors summarise and inherit the research results of scholars on theory and the fact of digital banking development at Vietnam's commercial banks: Vietnam Digital Banking 2021 Report of the Institute for Development and Research in Banking Technology;Report on digital transformation in Vietnam's commercial banks by the State Bank; etc. These are important evidences to evaluate the current situation of digital banking at Vietnam's commercial banks.

In-depth interview: The authors usein-depth interview techniques and focus group discussions to establish a theoretical basis for digital banking development. In which, in-depth interview method collects opinions, views and experiences of experts on digital banking development at Vietnam's commercial banks; Develop evaluation criteria for the management of digital banking development at Vietnam's commercial banks; Focus group discussion allows active research to reach consensus on digital banking development atVietnam's commercial banks. After interviewing 10 experts who are professionals, managers atcommercial banks chosen for the research, the authors conduct a discussion and design a questionnaire with 4 criteria on validity, effectiveness, modern, suitable (18 factors). In which, 5 factors show validdity, 4 factors show effectiveness, 5 factors show suitability and 4 factors show sustainability. Each factor is stated as a statement in the survey.

Data processing: The paper uses methods such as scientific abstraction, inductive and deductive methods, analytical and summary methods, statistics and comparisons; Combining with illustrations by tables, drawings for the research problem become more intuitive.

### 2.2. Quantitaive method

From the summarized theoretical basis, observed variables are built on 5-point Likert scale (from 1 = completely disagree to 5 = completely agree), which reflect 4 criteria

for assessingthe current situation of digital banking development at Vietnam's commercial banksin terms of validity, effectiveness, suitability and sustainability.

Quantitative research is conducted shortly rightafter with a sample size of 187 from managers at Vietnam's commercial banks; policymakers at commercial banks. The research period is from July 12, 2021 to July 31, 2021. The survey is designed on Google doc then emailed to managers and policy makers in commercial banks that are chosen for the research.After sorting the answer sheets, the invalid votes were eliminated, leaving 152 valid votes data entry and processing. The obtained data is imported into Excel file, then analyzed by SPSS 21 software. In particular, SPSS 21 software is used to statistically describe the performance of criteria, correlation coefficientsand Kano-IPAscatterplot is used to assess "Performance" and "Importance" and based on the mean of the two factors above to build a Quadrant matrix, which include 4 cells, with the following elements (see Figure 1).

**Figure 1: Kano-IPA scatterplot and corresponding strategies**
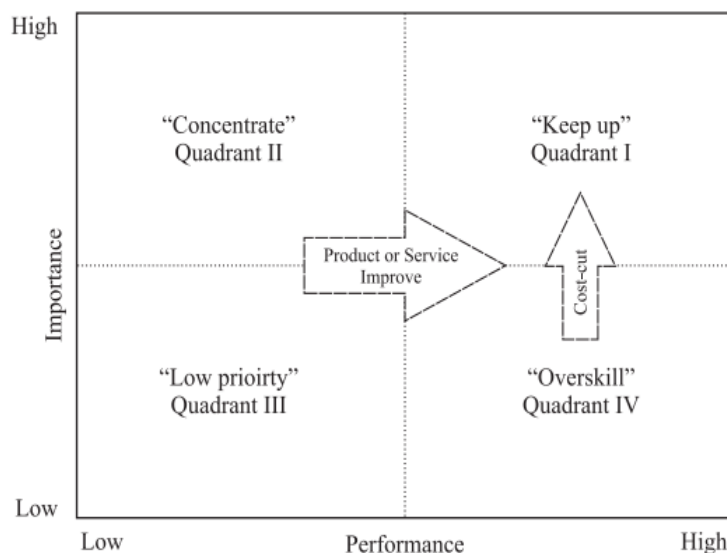


*Source: Martilla & James, 1977*

Thus, through qualitative and quantitative research, the collected data is categorised into: theoretical basis, statistics, primary data on the current situation, discussion data on research results and issues raised. On that basis, the authors establish an outline framework and integrate data to have a complete research.

## 3. Theoretical frameworkon digital banking development at commercial banks

### 3.1. *The concept of digital banking*

According to Moeckel (2013), digital banking aims to enhace the standard of online banking services and mobile banking by integrating digital technologies such as analytics tools, social interaction, innovative payment solutions, mobile technology and focus more on user experience.

According to Sarma (2017), digital banking is a form of banking that digitalises all traditional banking activies and services. In other words, daily activities that are performed by

customers in bank branches are digitalized and integrated into a single digital banking application. With this application, customers can perform all transactions without the need to physically be at the bank, at the same time carry out banking activities such as risk management, capital, product development, marketing, sales management as these are also digitalised.

Digital Banking is a form of digital bank which requires highly about technology including the innovation in financial services for the customers and commercial services around strategies on mobile, digital, AI, payment, RegTech, data, blockchain, API, distribution channel and technology (American Banker, 2018). The development of digital banking helps banks to save cost, increase competitiveness, compliance and transparent in business operation. To customers, digital banking helps customers use banking services more conveniently and securely with maximumutility, save cost and improve financial efficiency, support online business development.

### *3.2 Digital banking development at commercial banks*

**Table 1: Stages of digital banking development**

| No | Stage | Content |
|----|-------|---------|
| 1 | **Digitalisation** | This is the phase that banks improve the effectiveness of the activity by applying technology in data, document or in separate process in activity. In this stage, banks will change services, manual and traditional process to digital, online process or computerised process. |
| 2 | **Digital transformation** | This is the period when banks begin to digitalise all banking activities to create customer experience, support customer needs. Digital transformation in banks involves integrating and connecting digitalisation process atstage 1 together to deliver a personalised customer experience. |
| 3 | **Digital regeneration** | This is the stage when banks combine technology and digital platforms to generate revenue and results through product strategies and innovative experience. Digital regeneration in banking requires banks to fundamentally redefine how they interact with customers and stakeholders. |

*Source: Le Nhan Tam (2018)*

When mentioning the development of digital banking, it is necessary to remember the introduction of the first ATM that was invented by John Shepherd-Barron in 1967 based on the idea of a chocolate bars dispensing machine that was popular in the UK. This invention has helped banks to remove the barriers of space and time as transaction quantity. In 1973, SWIFT payment netwotk was established through a partnership between the Government and the national bank. This helped banks become more agile and better

customers understanding by ananlysing data collected from computer systems. The simple online banking modelfirst appeared in the US, then in the UK and Frane in 1983, provided the most basic services such as money transfer, account inquiry and payment of utility bills. This experience brings many significant advantages for banks such as transaction cost reduction, easy integration and services packaging and interactive marketing activities. In the next period from 2000-2017, the mobile banking model (banking model) was introduced thanks to the development of the Internet and smartphones so that customers can access banking services at all places and times. In this period, the digital hybrid model was combined the digitalisation of transactions with customers but still operated on the traditional processing system due to some limitations in infrastructure, data and risk management. Currently, with the strong development of financial technology, new models such as digital regeneration banks and open banks have emerged; Stages of digital banking development (see Table 1).

### 3.3. Digital banking development trends at commercial banks

- *AI application in bank:* AI is increasingly appeared in life and has changed the consumption behaviour of people in online transaction activities. Moreover, AI is applied widely in all areas such as: medical, security, agriculture, finance-banking, education, etc. In which, AI is the crucial key in competitive advantage improvement strategy among banks and financial companies to improve market share, increase revenue, and at the same time enhance customer experience in the digital age.Chatbots are considered the first and most visible application of AI technology in banking operations. It is modernising the way banks provide services to their customers.With this application, customers do not need to go tobank's branches to query information and find out other additional services. Customers can be consulted and answerd at all times and places with Mobile banking application on their phones. As customers use these apps to utilize banks' services, banks are integrating Chatbot services to provide personalized user experience and at the same time expanding its brands on the market. Apps in smartphones can track user behaviour and provide personalized recommendations that are valuable to user. Thus, Mobile Banking can improve customer service by integrating AI technology strategies. Currently, the demand for this type of app using AI has witnessed the strong growth of AI technology in the banking sector. In addition, there are a number of banks that have automated the registration processes, changed services or used AI to analyse the information of millions of customers, assess and forecast their debt repayment ability to make accurate lending decisions through the support of AI.

- *Combining the provision of banking services with technology companies:* Combining the provision of financial and banking services with Big Tech companies. Big Techs like Amazon, Google, Apple, Facebook based on the data analysis to create suitable, personalised and intuitive experience for user. Big Techs introduced payment services and combined with banks to gradually move into credit, insurance, savings, loans and investments. Core business activities of these companies are IT such as cloud computing, data anlysis; Or the

combination of banking services provision with Fintech companies which can be understood as the use of technologies to change financial services products to meet the needs of customers. With the flexibility in activity and breakthrough technology solution, Fintech companies have brought a wind of change into the activity of financial-banking system when providing products, services aiming at customer experience and satisfaction enhancement. Fintech with the advantages in speed, simplicity, effectiveness, respect for privacy and potential has allowed more sharing with customers, giving them control and decision in financial transactions and investment activities. The partnership here is conducted in a win-win situation, in which banks can immediately apply and update modern technologies without spending too much on initial infrastructure investment and can meet higher requirement of customers both in quality, price and reliability. As for Fintech companies, it is possible to exploit the customer network, data and capital of the bank to provide products and services to meet the needs of the market.

- *Trasnform core banking and Cloud:* Core banking is the heart of the entire information system of a banking system. Information system includes information about money, collateral, transaction, document, accounting books, computer data, etc. All transactions are transferred through core banking system and in a very short period of time it stilloperates and process information at the same time during the operation, or it can be said that Core Banking is a system to to centralize data at all times and places. The database of bank is centrally managed by relationship and module: deposit, international payment, money transfer, trade finance, lending, appraisal, capital source, Internet Banking, etc. Especially, the utility of core banking is the ability to better manage risk such as helping banks to manage market risks, mange credit risks, liquidity and operations, etc. with many different levels of management. In addition, thanks to the centralization of core banking, it is possible to improve the management of customer account and customer service provision. As for Cloud, it can help banks and financial services companies meet the increasing regulatory report requirements in a variety of jurisdictions (e.g.,capital adequacy analysis and assessment, solvency, etc.); Cloud platform provides banks with a wide range of third-party products and services. Plug and Play model makes it easy for banks to use the latest innovations.

- *Development of digital banking and e-wallet applications:* Development of digital banking applications with digital technology transaction space Digital Lab, money transfer via Facebook automated banking application, QR Pay utility, and other payment applications; Or e-wallets can be linked to many different bank accounts and cards; E-wallets have two cash flows: money in the wallet recharged by the user and a linked bank account. Money in the wallet can come from cash deposited directly at transaction points, money from a bank account transferred to a wallet, etc. For a bank-linked account, when paying for a transaction, the money can be deducted directly from the account. Popular features of current e-wallets include: payment of electricity, water, internet, telephone, bus tickets, and air tickets; shopping and paying for food and entertainment services; Fast money transfers between bank

accounts; Depositing/withdrawing money quickly from electronic accounts makes shopping transactions safer and simpler, etc.

### 3.4. Criteria for evaluating the development of digital banking at commercial banks

The State plays a crucial role in promoting the sustainable development of finance-banking in general and digital banking development in particular to effectively prevent the craze in the industry to avoid breakdowns and crises from happening. The role of the State is also very important in sanctioning and supervising to ensure the stable and safe operation of banking industry and digital banking. The intervention of the State will help reduce market defects in digital banking development at Vietnam's commercial banks. The criteria for evaluating digital banking development at commercial banks require the implementation of criteria in State management on digital banking development such as validity, effectiveness, suitable and sustainability:

*Validity:* a criterion for assessing the ability of the State to influence the development of digital banking in commercial banks. Phan Minh Ngoc (2018) states that:the indication of validity is the efficiency of administrative regulations, manners and compliance with the law and the policies and regulations of superiors, the rhythmic coordination among parts in the system. The validity of digital banking development in commercial banks is demonstrated through specific criteria (Table 2):

**Table 2: Criteria for evaluating the validity**

| Encryption | Specific criteria |
|---|---|
| VAL1 | The State, particularly the State bank correctly identifies the objective of digital banking development at commercial banks |
| VAL2 | Legal policies for digital banking development at commercial banks are timely promulgated |
| VAL3 | There is coordination among management levels on digital banking development at commercial banks |
| VAL4 | The State performs well the examination, supervision and inspection of commercial banks on digital banking development |
| VAL5 | Violation settlement with deterrent for commercial banks that violate digital banking development |

*Source: Phan Minh Ngoc (2018) and proposal of authors*

*Effectiveness:* The effectiveness of the management of digital banking development at commercial banks is evaluated by comparing the actual results that is achieved by State management with the costs spent to get those results. The effectiveness of State management on digital banking development at commercial banks is high when management activity fulfills the the set objectives with the lowest cost or the management achieves the highest

result with a certain cost on resources. The effectiveness of digital banking development at commercial banks is demonstrated through specific criteria (see Table 3).

**Table 3: Criteria for evaluating the effectiveness**

| Encryption | Specific criteria |
|---|---|
| EFF1 | The timely response of the regulatory agency to the unusual cases related to the development of digital banking at commercial banks |
| EFF2 | Investment cost for digital banking development at commercial banks is adequate with management effectiveness |
| EFF3 | The satisfaction of commercial banks on digital banking development with State management policies |
| EFF4 | The satisfaction of commercial banks on digital banking development with State support policies |

*Source: Phan Minh Ngoc (2018) and proposal of authors*

*Suitability:*The criterion for assessing the fitness, feasibility of State management with digital banking development at commercial banks in terms of policies, implementation organisation and supervision in certain economic and social conditions. The suitability of State management activities on digital banking development at commercial banks is demonstrated through specific criteria (see Table 4).

**Table 4: Criteria for evaluating the suitability**

| Encryption | Specific criteria |
|---|---|
| SUI1 | Objective of management with digital banking development at commercial banks is suitable with economic and social conditions of the nation |
| SUI2 | Management policies on digital banking development at commercial banks is feasible |
| SUI3 | The level of regulatory agency intervention in digital banking development at commercial banks is reasonable |
| SUI4 | Technical and technology means for management are effective tools |
| SUI5 | Management of digital banking development at commercial banks is suitable with international practice |

*Source: Phan Minh Ngoc (2018) and proposal of authors*

*Sustainability:* The criterion for evaluating the level of sustainable impact over time of management result with the digital banking development at commercial banks. This is a system of sustainable, effective and fair management methods to meet the development needs of digital banking to ensure the safety, durability and sustainability for customers,

contributing to the socio-economic development of thenation. The sustainability of management activities on digital banking development at commercial banks is demonstrated through specific criteria (see Table 5).

**Table 5: Criteria for evaluating the sustainability**

| Encryption | Specific criteria |
|---|---|
| SUS1 | Management policies for digital banking development at commercial banks are positive, stable in the direction of long-term development. |
| SUS2 | State management policies on digital banking development at commercial banks are open |
| SUS3 | The State creates a healthy competitive environment and clear difficulties for digital banking development at commercial banks |
| SUS4 | The State focuses on the forecast of fluctuation related to digital banking development at commercial banks |

*Source: Phan Minh Ngoc (2018) and proposal of authors.*

## 4. Research results on digital banking development at Vietnam's commercial banks

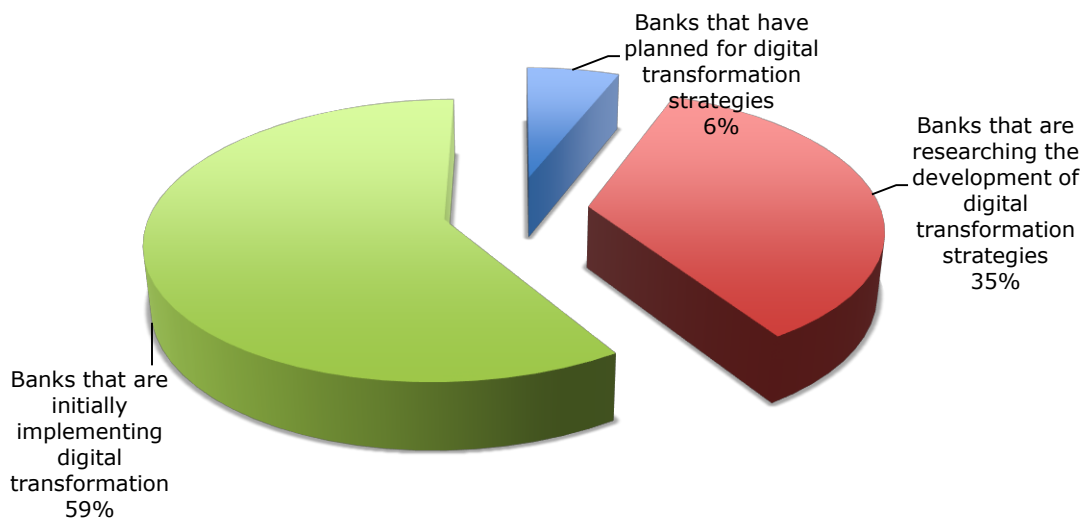### 4.1. Overview of digital banking development in Vietnam

Digital banking development at Vietnam's commercial banks has many optimist signs. According to Pham Tien Dung, Director of the Payment Department-the State Bank of Vietnam, there are currently a total of 45 million personal accounts inVietnam (duplicates are removed), equivalent to about half of the population of Vietnam. Recently, cashless payment in Vietnam has had a positive change with encouraging numbers. According to statistics of Vietnam E-commerce and Digital Economy Agency in 2019, the transaction value via the Internet and mobile increased by 239% and according to the statistics of the State bank in 2019, the value of transactions via POS increased by 36.5% over the same period in 2018.

The level of research on theimplementation of digital transformation strategies of Vietnam's commercial banks is demonstrated below (see figure 2).

According to the State Bank (2018), 59% of commercial banks have initially implemented digital transformation process. With the development trend of Industrial Revolution 4.0 and the growth of technology when Vietnam's commercial banks implement digital banking will achieve a number of certain successes in digitalisation and modern technology application in specific finance-banking activities such as: Digital banking/Digital Lab; Timo Bank, ATM + LiveBank, etc. Some commercial banks have successfully cooperated with Fintech companies to introduce new, modern technology into payment activity on mobile device such as biometrics application, use of QR code, Tokenization, mPOS technology, e-wallets, etc.Commercial banks have also taken the first steps in the process of researching and applying artificial intelligence (AI), robotic automation (RPA),

blockchain, etc. Thus, currently in Vietnam, there is no genuine digital banking, the development of digital banking is mostly at the level of decentralization and services sharing. Domestic banks in Vietnam have implemented digital banking at a transformation level in terms of processes and communication channels, with only a few banks transform digitally in the data platform.In terms of process, most of the top and middle banks (such as BIDV, Techcombank, Vietcombank, TPBank, VPBank, etc.) have completed the automatic transaction system, applying a part of big data. In terms of communication channels, some banks have applied AItechnology, self-learning machine and offered 24/7 automated consulting services, through automated chat box on the bank's website or social media channels (MB, Techcombank, etc.). For the front office, banks are providing NHS services, such as checking balances, paying bills, transferring funds, booking flights with user-friendly interfaces that are easy to use and constantly upgraded (iFast of Techcombank, E-mobile banking of Agribank, etc.). Some other services are only provided by a few banks such as investment (Agribank, Techcombank), online shopping (Agribank, Vietinbank), transfer via social networks (Techcombank), etc.

**Figure 2: The level of research on the implementation of digital transformation strategies of Vietnam's commercial banks**



*Source: The State bank, 2018.*

### 4.2. Current situation of digital banking development trend at Vietnam's commercial banks

- *Applying IT in bank:* In 2016, VpBank connected with Lifestyle Project Management VN to launch Timo digital banking, which is considered the first digital banking in Vietnam, marking an important milestone for digital banking development trend in Vietnam. Timo has all the features of a bank, with ATM cards and payment and savings accounts, etc. The difference of Timo is creative experience: No branch, no traditional transaction office, Internet application and Mobile banking are optimized with smart design, which brings the most convenience and unique features for users. Until now, typical banks that implemented AI are TPBankwith T'Aio virtual assistant application on Facebook Messenger and

VietABank with Chatbox operating on Fanpage, with main functions are: Consulting customer with information on interest rates, exchange rates, products, fee schedules, etc., answering customers' questions about locations, transaction fees, card opening process. In addition, there are a number of banks that have automated the registration and service change processes through the implementation of SMART FORM, typically MBBank (piloted since May 2017), thereby reducing the time required for registration and change of services performed at the counter down to an average of 3 - 5 minutes (excluding waiting time, scanning and approving documents). In addition, some banks use software to analyse information of millions of customers, evaluate and forecast their debt repayment ability to make accurate lending decisions like BIDV, which uses intergrated software Watson designed by Five 9.

*- Combining the provision of bank services with technology companies:* Most of the financial and banking services provided by Big Tech are not widely available. Some global brands entered Vietnam's market are Samsung Pay, Amazon (through owning 83% of Lazada's capital) and JD.com (throuhh the 50 million USD investment in Tiki). Big Tech groups in Vietnam (FPT, Viettel, CMC, VNG, BKAV, VC Corp) still mainly focus in technology area, a few groups approach the banking service supply segment through the development of electronic payment tools, such as WePay (VC Corp), Zalo Pay (VNG), Bao Kim (VNP), etc. Along with that, commercial banks are implementing cooperation model with finance technology enterprise. This partnership provides customers with many interesting experiences as well as access to diversified services with fewer transactions. At the same time, through cooperation, banks have increased the number of customers as well as investment cost in technology. Some cooperation deals have taken place such as VietinBank cooperation with Opportunity Network in providing digital platforms for businesses; Vietcombank and M-Service cooperate in money transfer payment; cooperation between VPBank and Moca in providing digital payment services, or a combination between VIB and Fintech company Weezi providing MyVIB Keyboard application to help customers transfer money via social networks; Techcombank cooperates with Fastcash to offer an increase in F@st mobile to help transfer money via Facebook and Google +, etc.

*- Core Banking and Cloud transformation:* This transformation is still slow due to the lack of capital resources or has been implemented but still formally at most and has not had adequate effectiveness. The reason is that over the last years, commercial banks have to priotised resources to deal with bad debt, liquidity assurance, etc., the core banking system is fairly outdated, not qualified to integrate digital applications based on big data, or transformed but do not buy all the features of modern Core Banking. Regarding data integration on the core, most banks have not yet implemented cloud computing due to sensitive data characteristics, complex and unsynchronised data systems. Currently, only a few banks have completed uploading data on private cloud, for instance, VietABank had performed this in 2014-2017; Or at VP Bank in 2018, Yolo digital bank launched and was the first digital bank

operating on the Amazon web service cloud, allowing rapid development in both quality and number of users. Specifically, Yolo allows users to buy insurance packages online without medical examination, at the same time, new bank customers can register to open a prepaid card (virtual card) with just email and phone number.

*- The development of digital banking and e-wallet applications:* Many banks show the positivityin providing banking services applying modern digital technology such as:Vietcombank with digital transaction space Digial Lab;MBBank allows customers to transfer money through Facebook; TPBankwith the launch of automatic banking service-LiveBank; BIDV launched BIDV SmartBanking-a mobile banking application with QR Pay utility;Sacombank with Sacompay-a payment application, which uses 2-factor authentication method; OCB with OCB OMNI application; Techcombank launched a card product with contactless payment technology; LienVietPostBank with a non-physical card-Vi Viet; In recent years, LienVietPostBank has focused on investing in creating a digital banking platform to become a significant transaction channel based on the Vi Viet. As of December 24, 2019, Vi Viet has more than 37,000 payment acceptance points and more than 2.7 million users nationwide. In the coming time, LienVietPostBank plans to launch LienViet24h service which is a 24/7 online banking service application including 3 main functions: Digital banking, Cards (physical and non-physical), E-wallets and at the same time, it integrates with the ecosystem to support users and business points in searching information, buying and selling goods and services, etc.

*Thus*, it can be seen that Vietnam's commercial banks have been determined to transform the operating model and digitalise the bank through a series of key projects, development of banks' products in the direction of promoting digitalised and automated services, to quickly approach and attract customers in the technology segment. The application of IR 4.0 to all areas of the economy in general and especially to the digital banking industry in particular is an inevitable and irreversible trend in the context of globalisation.

### 4.3. Current situation of critera for evaluating the digital banking development in Vietnam's commercial banks

Overall evaluation of the level of implementation of 4 State management criteria on digital banking development in Vietnam's commercial banks (see Table 6). The results show that digital banking development in Vietnam's commercial banks has validity criteria with a mean score of 3.4029, which is fairly good, the rest of the criteria EFF, SUI, SUS need more focussince they are just above average.

**Table 6: Descriptive statistics of the implementation of the criteria**

|      | Observations | Mean   | Standard deviation |
|------|--------------|--------|--------------------|
| VAL  | 119          | 3.4209 | .65171             |
| EFF  | 119          | 3.0576 | .76320             |
| SUI  | 119          | 3.3223 | .57853             |
| SUS  | 119          | 3.1825 | .59076             |

*Source: Summary from SPSS 21*

Regarding the correlation of the criteria performance: The results show that the above matrix between these criteria have a positive correlation and the correlation is statistically significant at 99% confidence level. In-depth analysis shows that the correlation between these criteria is different. Between validity and suitability criteria, effectiveness and sustainability criteria have a fairly good average correlation (correlation coefficient is greater than 0,4). Meanwhile, between the criteria of suitability and sustainability, validity and effectiveness, validity and suitability have average correlation (correlation coefficient is greater than 0,3), and between the criteria of validity and sustainability the correlation is fairly weak but still acceptable (correlation coefficient is greater than 0,25). In summary, the results after analysis show that the level of performance of digital banking development management criteria in Vietnam's commercial banks is positively correlated with each other and is statistically significant at 99% confidence level, no multicollinearity occurs.

**Table 7: Pearson correlation coefficient of the criteria**

|      |                     | VAL       | EFF       | SUI       | SUS       |
|------|---------------------|-----------|-----------|-----------|-----------|
| VAL  | Pearson Correlation | 1         | .336[**]  | .362[**]  | .287[**]  |
|      | Sig. (2-tailed)     |           | .000      | .000      | .000      |
| EFF  | Pearson Correlation | .336[**]  | 1         | .387[**]  | .415[**]  |
|      | Sig. (2-tailed)     | .000      |           | .000      | .000      |
| SUI  | Pearson Correlation | .362[**]  | .387[**]  | 1         | .323[**]  |
|      | Sig. (2-tailed)     | .000      | .000      |           | .000      |
| SUS  | Pearson Correlation | .287[**]  | .415[**]  | .323[**]  | 1         |
|      | Sig. (2-tailed)     | .000      | .000      | .000      |           |

*Source: Summary from SPSS 21*

The quantitative research of IPA model and data processing on SPSS 21 obtain 4 quadrant (see Figure 3) to assess the importance and the performance level of 18 variables built based on 4 evaluation criteria for evaluating the performance level of State management

on digital banking development in Vietnam's commercial banks, which has a positive correlation and statistically significant correlation, in which the suitability is met quite well while the validity, effectiveness and sustainability are assessed at average level.

From the scatter plot, it shows that out of 18 variables, there are 6 variables (SUS1, EF1, EF4, SUS4, VAL5, SUS4) that need to be improved, 3 variables (SUS2, EFF2, SUS5) should continue to be maintained, 4 variables (SUI4, SUI3, EFF3, VAL4) should not be invested excessivelyin and 5 variables (SUS3, SUI2, VAL3, VAL2, VAL1) should be paidlittle attention.

**Figure 3: Kano-IPA scatterplot**
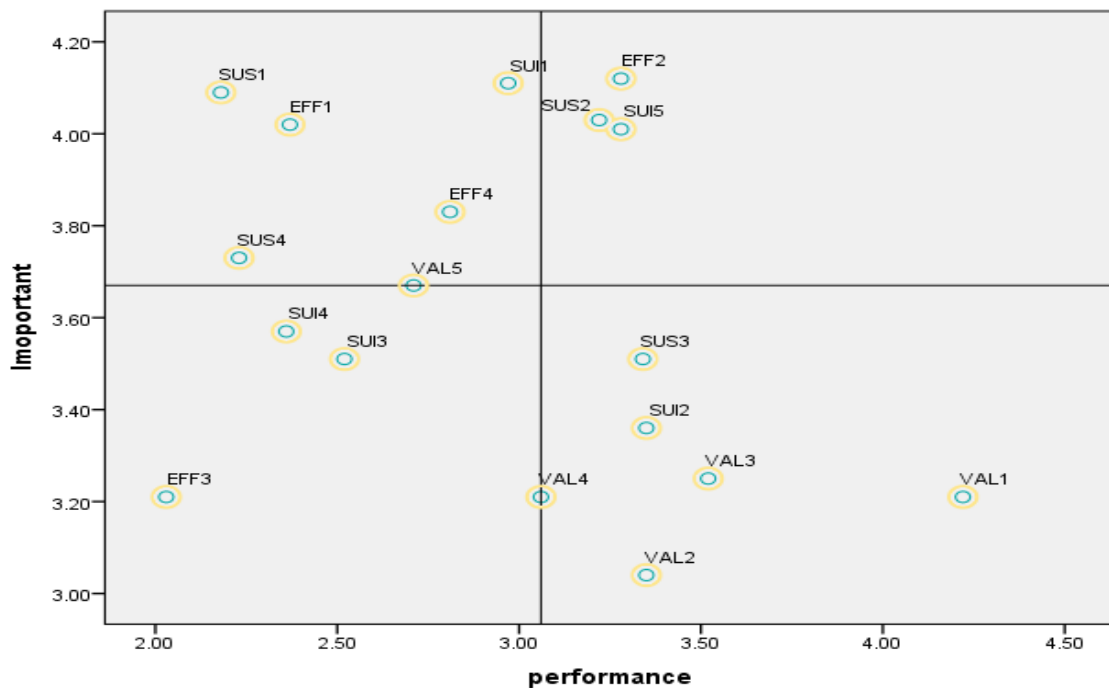


*Source: Summary from SPSS 21*

## 5. Discussion of research results and policy implications for digital banking development in Vietnam's commercial banks

From the aforementioned analysis, it can be seen that digital banking development is highly valued by many Vietnam's commercial banks, which is illustrated by a list of crucial projects, bank's products development in the direction of digitalised and automated services to quickly reach and attract customers. Bank development trends at Vietnam's commercial banks such as AI application in bank, combining banking services provisionwith technology companies, transformation of core banking and Cloud, developing digital banking and e-wallet applications. Eventhough digital banking have been implemented in many Vietnams' commercial banks yet the results are still limited, for instance: The digital banking development strategy at commercial banks is simply changing the interface of the application to interact with customers without paying attention to internal processes, using science to analyse data and ability of employees; In the digital transformation process, the requirement for human resources with knowledge not only on finance banking but also on technology is a great challenge. The

reality of Vietnamese banking human resources today is thatthose who are knowledgeable on banking and finance will not be knowledgeable about technology and vice versa. The evaluation result of 4 criteria (VAL, EFF, SUI, SUS) for State management on digital banking development in many Vietnams' commercial banks through Kano-IPA model shows a positive correlation and is statistically significant, in which suitability is assessed to be fairly good, while validity, effectiveness and sustainabiliy are evaluated at medium level.

From the scatter plot, it shows that out of 18 variables, there are 6 variables that need improvement, 3 variables should continue to be maintain, 4 variables should not be invested excessivelyin and 5 variables (SUS3, SUI2, VAL3, VAL2, VAL1) should be paidlittle attention. This shows that in digital banking development of Vietnam's commercial banks, inadequate and inconsistent legal provisions on policies are obstacles for commercial banks to boldly apply digital banking as there is no uniform regulation on current electronic documents and specific characteristicsof electronic documents arising in the transaction; The State Bank has not had official regulation on products applying for digital banking such as electronic deposit, internet banking services, mobile banking; The legal corridor to protect users on electronic transaction is still weak; Regulations on identifying customers at the counter increase the barrier to applying digital banking and there is any regulation on identifying electronic customers. Thereby creating many gaps in unhealthy competition between commercial banks and Fintech.

Digital banking development at Vietnam's commercial banks in IR 4.0 is an inevitable trend and a core issue for Vietnam's commercial banks to develop and maintain competitive advantages. Although, it has achieved some remarkable results, to better implement digital banking in the future, this paper recommends some implications as follows:

*Regarding the Government and the State Bank*

To begin with, the Government and the State Bank need to issue a legal framework to on the one hand create conditions for banks to easily implement digital banking application and on the other hand focus on the rights and benefits of the parties involved. In which, it is necessary to focus on perfecting the law on the contents (i) regulations to manage change on transactions in digital banking activiy such as electronic authentication for custom ers (e-KYC), applying cloud computing and blockchain in bank operation, etc.; The Government and the State Bank also need to soon issue the policy on safety and confidentiality of information in electronic transactions to protect the legitimate interests of consumers; At the same time, it is necessary to issue a process for conducting electronic transactions through banks, supervise digital banking activities and prevent money laundering.

In addition, promoting infrastructure investment as well as building data platform related to digital banking. To successfully implement digital banking, it is essential to remove obstacles caused by small distribution of data, create large databases with a high degree of service integration in the financial ecosystem, and implement data transformation in clould computing to boost the transformation process. Continue to implement scheme, program and

action plan to encourage online, cashless payments. These policies should aim to create a favourable environment for the development of digital banking on the basis of creating a healthy competitive market and encourage innovation. One of the key factors to develop digital banking relates to the customers' awareness. As a result, the State Bank should continue to work with universities and training facilities on finance banking as well as localities, especially remote areas, to propagate, guide and popularise financial knowledge to enhance users' awareness to easily use digital banking services.

*Regarding Vietnam's commercial banks*

**Figure 4: Digital ecosystem bank in 2025**
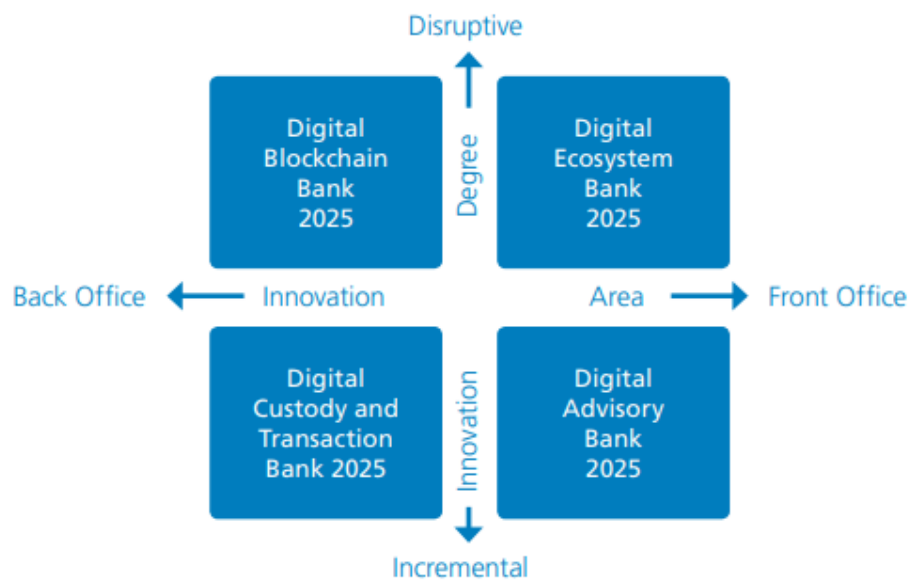


*Source: Gasser, 2017*

*Firstly*, commercial banks need to develop project, strategies and roadmap to transform traditional banking to digital banking. This clearly is not an overnight job, it requires time, energy and a large amount of capital. Therefore, when implementing digital transformation, banks need to clearly identify the method, transformation roadmap to fit with the conditions on human resources, capital, technology and current network. Since the digital banking ecosystem tends to form in 2025 (see Figure 4) due to changes in customer consumption trends, operating models, revenue models, digital banking platforms, banking industry data and banking value chains (Gasser et al., 2017). New types of banks that are likely to form in the digital banking ecosystem include digital custody and transaction bank, digital advisory bank, digital ecosystem bank and digital blockchain bank.

*Secondly*, gradually developing human resources to meet jobs' requirements when commercial banks deploy digital banking. Currently, human resources have knowledge on finance banking and technology in commercial banks are rare, requiring commercial banks to ensure suitable benefits for high quality human resources and have a reasonable placement policy for these human resources when implementing digital banking. At the same time, in addition to implementing self-training plans, commercial banks need to work more closely

with financial and banking training institutions to help orient training for young human resources, to meet the actual requirements of the market.

*Finally,* promoting the implementation of cashless payment. Commercial banks can work with Fintech to introduce products suitable with payment needs of customers, reduce excessive investment costs and learn from partner's experiences in the process of digital transformation. Besides, commercial banks also need to gradually improve databases, apply AI and big data to data analysis and customer credit scoring.

## 6. Conclusion

The development of digital banking at Vietnam's commercial banks is at the stage of establishment and its growth potential is fairly high, stemming from market demand, development orientation of the banking industry and finance intergration. However, the development of digital banking in Vietnam is facing many difficulties from limitations of the legal framework, internal issues of banking industry, information security issues from the user side. Some solutions for creating an environment for digital banking development, focusing on completing the legal framework for digital banking development, which enables electronic customer identification and encourages the development of finance technology in a smart production and innovative economic of digital economy and IR 4.0.

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# IMPACT OF FINANCIAL LITERACY ON BEHAVIOR OF USING ELECTRONIC PAYMENT SERVICES IN BAC NINH

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## Abstract

*In recent years, along with the development of science and technology, online payment forms are increasingly diverse with many new features and utilities. In Vietnam, e-payment has made a remarkable development, with the number of payment transactions via internet and mobile banking reaching 551 million items, much higher than other non-cash payment methods (number of payment transactions via internet and mobile banking reaching 551 million items). data of the State Bank of Vietnam in the first quarter of 2021). This study was conducted to evaluate the influence of financial literacy on the behavior of using electronic payment services. Based on survey data from 126 customers in the first 6 months of 2021 in Bac Ninh, using Logistic binary regression method, we found that financial literacy has a positive and significant impact on behavior vi using electronic payment services. In addition, the study also found a statistically significant impact of some demographic variables on the behavior of using electronic payment services. From the need to conduct the research and based on the research overview, the authors present research methods, research results and policy suggestions.*

*Keywords: customer behavior, financial literacy, electronic payment.*

## 1. Introduction

Non-cash payment is a form of payment using non-cash payment means such as assets, valuable certificates, tangible assets, payments using digital technology, or indirect payments in cash through credit institutions. from the mid-2010s, there were many countries witnessing extremely impressive non-cash payment habits such as Belgium, France, Canada, UK... with the rate of non-cash payment in consumption surpassing 90%. Along with the rapid development of technology, non-cash payment forms are increasingly diverse, with many new features and utilities, especially electronic forms of payment. In the past two decades, electronic payments have attracted the attention of various researchers. Concepts of electronic payment are also understood from different perspectives in accounting, finance, business technology and information systems. Electronic payment is an integral part of electronic commerce, which is a form of payment in which money is exchanged electronically (Abrazhevich, D., 2004). Or electronic payment is a form of association between organizations and individuals supported by banks that allows the exchange of money in electronic form (Briggs, A., & Brooks, L., 2011). According to Ogedebe, P. M., & Jacob, B.

P. (2012), electronic payment refers to payment for the purchase of goods or services via the internet or any type of electronic money transfer. Similarly, Roy, S., & Sinha, I. (2014) argued that electronic payment is a platform used to pay for goods or services purchased online through the use of the internet. Internet and mobile-based payments are common forms of electronic payment in developed countries (Izhar et al., 2011). Thus, it can be understood that electronic payment is an intermediary payment service that customers pay through the Internet or mobile phones when purchasing goods and services. This form of payment helps to overcome the limitations of traditional cash and non-cash payments such as minimizing costs and payment time, minimizing frauds, etc. Since then, electronic payments contribute to promoting the process of exchange goods and capital transferring, and the improvement of the efficiency of the entire economy. Recognizing this importance, many countries have developed strategies to develop e-payments to promote financial inclusion and foster the economic development.

In Vietnam, forms of electronic payment include payment by card (including credit and debit cards, mainly credit cards), payment by e-wallets (Payoo, VnMart, Mobivi). ...), payment by smart mobile device (Mobile banking), payment by bank transfer (via ATM or direct transaction at the bank. In the past time, online payment has been and is being done. According to statistics from the State Bank (2021), there are 78 organizations providing internet payment services and 43 organizations supporting mobile payment services. Data from the Department of E-commerce and Digital Economy - Ministry of Industry and Trade shows that e-commerce in Vietnam has seen positive changes in the past time when transactions via the internet and mobile increased by 238% in terms of value (in 2020).

**Figure 1: Payment via Internet and Mobile**
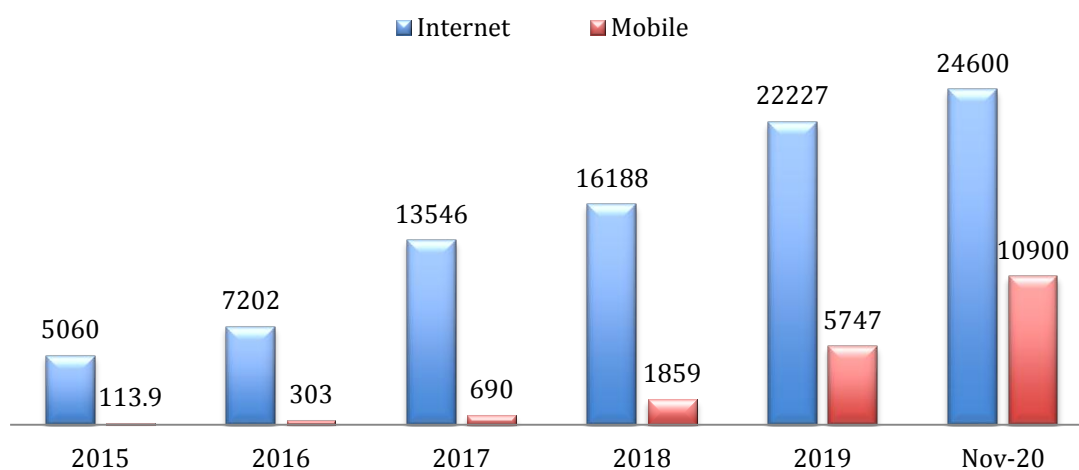


*Source: State Bank*

However, cash is still dominant, accounting for nearly 80% of transactions in 2021?. According to data from Vietnam Digital 2021, as of January 2021, Vietnam has 154.4 million mobile subscribers, 68.72 million internet users (accounting for 70.3% of the population) and the online shopping rate is 78.7%. In contrast, the percentage of people having accounts at

financial institutions is significantly low (only 30.8%). Especially, only 20.5% of the population makes online purchases and payments. .

In recent years, there have been many domestic and international studies on factors affecting the behavior of using financial services in general as well as electronic payments in particular. However, these studies mainly focus on assessing users' perceptions on different aspects of financial services such as usefulness, ease of use, trust, risk, etc. There are very few studies which deals with the impact of financial literacy. In particular, there have not been any research which evaluates the impact of financial literacy on the behavior of using electronic payment services in Vietnam. Therefore, this study was conducted to provide more evidence on the influence of financial literacy on the behavior of using online payment services in Vietnam.

## 2. Literature review

The literature on financial literacy and its impact on customer behavior has been researched by various authors. Here, the authors present some studies to make an overview for this study.

Sandra J.Huston (2010) has summarized financial literacy measures used in previous studies, thereby providing the meaning and measurement of financial literacy. According to research, financial literacy includes both knowledge and application of that knowledge to manage personal finances. To measure the financial literacy, individuals must demonstrate the knowledge and skills necessary to make choices in financial markets. This might be the right approach to measure financial literacy, but it reflects the reality that all individuals make choices between standard financial products and services.

David L.Remund (2010) also analyzed different conceptions of financial literacy and how it is measured. Accordingly, the author gives a definition of financial literacy as a measure of the extent to which a person understands financial concepts and has the confidence to manage personal finances through appropriate decision making, sound short-term and long-term financial planning, while also taking into account emerging events as well as changing economic conditions.

Lusardi et al. (2011) conducted the survey by asking the same questions about three areas: understanding of compound interest, understanding of inflation, and understanding of risk classification to measure financial literacy in eight countries. The study concluded that the level of financial literacy worldwide is very low, regardless of the level of financial market development. In addition, the research showed that changes in the market do not bring about an improvement in their financial knowledge but are brought about by their financial experience (cite). In particular, there are age and gender differences in financial literacy.

Marc Oliver Rieger (2020) has introduced a new method of measuring financial literacy that is the combined method (CL scale). According to this method, the author has conducted a survey on financial literacy scales, measured a number of control variables such

as self-assessment ability, attitude to money and demographics, finally, investment hypothetical questions to give general ideas about long-term investing. To get the results, the research has surveyed on two sample samples, the difference between the second sample and the first sample is the addition of questions. Respondents are university students, but there are also working subjects. The results show that men, students, working people, and university degree holders are more financially savvy.

Grohmann, A. (2018) conducted an analysis of the financial literacy and financial behavior of the middle class in Bangkok, Thailand. The study conducted a middle class survey in Bangkok, Thailand in December 2012 based on the basic survey set by Lusardi and Mitchell that was first used in the United States in 2004. Survey questions based on three main dimensions: interest rates, inflation and risk diversification. Research results showed that the level of financial literacy of the middle class in Bangkok is at an average level, comparable to that of other countries.

Different from the research of Antonia Grohmann (2018), the study of Panayiotis C. Andreou Sofia Anyfantaki (2019) focused on studying financial literacy and influencing customer behavior in online banking. The study surveyed 600 adults in Cyprus on issues of: (i) demographics; (ii) assess financial literacy through: compounding, consequences of inflation, benefits of risk diversification, understanding and use of percentages, and awareness of banking issues ; (iii) questions regarding the source of information the person seeks to resolve financial matters; (iv) questions related to banking activities and behavior of using banking services (especially online banking). OLS regression results have shown that financially savvy customers will prefer to regularly use online banking products, whereby the increase in online banking usage is due to increased understanding, know your client's finances. In addition, the study also showed the interplay between digital and finance as well as the positive effects on the use of digital financial services.

To examine the relationship between financial literacy and use of financial technology (Fintech) products, the research by Morgan and Trinh (2019) was conducted in Laos, a developing country. The study also used the standard OECD questionnaire on financial literacy, the control variable is still the customer's characteristics, then the author uses OLS regression to assess the impact of financial literacy. The results showed that financial literacy has a strong and positive impact on customers' perception of fintech products. The results also showed that people with incomes higher than 3.5 million kips (per month) are more likely to know about a fintech product than those with incomes lower than 2 million kips (reference group). In addition, the authors also provided a group of instrumental variables to test the level of financial literacy and the conclusions of the study remain the same.

More specifically on bank lending products, Lyons et al. (2019) examined the impact of financial literacy on the use of bank loans. and non-bank loans. To measure financial literacy, the authors conducted a survey on issues related to interest rates, inflation and investment risk. In addition, the authors have shown whether social and infrastructural factors

affect the use of loans. The authors had a survey on three groups of subjects: rural, illiterate and migrant. Probit regression then shows that the most vulnerable groups may benefit less from financial literacy, especially when using formal bank loans. Other factors such as those related to society and infrastructure may be more important than financial literacy.

Finally, the study by Junhong Yang et al. (2020) measured financial literacy and studied its relationship with the digital financial needs of households. The study conducted two surveys in 2015 and 2017 with a total of 19,859 observations. To measure financial literacy, they also use questions related to interest rates, inflation, and risk. to assess demand for digital finance, the team asked respondents if they used any digital finance, i.e. mobile payments, internet financial products. Probit regression results show that the majority of households in the People's Republic of China have limited financial literacy. Furthermore, the positive impact of financial literacy on digital finance is even more apparent for young, high-income, affluent households, women, and households in urban areas. and coastal.

In Vietnam, a study by Nguyen Tuong Van (2019) investigated the relationship between financial literacy and other factors to individuals' saving behavior. Regression results according to Binary Logistic method show that financial literacy, major in finance and banking, gender, marital status and other related behavioral and attitude factors have a positive effect on personal saving behavior.

In addition, there is a study by Phan Thi Thanh Huyen (2020) that used the Global Findex dataset and surveyed the current situation of people using payment accounts. The author has applied Binary Logistic regression analysis method to evaluate the influence of demographic factors on the use of personal accounts in payment in Vietnam. The results show that age, education level and income all affect individuals using accounts to make payments.

From the above review, it shows that there has not been any research examining the influence of financial literacy on the behavior of using online payment services of commercial banks. Therefore, this is the gap and also research question that need to be explored. The answer to this research question will be presented in sections 3 and 4 of the study.

## 3. Research Methods

### 3.1. Data

The data for the study was conducted on the basis of an online survey in the period from June 1, 2012 to June 15, 2021 in Bac Ninh province. A total of 153 votes were collected, of which 126 valid votes were retained for the study. The survey consists of 3 parts, including questions about behavior of using electronic payment services, financial literacy and questions about demographics (Part 1 is about behavior of using online payment services, includes 1 question; Part 2 on financial literacy includes 3 questions on the aspects of interest rates, inflation and risk; Part 3 on personal characteristics includes questions about gender, age, and education level and place of residence).

### 3.2. Research models

To conduct research on the influence of financial literacy on the behavior of using electronic payment services, the authors use Binary logistic regression model. This is a common model in research used to estimate the probability of an event occurring. The characteristic of binary logistic regression is that the dependent variable has only 2 values, 0 and 1. When the dependent variable is in binary form, the normal linear regression will violate the regression assumptions, leading to the estimation results. quantity is no longer accurate. While the binary logistic regression does not need to satisfy these assumptions. The model adopted in this study is shown in following equations:

$$PAYMENT = \beta_0 + \beta_1.LITERACY + \beta_2.AGE + \beta_3.GENDER + \beta_4.EDU + \beta_5.MARRIED + \beta_6.URBAN + \beta_7.HOUSE$$

Where:

The dependent variable is the behavior of using electronic payment services (Payment) - a binary variable that can receive the value 1 if the customer uses it and gets the value 0 if the customer does not use it.

Independent variables include:

- Financial literacy (LITERACY): In this study, the authors measure financial awareness in the areas of interest, inflation and risk through 3 questions that are widely popular in the United States and many other countries elsewhere (Lusardi & Mitchell, 2011). Question number one relates to concept of "compound interest calculation" (OECD, 2016; Lusardi & Mitchell, 2011). Question number two relates to the concepts of "understanding the consequences of inflation" (Lusardi & Mitchell, 2011). Question number three is about Benefits of risk diversification (Lusardi & Mitchell, 2011). For each question, if the person understands the question and answers correctly, the value is 1, the rest is 0). The financial literacy measure is the average score of the correct answers on the total number of questions.

- Demographic variables include:

+ Age (AGE): get the value 1 (15 - 18 years old), 2 (19 - 22 years old), 3 (23 - 35 years old), 4 (36 - 45 years old), 5 (46 - 60 years old), 6 (over 60 years old).

+ Gender (GENDER): get value 1 (if male) and 0 (other cases)

+ Educational Qualification (EDU): get value 1 (Not graduated from high school), 2 (Graduated from high school), 3 (College, university), 4 (graduated)

+ Marital status (MARRIED): get 1 (married) and 0 (remaining cases)

+ Residence (URBAN): takes the value of 1 (if residing in a rural area), and 0 (remaining areas)

+ HOUSE: get value 1 (if owning a house) and 0 (if not owning a house)

To test the regression results, the authors use the Wald test to check whether the independent variables have an influence on the dependent variable, and the Omnibus test on the goodness of fit of the model.

### 3.3. Research hypotheses

H1: Customer's financial knowledge affects the behavior of using electronic payment services;

H2: Demographic variables have an impact on the use of electronic payment services.

## 4. Results and discussion

### 4.1. Descriptive statistics of the study sample

**Table 1: Descriptive Statistics**

|  | N | Min | Max | Mean | | SD |
|---|---|---|---|---|---|---|
|  | Statistic | Statistic | Statistic | Statistic | SE | Statistic |
| PAYMENT | 126 | 0 | 1 | .87 | .031 | .343 |
| LITERACY | 126 | .00 | 1.00 | .4206 | .02228 | .25008 |
| AGE | 126 | 2 | 5 | 2.98 | .076 | .853 |
| GENDER | 126 | 0 | 1 | .47 | .045 | .501 |
| MARRIED | 126 | 0 | 2 | .69 | .047 | .529 |
| URBAN | 126 | 0 | 1 | .43 | .044 | .497 |
| EDU | 126 | 1 | 4 | 2.89 | .061 | .684 |
| HOUSE | 126 | 0 | 1 | .45 | .045 | .500 |

*Source: Results from SPSS*

Regarding the characteristics of the research sample, out of a total of 126 valid votes, 53.2% were female and 46.8% were male. In terms of age structure, mainly customers are between 19 and 45 years old, there are no customers under 19 years old and over 60 years old. Specifically, customers aged 19 to 22 accounted for 33.3%, from 23 to 35 accounted for nearly 40%, from 36 to 45 accounted for 23%; over 55% are 3rd year students, 29% are 2nd year students, 1st and 4th year students account for 13%. Regarding marital status, up to 62.7% of customers participating in the survey were married. In terms of residence, customers from rural areas account for a lower proportion than the rest, less than 50%. Regarding home ownership, only 45.29% of customers own a home, the rest over 50% do not own a home. Regarding qualifications, over 50% of respondents graduated from college or university; 27% graduated from high school and 17.5% graduated from graduate school. A very small percentage, customers have not graduated from high school.

Regarding the behavior of using electronic payment services, the largest value is 1 and the smallest is zero. Mean = 0.87 proves the majority of customers participating in the survey

use electronic payment services. The rest, only 13.5% of customers do not use. In terms of customer's general financial knowledge, it is rated at a low average level, with an average value of 0.42, while the highest value is 1 and the minimum is 0. On each specific aspect, knowledge about the highest rated interest rate with 82.5% customers with correct answers; followed by knowledge about inflation with a correct answer rate of 46.8%. Meanwhile, risk knowledge was rated at the lowest level, only 15.9% of customers answered correctly.

## 4.2. Regression results

### Table 2. Regression results

|         |          | B      | S.E.  | Wald  | df | Sig. | Exp(B) |
|---------|----------|--------|-------|-------|----|------|--------|
| Step 1ª | LITERACY | 3.766  | 1.433 | 6.907 | 1  | .009 | 43.205 |
|         | EDU      | 1.499  | .608  | 6.082 | 1  | .014 | 4.477  |
|         | AGE      | -.901  | .481  | 3.512 | 1  | .061 | .406   |
|         | GENDER   | .241   | .610  | .157  | 1  | .692 | 1.273  |
|         | MARRIED  | .670   | .847  | .626  | 1  | .429 | 1.954  |
|         | URBAN    | -.362  | .590  | .377  | 1  | .539 | .696   |
|         | HOUSE    | .988   | .658  | 2.251 | 1  | .134 | 2.685  |
|         | Constant | -1.624 | 1.764 | .847  | 1  | .357 | .197   |

a. Variable(s) entered on step 1: lite, EDU, AGE, GENDER, MARRIED, URBAN, HOUSE.

*Source: Results from SPSS*

To test regression coefficients, the authors use Wald test. Wald test results with Sig value of variable financial literacy < 0.05 implying that, with 99% confidence, financial literacy variable has a positive and significant impact on service use behavior. online paying. With the Beta coefficient = 3.766, it proves that, if financial literacy increases by 1%, the probability of using online payment services increases by 3.766%. This result is completely consistent with the hypothesis of the model as well as the study of Nejad, MG, & Javid, K. (2018), Yang, J., Wu, Y., & Huang, B. (2020), Andreou, PC, & Anyfantaki, S. (2020). Therefore, in order to enhance the ability to use electronic payment services, it is necessary to improve the level of financial understanding of customers in terms of financial knowledge. To do this, state management agencies as well as organizations providing electronic payment services need to promote the dissemination of knowledge to raise awareness to change people's behavior of using services. At the same time, it is necessary to strengthen propaganda, promotion, and guidance on utilities as well as electronic payment transactions.

In addition, demographic variables also affect the behavior of using electronic payment services. Customer age has a negative impact on the use of electronic payment services at the 10% significance level. This result implies that young people use electronic payment services more than the elderly. This is explained by the fact that elderly people often have more difficulty in accessing technology, so they are more hesitant to use electronic payment services. In contrast, the education variable has a positive impact on the behavior of using electronic payment services. Customers with higher education level are more likely to use e-payment services than customers with low education. This result is explained because when customers have a high level of education, they are well aware of the online payment platform as well as its uses. And these perceptions have influenced the consumption behavior of customers.

To test the appropriateness of the model, the authors use Ominibus test, the results are in Table 3. The sig value of the model is 0.005 <0.01 indicating that with 99% confidence, the independent variables are related. linear system with the dependent variable in the population. In other words, the selection model is appropriate. In addition, with the results in the Classification table (Table 4), the prediction accuracy level is 88.1%.

**Table 3. Omnibus Tests**

|        |       | Chi-square | df | Sig. |
|--------|-------|------------|----|------|
| Step 1 | Step  | 20.289     | 7  | .005 |
|        | Block | 20.289     | 7  | .005 |
|        | Model | 20.289     | 7  | .005 |

*Source: Results from SPSS*

**Table 4. Classification Table**

| Observed |         |   | Predicted |     |            |
|----------|---------|---|-----------|-----|------------|
|          |         |   | PAYMENT   |     | Percentage Correct |
|          |         |   | 0         | 1   |            |
| Step 1   | PAYMENT | 0 | 4         | 13  | 23.5       |
|          |         | 1 | 2         | 107 | 98.2       |
|          | Overall Percentage |  |    |     | 88.1       |

a. The cut value is .500

*Source: Results from SPSS*

**5. Conclusion**

Technology are changing the financial services industruy rapidly. Therefore, consumers need to make progressively more well-informed financial decisions. The financial markets offer consumers a vast array of digital financial instrument, so thay must be equipped with the knowledge and skill sets required to evaluate the options and make the best choices to maximise their long – term financial well – being. Cusumers need to have an ever – increasing financial sophistication to effectively use products offered through electronic channels. The purpose of the study is to evaluate the impact of financial literacy on customers' behavior of using electronic payment services. By logistic regression method, the study has shown the positive impact of financial literacy on the behavior of using electronic payment services of banks. This result is consistent with the author's expectations as well as the results of previous studies. In addition, the study also shows that the demographic variables of age and education level are statistically significant in explaining the behavior of using electronic payment services. Based on this result, the research team proposes some recommendations to promote electronic payments as follows:

First, strengthen financial education activities for people in order to change awareness and behavior in payment. Because, increased levels of digital financial literacy could enable individuals to make well-informed and sound decisions, to prevent irresponsible behaviour and to better judge the risks and benefits associated with products and services offered through financial technologies. It is necessary to diversify contents and forms of financial education suitable for each audience. Personal Finance course in secondary and college curricula could enable students to learn important financial concepts that would then help them make sound financial decisions later on their life. At the same time, it is also necessary to further promote communication activities on financial education. Organisations could offer online training courses, design interactive activities and implement compettions for students to test their financial knowledge.

Second, enhance technology application, improve payment process, diversify and add more conveniences of online payment forms. On the part of organizations providing online payment services, it is necessary to accelerate the equipment of modern technology, improve security for customers, limit losses as well as the reputation of the organization. In addition, it is necessary to strengthen customer support, shorten transaction times, and reduce payment service fees.

Third, promote marketing activities on TM in general and e-payment in particular. Need to strengthen communication about the benefits, value and usage of online payment. Especially, carry out communication in a transparent way about fees for people to use with peace of mind. These are important factors to form and change people's habits.

The limitation of the study is that it has not been able to evaluate some other factors affecting the behavior of using electronic payment services such as past consumption experiences in the past, or family characteristics.

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# CLOUD ERP - A SOLUTION TO ENABLE DIGITAL TRANSFORMATION IN VIETNAM'S TEXTILE AND APPAREL INDUSTRY

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## Abstract

*The textile and apparel industry has been ranked second among Vietnam's largest export industries. Under the high pressure of substantial global demand, this industry sector in Vietnam has been facing challenges in changing equipment and technology to meet the world market requirement and improve its world competitiveness. While worldwide manufacturing is going digital, the digital transformation in the textile and apparel enterprises is still a new issue in Vietnam. This paper attempts to describe the current situation of the textile and apparel enterprises in Vietnam in the urgent need of digital transformation that can help them to boost up their productivity and competitiveness. Furthermore, we introduce the solution of the cloud-ERP implementation with lower upfront operating costs and higher scalability that is flexible for Vietnam's textiles and apparel enterprises in their road towards digital transformation. As a specific example, we will present a case study of cloud-ERP implementation in a garment factory in the Central region of Vietnam. The case study will show how the cloud-ERP solution could meet their current situation and help them solve the challenges in their digital transformation process.*

*Keywords: Textiles and apparel enterprises, Digital transformation, Enterprise resource planning, Cloud ERP.*

## 1. Introduction

Vietnam has a long tradition and history from hundreds of years ago in textile and apparel manufacturing. Recently, Vietnam turned to be an emerging global player in this industry sector. This branch of industry has seen speedy and sustainable development over more than a decade. In 2016, Vietnam ranked after China and Bangladesh to be the third top garment exporters globally. Presently, the garment industry played a crucial role in national socio-economic development and became the major contributor to the total export earnings of Vietnam, accounting for 16% of the country's total exports (2017) (Trinh, 2020). This sector also creates a huge job opportunity for the country. With a population of 90 million, 2.5 million people are now working in nearly 6,000 textile and apparel manufacturing companies.

The primary market for Vietnam's textile and garment products are U.S., Europe, Japan, and South Korea (Trinh, 2020) (Trinh, 2020). However, under the high pressure of substantial global demand, this industry in Vietnam has been facing challenges in changing equipment and technology to meet the world market requirement and improve its world competitiveness. As a result, Vietnam's garment industry productivity is still lower than other players in the same region, such as China, Thailand, Philippines, and Indonesia (IDS, 2018).

Furthermore, although the textile and apparel sector is one of the key industries in Vietnam with increasing exports in recent years, manufacturing and exports are mainly based on the simplest method of outsourcing, Cut - Make - Trim (Bui Van Tot, 2014). Therefore, the profits Vietnamese enterprises gaining from the production are not large, and the added value is still deficient.

Improving productivity and quality and bringing higher added value for Vietnamese garment products are the primary concerns of this industry's managers and policymakers. Many practical ways can help garment factories boost their current labor productivity and improve the profit gained from their products (Hiba, 1998). Among those, higher productivity and smooth process driven by digitally transforming garment production are critical approaches. Many advanced information systems equipped with techniques and algorithms for line balancing, intelligent and green manufacturing, and enterprise management have been used in garment factories in many developed countries. However, digital transformation is still in the early stage for the textile and apparel sector in Vietnam.

In recent years, applying the innovative modern enterprise resource planning (ERP) system for functioning and controlling the entire internal activities and processes in the garment factories, which led to increases in efficiency, quality, and better cost savings, is a critical approach. Significantly, the emergence of cloud computing has currently made a profound change to the ERP market[1]. There are many benefits of implementing an ERP system in the cloud. For startups or fast-growing businesses in Vietnam's textile and apparel industry, the very critical features of the cloud platform can help them run an ERP system successfully.

This paper attempts to describe the current situation of the textile and apparel enterprises in Vietnam in the urgent need of digital transformation that can help them to boost up their productivity and competitiveness. We emphasize the benefits of the cloud-ERP applications for Vietnamese enterprises and their difficulties in implementing this kind of information system. In this circumstance, we will introduce a case study of cloud-ERP implementation in a given garment factory in Quang Tri, a province in the Central region of Vietnam. The case study will show how the cloud-ERP solution could meet their current situation and help them solve the challenges in their digital transformation process.

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[1] https://www.acumatica.com/why-cloud-computing-is-the-future/

For that purpose, the paper is structured as follows: Section 2 provides the overview of Vietnam's textile and apparel industry. While section 3 emphasizes the challenges for Vietnam's textile and apparel industry in the 4.0 era under the higher demand and competitiveness of the world market, section 4 explains how digital transformation can be an opportunity for this industry sector. We describe in detail the current technical capacity and digital transformation in the textile and apparel enterprises in Vietnam in section 5. Based on that, we will propose a framework of cloud-ERP dedicated to meeting the specific requirements features of Vietnamese textile and apparel enterprises in section 6. The paper will provide a case study of a particular garment factory in Quang Tri as a typical example of the successful implementation of cloud-ERP for Vietnam's textile and apparel enterprise. Finally, the paper ends with a conclusion.

## 2. Overview of Vietnam's textile and apparel industry

**Figure 1: Growth of Vietnam's textile and apparel exports in the period 1986 - 2017**
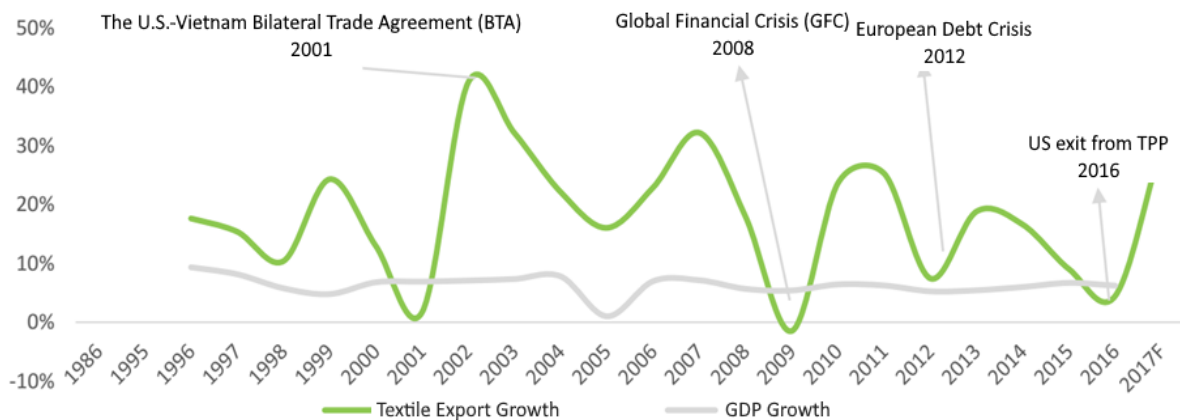


*Sources: Customs Trade Statistics - Customs Trade Statistics[2]*

After more than 20 years of development, Vietnam's textile and apparel industry has been ranked second among the country's largest export industries (while the first position belongs to the phones and mobile devices sector). Figure 1 shows that since the process of reform, open-door policy, and international integration in Vietnam in 1986, the growth rate of textile and garment exports has always achieved double-digit growth, surpassing GDP growth (IDS, 2018). Significantly, the bilateral trade agreement with the U.S. that came into effect in 2001 has created a premise for the growth of textile and garment exports to the U.S. market. As a result, for the first time in Vietnam's textile and apparel history, the growth in export scale was approximately 41% in 2002. However, textile and apparel exports are directly affected by the world economic situation. It is shown clearly that in 2009 and 2012, textile and apparel export growth was low due to the impact of the world financial crisis in 2008 and the European public debt crisis in 2012 (Herr et al., 2016). Overall, the average growth rate of textile and apparel exports in 1998 - 2016 reached 17.7%/year (while GDP growth in the same period was 6.05%/year) (Bui Van Tot, 2014).

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[2] https://www.customs.gov.vn/Lists/EnglishStatistics/Default.aspx?language=en-US

Vietnam garment products are exported to over 180 countries and territories with an export turnover of 17.9 billion USD in 2017, accounting for 13.6% of the total export turnover of Vietnam and 10.5% of the national GDP. Moreover, the annual growth rate of the garment industry in the 2008-2017 period reaches 14.5%, which makes Vietnam become one of the fastest-growing countries in textile and apparel export (Chi, 2020).

Vietnam's textile and apparel industry plays an increasingly important role in the economic growth of the country but also has a significant impact on Vietnam's socio-economic development. The textile and apparel is an industry with many enterprises and a high level of employment in Vietnam. There are about 6,000 textile and apparel enterprises in the country, attracting more than 2.5 million workers, which accounts for about 25% of labor in the industrial sector in Vietnam (Bui Van Tot, 2014). According to the Vietnam Textile and Apparel Association (VITAS), every one billion USD of garment export could create jobs for 150-200 thousand employees. Of which, 100 thousand employees in the garment businesses and 50-100 thousand employees in the other supporting industries. Most Vietnamese textile and apparel enterprises in the private sector (84%) are concentrated in the South East (60%) and the Red River Delta (Table 1).

**Table 1. Overall statistics of Vietnam's textile and apparel industry**

| Indicators | Unit | Value |
|---|---|---|
| Number of companies | Companies | 6,000 |
| Enterprise scale | People | SMEs of 200-500+ account for a large proportion |
| Company structure based on ownership | | Private (84%), FDI (15%), State-owned (1%). |
| Company structure based on operation | | Sewing (70%), spinning (6%), weaving/knitting (17%), dying (4%), ancillary industries (3%) |
| Geographical allocation of company | | North (30%), Central and plateau (8%), South (62%). |
| Number of employees | People | 2.5 million |
| Average income per worker | VND | 4.5 million |
| Number of working days per week | Day | 6 |
| Number of hours worked per week | Hour | 48 |
| Number of shifts per day | Shift | 2 |
| Value of textile export in 2013 (excluding fiber) | US$ | 17.9 billion |
| Value of textile and apparel imports in 2013 | US$ | 13.5 billion |
| Main export markets | | United States, EU, Japan, South Korea |
| Main import markets | | China, South Korea, Taiwan |
| Major export products | | Jackets, shirts, pants |
| Method of production | | CMT (85%); others (15%) |
| Lead time | Day | 90 – 100 |

The global textile and apparel value chain consists of five primary stages: (Stage 1) Supply of raw materials, including natural cotton, thread, etc.; (Stage 2) Production of intermediate goods; (Stage 3) Design and manufactures finished products implemented by garment companies; (Stage 4) Export by commercial intermediaries; (Stage 5) Marketing and distribution. Leading countries such as U.S, E.U., and Japan focus solely on the highest-value stages of the textile and apparel value chain, which are designing, marketing, and distribution.

Meanwhile, manufacturing activities are concentrated in China, India, and other developing countries such as Bangladesh, Vietnam, Pakistan, Indonesia, etc. (Figure 2).

Vietnam exports textiles and apparel mainly to the U.S., E.U., Japan, Korea, Canada, in which the U.S. market accounts for the highest proportion (in 2015, it was 51%) (Multilateral Trade Assistance Project (MUTRAP), 2015). Vietnam has been joining in bilateral and multilateral free trade agreements with these partners and enjoys particular tariff preferences in these markets.

**Figure 2: Global Textile and Apparel Value Chain**
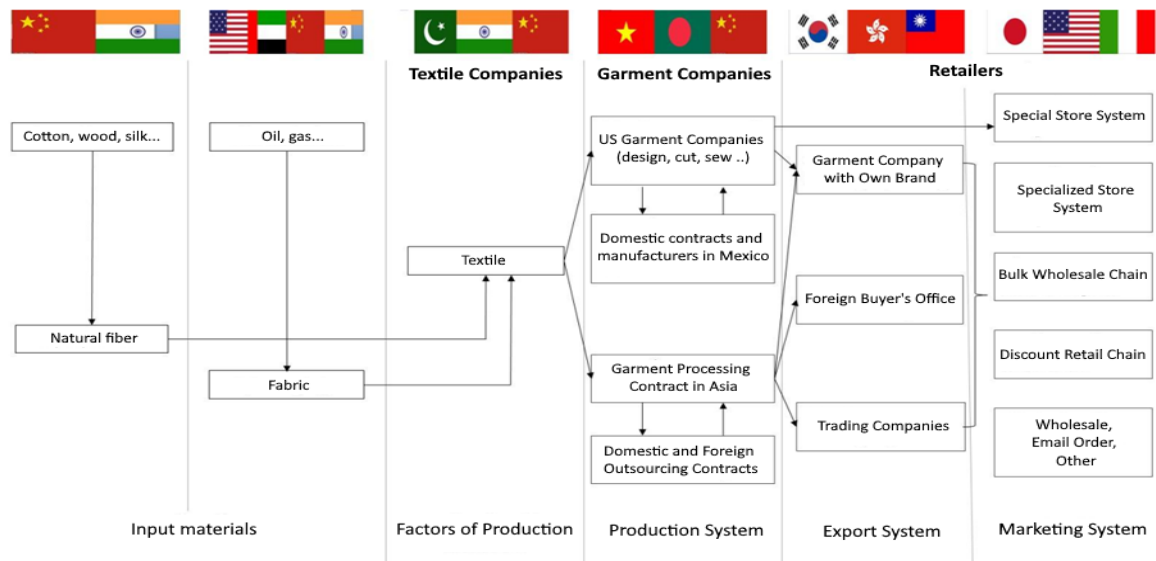


*Sources: Appelbaum & Gereffi (1994)*

## 3. Challenges of Vietnam's textiles and apparel industry in the 4.0 era

Although Vietnam's textile and apparel is an industry composed of many enterprises and a high level of employment, this sector has not yet added high value since the product is mainly based on the CMT (Cut - Make - Trim) method. According to statistics of VITAS in 2015, Vietnam's garment industry participates in the global value chain at the production stage, mainly by the CMT method accounting for 65%, by the FOB (Free On Board) method accounts for 30% and by ODM (Original Design Manufacturing) only accounts for 5% (Ha Nguyen & Vu Duong, 2016). CMT, FOB, and ODM are the three standard export methods in the outsourcing businesses for the garment. Among these, CMT, which stands for Cut - Make - Trim, is the easiest export method of the garment industry yet brings the lowest added value. When running under this method, purchasers offer entire input to outsourcing businesses for production, including raw materials, transportation, design, and specific requirements. For this method of garment export, Vietnamese manufacturers only carry out stages of cutting, sewing, and finishing products. Therefore, businesses running by the CMT method only need to understand design patterns and produce finished products. Usually, the CMT unit price is 25% of the export value, and the profit after tax for CMT enterprises only reaches 1-3% of the unit price. The fact is that more than 65% of Vietnamese garment enterprises operate under

this CMT method (Ha Nguyen & Vu Duong, 2016). Therefore the profits that Vietnamese enterprises enjoy from this sector are not high.

FOB, which stands for Free On Board, is the export method that creates higher value than CMT and is a production method of "buying raw materials, selling products." Businesses are actively involved in the production process, from raw materials to production until the final products. Unlike CMT, exporters running by FOB actively buy necessary materials and other inputs instead of being supplied directly from their buyers. For FOB orders, enterprises are responsible for importing raw materials and planning production lines to meet the orders. In the end, enterprises enjoy about 30% of export value, and profit after tax is about 3-5% of net revenue. However, Vietnamese garment enterprises producing by this method account for only about 30% (Chi, 2016).

The third method is ODM which stands for Original Design Manufacturing. This production method for garment export includes designing, purchasing fabric and materials, cutting, sewing, finishing, packaging, and shipping products. It requires a higher level of knowledge of the providers and, therefore, will bring higher added value for products. ODM businesses create designs, finish products and sell them to buyers, which are most of the owners of major brands in the world. For ODM orders, companies enjoy after-tax profits of 5-7% or more. However, Vietnamese garment enterprises producing this method account for a modest percentage of about 5% (Chi, 2016).

**Figure 3: Three export methods of the garment in Vietnam in 2016**
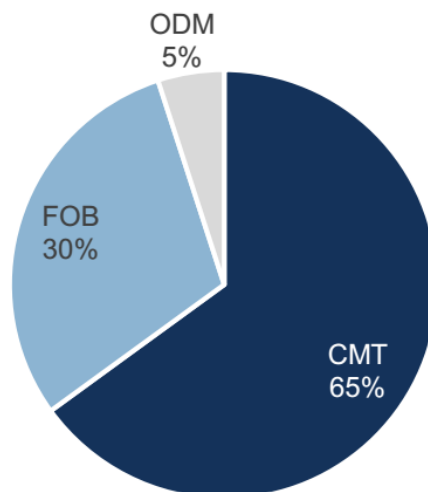


With CMT exporting, despite the garment export turnover of Vietnamese enterprises of 9.4 billion USD in 2016, the profit after tax of Vietnamese enterprises is only 0.26 billion USD (about 3% of export turnover) (Smith, 2019). Thus, although the export turnover of textiles and garments is substantial, Vietnamese enterprises receive a low profit in terms of export scale. To change the garment export picture, Vietnamese enterprises have to adjust their production methods with a higher rate of added value by applying technology and digital transformation. On the other hand, the world's textile and apparel manufacturing centers such as China, Germany, Italy, Switzerland, and India compete fiercely due to their invention and

procurement of modern technologies and their quick adaption of digital transformation. Therefore, they are the role models for Vietnamese enterprises on the road of digital transformation. By that, Vietnam's textile and apparel industry might achieve a significant breakthrough.

Another challenge for Vietnamese textile and apparel enterprises is that the input material import process takes time; it, therefore, reduces their competitive advantage in getting export orders from foreign buyers. Currently, in Vietnam, there are only about 10-15 enterprises such as Viet Tien, Nha Be, and Phong Phu garment companies that have enough supply capability of input material resources to meet the requirements of foreign buyers. Moreover, many Vietnamese firms cannot actively and domestically control the input materials to meet the on-time demand due to the delay of the raw material input process. Therefore, the production time is much longer than that of the competitors from China and India because they have self-control in their input materials.

**Figure 4: Average production time for apparel orders in Vietnam**
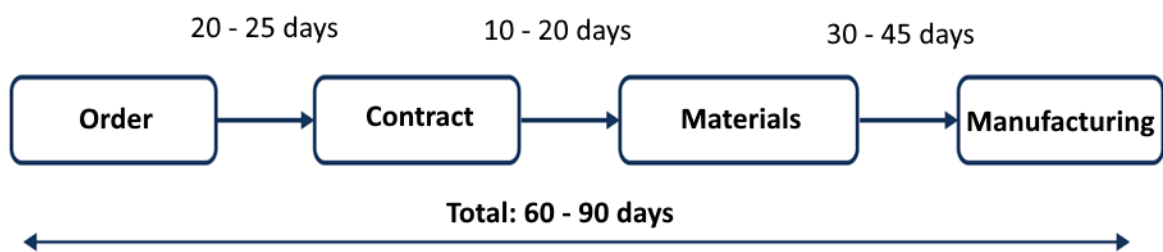


*Source: FPTS Summary*

Another critical issue is that Vietnamese garment enterprises still have a limited capacity in processing and managing orders and contracts from foreigners. While the other competitive firms from China and India are applying information systems to digitally process the stages of production lines, many Vietnamese firms still manage these stages manually. Thus, if Vietnamese firms can actively control the domestic materials and change the method of processing orders by digital transformation, the competitive advantage of Vietnamese garments will increase significantly.

In addition, enterprises in Vietnam's textile and apparel industry face many other difficulties and challenges when integrating deeply with the global market. More importantly, compared to other countries, labor productivity in this Vietnamese manufacturing sector is low. For example, the labor productivity index of Vietnam's manufacturing sector only reached 2.4, while other major textile producing countries such as China, Indonesia are 6.9 and 5.2 respectively. It is one of the most significant deficiencies of this labor-intensive manufacturing industry of Vietnam.

## 4. Digital transformation as an opportunity for Vietnam's textiles and apparel industry

Facing the above challenges, the matters to consider for the Vietnamese textile and apparel industry as the whole is: (1) changing production methods towards increasing the

value-added ratio, (2) effectively managing raw materials to increase competitive advantage in garment production, (3) transforming the orders and contracts processing, (4) increasing productivity in the assembly line, and (5) managing product quality digitally. Digital transformation would help the textiles and garment enterprises in Vietnam solve these issues and catch up with the current growth trend. Although the expected benefits for digital transformation vary from one enterprise to another, experts said that there are several overarching digital transformation benefits for the business. The first one is increased efficiency and productivity. Digital technologies deliver gains in efficiency and productivity by speeding up processes and streamlining operations. Business intelligence software and data analytics tools can collect and analyze data at a speed and accuracy unmatched by humans. Workers then use that analysis to help them make decisions faster than they could without advanced technologies. The second benefit from digital transformation is better resource management. Experts said this end-to-end digital technology approach has helped managers eliminate duplicate and superfluous technologies, as well as associated costs. Another most significant digital transformation benefit is shortened product lifecycles. Moreover, since digitally transformed organizations have better customer engagement initiatives, they can anticipate evolving customer requirements and changing marketplace dynamics. By gaining these benefits, Vietnam firms could increase their competitiveness with other major textile and garment exporting countries to integrate with the international market.

It is clearly shown that worldwide manufacturing is going digital. The most significant catalysts for this ongoing digital transformation trend in many countries are higher customer expectations, increased connectivity and, technological improvements. Many companies have realized the long-term benefits of digital transformation that result in enhanced efficiency, optimized data use, increased scope of innovation, and overall cost reduction. It is an inspiring time for the garment manufacturing industry because the Industry 4.0 era is still in process. Many companies are shifting gears with the use of advanced technology to automate their manual processes. In developed countries, many information systems are installed to automate production methods, manage input materials, and automate order processing, productivity management, and product quality control, reducing production costs and increasing market competitiveness.

Regrettably, the digital transformation in the manufacturing industry and textile and apparel enterprises is still a new issue in Vietnam. Even though most leaders of Vietnamese garment enterprises are gradually becoming aware of the importance of I.T. application in business operations, the implementation process is still facing many difficulties and confusion in choosing asynchronous solutions. The report in 2018 of Vietnam Textile and Garment Group (VINATEX) (IDS, 2018) shows that the I.T. capacity of Vietnamese textile and apparel is still at a very modest level. In terms of hardware equipment, computers and telecommunication networks are still under limited condition, most of which are old generation types of equipment. While 100% of garment enterprises use computers, only 50%

of businesses are equipped with Intranet/Internet. 50% of Vietnamese garment enterprises only use the Internet to receive and send emails, 65% for online advertising. Some software and I.T. tools are deployed for operational and database management, yet mainly served for specialized business operations. Currently, 60% are applying the software for their operational processes such as accounting software, human resources, and salary, management. While 80% of businesses have their website, 60% of these are deployed only for general information, only 15% of them embedded e-commerce transactions, and 5% provided online payments methods. However, 100% of businesses admit that their websites have not been adequately concerned about network security and data security. Regarding the human factor in I.T. management, only 20% of garment enterprises have specialized I.T. staff. The current situation of the low application of I.T. and the slow process in digital transformation is mainly because the Vietnamese enterprises themselves face difficulties in finance, human resources, and lack of professional consultants.

In short, the current situation of the textile and apparel enterprises in Vietnam is urgently needed to implement a suitable digital transformation solution that can help them boost their productivity and competitiveness. Therefore, in the next part, we introduce the key and the benefits of the emerging cloud-ERP application that could meet the current situation of the Vietnamese textile and apparel enterprises and help them solve the challenge in the road of digital transformation.

## 5. Cloud ERP - A solution to enable digital transformation in Vietnam's textiles and apparel industry

### 5.1. ERP vs. Cloud-ERP

Enterprise resource planning (ERP) is a term used to describe an integrated information system to manage all the flows of information running in an enterprise. ERP integrates all the business processes and tasks in the enterprise into a single computer system to serve all the specific needs of the different parts of the business. At the same time, this integrated information system allows the departments in an enterprise to share information and communicate with each other easily. Thus, it will enable the coordination of all business activities and increase the business processes efficiency.

The application of ERP brings many benefits to businesses, in which integration is the first and the most important one. ERP system can integrate all the flows of information from all departments of an enterprise into a single database to serve an individual request and an array of diverse needs from different departments. For this reason, the managers can capture the details of the business situation in real-time and make various types of management decisions in a timely and rapid manner based on the immediately updated information (Gsotgroup.vn, 2020).

The second benefit of an ERP system is the flexibility in meeting the different business needs of an enterprise. Firstly, ERP helps in the overall management of the business. ERP solutions can simultaneously manage many different modules in the enterprise.

Second, the ERP system can be customized to the unique and specific needs of each business. Unlike other pre-packaged software, ERP is designed and customized based on the particular requirements of each company.

Therefore, ERP is considered the latest trend of modern enterprise information systems, helping the enterprise limit risks and unnecessary errors in the operational process. Another advantage of the ERP system is analyzing the data and producing the reports better and faster. In addition, with the integration and flexibility in real-time, the generation of the report and the analysis of data is implemented based on various aspects, which can provide valuable and timely information to support decision-makers in the enterprise.

However, these benefits are not easy to be achieved. Along with the help from ERP, the enterprise also faces difficulties when implementing this system. Implementing an ERP system is a long process, consuming a vast cost, human and other enterprise resources, and other pressures and challenges (Elragal & Haddara, 2012). The cost of implementing an ERP system often depends on the size of the business. For small companies, ERP implementation costs between VND 100 million and VND 1 billion. For medium-sized enterprises, the price ranges from 1 billion VND to more than 10 billion VND. However, for large enterprises, the implementation of ERP requires a significant financial amount from 10 billion to 50 billion VND (ITG, 2020). The expenses related to ERP implementation include investment in hardware and software licenses, consulting fees, expenses for I.T. staff for system operation, and user training costs. Besides, the cost of maintaining and upgrading the ERP system also requires significant financial resources for businesses.

In addition to the cost issue, ERP systems are often very complex and impose changes to employees' existing business processes. Therefore, the enterprises need to ask for support from consultants for ERP implementation to bring the desired results. Furthermore, the length of time it takes to implement an ERP system depends on the size of the business, the scope of change, and the willingness of employees. For example, an ERP system deployed in a small business with less than 100 employees could be implemented and delivered within three months. However, in large companies with many locations or multinational companies, the implementation might take years.

Moreover, another essential aspect that needs to be considered when installing an ERP system for an enterprise is the human-related issue, precisely the attitude of employees at all levels in the business towards applying the new system.

For these reasons, it makes ERP projects in many businesses fail or encounter many difficulties in the implementation process. Especially, small and medium-sized companies often face the dilemma of deciding whether to deploy an ERP system for their business or not. However, in recent years, the emergence of cloud computing has made a profound change to the ERP market (Chandrakumar & Parthasarathy, 2014). Cloud computing is defined as a new model where users do not need to own hardware, software, network infrastructure, servers, and other systems. Instead, the resources are provided, maintained, and upgraded by third

parties, and the management of these resources does not require any involvement for the end-users. Thus, the presence of cloud computing increasingly allows vendors to bring to market innovative, highly viable ERP solutions that can be an alternative to traditional models.

The potential of cloud business models and their competitive advantages over traditional softwares has been widely debated in recent times. Cloud computing has outstanding necessities, reliability, usability, utilization rate, and service scalability. In addition, as there are more enterprises using and experiencing the benefits of cloud computing, this service becames popular and began to spread across many fields of application. Using cloud computing services will help reduce the initial infrastructure investment costs, and more importantly, services will be provided in real-time. Besides, all maintenance tasks are handled by the vendors, including system updates and upgrades.

In that trend, cloud-based ERP solutions, also known as cloud-ERP, were born, and most of them are currently provided as software as a service. The cost is much lower than the previous traditional ERP solutions. The software is provided as a service hosted in virtual servers on the Internet instead of in the computer at the enterprise's office, allowing users to connect and use it when they need it. Businesses do not have to purchase and maintain hundreds or even thousands of computers and software. They also do not need to have in-depth technical knowledge and experience, nor do they need to care about the infrastructure to serve those technologies.

Moreover, they only need to pay for their services instead of buying the whole system (Gupta, Kumar, et al., 2018; Gupta, Misra, et al., 2018). Deploying a professional ERP system and data-center through virtualization on cloud computing platforms is the current technological trend with flexible management. This quick resolution meets almost the stringent requirements of enterprises. Therefore, cloud ERP is becoming an important research area of modern information systems. Many businesses worldwide, especially small and medium-sized enterprises, are interested in learning about Cloud-ERP with lower costs, ease of use, and faster deployment (Alex Peng & Gala, 2014).

### 5.2. Why Cloud-ERP is flexible for Vietnam's textiles and apparel enterprises

As of 2018, the number of enterprises in the textile and apparel industry was more than 6,000, accounting for about 2% of the country. However, only about 30 enterprises had a scale of over 5,000 people. Moreover, most garment enterprises in Vietnam are small and medium-sized, with 200-500 workers (IDS, 2018). Therefore, many small and medium-sized enterprises of the Vietnamese garment industry require an appropriate management information system solution to continue boosting production capacity for the economy.

Therefore, based on the fact that most Vietnamese textiles and apparel enterprises are small and medium-size with a low financial capacity which in turn, could not spend significant investments in I.T. infrastructure. Therefore, the enormous budgets for implementing a traditional ERP are impractical for most of them. In this situation, cloud-ERP

can be configured based on their demand and capability. In turn, it will lead to lower ERP investment costs, including the upfront costs and operating costs.

Next, cloud ERP can be quickly deployed in the enterprise, while traditional ERP requires more I.T. capabilities from the enterprise side and takes more time to implement (Perkins, n.d.). Therefore, with a cloud ERP solution, Vietnamese textiles and apparel enterprises can reduce the burden in their I.T. capacity and shorten the ERP system deployment time.

Besides, scalability, one of the profound benefits of cloud ERP, is also an essential factor for Vietnamese small and medium enterprises in the garment sector, especially for small organizations who desire to expand their market and compete with larger competitors. Moreover, by applying the cloud ERP model, Vietnamese textiles and apparel enterprises could find it easier to access the world's advanced resources and technologies. Thus, it helps them to catch up and gain a competitive edge over their stronger competitors in the world.

However, the risk is the biggest drawback of cloud ERP compared to traditional ERP (Dua et al., 2012), in which the risk of data security is the most concern. Some businesses are reported to feel insecure when data is stored in the cloud because they have no control over data security yet depend on cloud-based service providers. In addition, the system performance tends to decrease significantly as the number of users and amount of data transmitted increases. Another concern is the limit on the ability to customize the system and integrate with other on-running services. This issue poses many technical and business process challenges for both ERP suppliers and ERP adopters.

However, these concerns are often seen as less critical for small and medium-sized enterprises than large enterprises. According to Kaspersky's survey in 2018 – "Growing businesses safely: Cloud adoption vs. security concerns," (Kaspersky, 2018) 74% of small and medium-sized businesses admit that data security is not currently among their top priorities. Moreover, in most Vietnamese enterprises, digital transformation is just at the beginning stage. Therefore, consideration such as the decrease in system performance due to the increase in the number of users and transmitted data or the issue related to integration ability with the existing internal systems does not pose high pressure for them.

To make it short, the lower upfront and operating costs, the scalability, and the promising and swift approach to access to advanced technology are of particular importance for Vietnamese SMEs in the textiles and apparel industry to consider when adopting cloud-ERP. On the other hand, some disadvantages recognized by cloud-ERP, such as customization and integration, could be less critical than for small and medium-sized businesses in Vietnam. Similarly, the capacity to control I.T. systems and security often do not play as the major problem for small and medium-sized enterprises in Vietnam in the current context.

## 6. Case study: A proposed cloud-ERP framework for GIOGARCO Enterprise

### 6.1. The urgency of digital transformation in GIOGARCO

Gio Linh Garment & Trading Joint Stock Company (GIOGARCO) is an enterprise located in Quan Ngang Industrial Park of Quang Tri, a province in the Central region of Vietnam. The company has many years of experience in manufacturing and trading in the garment industry. The company currently has an average output of 100,000 standard products/month[3]. The main products are jackets, polo shirts, jackets, and sportswear. The company's products are currently being exported to Europe, North America, Japan, Taiwan, and Korea. The enterprise composes 11 sewing lines with more than 600 machines and other automatic cutting machines to meet the garment industry's high quality and increasingly diverse requirements of fashion design. In terms of labor, more than full-time 500 employees are engineers, professional technicians, and workers currently working in the factories. The enterprise's development strategy focuses on shifting from the CMT method to FOB export in the forthcoming years. In its current strategy, the enterprise intends to develop and build another garment factory to create jobs for more than 1,000 local workers and increase the annual production capacity to over 3 million products. For successfully realizing this strategy, GIOGARCO urged to embrace digital transformation. The leading managers of the firm recognize the importance to develop a plan for digital transformation to ensure their survival and future development,

In terms of the current state of the I.T. application at GIOGARCO, the company daily handles and stores operational data. However, it is mainly by Excel spreadsheets and separated and disintegrated software such as accounting and payroll management. Although aware of the importance of I.T. applications in their business operations, the managers face many difficulties in their current digitalization status that gains minimal efficiency. Therefore, the company desires to deploy an overall enterprise management information system to optimize the available resources. Especially, GIOGARCO prioritizes the deployment of automatic tools to transform production management digitally from the planning stage to monitor production lines' implementation progress in the factory.

### 6.2. A proposed framework of cloud-ERP solution for GIOGARCO

The garment is a unique manufacturing industry because the assembly line is composed of many specific stages. Each stage has its production process, which is complex and includes many sub-production functions. Meanwhile, the production runs under many criteria from the retailer's order. Along with the production line, the activities such as sales tracking, raw material supply, and line balancing have to be observed and managed strictly. Therefore, separated and disintegrated applications could not take full advantage of the enterprise resources to achieve high efficiency in production.

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[3] http://giogarco.com/gioi-thieu-2/

To suggest an appropriate and overall I.T. solution for GIOGARCO, we need to identify which processes they need to transform and map out an optimal digital transformation process with the support of a technology solution. Figure 5 is the basic working process in the GIOGARCO production line. It starts with the stage (1), where orders and contracts are processed, then provides designing or sewing samples for orders or contracts. The sewing sample is the primary stage for building the sewing process for the assembly lines in actual production. The sampling is the basis to determine the level of material (BOM). BOM (Bill of Material) is a list of raw materials needed to be sourced to make a garment and make it ready for shipment as per the buyer's requirement. It is also essential to define production costs, raw materials inventory, and other production plans in the production management process.

Phase (2) is production planning. First, the warehouse department will check the fabrics, accessories, and other input materials for the production process. Next, the human resources department assigns personnel to the sewing lines. When the production plan and the labor arrangement plan are completed, the lines go into production.

Stage (3) is the stage when the line goes into production. In the production process, the sewing line manager needs to evaluate the efficiency of each line to maximize work capacity while minimizing working time. Usually, a sewing line is divided into many stages of sewing each small part, then assembling the details into a finished product. The workers will take on one or more of these steps to complete it, leading to some workers working at total capacity. Others have to wait because the time to perform different work steps is different. To minimize this waiting time, the line manager needs to find a way to distribute the work properly to create a balance for the sewing line.

In the production process, the final stage, stage (4), is the management of output finished products and inventory of finished products.

After evaluating the current status of digital transformation and the production process of GIOGARCO, we have proposed a cloud-ERP solution with eight modules designed explicitly for garment enterprises, focusing on the management tasks in the production lines of a garment factory. In corresponding to the four above-listed stages in the workflow of a garment factory, this proposed cloud-ERP solution includes the following specific modules:

Under phase (1) in the working process of garment factories (the stage of receiving orders and contracts and designing or sewing samples for orders or contracts), our proposed cloud-ERP system will compose the *Sales and Order Management Module*.

Following phase (2) in the working process of garment factories (production planning stage), our cloud-ERP system will be proposed, including a module so-called *Planning Management Module*. This stage requires preparing the fabric and accessories from the warehouse for the production process and allocating personnel to the sewing lines. Therefore, to support the production and planning stage, the cloud-ERP system includes two additional modules: the *Human Resource Management Module* and *Inventory Management Module*.

For phase (3) in the working process of garment factories (the production line), our cloud-ERP system will be proposed, including a *Production Management Module* and *Assembly Line Balancing Module*.

Corresponding to the final stage, stage (4) manages finished output products and inventory in the production process. Therefore, the proposed ERP system includes a *Productivity Management Module*.

The final is the *System Management Module* that manages all the transactions of users in the cloud-ERP system. In total, these eight modules have mutual interaction, connecting all business processes in the enterprise into a joint and single database to allow users to build reports and analyze analysis on the same dataset in real-time, without any manual data merging. The data needed for production is also provided quickly, helping businesses make easier decisions, simplifying management and collaboration across departments.

**Figure 5: Basic working stages in the GIOGARCO production line**
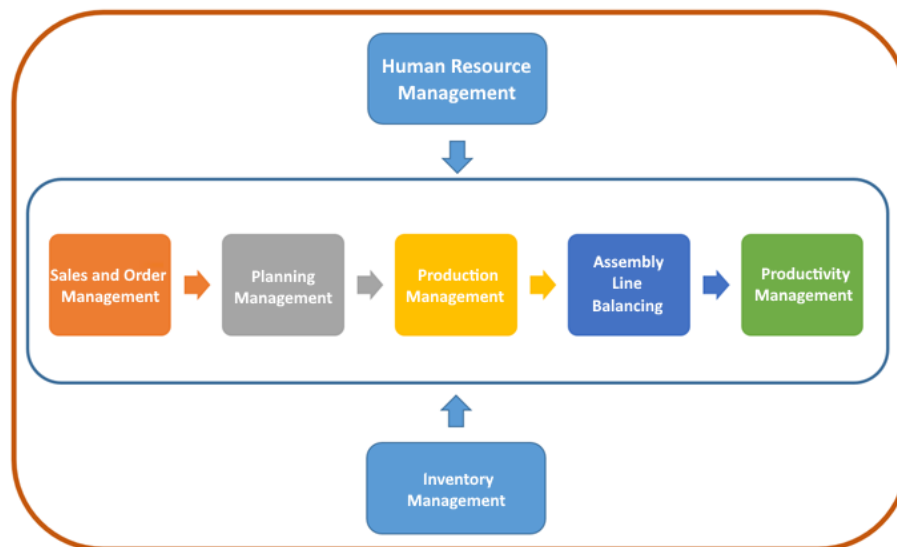


In terms of system architecture, our proposed cloud-ERP system has three-tier architecture, including: (1) Client tier: This layer allows the client to send a request to the web server; (2) Middle tier: This layer is considered as the webserver layer and the application service layer, which is the logical layer between the client interface and the database; and (3) Data tier: It is the database layer that stores and manages the data. This system architecture is illustrated in Figure 6. The middle and data tiers are subjected to the control and responsibility of the cloud service provider. The advantage of this three-tier architecture is that it will perform very well even when the number of users increases significantly. Therefore, expanding the system also becomes easier by adding more server components. Nevertheless, its most significant limitation is that the system will be more complex with the surge in the communication messages between layers.

**Figure 6: The architecture of our proposed cloud-ERP system**
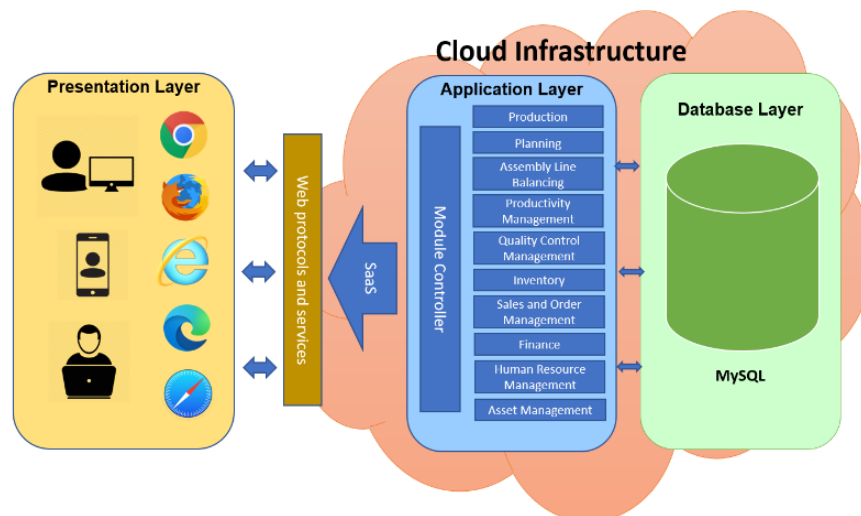


Our cloud-ERP system will be offered as a SaaS, which means a software-as-a-service model. For this solution, the service provider will be responsible for all the necessary tasks, including managing the database, configuring network infrastructure, providing and maintaining hardware and applications. The system will be "stored in the clouds." The servers are managed and taken charge of by the cloud-ERP provider. The only thing that enterprise users need to do is do some system configuration to suit the business situation. Users access the application through web browsers and pay the usage fee according to their demands. With this solution, businesses only need to pay for their services instead of buying the whole system. Companies also will not have to worry about service maintenance or hardware infrastructure management. The modules with various management functions are offered as a service on the Internet instead of software packages purchased by individual customers.

## 7. Conclusion

Many pieces of research have been carried out on the technical, functional, and managerial issues of ERP. Still, a few are available specific to ERP functioning and usage in the textile and apparel industry. This paper has described the current situation of the textile and apparel enterprises in Vietnam in the urgent need to implement a suitable ERP solution that can help them boost their productivity and competitiveness. We emphasize the benefits of the emerging cloud-ERP application for Vietnamese textile and apparel enterprises in their road towards overall digital transformation. In this circumstance, we have introduced a case study of a specific small and medium-sized enterprise in the central region of Vietnam, named GIOGARCO, which successfully deployed our framework of cloud-ERP. As a result, the application of ERP meets their current situation and helps them solve the challenges in the production line. This framework is a system with three-tier architecture and composed of eight modules, including not only the basic management modules such as inventory management, sales and order management, human management, but also the very specialized modules for the exceptional characteristics in planning, production, and balancing assembly lines in textile and apparel factories.

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# APPLICATION OF TRACEABILITY TO MANAGE PRODUCTS IN VIETNAMESE ECONOMY: OPPORTUNITIES, CHALLENGES, AND SOLUTIONS

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## Abstract

*Traceability (TXNG) is becoming a trend that many people are interested in these days. In the digital transformation within the industrial revolution 4.0 (Industry 4.0), traceability is known as the solution to solve the counterfeit, imitation goods, and low-quality goods consumed in the market. At the same time, traceability is the foundation for supply chain optimization in the 4.0 economy. Therefore, TXNG is becoming a hot issue of global concern. Vietnam has also accepted and is gradually approaching this trend as an inevitable thing as Vietnam has moved towards globalization, international economic integration, and trade liberalization since 1986. The application of TXNG technology to manage products is an opportunity for Vietnam to reach out to countries with high and demanding requirements for products quality. In recent years, applied traceability technology to manage products, goods in Vietnam has increased the transparency and clarity of products information. Then, promoting domestic product consumption and export, contributing significantly to the economic growth of the country. However, besides the opportunities, there are many challenges that Vietnam needs to overcome.*

***Keyword:*** *Traceability, Products Management, Opportunities, Challenges, Vietnam.*

## 1. Introduction

21st century is the era of the industrial revolution 4.0. The world and Vietnam recognize the remarkable development of technology and science in this era. The growth of science and technology has had a massive impact on all areas of the socio-economic life of countries worldwide. Applying 4.0 technology in production and business has risen as a worldwide trend in which organizations have to compete fiercely in domestic and international in the current context. Organizations that take advantage of opportunities, invest and succeed in applying 4.0 technology have all gained theirs' competitive advantages. Among those technology applications, traceability has emerged as a new trend that has attracted much attention recently, especially in the era of digital transformation. Traceability has a very significant role in the business activities, import, and export of enterprises. The successful application of the traceability system will help organizations take advantage of innovations, improvements, and the rapidity of science and technology, contributing to more effective management and business.

Traceability is no longer unfamiliar to enterprises, consumers, and stakeholders over the world. In most developed countries, traceability is a crucial and mandatory element for many types of products. The number of counterfeit goods, imitation goods, poor quality goods, products of unknown origin, etc., is increasing rapidly. Applied successful traceability systems help organizations create customers' trust, create transparency about their products' quality. However, this technology is still new to Vietnamese organizations and businesses. Therefore, Vietnamese enterprises cannot avoid difficulties and challenges when applying traceability. According to the Import-Export Department, traceability is a common requirement for export-import items. In other words, if Vietnamese businesses want to access potential markets, they need to be aware that traceability is a requirement that they have to fulfill whether they like it or not. Faced with this situation, studying the opportunities and challenges when applying traceability is necessary for businesses in Vietnam. Since there, the proposed solutions will contribute to promoting and encouraging the application of traceability in Vietnam. Vietnam can catch up with the trend of the world, increase its enterprises' competitiveness within the region and the world.

## 2. Theoretical framework, Literature review, and Methodology

### 2.1. Theoretical framework

**The concept of traceability**

In the past, the food industry has witnessed many scandals related to food quality and safety. The causes were not only from the internal problems of the food such as chemical composition, bacterial contamination, microbial contamination, chemicals that affects toxic to consumerus. But also many other related issues as environmental pollution, changing farming practices, or even technological innovation. The cause of the un-clean food was not accurately determined, making it tougher to manage, control, and ensure food safety and hygiene, then the number of un-safety food was rising in the world. The food industry needed to have solutions to control food more safely to handle this situation. The system of traceability was born due to that purpose. It helps government agencies to monitor and manage the number of contaminated food which was rising. However, at that time, science and technology had not developed, traceability was deployed in the old way, relying only on manual recording in books to track the origin of forming products. Therefore, traceability at that time has many shortcomings.

Until the end of the 20th century and the beginning of the 21st century, science and technology boomed and developed. Traceability has become a global solution and does not use only in the food sector. This technology has been applying in many different fields such as health, agriculture, production, business, etc. The scope of traceability has expanded widely. Then, the concept, the methods to trace products also need to be more comprehensive and diverse. It helps manage products in an adequate, accurate, and overview manner. The concept of traceability that countries applying is based sorely on the definitions issued by international organizations. Specifically as:

- At the Article 18, Regulation (EC) No. 178/2002 regulated: *"The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing, and distribution."*).

- In the Global Traceability Standard (GTS) of International not-for-profit Association about designing and implementing of global standards and solutions (GS1) đưa ra khái niệm: *"When considering a product or a service, traceability can related to: origin of materials and parts; processing history; distribution and location of the product or service after delivery"*.

- According to the national standard TCVN 12850: 2019, traceability is: *"The activity of monitoring and identifying a unit of product or service through each stage according to the time and location of the production, processing, storage, preservation, transportation, distribution and trading process. "*.

It means, when considering the origin of a product or service, it may relate to the source of the material or the section, the piece; manufacturing process history; the delivery and placement of the product or service upon delivery. To sum up, the definition of related terms are mentioned such as: the definition of chain of custody, chain of ownership, critical tracking event, key data element, data carrier, parties, organization, supply chain, etc.

- In the ISO 9000:2015 Standard of International Organization for Standardization (ISO) mentioned the definition of traceability as *"Traceability is the ability to trace the history, application or location of an object"*.

In simple terms, traceability is a solution to help retrieve the product information from the beginnings as raw materials, production process, etc., to transportation, distribution. Traceability is attached to goods in the form of a code, which is encrypted and is capable of downloading information to the user quickly when scanning with a smartphone.

**General principles**

In national standard TCVN 12850:2019, it has mentioned the general requirements for the traceability system in an organization also the entire supply chain. Muranwhile, it is also applicable to all areas of production and business, regardless of the size of the organization or the supply chain. Specifically, the standard sets forth requirements (TCVN, 2019) such as:

- The principle of "One step before - one step later": ensuring the ability to monitor and identify the previous production and business stages and the next production and business stages in the production and business process for customers. with a product.

- Principle of "main data element availability": key data elements must be collected, stored, and updated promptly in reports detailing important events in the production process. export and supply chain.

- Principle of "transparency": the traceability system must meet minimum transparency requirements using static data about customers, suppliers, products, and production conditions.

- Principle of "participation of all traceability parties": the traceability system must include the participation of all traceability parties of the organization.

Businesses are required to follow these principles when implementing their traceability systems. To ensure that the traceability system complies with the above four principles, enterprises also need to meet specific system requirements such as interoperability, diversity, identity, traceability system, management system, or traceability data requirements such as data requirements, data interchangeability, traceability data within the organization, data supply chain traceability, traceability data management requirements, etc.

**The benefits of traceability**

Nowadays, the traceability system has developed and brought more values and benefits to all the consumers, businesses, and the country. According to TraceVerified – an organization providing solutions – There are four characteristics of traceability can be referred to Traceverified (2019) as follows:

*(1) Information is updated in real-time*

With traditional methods, the storage of information takes place by recording between many stakeholders. In this way, information passing through many parties can be misleading, misunderstanding, or affecting the transparency and transmission to customers. However, the application of high technology and the connection of the internet continuously on the data system to trace the origins helps the information being updated directly, and in real-time.

Typically, in the agricultural field, traceability plays an important role in ensuring information related to farming. The necessary information is updated accurately, in real-time. After harvesting, the information related to products can be updated immediately on the data system. The information will be integrated within code on the traceability stamp affixed to the packaging of agricultural products. Customers will know properly when the products were picked, the processes, the time of cultivation, whether the cultivation meets the regulations as in the standard.

*(2) Updated data is difficult to change*

When updating information on the data system, the user can only change it within a fixed time. Then, the editing function will be locked, avoiding changes for their unjustified purposes. In addition, to save information from leakage or information hacking, the information will be kept safe through many layers due to new technologies and delivered to the buyer in the most accurate way. With this edit lock function, companies need to update information carefully, accurately, do it right from the beginning, and avoid having information changed many times, causing a loss of transparency of the data. Besides, consumers feel more confident and assured about the traceability information integrated into stamps attached to products and goods.

*(3) Quick and smart retrieval*

With the dense infrastructure and network connection system, when users scan code through the access stamp, they will immediately receive information and retrieval results and in detail. In addition, through the intelligent retrieval system, users can also know the exact condition of the product as the expiry date of the goods, whether the product is real or fake.

*(4) Smart linkage with other solution utilities*

Other applications such as shipping, e-commerce, etc., can also use the information within this great data system to manage their activities. The related data, systems need to be constantly improved and updated through new technologies. So, it will bring transparency to the market and bring traceability solutions closer to consumers.

Countries around the world have recognized these values that traceability brings early on. The use of QR codes for traceability is no longer strange to organizations, consumers, and stakeholders in these countries. They have put traceability into use and become mandatory in some regions of the world. In most developed countries, traceability is an essential and compulsory element for many products, especially nutritional ones. Nations around the world have been applying traceability for a long time. Since 2005, the European Union (EU) has made it mandatory for member countries to use traceability. According to the FLIS (Food Labeling Information System) tool introduced by the European Commission, imported goods into these member countries must identify signs for each manufacturer and synthesize them into a complete system. Goods must be monitored and have retrieval signs by each factory, including importers. Specifically, companies that want to import into the EU must have a label on their products that contains all the information required by the EU market. So, consumers can identify and trace the origin when their imported products are defective. The person importing these consignments into the EU is also required to be responsible for all imported products are labeled and affixed following relevant regulations. (European Commission, 2021). Due to these regulations, the EU has well-controlled the food, products, and goods imported into this market, minimizing the consumption of low-quality products and unclear origin. Compared to the EU, the United States (US) has also issued several laws to regulate traceability. In January 2011, the country released the Food Safety Modernization Act (FSMA), which requires enhancing monitoring, tracing, and record-keeping for high hazardous foods to protect public health. (United States, 2011). In the Health Security Law of this country, each point along the chain must have an account identified for the place of delivery. Every information emitting point in the production chain must have someone responsible for it. More than the EU, the US market focuses on intentional risk prevention, thereby preparing a response plan, including accidental hazards. Other countries as Ireland, Canada have strict regulations in the use of labels to identify products and production facilities. To sum up, these developed countries are very concerned and attach great importance to the origin of goods, especially ones that directly affect consumers' health.

In Asia, member countries have also gradually approached and successfully applied traceability technology to manage products and goods circulating in their markets. For

example, in India, since 2006, manufacturers and processors of grape products have established and applied the GrapeNet electronic traceability system. This electronic traceability system allows stakeholders in the supply chain of grapes and grape products, customers, and consumers to look up and retrieve information about grape varieties, time, and process cultivation, also the time of grape harvest, the raw materials for the manufacture of the products, or other processes involved in, etc. With this system, grape producers in India can join the world's system and help them gain belief totally from the EU import market. Thailand - a country famous for tropical fruits - has issued a national standard on electronic traceability, built a portal for people to register for free use since 2010. Accordingly, bananas, bananas products, and durian products sold at small stores in Thailand are all affixed with a QR Code. So, the consumers can instantly access detailed information about these fruits, and at the same time, the system brings obvious economic benefits to Thai farmers.

Since 2005 Australia has had regulations on issues related to traceability for livestock and mandatory identification tags for cattle, sheep, and goats. These cattle information and tag codes are also registered on the Australian Cattle Portal, supporting cattle meat production throughout the supply chain. The entire life of an individual animal from birth to slaughter, and even their movements, is monitored through the national animal identification system and registered in the facility system data.

From these examples, traceability is a solution that countries around the world are aiming to apply. The most developed and leading countries worldwide have been using traceability technology in their production and business activities to manage products and goods most conveniently and comprehensively. Traceability has become a strategic priority for organizations around the world. In addition to enabling increased supply chain quality, efficiency, and transparency, the sharing and use of traceability data enable the development of solutions that enhance supply chain security and safety. It is an inevitable trend that Vietnam will have to accept to keep up with the world.

### 2.2. Literature review

Traceability is a relatively new topic in Vietnam. Therefore, there are not many studies related to it.

- In the paper "Assess the needs of enterprises and consumers for a traceability tool that applies code and barcode technology" (Lam Huu Danh et al., 2020), there are three conclusion as: The first point is *"traceability is a new definition and awareness to a large number of customers"*. Second, he found that *"the most important function of a traceability system is to identify the counterfeit goods, fake goods"*. And the third conclusion is *"customers is curently identifying the counterfeit goods based on their experiments"*. The paper hasn't shown the oppotunities or challenges for the enterprises but it pointed out that traceability is an effective tool that helps organizations and customers to ensure the quality in production and customers' rights.

Due to the lack of research in this topic. It is a new and up-to-date topic for analyzing the opportunities and challenges for Vietnamese organizations. Since there, the author hopes that the article can bring new points to other related studies in the same field.

### *2.3. Methodology*

The article mainly uses the method of collecting secondary information from seminars related to this topic. The used information is from the annual reports of the Ministry of Industry and Trade, the opinions of individuals answering interviews of the mouthpieces, newspapers, television stations, presentations at seminars, seminars, introduction to traceability at Government-affiliated organizations, press agencies, ministries, departments, branches, thematic reports of the Ministry Industry and Trade.

The dominant method of data analysis used in this paper is a generalization, synthesis, and analysis to make research conclusions, as a scientific and practical basis for proposing appropriate solutions to take advantage of the database to overcome challenges and grow.

### 3. Results and discussion

### *3.1. The situation of trading counterfeit goods, and traceability applications in Vietnam*

21st century is known as the era of the industrial revolution 4.0 (Industry 4.0). The world and Vietnam have recorded the remarkable developments of technology and science in this period. The evolution of science and technology has created powerful impacts on all areas of the socio-economic life of countries around the world. Applying traceability technology in production and business has emerged as a worldwide trend when organizations are emulating fiercely locally and abroad. Organizations that have taken advantage of the chance, invested and succeeded in applying this technology have gained their competitive advantage. Traceability technology helps organizations and businesses take advantage of innovations, improvements and the rapidity of technology, management, and business activities are therefore also more effective.

The development of science and technology creates conditions for the introduction of new materials at a low cost. It means that goods produced by counterfeit materials can cost as little as one-third of an authentic product. It has an impact on businesses and consumers. Companies face loss of reputation and competitive advantage at any time because their products and goods may have been fake while they do not know. Consumers are also affected when consuming these low-quality goods. Typically their health can be seriously affected when consuming fake and unqualified foods. Accordingly, traceability is an essential solution for businesses to protect companies' interests and consumers' rights.

According to the yearly report of the General Department of Market Management (Ministry of Industry and Trade), the number of counterfeit goods, imitation goods, goods infringing upon intellectual property rights, low-quality products, etc., circulating on the market is remarkably high. Although the Market Management Sub-departments have changed the way to check for counterfeit goods, the number of counterfeits is still high. Instead of

spreading the check like before, now they have developed a plan to attack specific locations. However, counterfeiting is very sophisticated, plus the increase of unregulated e-commerce platforms makes the inspection and control of goods even more difficult.

**Table 1: Statistical data on inspection and handling of violations counterfeit goods, imitation goods nationwide (2016 - 2020)**

| Year | Number of inspections | Number of violations | National budget (billion VND) |
|------|----------------------|---------------------|-------------------------------|
| 2016 | 167,101 | 104,807 | 548.90 |
| 2017 | 164,355 | 103,146 | 511.75 |
| 2018 | 155,583 | 98,167 | 490.27 |
| 2019 | 150,356 | 84,619 | 429.11 |
| 2020 | 125,702 | 66,737 | 352.15 |

*Source: Author's summary from the report of the General Department of Market Management*
*- Ministry of Industry and Trade*

The above statistics table shows that, in the period from 2016 to 2020, the number of inspection cases related to counterfeit and fake goods is always high, averaging about 152,000 circumstances per year with the number of violations at about 91,000 plights per year, accounting for about 60% of inspection cases. It means that, on average, every fifteen situations of inspection recorded nine detected and handled instances that are related to fake and counterfeit goods. It is an alarming situation. If no timely measures are acquired, consumers will lose confidence in products and goods on the market.

The current situation also shows that consumed fake goods, imitation goods, low-quality goods, goods infringing intellectual property, goods circulating on the market without origin, products contain banned substances, toxic substances are affecting the consumers' health. The number of these products is increasing, then the use of stamps and labels to ensure food safety and quality on products as before is no longer appropriate. Also, it still has many shortcomings. These stamps and labels can be faked, leading to inaccurate information about products, confusing consumers when using them. Hence, products of enterprises are easily counterfeited or infringed upon intellectual property rights. Many companies in Vietnam were revealed by the authorities while copying or counterfeiting these stamps and labels, as many cases of being exposed while consuming products with stamps, fake labels. Due to that, the application of traceability is a modern, up-to-date real-time, transparent solution, contributing to solving problems related to counterfeit and imitation goods that are outstanding in the market. Customers and consumers will have believes when using traceable products because they can access the origin of products and goods themselves. Companies can easily handle shipments of low-quality or counterfeit goods through the use of traceability technology. At

the same time, they also may manage product-related information from input materials, production processes until the product reaches the consumer. As a result, they can control the goods entering the market closely, transparently, and, protecting their reputation, even increasing their competitiveness.

Product traceability has become an essential factor and objective demand in the production and distribution process of products. In the era of globalization, Vietnam has no choice but to accept the compulsory rules, including meeting the requirements for green development. Many Vietnamese enterprises have started applying this technology to meet the needs of domestic consumers and abroad.

Along with it, Vietnam has raised the level of its economic relations with partners to a new position after joining regional and international organizations such as ASEAN, APEC, WTO and TPP, engaged in trade agreements with the United States (US), and signed conventions with the European Union (EVFTA). It is also "tickets" to help Vietnamese companies reach out to difficult-to-please countries and regions, contributing to bringing Vietnamese products and goods to the international level. One of the requirements for Vietnamese products to be imported into these countries and markets is traceability. By capitalizing on these technology advantages, Vietnamese enterprises may apply properly in their production and business activities, thereby, they may integrate deeper into the potential markets.

In recent years, Vietnam has made constant efforts to harmonize international business activities, including harmonizing traceability standards for market management, product and goods management, and consumer protection. Standardization activities for traceability have intensified in Vietnam in recent years. There are many Vietnamese standards related to traceability activities that have been established and promulgated. These standards are the legal bases and corridors for enterprises to apply traceability technology. There are dozens of national standards for traceability. Such as standards for the general requirements of traceability, standards for tracing in each product kind, or for each area of activity, and related standards in the product supply chain. However, these standards have not been disseminated, propagated, and promoted in organizations or communicating to consumers. Therefore, the standardization of traceability activities is an objective necessity to manage the production and business process and protect consumers, to ensure the fight against counterfeit and low-quality goods labor.

### 3.2. Opportunities and challenges for Vietnam in the application of traceability technology and business management

#### 3.2.1. Opportunities

In the current integration context, competition occurs not only when Vietnamese goods export overseas but also at the domestic range when foreign goods and products enter Vietnam. Ensuring goods and products of good quality is extremely important for the competitiveness of Vietnamese enterprises. Experts say that the application of traceability

technology in the current 4.0 technology era is a trend that businesses need to grasp and implement immediately to keep up with the world. Enterprises may enhance the value of goods and raise consumer belief in products through traceability. At the same time, Vietnamese goods may create prestige and trust in both domestic and foreign markets. As a result, Vietnamese companies need to grasp the opportunities that traceability brings to businesses and their products, also to consumers.

*First,* Vietnam has the advantage in export.

According to the Ministry of Industry and Trade's statistics, after 25 years since joining ASEAN, more than ten years joining WTO, Vietnam has become the 22nd largest export economy worldwide. Vietnam's export growth recorded a robust increase, surpassing large economies in Asia. Specifically, in the first quarter of 2021, export turnover of goods reached 77.34 billion US dollars (USD), up 22%, much higher than other economies in the region such as Indonesia: up 8.56%; Singapore: up 1.1%; Korea: up 10.5%; Japan: up 9%; Thailand: down 1.16%;... (Ministry of Industry and Trade, 2021). Besides, from 2016 through 2020, Vietnam has had significant growth in total export value.

**Table 2: Total export value and distribution of export markets of Vietnam**

**(The period from 2016 to 2020)**

| Year | Total export value (Billion USD) | Asia (%) | Americas (%) | Europe (%) | Others (%) |
|------|----------------------------------|----------|--------------|------------|------------|
| 2016 | 176.6 | 48.4 | 26.3 | 20.7 | 4.6 |
| 2017 | 215.1 | 52.4 | 23.9 | 19.1 | 4.6 |
| 2018 | 243.7 | 53.6 | 23.4 | 18.5 | 4.5 |
| 2019 | 264.3 | 50.6 | 27.6 | 17.5 | 4.3 |
| 2020 | 281.5 | 48.9 | 31.4 | 15.5 | 4.2 |

*Source: Author's statistics from the report of the Ministry of Industry and Trade*

According to the Ministry of Industry and Trade report, the total export value of Vietnam has continuously increased over the years. Specifically, in 2016, the total export value of Vietnam reached 176.6 billion USD. This value has risen sharply over the years, reaching 281.5 billion USD in 2020. (Ministry of Industry and Trade, 2020) The main export markets of Vietnam are countries in Asia, America, and Europe, and the allocation ratio is about 50%, about 27%, and about 18% of the total export value, respectively. Also, many export products of our country retain a crucial position in the ranking of export achievements of the world. For example, Textile ranked the seventh in the world with a turnover of about 33 billion USD. Footwear is in the third worldwide in production and the second in export with a turnover of about 17 billion US dollars. Electronics gets the twelfth in the world in terms of exports, the second in the world with electrical goods, mobile phones with a turnover of about

50 billion USD. Or seafood and furniture at the fourth and the fifth respectively globally with a turnover of about 9 billion USD.

Without a doubt, export is the "bright spot" of Vietnam's economy. Exporting is both an advantage and an opportunity for Vietnam to go further in the international market. Vietnam's products and goods have gained a foothold in the world markets, typically in Asia, America, etc. Therefore, Vietnam needs to maintain these positions to ensure the growth of its economy. Along with new-generation trade agreements such as Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), European- Vietnam Free Trade Agreeement (EVFTA), when applying traceability technology to products and goods, Vietnam will have more conditions to penetrate partner markets with preferential tariffs and commit to facilitation to reduce barriers.

*Second*, Vietnam has timely realized the meaning and importance of traceability. During the integration process, Vietnam has also issued the national standard and several policies on commodity traceability.

Accordingly, the People's Committee of Ho Chi Minh City has issued Decision No. 4199/QD-UBND approving the Managerial Project, identification, and traceability of pork origin in the city, the Decision No. 231/QD-UBND on permitting the target program to develop safe vegetables in the city, etc. Or the Department of Agriculture and Rural Development has Plan No. 3355/KH-SNN on pilot implementation of traceability of vegetables in Ho Chi Minh City. The Ministry of Agriculture and Rural Development also issued the consolidated document numbered 01/VBHN-BNNPTNT 2018 on traceability of unclean food on May 18th, 2018. This document stipulates that the traceability must comply with the principle of "Trace one step before - one step after.". In addition, since 2019, Vietnam Institute of Standards and Quality has issued the national standard about traceability. At the same time, the Government has approved the project on traceability (Project 100). The National Barcode Center is the unit that implements the contents according to the scheme to improve the efficiency of managing the quality and safety of products throughout the supply chain, thereby increasing the value of Vietnamese goods. One of them is to build and put into operation the national product traceability portal. Supply chain parties such as manufacturers, packers, transporters, distributors, retailers, traceability providers, and regulators can use this portal. After realizing its importance to production, business, also the economy, the Government and local government agencies issued policies related to traceability. These policies are not only requirements but also orientations. It helps Vietnamese organizations can build traceability systems. Then deploy them, and execute the related activities easier and more conveniently.

Traceability is a relatively new activity in Vietnam. To ensure that Vietnamese enterprises can correctly apply the conditions of this technology, the Ministry of Science and Technology has drafted a circular guiding the implementation of this technology of the National Barcode Organization global GS1 economy. Accordingly, traceability needs to

ensure factors such as: (1) The traceable information must represent the product value chain. Any product is required to show information about the product's formation and transportation process. Each process of all participants in the chain must show in the traceability information. (2) Information of the product when retrieved must show the same as announced for circulation. (3) There should be third-party inspection and supervision in the entire process of creating that product. Products need to show the related quality checks, tests, certifications, and evaluations within the linked chain from a third-party organization. (4) An electronic diary of the entire product formation process is required. Relying on these electronic logs, consumers can pinpoint precisely where does the problem is throughout the chain. Since there, products with quality problems when reaching consumers can trace who has to responsible for it. (Ministry of Science and Technology, 2019).

Grasping the values of traceability, Vietnam has applied this technology in some specific fields. Typically, in the import and export, Vietnam has used traceability in exporting fruits through official channels to China. Or Vietnam is completing the traceability system of imported fruits from Australia, along with a fruit map to help access quickly and trace the origin of the fruit. In the agricultural sector, organic agricultural products based on Global Gap, VietGap, Participatory Gurantee System (PGS), etc., standards have used this technology to clarify the organicity of farming products. Therefore, identifying the details of organic materials in the product helps consumers accurately discern the percentage of organic is 100% organic, at least 95% organic, or at least or less than 70%. In addition, traceability helps control and retrieve motor vehicle insurance information. Police can use traceability stamps attached to motor vehicle insurance to accurately identify insurance information such as chassis number, engine number, vehicle owner information, and others information related to registration and registration check. Hence, they can monitor and manage vehicles closely and in detail. Besides, this technology is using in the internal activities of enterprises or farming managerial activities, mechanical factories, imported car warehouses, management in hospitals, and the medical field.

By promptly recognizing the values, importance, and necessity of applying traceability, Vietnam can catch up with the world trend. Moreover, Vietnamese enterprises can promote this technology in production, management and improve their traceability system. To do that, they need to implement strictly and fully the guidelines, regulations, and policies. Thus, they can increase their competitiveness at domestic and abroad.

*Third*, more and more Vietnamese consumers are interested in the origin, production, and transportation of products and goods.

According to the Ministry of Industry and Trade survey result, 49% of consumers are interested in product traceability. Consumers are increasingly concerned and aware of traceability. Free trade has created opportunities for international products and goods to penetrate the Vietnamese market. With the same commodity, but with imported products, consumers can feel secure and have more belief when they can trace the origin, production

process, and related information. Compared to another similar product from a domestic enterprise, but the information is unable to be retrieved. It means that the more transparent and clear product and goods information is, the more it can win the customers' faith. For this reason, Vietnamese organizations need to promote the use of this technology in their products, and they can gain the consumer's trust. In that case, they can raise the competitive level with imported products export.

*3.2.2. Challenges*

Besides the opportunities that traceability technology can bring to organizations and countries, there are still difficulties and challenges that Vietnam needs to overcome. So, Vietnam can apply traceability effectively, catching up with world trends, contributing to the positioning of Vietnamese products and goods in the international market.

*(1) The majority of Vietnamese enterprises are small and medium sized*

According to the General Statistics Office statistics, Vietnam has nearly 90% of the sum organizations, are small and medium enterprises (SMEs). These Vietnamese enterprises have limited facilities and resources. It leads to many difficulties in researching, building, and implementing a traceability system for each specific product, product group, and industry. Many companies still manually record the origin of goods according to the books. It makes the application of this technology on a national scale uneven, and the traceability systems between stakeholders in the supply chain are not linked together for tracing original products.

*(2) The deployment of traceability stamps in localities is still spontaneous and lacks consensus on a national scale*

Traceability activities in Vietnam currently are taken in many different forms. Some businesses and organizations apply traceability according to ISO 9000, ISO 22005, etc. Some others choose GS1 regulations and standards. The difference in applying the standards leads to asynchronous and uniform traceability activities nationwide. The types of stamps used for traceability are also diverse, which causes the phenomenon of "stamp disorder" in the market. In reality, these stamps do not have a consensus on the content and form, leading to the access to only stop at the internal code. It means they can only show information within the unit system without any association connected to the outside. Likewise, when consumers or regulatory agencies want to retrieve information about a product or goods, they only get general information, cannot trace to the beginning of product origin, goods, or others information of related parties. Especially at present, there are no specific regulations on the responsibilities of the parties involved. Besides, the cost for producing these stamps is relatively high, affecting product prices, so many businesses have not paid attention to, invest in, and use these stamps formally. This necessary information is lacking will cause difficulties in managing products and goods, also difficulty in assigning responsibility when products and goods have quality problems.

*(3) The traceability stamp only provides information, does not show the link chain of the goods for final accountability*

A survey by the Ministry of Industry and Trade on consumers' interest in traceability has shown that 47% of respondents said they want to look up the origin of products and goods but do not have enough information. 74.8% of respondents said that it is difficult to trace the origin of goods. According to the Institute of Agricultural Environment research, up to 95% of products currently circulating in supermarkets are used electronic stamps with QR codes and are traceable. However, these products can only partially retrieve information and data, but no standardization in content and form, not associated with management activities, and no depth in the aspects of data.

At many production facilities, traceability information is not recorded in detail, is still sketchy, and not followed the process to serve the traceable task. The method of taking notes is still manual on paper or excel software. So, the content and form of traceability information among enterprises within an industry are inconsistent. Thus, the lack of linkage in the system makes it difficult to trace the product's origin. Moreover, some enterprises have export activities, so they are forced to apply international standards for production and processing. These businesses have traceability information, but most of the information mentioned in manual books is formal, not directly tied to specific shipments. Thus, the information about the shipment when retrieved is only "virtual" information without reality, not accurately representing the true origin of the shipment.

The cause for the traceability stamp only stopping at the "top" like this comes from the two challenges above. The traceability in Vietnam is still doing manually. The production process is recording in a production diary, then manually entered into the computer. This action needs repeated many times to get product information to export the stamp code. In addition, the level of many production facilities is still limited, so right from the production logging stage, they encountered confusion. Meantime, the traceability stamps have not been unified, standardized in content and form, and have not shown the management and inspection of the authorities. It makes QR codes for traceability only provide the address, product name, production time, but not the entire production process along the value chain. Therefore, when an incident on food safety and hygiene occurs, it is difficult for the management agency to trace reversely the information by the QR code electronic traceability system itself.

*(4) The traceability regulations of each region have different requirements for the level of traceability*

As mentioned above, EU regulation emphasizes monitoring of each factory, including the importer; US regulations: requiring each point in the value chain to have a specific responsible person; Japanese regulations: promote self-responsibility and increase sampling when there is a mistake. As can be seen, there are different requirements for each region. It is a challenge for Vietnamese enterprises. Inevitably, the same traceability system will not be able to meet all the requirements of different markets. Therefore, Vietnamese enterprises need to invest and complete their traceability system. Then, they can meet the diverse requirements

of various regions. That is a difficulty because the traceability systems in Vietnam are still limited and not comprehensive. Furthermore, the size of Vietnamese enterprises is mostly SMEs. So, investing in and perfecting the traceability system requires them to precisely "spend" on this technology.

*(5) Awareness of traceability is still low*

According to the National Center for Codes and Barcodes (General Department of Standards, Metrology, and Quality), many people currently do not understand the correct meaning of traceability. They just vaguely understand that traceability is a product with a QR code. About 95% of the products are selling in supermarkets and shops are attached with QR codes and are promoted as traceable. But such fact is only information retrieval, not traceability like the information is superficial and inadequate, only the name of producers. So, customers cannot distinguish the goods are real or fake? (Thu Huong, 2020)

*(6) Lack of consistency in providing traceability solutions*

In reality, many companies provide traceability solutions. Each company has different trends and solutions. Besides, no clear regulations on traceability so, there is no unifying among these companies. Many establishments and enterprises use QR codes to provide information about products. However, the retrieval activity through this stamp has not been consistent in content and form. In addition to this, this access stamp can only use the internal code system, does not meet the access requirements, especially has not been connected to the management agencies. And, it does not allow other related parties to participate in other channels or do not connect to the traceability systems of other countries in the world.

## 4. Solutions to promote the application of traceability in Vietnam

Without a doubt, traceability is a trend that Vietnam will have to apply whether it likes it or not. Therefore, it is necessary to have solutions to help enterprises realize the importance and be encouraged to execute it to their production and business, or their products and goods.

*Firstly*, the Government needs to have policies to promote, facilitate and support enterprises, especially SMEs. These companies have limited resources and insufficient facilities to be able to build and deploy their traceability system. Hence, the Government's policies need to create incentives and encourage companies to use this technology methodically and strictly.

*Secondly*, the central State management agency needs to have specific regulations on traceability. They need to check regularly to ensure companies have enough capacity to build traceability solutions, and they precisely follow the rules. Next, there must be specific regulations on organizations' capability of testing and evaluating traceability. The traceability activities are meaningful if the rules are mandatory for enterprises. And it is supervised by state agencies. The products will be valuable high due to proven quality. It creates the brand name of Vietnamese goods for export, creating the trust of consumers. Local state management agencies must understand the regulations and requirements on traceability to

support local companies. Enterprises also need to build links with stakeholders in the chain. Standards are not only a barrier but also a catalyst for enterprises in the industry to develop. National standards on traceability need to be compared with and based on international standards. However, it should be strict enough but appropriate for the general Vietnamese enterprises' development. So, products and goods that meet the requirements of this national standard can be qualified to import into fastidious markets. A specific national standard for traceability will allow companies a particular orientation, and the standards' requirements are moderate to implement. Enterprises have insufficient resource will be in trouble when they try to meet international strict standards and policies. So, the national traceability standard helps companies orienting moderately to carry out their traceability activities. Also, implementing this traceability standard help create uniformity and consistency in the national scope.

*Third,* local management agencies and companies need to be trained methodically on traceability activities. On the part of local management agencies, they must need the education to have stricter management of registration and use of QR codes, to avoid fake and low-quality goods having the opportunity to mix. On the side of enterprises, it is necessary to have trained how to manage traceability stamps through IT. Also, they need training on related skills and how to record also update traceability information fluently, accurately, and quickly. At the same time, traceability policies and regulations from countries where the local products and goods exported need to be regularly updated. Hence, both the local management agencies and local enterprises can grasp the new aspects and changes to approach this technology flexibly and timely.

*Fourth*, traceability activities need to be associated with state management activities to improve transparency and clarity about product origin also stakeholders in the product value chain. Along with it, the system will promote the effectiveness of traceability. Since there, the new information retrieved is correct and complete, and at the same time strengthens the responsibility of the parties involved in the creating process of those products and goods. A product or goods guaranteed to provide all necessary information related to traceability need to show information as the parties directly involved in the production process, the supplier, input materials, the transportation process, distribution to consumers, along with information certified by state management agencies, etc. Each organization related to products and goods must show in the retrieval information, especially information related to the state's checking and certification.

*Fifth*, on the side of traceability service providers, need to do research and improve products and service provision processes. So, to meet customer requirements in terms of quality, price, transparency, security, and ease of use. Along with ensuring the requests of state management and law for its operations.

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# BLOCKCHAIN BILL OF LADING:
# THE FUTURE OF LEGAL REGULATION IN VIETNAM

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## Abstract

*The international shipping industry is responsible for the carriage of around 90% of world trade. Currently, technology and blockchain, including Blockchain bill of lading are gradually changing the face of this long-standing traditional industry. Vietnam is a developing country but is quite responsive to technological change. But has the Vietnamese law created favorable conditions for blockchain bill of lading to develop yet? In this research paper, we will answer two research questions including (1) whether the Vietnamese legal framework is enough to encourage the development of electronic bills of lading on the Blockchain platform and (2) how to improve the legal framework. The research methodology is legal analysis and synthetic method.*

*Keywords: blockchain, blockchain bill of lading, electronic bill of lading, security, maritime law.*

## 1. Introduction

Blockchain is considered to be the "key" of the Industrial Revolution 4.0 and the foundation of future information technology. Currently, the keyword phrase "Blockchain" or "Bitcoin" is one of the most searched words in the world. However, Bitcoin is only a small part of Blockchain technology. Blockchain technology has many more applications than Bitcoin, such as smart contracts or other applications for different fields, including the maritime sector.

In 1990, CMI (The Comité Maritime International - International Maritime Commission) accepted the electronic bill of lading (BL) to replace the traditional paper bill of lading and issued the principle of electronic bill of lading (The Comité Maritime International, 1990). This principle is optional, not mandatory, but it is the basis for the parties of the contract of carriage to agree to use the electronic bill of lading. This rule does not interfere with the Hague-Visby Rules, Hamburg Rules because it stipulates that "*the contract of carriage shall be subject to any international convention or national law which would have been compulsorily applicable if a paper bill of lading had been issued*" (The Comité Maritime International, 1990, article 6). Thereby opening up opportunities for the maritime industry to develop electronic bill of lading to replace paper bill of lading. Blockchain bill of lading helps to limit the weaknesses of paper BL and is more interested in the context of the COVID pandemic.

Some platforms that currently use Blockchain BL have emerged such as TradeLens, CargoSmart (GSBN), Wave, and CargoX. Within the scope of the study, we will only mention the terms of the contract provided to users of the CargoX and Wave platform, which provide Blockchain solutions for electronic bills of lading, approved by the P&I Club, as reference cases in practice.

Vietnam's law does not clearly stipulate electronic bills of lading, but there is no ban on electronic bills of lading. In accordance with the article 148 Vietnam Maritime Code 2015, *"Transport document includes bill of lading, through bill of lading, sea waybill, and other transport documents"*. Thus, whether it is a paper bill of lading or an electronic bill of lading, it is a transport document that ensures the three main statutory functions of a bill of lading: a receipt, evidence of a contract of carriage, and a document of title.

However, the issues are (1) whether the Vietnamese legal framework is enough to encourage the development of electronic bills of lading on the Blockchain platform and (2) how to improve it. Two issues will be presented in the paper.

## 2. Literature review

There have been many research papers on blockchain and its application in the maritime sector, which must be mentioned the article in 2018 named "The Use of Authentication Technology Blockchain Platform for the Marine Industry" written by co-authors Mamunts, DG, Marley, VE, Kulakov, LS, Pastushok, EM, & Makshanov, AV. The paper analyzes the use of blockchain technology in the shipping industry: its issues related to digital identity, authentication and confirmation of access rights issues; documents of technical inspections of ships and oil installations. The authors outline Russian legal regulations on blockchain technology, specifically cryptocurrencies, but do not specify how other blockchain technologies are controlled by the government.

There have also been some research papers on Blockchain BL such as Chapter 6 of the book "Big Data and Global Trade Law" about "Blockchain's Practical and Legal Implications for Global Trade and Global Trade Law" written by Emmanuelle Ganne (in 2021); a paper (in 2021) written by Wang, F. entitled "Blockchain Bills of Lading and Their Future Regulation". Both papers analyze the development of the Blockchain BL in the maritime sector, legal challenges of using the Blockchain BL, and provide measures to promote the development of the Blockchain BL. While for the former, the role of the WTO is emphasized, for the latter, the role of self-regulatory entities and instruments of the maritime industry is appreciated. Another paper named "The Bill of Lading on the Blockchain: An Analysis of its Compatibility with International Rules on Commercial Transactions" (in 2021) of Shope, M. L. analyzes the international legal aspects of the bill of lading on the blockchain, including the Conventions international on Bill of lading and the Model Law on Electronic Commerce, Electronic Signatures, and Electronic Transferable Records to answer the question whether a blockchain bill of lading is compatible with international commercial instruments. The new point of the article is that the article is the first study in Vietnam to study blockchain bill of

lading, opportunities, and challenges for Vietnam to receive this new technology. The article points out that the current legal regulations are not enough to regulate this field and need further study to form a safe legal framework for platform users and the state could manage this sector. While waiting for new legal regulations, users can protect themselves when participating in the system by some solutions presented in the research paper.

The qualitative research method is the method of analysis and synthesis. The analysis method is used to analyze legal regulations on bills of lading, electronic bills of lading, and blockchain bill of lading. The analysis clarifies the current state of economic regulations to show the positive and negative aspects of regulating blockchain bill of lading. The synthesis method is used to synthesize the analysis of legal provisions to have a basis for proposing solutions and recommendations to improve the law.

### 2.1. Overview of Blockchain

Traditional databases are maintained by a governing organization. This organization has the right to control and interfere with the data. However, the fact that data is managed by an organization will sometimes be unsafe for users and for the organization itself because the intervention was assigned to only one subject (Mamunts et al., 2018).

Blockchain is a decentralized database based on the peer-to-peer (p2p) network, the public registry, and the cryptography of the public and private key. Entering the blockchain network, the user connects to other computers on the network in order to exchange data with them: blocks and records. This is a way of storing data or a digital register of transactions, transactions, contracts (Casino et al., 2019). A blockchain, as a database, contains the history of all the exchanges between its users since its creation. It is shared by its various users, without intermediaries, which allows each one to check the validity of the channel.

**Figure 1: Structure of traditional centralized processing network (a),**
**decentralized processing network (b), and blockchain technology processing network (c)**
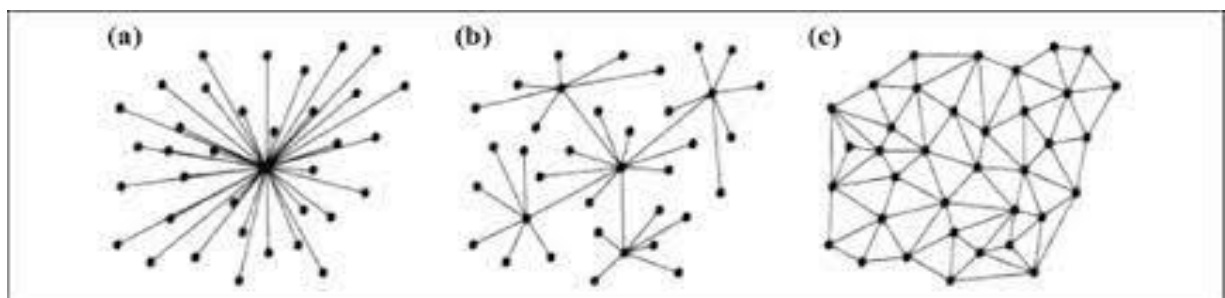


*Source: (Baran, 1964)*

Blockchain implementations can be either public (public Blockchain) or private (private Blockchain).

Public blockchain means anyone can read, use it to make transactions, and can take part in the consensus, for example, public blockchain platform Ethereum. The Ethereum has "transactions". Transactions contain the recipient of the message, a signature identifying the sender, the amount of ether and the data to send, as well as two values called STARTGAS

and GASPRICE (Shrestha et al., 2020). This is a fully decentralized network system, with no centralized registration, and no trusted third parties. In addition, public blockchain does not have any regulations that the nodes have to follow. Bitcoin is an example of a public blockchain and currently, bitcoin is not considered a legal means of payment in Vietnam (according to Official Letter 5747/NHNN-PC of the State Bank of Vietnam dated July 21, 2017, sent to government office). Currently, both Wave and CargoX platforms claim to use public blockchain (Ethereum) (The UK P&I Club, n.d.) but with the data currently provided by the two companies, there is no guarantee that the two blockchain systems have all the benefits of a public blockchain (Wang, 2021). The advantage of these two platforms is the unlimited number of participants, facilitating transactions in international trade.

In contrast, for a private blockchain, the consensus process can only be achieved by a limited and predefined number of participants. A private blockchain is not fully decentralized like a public blockchain platform (Wang, 2021) because an organization to have authority over the network, i.e. not open for the public people to join in, read permissions can be public or limited (Guegan, 2017). Therefore, in the case of participating in the private blockchain, a user may have to accept the regulations that the system offers, the number of participants will be limited. The private blockchain is currently being applied quite a lot in the company's internal network or in several areas that need high privacy and management, which can be classified into 3 types: (1) Applications for the transfer of assets ( 2) Applications of the blockchain as a register (3) Smart contracts (Guegan, 2017). Currently, the platforms using private blockchain in the field of bills of lading are TradeLens and CargoSmart (GSBN)...

## 2.2. Overview of Blockchain bill of lading

A Blockchain BL is an electronic bill of lading, sent through the Platform for Blockchain. It could be negotiable and the new owner could claim legally ownership rights. However, cryptographic techniques, for example, using hashing, will help ensure the security of the transfer and possession of the BL, helping to maintain the uniqueness of the BL like paper BL. The decentralized nature of blockchain will distinguish blockchain bills of lading from former eBL systems such as Bolero (Wang, 2021)

With Blockchain BL, multiple parties will keep copies of recorded transactions, including the transfer and possession of the bill of lading, so the information cannot be changed. If a part of the nodes fails, the network can still operate normally because other computers and nodes will continue to work to protect information. The information is expanded in real-time. The confirmation of information is automatic and does not need intermediaries. Blockchain technology attracts investors because of its transparency and security. Thanks to the online ledger, all information must be transparent (Mathis, 2016). That leads to the reduction of risks and fraud.

Some of the advantages of applying BL blockchain to international commercial transactions are listed as follows: First, it helps to speed up transactions. Modern technology has increased the speed of ships, possibly even faster than sending a paper BL. There are

cases where the goods have arrived at the port of destination but the consignee has not yet received the original bill of lading to release the goods. This hinders trade activities, increases demurrage, detention charges, and a number of other operating costs. Sending a blockchain BL normally takes only a few seconds (see more on Cargo X and Wave BL websites) instead of days like traditional paper BL. Second, it helps to avoid the situation of losing the original bill of lading (Shope, 2021, tr.186). Losing the bill of lading will lead to many complicated consequences. Usually, when the consignee or shipper loses the original bill of lading, the carrier will ask for a bank guarantee or a letter of indemnity or a mortgage for a period of time, about 2-5 years, of the same or higher value of the consignment. Either way, the consignee or shipper still has to pay a fee to the bank or carrier or accept a freeze of money as security for the release of the goods. Third, it saves costs. The cost of sending a bill of lading by post represents an expensive expense, not to mention the costs if the bill of lading arrives later than the freight ship also leads to many additional costs related to warehousing, ports, and transportation costs. other act. Fourth, cryptographic techniques such as "hashing" will help secure information, secure the transfer and ownership of bills of lading, making the BL blockchain unique like paper BL. The owner of Blockchain BL is clearly shown and the parties in this process can clearly understand who is the owner of the BL and has the right to take delivery. And fifth, two BL blockchain platforms, Wave and Cargo, have been accepted by the P&I Club, thereby facilitating the protection of the interests of ship owners and their vessels. This can also be the basis for later acceptance by courts and arbitrators.

However, this application incurs the following disadvantages: Firstly, because of the decentralization of the blockchain, there are two possible problems. The first is the threat of attack from a person or group of people who control more than 51% of the computer power, specifically more than 50% of the network's mining hash rate, creating a "51% attack." (Ye, C., Li, G., Cai, H., Gu, Y., & Fukuda, 2018). Furthermore, there is no central authority that controls and is responsible for maintaining the system or for updating the software operating on the computers or the availability or security of a particular blockchain network (Salmon & Myers, 2019, p.3), especially for public blockchain, the responsibility of real controllers of the platform is a challenge to the conventional legal regime (Wang, 2021). In case of the malfunction of the platform, who will be responsible for damages and compensate users. For the public blockchain, technically, nobody will. Cargo X also put an exclusion clause in its contracts with blockchain users: "Cargo X does not represent or warrant that its website will be error-free, free of viruses or other harmful components (viruses, trojan horses, worms, time-bombs, keystroke loggers, spyware, adware or any other technologically harmful programs, phishing, data or code.), or that defects will be corrected or that it will always be accessible" (article 13.2 of the CargoX Blockchain Based Smart Bill of Lading Solutions Special Terms and Conditions). And the P&I Club will not cover cyber risks related to blockchain platforms that are not approved (The UK P&I Club, 2018). Another problem is

that all users of the system have access to the system's data, so it is difficult to protect the privacy and personal data (Salmon & Myers, 2019).

Secondly, in terms of security, Blockchain is a technology solution, so cyberattacks are inevitable, for example "51% attack". In addition, even though the blockchain is "fraud-proof" because the information that has been validated in the block will be very difficult to be changed and will last forever, but if the information is recorded as incorrect information or is forged from the beginning, it will lead to fraudulent activities later. Another problem is related to digital signatures, also known as blockchain keys, which are usually issued to a single entity and the latter is responsible for the key. Therefore, if the key falls on another person, it will no longer guarantee the identity of the owner of the bill of lading. And because of the lack of interaction between the online and offline world, the subsequent users do not know that fraud is happening (Wang, 2021).

## 3. Results and discussion

### 3.1. *Legal regulations in the world and Vietnam on Blockchain bill of lading*

Blockchain BL is a form of electronic bill of lading, which is governed by the Vietnam Maritime Code, the Law on Electronic Transactions 2005, and other by-laws. Article 10 of the Law on Electronic Transactions 2005 lists the following formats of data message: "*A data message is expressed in the form of electronic data interchange, electronic documents, e-mails, telegrams, telegraphs, fax and other similar forms*", where Blockchain BL is a form of the electronic document.

The Vietnam Maritime Code does not mention that the form of the bill of lading is required to be in paper form or can be presented in electronic form, so it does not deny an electronic bill of lading. When building the Blockchain BL platform, some legal issues related to Blockchain BL arise as follows:

### 3.1.1. *Electronic signature*

In accordance with article 20 of UCP 600, "*A bill of lading, however named, must appear to: i. indicate the name of the carrier and be signed by: - the carrier or a named agent for or on behalf of the carrier, or - the master or a named agent for or on behalf of the master. Any signature by the carrier, master, or agent must be identified as that of the carrier, master, or agent. Any signature by an agent must indicate whether the agent has signed for or on behalf of the carrier or for or on behalf of the master*". Vietnam Maritime Code 2015 also stipulates the obligations of the carrier in the issuance of the bill of lading in Article 159. Thus, the signature on the electronic bill of lading must identify the signatory, specifically here the carrier. transfer, master, or person acting on their behalf. When first joining the Blockchain BL platform, users will create their digital signature. They will use this to sign, transfer, sign additional comments, or surrender documents. Thus, each user will have his or her signature and this signature will identify that user during the process of setting up, transferring, changing, or terminating the bill of lading. In addition, thanks to the blockchain

key mechanism, the fact that each user has only one key and no one else can use that key to use the account is also a mechanism to help identify the user. The user should take full responsibility for the security of the key, to avoid the key being lost or known by others.

In accordance with article 8.4 of the "CargoX Blockchain-Based Smart Bill of Lading Solutions Special Terms and Conditions", version 1.0, dated 10 February 2020, the parties of the contract of carriage of goods that Smart BL is the proof of, including the original user and subsequent users, must expressly agree that Smart BL's electronic signature is valid and undertake not to deny this. In other words, the parties to the contract are not only responsible for their own signatures but also those of other parties. If the signature is invalid, the parties are solely responsible, the platform provider is not responsible. This creates risks for users of the platform. To avoid these risks, users should pay attention to several legal issues stipulated in the Law on Electronic Transactions 2005 about the validity of electronic signatures.

The legal validity of an e-signature is divided into two cases, including the legal validity of an electronic signature as a signature and an electronic signature as a seal (Article 24 Law on Electronic Transactions 2005). However, according to Vietnamese law as well as international practice, the company's stamp on the bill of lading is not required. Thus, a signature on an electronic bill of lading is legally valid when it fully meets the following conditions: "*(1) The method of creating an electronic signature allows the signatory to be identified and indicating his/her approval of the contents of the data message; (2) The method is sufficiently reliable and suitable for the purpose for which the data message is generated and sent*". However, the law needs to clarify how the method is reliable and appropriatein the case of a blockchain platform..

Electronic signatures should be certified. If the signature cannot be verified by a third party, an electronic signature needs to meet the conditions stipulated in article 22, namely, it needs to meet a security verifying process agreed upon by transacting parties to determine that the signature that is attached only to the signatory, only under the control of the person who signed, any changes after the signing will be detected. Thus, the law allows parties to create their signature verification and validation processes or through a third party.

### 3.1.2. Security of digital signatures

Although the Law on Electronic Transactions admits the legal validity of electronic signatures, the legal documents guiding the implementation of this Code such as Decree No. 130/2018/ND-CP dated September 27, 2018, on guidelines for the law on E-transactions of digital signatures and digital signature authentication only regulates digital signatures, or on the tax declaration system and accounting documents, only digital signatures are allowed to be registered. This leads to the fact that some documents submitted to government agencies, or banks will not be accepted for electronic signatures. One of the conditions to ensure the security of digital signatures is that they must be generated using a private key corresponding to the public key recorded on the digital certificate issued by one of the following organizations: "a) Root Certification Authority; b) Specialized certification authorities of the

Government; c) Public certification authorities; d) Specialized certification authorities of agencies and organizations issued with certificates of eligibility for special-use digital signature security as prescribed in Article 40 of this Decree" (article 9 of this Decree). Accordingly, if a contract is signed electronically between a Vietnamese trader and a foreign trader, but the digital signature of this foreign trader is not legally issued by a specialized certification authority mentioned above, the signature of the latter has no legal value. Moreover, article 44 of Decree 130 stipulates that only the following people are allowed to use foreign digital certificates "(i) foreign entities in Vietnam and (ii) Vietnamese entities who need to make electronic transactions with foreign partners but digital certificates of local certification authorities have not been recognized in such country". This means that if a foreign entity does not have a commercial presence in Vietnam, and they want to make electronic transactions with a Vietnamese entity through digital signatures, they cannot use foreign digital certificates but can only require specialized certification authorities stipulated in Article 9 of Decree 130 to grant. This will create a big barrier for blockchain BL.

### 3.1.3. Responsibilities of platform providers

The Vietnamese law does not specify the rights and obligations of individuals/organizations who provide platforms. As analyzed in part 2.1, determining the responsibility for the company creating a public blockchain platform is a challenge for the legal system of countries. Cargo X also includes an exclusion clause in its contract with users of the blockchain platform, whereby the company will not be responsible for any loss, damage, delay due to any cause beyond the reasonable control of Cargo X, which includes cyber risks such as viruses (article 13 CargoX Blockchain Based-Smart Bill of Lading Solutions Special Terms and Conditions). In addition, if problems arise that are not covered by the exclusion clause, Cargo X is also limited to its liability to three million euros (article 14 CargoX Blockchain Based Smart Bill of Lading Solutions Special Terms and Conditions). Cyber risk is also not automatically considered a risk covered by the P&I Club. Therefore, the parties of Blockchain BL need to be cautious about the data provided and data security.

### 3.1.4. Data protection, personal information, and privacy

The relationship between data collectors and their service providers in a centralized system is not compatible with blockchain technology's distributed peer-to-peer network architecture. It is difficult for blockchain users to ensure the legality of the processing of personal data, for example by obtaining the consent of the owners of personal information (Shah et al., 2019). In accordance with article 17 of the Law on cyber information security 2015, the collection and processing of data only need to satisfy the condition that there is the consent of the owners of personal information. Although this regulation protects users better but is stricter for data processors. Article 6 of GDPR ( General data protection regulation) extends more options to the latter: "(i) consent of the owner of personal data...; (ii) necessary for the performance of a contract...; (iii) necessary for compliance with a legal obligation..., (iv) necessary to protect the vital interests of the data subject or of another natural person, (v)

necessary for the performance of a task carried out in the public interest...; (vi) necessary for the purposes of the legitimate interests pursued by the controller or by a third party but need to protect personal data of others and a child". In addition, Article 18.1 of the Law on Cyber information Security 2015 stipulates the right of updating, alteration, and cancellation of personal information of the owners. However, the immutability and permanent data storage mechanism of blockchain may conflict with the "right to be forgotten" on centralized systems (Suominen, 2018).

The protection of data and personal information is very important, especially for valuable documents like BL. Technically, no one on the platform is responsible for security on the blockchain, and all users can access the data on the network. A cloud service provider may not know whether personal data is uploaded by a customer to its cloud environment. Generic blockchain can make it difficult for the developer to build a privacy protection (Salmon & Myers, 2019).

The Law on CyberInformation Security 2015 stipulates the responsibilities and obligations of is the basis for the parties of the contract of carriage to agree to use the electronic bill of lading. This rule does not interfere with the Hague-Visby Rules, Hamburg Rules because it stipulates that "*the contract of carriage shall be subject to any international convention or national law which would have been compulsorily applicable if a paper bill of lading had been issued*" (The Comité Maritime International, 1990, article 6). Thereby opening up opportunities for the maritime industry to develop electronic bill of lading to replace paper bill of lading. Blockchain bill of lading helps to limit the weaknesses of paper BL and is more interested in the context of the COVID pandemic.

Some of the platforms that currently use Blockchain BL have emerged such as TradeLens, CargoSmart (GSBN), Wave, and CargoX. Within the scope of the study, we will only mention the terms of the contract provided to users of the CargoX and Wave platform, which provide Blockchain solutions for electronic bills of lading, approved by the P&I Club, as reference cases in practice.

Vietnam's law does not clearly stipulate electronic bills of lading, but there is no ban on electronic bills of lading. In accordance with the article 148 Vietnam Maritime Code 2015, "*Transport document includes bill of lading, through bill of lading, sea waybill, and other transport documents*". Thus, whether it is a paper bill of lading or an electronic bill of lading, it is a transport document that ensures the three main statutory functions of a bill of lading: a receipt, evidence of a contract of carriage, and a document of title.

However, the issues are (1) whether the Vietnamese legal framework is enough to encourage the development of electronic bills of lading on the Blockchain platform and (2) how to improve it. Two issues will be presented in the paper.

### 3.1.5. *Choice of applicable law*

In principle, contract law gives priority to the parties' right to choose the applicable law and dispute resolution methods. In case the contracting parties fail to agree, the law of the country with which such contract closely associated shall apply (Article 683 of the Vietnam Civil Code 2015). The carriage of goods by sea is characterized by its international nature, which leads to changes in the applicable law if there is no prior agreement between the contracting parties.

If any country's law does not recognize the legitimacy of Blockchain BL, to ensure the interests of the parties involved in the bill of lading, it will be quite complicated for stakeholders to re-establish the BL paper, such as the carrier must re-issue a paper BL that has an equivalent value, or the endorsement must be shown on BL to ensure the ownership of the BL. This can reduce the efficiency and advantages of Blockchain BL. Therefore, if Vietnamese law regulates electronic bills of lading and Blockchain BL, this will create favorable conditions for the development of Blockchain BL platforms.

According to some precedents and judgments of the Vietnam Supreme People's Court, such as *Case No. 04/2016/AL dated April 6, 2016, on disputes over a contract on transfer of land use rights; Case No. 07/2016/AL dated October 17, 2016, regarding recognition of the house purchase contract entered into before July 1, 1991; Supreme Court Cassation Decisions No. 47/2016/KDTM-GDT dated August 29, 2016*, Vietnam courts tend to recognize the validity of a transaction based on the intent to establish a transaction between the parties rather than just considering the form of the transaction (Trương, N. Q., & Huỳnh, 2020). However, blockchain is a new and unfamiliar technology, that is why not all judges in Vietnam can fully understand its nature. This leads to the fear of recognizing the legality of the BL blockchain if there is no regulation about its legitimacy.

### 3.2. *Recommendations for Vietnam*

Firstly, Vietnamese law needs to confirm that electronic transport documents have the same legal validity as paper transport documents, because maritime activities often involve several authorities such as customs, port authorities or with banks or courts, arbitration in case of a dispute... For example, if there is any error or fraud against the BL blockchain on the platform, the fraudulent party has to take responsibility as in the case of paper BL. Failure to recognize the legality of the electronic bill of lading will be an obstacle for its future development.

Secondly, it is necessary to have a document guiding the implementation of the Law on Electronic Transactions 2005 about the validity of electronic signatures. Although most electronic signatures on blockchain platforms are digital blockchain signatures, there might still be scanned or image signatures. Therefore, we recommend that first, the reliability of signatures should be classified, with the highest level being digital signatures, and should not be limited to just using digital signatures. Then, the law needs to clarify how reliable and

appropriate is the method of creating the e-signature. Moreover, we propose to expand the subjects allowed to use foreign digital certificates according to Article 44 to include foreign entities, it is not necessary that the individuals or organizations must be in Vietnam. Another problem is that digital signatures need to be certificated by a domestic organization, leading to the inadequacy of transactions with foreign entities, because a digital signature of foreign carriers in Vietnam certified by a foreign organization might not be validly recognized. Therefore, we propose to recognize the legal value of digital signatures certificated by foreign organizations.

Third, international treaties that are currently widely recognized for bills of lading such as Hague-Visby Rules, Hague Rules, Hamburg Rules are still the main treaties governing bills of lading and serve as the basis for the parties to reach an agreement. However, the disadvantage of these conventions is that they do not regulate electronic bills of lading. Thus, some international standard "model laws" for electronic bills of lading and blockchain BL could become references for Vietnam to generate national regulations in this field such as The Uncitral Model Law On Electronic Commerce (1996), The Uncitral Model Law On Electronic Signatures (2001), the United Nations Convention On The Use Of Electronic Communications In International Contracts (2005), and the Uncitral Model Law on Electronic Transferable Records (2017). In particular, the latter provides requirements for electronic documents to be considered as transferable documents, including Blockchain BL, and the principle of "non-discrimination against the foreign origin or use abroad of an electronic transferable record" Consulting to the "model law" to develop national law should be accompanied by regulations allowing the authorities to access information, for example, customs for blockchain BL.

Fourth, maritime activities involve many stages and organizations. Therefore, the cooperation of stakeholders is very important for the development of blockchain BL, which includes P&I Club, ICC, banks, customs, port authorities. The Vietnamese government could test the sandbox for Blockchain BL. Sandbox mechanism is an isolated but fully functional testing environment where software, applications, and programs can be tested. This mechanism will allow to examine and test their products, services, or solutions in the market under a more relaxed regulatory environment but in a defined space and period of time. In the sandbox, the government determines sandbox participants, tests Blockchain BL stakeholders, defines criteria for evaluation, approval, licensing for participants, loosening regulations . Some regulations should be tested such as regulations on user data protection, specifically data collectors and processors need to clearly notify the collection, processing of personal data on the distributed system and have the explicit consent of the user. In addition, the regulations related to the rights of data collectors and processors should be expanded, similar to Article 6 of GPDR.

Fifth, blockchain platform standards are necessary to avoid blockchain risks and exclude weak and substandard companies. Then, the standard makes the product widely

available and popular among those in need, also helps to increase the trustworthiness of the Blockchain, and becomes the basis and criterion for determining the legality of the document. It should be noted, however, that many countries are currently pushing to establish national or regional blockchain standards, but it will fragment the global blockchain ecosystem, one whose power lies precisely in scalability across borders. Therefore, the Vietnamese government might consider applying ISO/TC 307 on Blockchain and distributed ledger technologies by ISO (the International Organization for Standardization) instead of creating its own standard.

## 4. Conclusions

The validity of Blockchain BL has not been clarified in Vietnamese law, so it is necessary to regulate Blockchain BL in the law. Legislators can refer to model laws, international standards ISO on blockchain and distributed ledger technologies, and test the product by sandbox mechanism to create a legal framework for Blockchain bill of lading. This will help apply Blockchain BL to maritime trade in Vietnam and take advantage of the benefits and limit the disadvantages of Blockchain BL.

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## A GUIDELINE FOR A BETTER LITERATURE REVIEW WITH R PACKAGES

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**Abstract**

*A literature review is the key to success for researchers as it helps them comprehend the big picture of their topic and set out the significance and scope of the research. With the development of technology, especially in dealing with big data, it has been observed that there is an increasing number of applications and software arming researchers to achieve a better literature review. Up to now, however, few studies have served as a guideline for researchers of how to apply those IT assistants to the process of the review. This study, therefore, attempts to provide the use of R packages in searching, selecting, and synthesising the literature. It proposes a new methodology for a more critical and systematic review.*

***Keywords:*** *literature review; systematic review; R packages; green logistics.*

## 1. Introduction

A literature review is one of the most important tasks when conducting scientific research (Saunders et al., 2019). It helps the researchers to comprehend the big picture of the topic. It also helps them show their expertise and knowledge in the field of study, which allows the readers to understand the significance and scope of the research. The literature review then starts just right after a researcher has an interest, and the process should be kept open until he or she finally submits his or her paper.

However, a literature review is a subject that is easy to learn but difficult to master (Saunders et al., 2019). There are many concerns researchers have to solve in order to have a critical and comprehensive literature review. For example, how can the researchers really obtain the big picture? Are they read enough to reach the point in which the extant literature becomes saturated? Are they critical enough to be able to synthesise the large body of literature? Are they systematic enough to cover not only high quality, peer-reviewed papers but also grey literature that is often neglected? In fact, the need for a better literature review is always a desirable goal for every researcher, but the actual reviews are most often left with more doubts and questions than satisfaction.

Luckily, with the development of technology, especially in dealing with big data, it has been observed that there is an increasing number of applications and software arming researchers to achieve a better literature review. Up to now, however, few studies have served as a guideline for researchers of how to apply those IT assistants to the process of the review.

This study, therefore, attempts to provide the use of R packages in searching, selecting, and synthesising literature. It proposes a new method for a more critical and systematic review.

## 2. Concerns when conducting a literature review

Traditionally, in business and management, there are six basic steps to conduct a literature review (Saunders et al. 2009). Firstly, authors have to define the topic and come up with research questions as well as research objectives. Secondly, based on those research questions and objectives, a search strategy needs to be developed as it helps the researchers to identify where the information is and which tools are most suitable to gain access to those sources. The next step is to locate the information which can be books, articles, review articles, technical reports and so on. Fourthly, after successfully locating useful and relevant material, the authors must read them all, evaluate their quality, and decide whether they are suitable for the research. The fifth step is to thoroughly understand, organize and integrate the information with the use of the authors' words to synthesise and explain the relevance between their research and the extant literature. Finally, during each of above steps, the researchers have to make sure to assess their work in order to make sure their work is completed and reaches high quality.

There are three major concerns currently being considered in carrying out a literature review in a traditional way (Haddaway et al., 2020). One is selection bias. Researchers may review studies that are not representative of the population intended to be analysed (the big picture) and then accept their outcomes and conclusions without giving proper consideration to whether the proper randomisation is achieved and based on trustful evidence (Keenan, 2018). This type of bias usually leads to the lack of comprehensiveness of the literature review. Some point out the reason for this problem is the inappropriate search method, and the quality of literature is based on the depth of the search of keywords. Researchers are believed to have selection bias when they use too narrow keywords and only based on their own expertise and knowledge. As a result, the reviews end up with the wrong evidence for the research questions (Keenan, 2018).

Secondly, the failure to mention grey literature - unpublished academic studies - and to overcome publication bias in a literature review may lead to incorrect or even misleading conclusions. Publication bias is believed to happen when the research's findings affect its chance of being published (Easterbrook et al., 1991). More specifically, publishers have a tendency to prefer (they publish faster and more) studies whose findings show positive relationships to ones having negative findings. Consequently, researchers seem to comply with this soft rule by excluding the grey literature and building the literature review based on previously published data that may already have publication bias (Mlinarić et al., 2017). Besides, locating the unpublished studies often are said to be complicated or unsatisfactory. Therefore, excluding grey literature may be intentional or unintentional.

Last but not least, the traditional way of conducting a literature review often lacks appropriate critical appraisal tools. Critical appraisal systematically examines research

evidence to evaluate its quality and utility in a specific context (Katrak et al., 2004). It minimises potential biases generated via the process of reviewing, which in turn allows researchers to use previous studies efficiently and reliably. However, the problem here is that there are too many critical appraisal tools for generic and specific design purposes. The Agency for Health Research Quality reported 93 critical appraisal tools for quantitative research (West, 2002). As a result, researchers may find it challenging to conduct a proper critical review without a' gold standard' tool - an important component of evidence-based practice.

## 3. Solution for a better literature review

In order to overcome those concerns mentioned above, researchers are said to adopt the following activities. Firstly, for the selection bias, they should carefully design and trial a search strategy as well as publish search methods in a prior protocol for peer-review (Haddaway et al., 2020). Next, they may attempt to find grey literature by using multiple bibliographic sources of both unpublished academic studies and organisational reports as possible evidence to test publication bias. Finally, the researchers need to carefully test and adopt a critical appraisal tool blueprinted from existing robust ones before starting the official process (Haddaway et al., 2020).

Many researchers have found great help in doing those activities via R - a free, open-source, and easily accessible software. It is a "free software environment for statistical computing and graphics" and much more. Below is the tutorial on how to use R packages to achieve a better literature review.

Firstly, the R packages need to be installed and loaded.

**Figure 1: Loading R packages**

```
library(litsearchr)
library(revtools)
library(dplyr)
library(ggplot2)
library(ggraph)
library(igraph)
library(readr)
```

These packages R [Version 4.1.1; R Core Team (2020)] and the R-packages *dplyr* [Version 1.0.7; Wickham et al. (2021)], *formatR* [Version 1.11; Xie (2021)], *ggplot2* [Version 3.3.5; Wickham (2016)], *ggraph* [Version 2.0.5; Pedersen (2020)], *igraph* [Version 1.2.6; Csardi & Nepusz (2006)], *litsearchr* [Version 1.0.0; Grames et al. (2019)], *pacman* [Version 0.5.1; Rinker & Kurkiewicz (2018)], *papaja* [Version 0.1.0.9997; Aust & Barth (2020)], *readr* [Version 2.0.1; Wickham & Hester (2020)], *revtools* [Version 0.4.1; Westgate (2019)], *rmarkdown* [Version 2.11; Xie et al. (2018); Xie et al. (2020)], and *rticles* [Version 0.21; Allaire et al. (2021)] are used for all analyses.

In this example, assume that the topic of interest is "green logistics." The starting point is to use the two keywords "green" and "logistics" to carry out a basic and naive search. The R package "litsearchr" will help suggest improvements that might capture more relevant articles to the topic and build up the search strategy.

The keywords are applied to the search via Google Scholar, Web of Science, and Scopus. The search results are then downloaded to a folder the package "litsearchr" can read.

**Figure 2: Commands to search**

```
naive_results <- litsearchr::import_results(directory =
                             'naive_search_results'
                             , verbose = TRUE)
naive_results <- litsearchr::remove_duplicates(naive_results
                             , field = "title"
                             , method = "string_osa")
```

The package "litsearchr" stores the search into columns such as the title, authors, date, abstract, and so on.

**Figure 3: Sorted columns**

```
colnames(naive_results)
```

```
 [1] "type"                      "author"
 [3] "title"                     "journal"
 [5] "year"                      "volume"
 [7] "number"                    "pages"
 [9] "month"                     "abstract"
[11] "publisher"                 "address"
[13] "language"                  "affiliation"
[15] "doi"                       "issn"
[17] "eissn"                     "keywords"
[19] "research_areas"            "web_of_science_categories"
[21] "author_email"             "orcid_numbers"
[23] "number_of_cited_references" "times_cited"
[25] "usage_count_last_180_days"  "usage_count_since_2013"
[27] "journal_iso"               "doc_delivery_number"
[29] "unique_id"                 "da"
[31] "article_number"            "researcherid_numbers"
[33] "oa"                        "keywords_plus"
[35] "funding_acknowledgement"   "funding_text"
[37] "editor"                    "booktitle"
[39] "series"                    "note"
[41] "book_group_author"         "organization"
```

One of the purposes of doing the "naive search" is to obtain potential search terms related to the topic. These additional terms then are added in a new search to get more relevant results. This can help to overcome the selection bias. There are two methods to obtain the new terms. Firstly, the simplest method to obtain new search terms is just to examine what keywords were already attached in the downloaded articles. The keywords need to exclude common and unnecessary words (aka. stopwords) such as "the", "review", and so on.

**Figure 4: Extracting the keywords**

```
clinpsy_stopwords <- read_lines("clin_psy_stopwords.txt")
all_stopwords <- c(get_stopwords("English"), clinpsy_stopwords)

keywords <- extract_terms(keywords=naive_results[, "keywords"]
                          , method="tagged", min_freq = 2,
                          ngrams = TRUE,
                          min_n = 2,
                          language = "English",
                          stopwords=all_stopwords)
keywords
```

```
 [1] "circular economy"            "closed-loop supply chain"
 [3] "consumer behavior"           "consumer behaviour"
 [5] "consumer demand"             "environmental sustainability"
 [7] "experimental economics"      "focus group"
 [9] "food attributes"             "green consumer"
[11] "green consumer behavior"     "green consumption"
[13] "green electricity"           "green food"
[15] "green logistics"             "green marketing"
[17] "green packaging"             "green products"
[19] "hybrid meta-heuristic method" "influential factors"
[21] "logistic regression"         "organic food"
[23] "purchase intention"          "reverse logistics"
[25] "social sustainability"       "supply chain"
[27] "supply chain management"     "sustainable consumption"
[29] "sustainable development"     "sustainable products"
[31] "theory of planned behavior"  "willingness to pay"
```

There are a number of new terms related to the naive search terms "green logistics," such as "circular economy" or "closed-loop supply chain." Therefore, it is safe to say that the package "litsearchr" is able to provide researchers with more terms, which means more ideas and knowledge.

The second method to get new terms is based on the titles of downloaded articles just in case some articles do not even provide keywords.

**Figure 5: Extracting the titles**

```
title_terms <- extract_terms(text=naive_results[, "title"]
                             , method="fakerake", min_freq=2,
                             ngrams = TRUE, min_n=2
                             , language = "English",
                             stopwords=all_stopwords)
title_terms
```

```
 [1] "carbon footprint"       "circular economy"
 [3] "competitive advantage"  "consumer behaviour"
 [5] "green consumer"         "green consumption"
 [7] "green electricity"      "green logistics"
 [9] "green marketing"        "green packaging"
[11] "influencing factors"    "purchase intention"
[13] "remanufactured products" "supply chain"
[15] "supply chains"
```

The new terms stemmed from the titles and abstracts then will be combined after duplicates removed.

**Figure 6: Combining keywords and titles**

```
terms <- unique(append(keywords, title_terms))
terms
```

```
 [1] "circular economy"          "closed-loop supply chain"
 [3] "consumer behavior"         "consumer behaviour"
 [5] "consumer demand"           "environmental sustainability"
 [7] "experimental economics"    "focus group"
 [9] "food attributes"           "green consumer"
[11] "green consumer behavior"   "green consumption"
[13] "green electricity"         "green food"
[15] "green logistics"           "green marketing"
[17] "green packaging"           "green products"
[19] "hybrid meta-heuristic method" "influential factors"
[21] "logistic regression"       "organic food"
[23] "purchase intention"        "reverse logistics"
[25] "social sustainability"     "supply chain"
[27] "supply chain management"   "sustainable consumption"
[29] "sustainable development"   "sustainable products"
[31] "theory of planned behavior" "willingness to pay"
[33] "carbon footprint"          "competitive advantage"
[35] "influencing factors"       "remanufactured products"
[37] "supply chains"
```

It is said that a picture of the network of terms is necessary to obtain a better idea of the search's structure. This is not easy due to the fact that many terms are needed to be linked.

However, the "ggraph" package provides some useful tools for drawing networks. In this study, the network is kept simple and only shows the basic network visualization.

**Figure 7: Commands to draw networks**

```
docs <- paste(naive_results[, "title"]
            , naive_results[, "abstract"])
dfm <- create_dfm(elements=docs, features=terms)
g <- create_network(dfm, min_studies=3, min_occ = 2)

ggraph(g, layout="stress") +
  coord_fixed() +
  expand_limits(x=c(-3, 3)) +
  geom_edge_link(aes(alpha=weight)) +
  geom_node_point(shape="circle filled", fill="white") +
  geom_node_text(aes(label=name), hjust="outward"
                 , check_overlap=TRUE) +
  guides(edge_alpha=FALSE)
```

**Figure 8: Terms network**
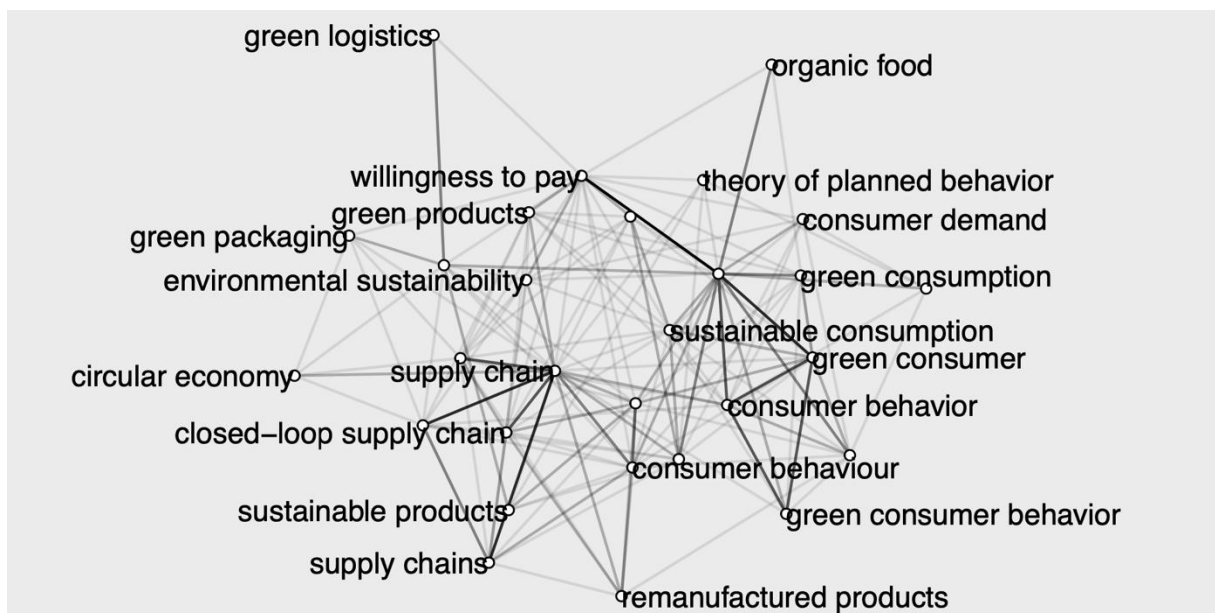


Terms locate near the centre of the graph and link to one another by darker lines are probably more important for the overall topic. Their names are not labeled in the graph. On the other hand, terms locate at the margins of the graph and are linked to any other terms only by blurred lines. These are not closely related to any key terms and thus are tangential at most and do not belong to the main topic.

The network of the search terms is usually ranked by importance to cut off the least important terms. The 'strength' of each term in the network is counted based on the number of other terms it links.

**Figure 9: Ranking the terms**

```
strengths <- strength(g)
data.frame(term=names(strengths)
          , strength=strengths, row.names=NULL) %>%
  mutate(rank=rank(strength, ties.method="min")) %>%
  arrange(strength) ->
  term_strengths
term_strengths
```

|    | term | strength | rank |
|----|------|----------|------|
| 1 | green logistics | 4 | 1 |
| 2 | organic food | 5 | 2 |
| 3 | circular economy | 6 | 3 |
| 4 | green food | 6 | 3 |
| 5 | theory of planned behavior | 6 | 3 |
| 6 | green packaging | 7 | 6 |
| 7 | sustainable products | 8 | 7 |
| 8 | consumer demand | 9 | 8 |
| 9 | green consumption | 11 | 9 |
| 10 | remanufactured products | 11 | 9 |
| 11 | green marketing | 13 | 11 |
| 12 | green products | 13 | 11 |
| 13 | environmental sustainability | 14 | 13 |
| 14 | green consumer behavior | 14 | 13 |
| 15 | influencing factors | 14 | 13 |
| 16 | sustainable development | 16 | 16 |
| 17 | competitive advantage | 16 | 16 |
| 18 | reverse logistics | 17 | 18 |
| 19 | supply chain management | 17 | 18 |
| 20 | supply chains | 17 | 18 |
| 21 | sustainable consumption | 19 | 21 |
| 22 | closed-loop supply chain | 20 | 22 |
| 23 | consumer behaviour | 21 | 23 |
| 24 | purchase intention | 21 | 23 |
| 25 | consumer behavior | 23 | 25 |
| 26 | willingness to pay | 25 | 26 |
| 27 | green consumer | 26 | 27 |
| 28 | supply chain | 44 | 28 |
| 29 | logistic regression | 45 | 29 |

At the top of the list are terms that are most weakly related to the others. Their positions on the graph visualisation above are believed to locate near the periphery of the graph. Most of them are entirely irrelevant and have been found in a few articles in the naive search for arbitrary reasons. If it is not the case, they may be still relevant but are seldom

used. As a result, these terms should be removed. It is said that the visualisation of the term strength can be used as a criterion to discard unnecessary terms.

**Figure 10: Commands to discard unnecessary terms**

```
cutoff_fig <- ggplot(term_strengths
                    , aes(x=rank, y=strength, label=term)) +
  geom_line() +
  geom_point() +
  geom_text(data=filter(term_strengths, rank>5),
            hjust="right", nudge_y=20, check_overlap=TRUE)

cutoff_change <- find_cutoff(g, method="changepoint", knot_num=3)

cutoff_fig +
  geom_hline(yintercept=cutoff_change, linetype="dashed")
```

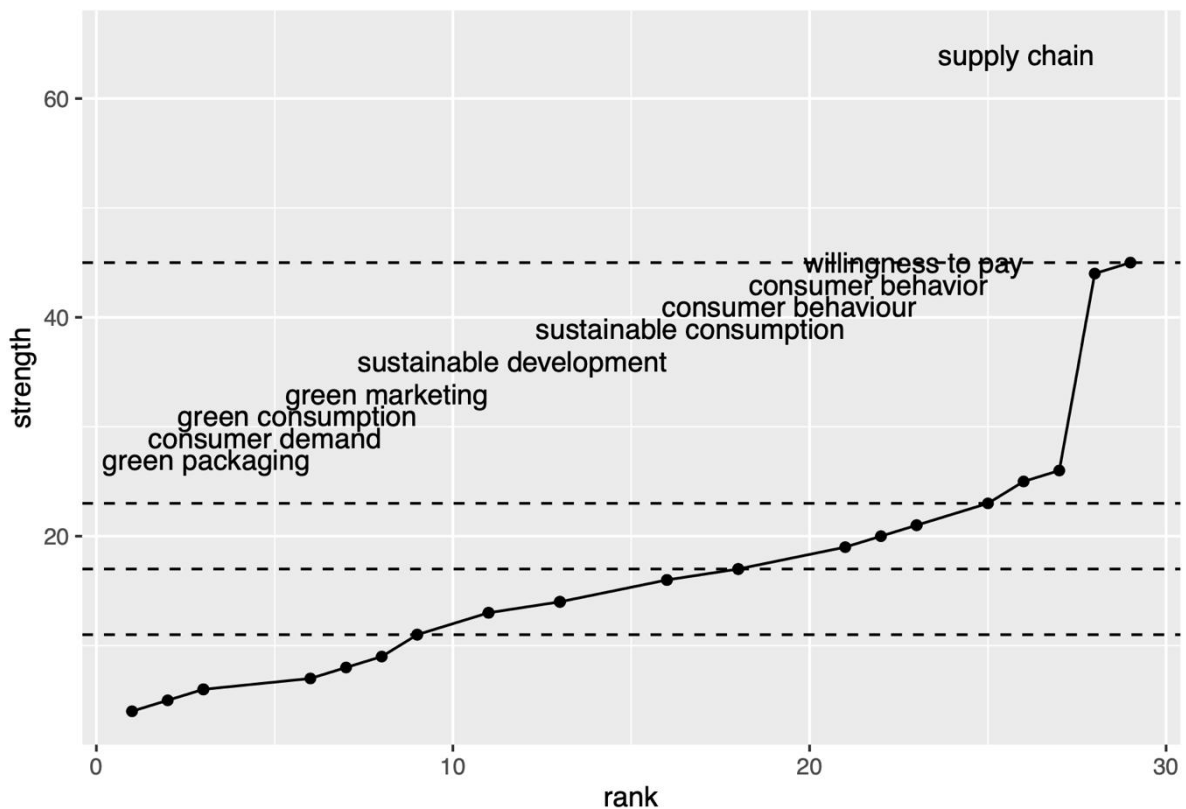**Figure 11: The graph of remaining terms**

**Figure 12: Selected terms**

```
g_redux <- reduce_graph(g, cutoff_change[1])
selected_terms <- get_keywords(g_redux)
selected_terms
```

```
 [1] "closed-loop supply chain"    "consumer behavior"
 [3] "consumer behaviour"          "environmental sustainability"
 [5] "green consumer"              "green consumer behavior"
 [7] "green consumption"           "green marketing"
 [9] "green products"              "logistic regression"
[11] "purchase intention"          "reverse logistics"
[13] "supply chain"                "supply chain management"
[15] "sustainable consumption"     "sustainable development"
[17] "willingness to pay"          "competitive advantage"
[19] "influencing factors"         "remanufactured products"
[21] "supply chains"
```

After removing the unnecessary search terms based on the term strength, if the terms of the original naive search are not included, they need to be added along with extra terms researchers want to have in the final set of search terms.

**Figure 13: Adding extra terms**

```
extra_terms <- c("green logistics",
                 "motivation",
                 "attitude",
                 "experience")

selected_terms <- c(selected_terms, extra_terms)
selected_terms
```

```
 [1] "closed-loop supply chain"    "consumer behavior"
 [3] "consumer behaviour"          "environmental sustainability"
 [5] "green consumer"              "green consumer behavior"
 [7] "green consumption"           "green marketing"
 [9] "green products"              "logistic regression"
[11] "purchase intention"          "reverse logistics"
[13] "supply chain"                "supply chain management"
[15] "sustainable consumption"     "sustainable development"
[17] "willingness to pay"          "competitive advantage"
[19] "influencing factors"         "remanufactured products"
[21] "supply chains"               "green logistics"
[23] "motivation"                  "attitude"
[25] "experience"
```

Researchers can use the revised list of search terms to generate a new search strategy to get more articles relevant to the same topic. The new search needs to be more rigorous with the addition of AND and OR operators. This approach is usually known as BOOLEAN search. More specifically, researchers can use AND operator to narrow a search by combining terms and get articles that mention at least one word from each of the interested subtopics. On the other hand, OR operator is said to broaden a search by including articles that contain any selected terms. Currently, with the "litsearchr" package, setting up a BOOLEAN search is to put the chosen terms into a list of separate vectors manually.

**Figure 14: Grouping terms**

```
grouped_terms <-list(
  greenlogistics=selected_terms[c(1,4,9,12,13,14,15,16,21,22)],
  cognitive=selected_terms[c(2,3,5,6,7,11,17,19,23,24,25)]
  )
grouped_terms
```

```
$greenlogistics

 [1] "closed-loop supply chain"    "environmental sustainability"
 [3] "green products"              "reverse logistics"
 [5] "supply chain"                "supply chain management"
 [7] "sustainable consumption"     "sustainable development"
 [9] "supply chains"               "green logistics"

$cognitive
 [1] "consumer behavior"           "consumer behaviour"
 [3] "green consumer"              "green consumer behavior"
 [5] "green consumption"           "purchase intention"
 [7] "willingness to pay"          "influencing factors"
 [9] "motivation"                  "attitude"
[11] "experience"
```

The write_search() function takes the list of grouped search terms and then writes a new search text. This is a helpful search strategy with BOOLEAN use, and if it is used in many database sources (both published and unpublished ones), the selection and publication biases will be addressed and overcome.

**Figure 15: commands for BOOLEAN search**

```
write_search(
  grouped_terms,
  languages="English",
  exactphrase=TRUE,
  stemming=FALSE,
  closure="left",
  writesearch=FALSE,
  verbose = FALSE)
```

**Figure 16: BOOLEAN search**

```
"((\"closed-loop supply chain\" OR \"
environmental sustainability\" OR \"green products
\" OR \"reverse logistics\" OR \"supply chain\" OR
 \"sustainable consumption\" OR \"sustainable
development\" OR \"green logistics\") AND (\"
consumer behavior\" OR \"consumer behaviour\" OR
\"green consumer\" OR \"green consumption\" OR \"
purchase intention\" OR \"willingness to pay\" OR
\"influencing factors\" OR motivation OR attitude
OR experience))"
```

Based on the new BOOLEAN search, the results are stored and prepared for screening. Some software and applications can assist the process, but the screening stages are mainly manual so far. The R "revtools" package is said to support researchers effectively in the title and abstract screening.

Firstly, for the title screening, the package "revtools" works as an independent application that researchers can load the data directly from the new search stored above or load it via a file in CSV format.

### 3.1. Title screening

Once the researchers have loaded the application and added the data of the term search, they can manually select or deselect articles in individual or groups. The application also provides the function of navigating between pages using the arrow buttons. The researchers have to decide which titles to include or choose 'unknown' for unclear articles.

Secondly, abstract screening is run through the function screen_abstracts. In general, the two ways of screening are similar. However, unlike title screening, the abstract screening has only been done for one article at a time, and it allows researchers to take notes if they would like to.

**Figure 17: Title screening**
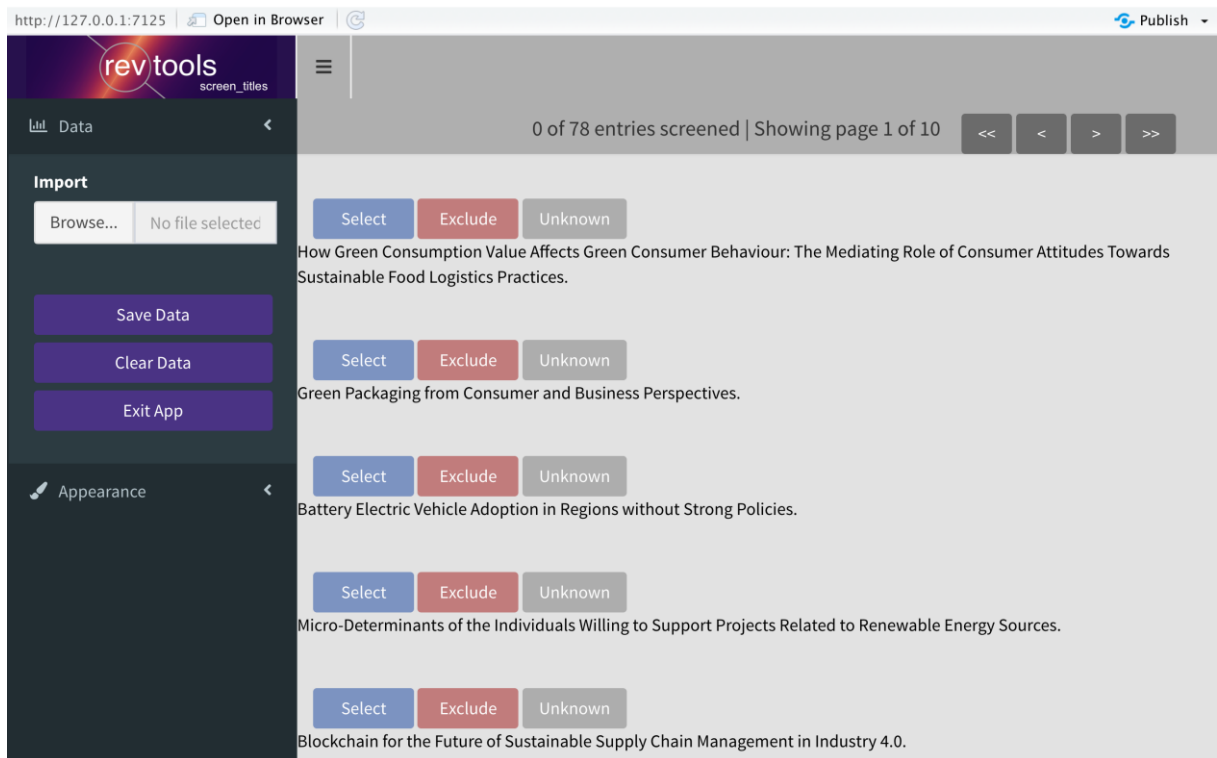


## 3.2. Abstract screening

**Figure 18: Abstract screening**
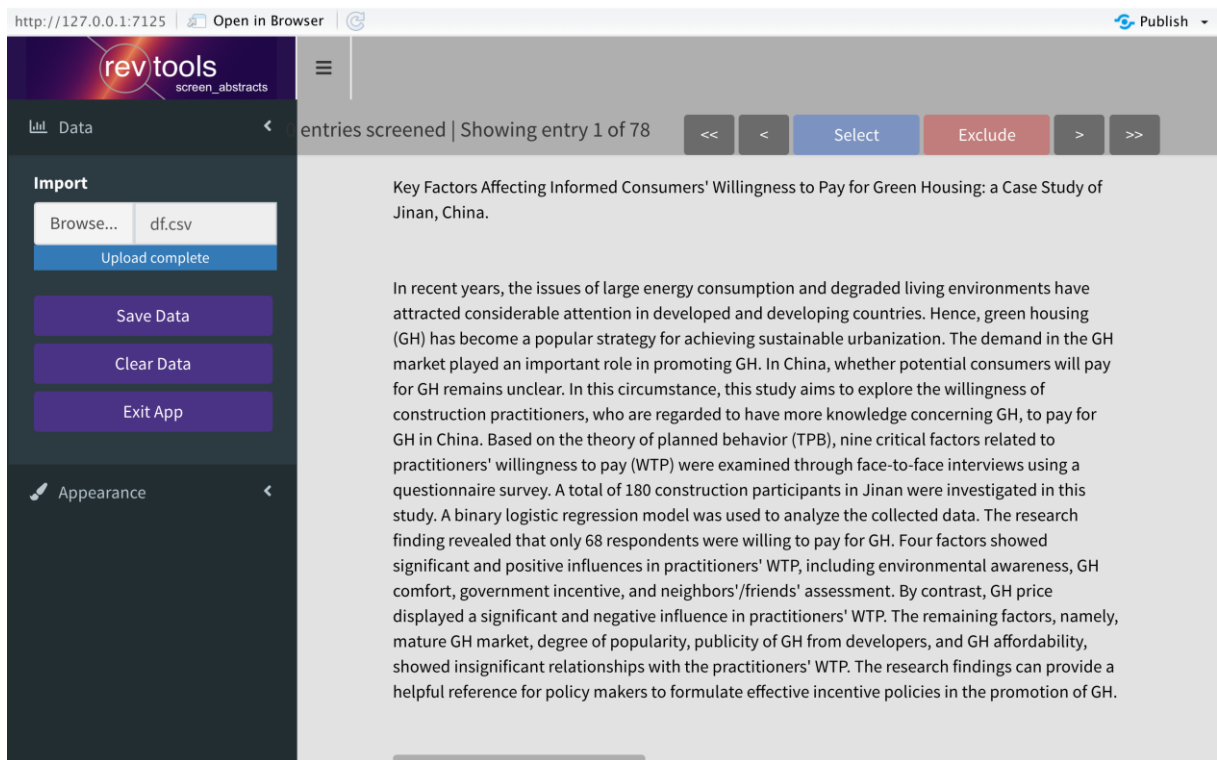


Finally, researchers can carry out the screening with topic models. To do so, the main way to investigate the results of a topic model in package "revtools" is via the command screen_topics. This function behaves similarly to the two ways of screening above.

### 3.3. Screening with topic models

After the topic models have been identified, the application creates a plot called 'ordination.' The axes on this plot are unlabelled as they do not have any implicit meaning. The researchers, instead, need to focus on the points that sit together as they are said to contain similar topics. They can hover over those points to see the title of the selected articles and the strongest-weighted topic for those papers. This is an excellent help for synthesising the literature.

**Figure 19: Topic screening**
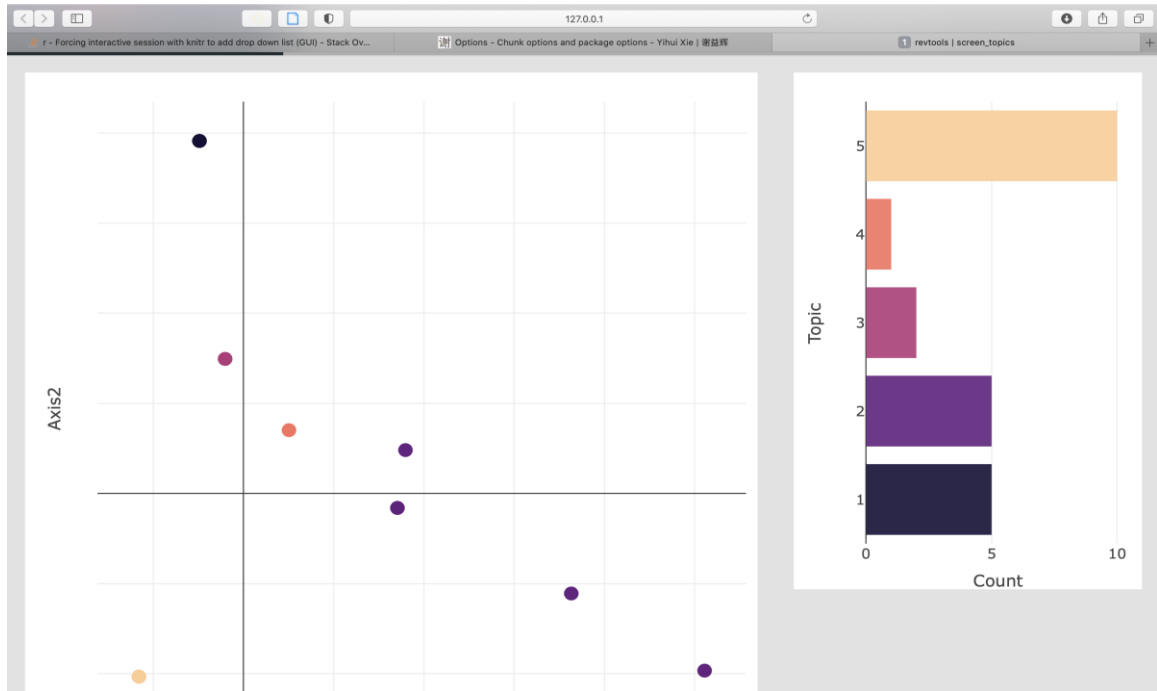


### 4. Conclusion

The main goal of the current study is to introduce R packages that are powerful to assist the process of literature review. With the help from the packages, researchers will find it easier to carry out a more critical and systematic literature review. The review, if conducted properly, is also believed to overcome the concerns of the traditional reviewing process such as selection and publication bias and the lack of appraisal critical.

Although this study has provided a deeper insight into the literature review process, one of its limitations is that the suggested R packages are still in the infant stage with the lack of a number of essential functions such as automatic term grouping or full-text screening. It is recommended that further research should be undertaken when those missing functions are added, or current functions are upgraded or changed. If so, the suggested R packages are likely to be one of the great assistants to researchers for a better literature review in terms of being critical and systematic.

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# A VISUAL SEARCH SOLUTION FOR E-COMMERCE WEBSITES

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## Abstract

*We propose the design and implementation of a visual search system for real-time image retrieval on SME e-commerce websites, the integration of visual search features in e-commerce systems will bring much value to customers and businesses, thereby promoting and facilitating online shopping. Customers can search for products by specific images instead of by keywords or voice, which is especially useful when they have difficulty describing product information with keywords or due to language barriers.*

*Keywords: Visual search, real time, image retrieval, scalability, e-commerce, indexing*

## 1. Introduction

In recent years, the growth rate of online shopping seems to be steadily increasing, and many technologies developed and are involved in this trend. Among these technologies, search engines are the critical component; to be specific, product search in e-commerce plays a vital role in improving customer satisfaction. When a user goes online to purchase a product, he usually finds it by entering product-related details into search engines like Tiki or Shopee. A suggestion of related items is recommended to the consumer based on the input they gave. If the consumer is unsure of the product details or has just seen something he wants to purchase, searching for that item online the conventional way can be time-consuming and decrease their satisfaction. These search engines allow users to find products based on criteria such as keywords, categories, etc. However, the searching based on keywords or voice hard to deal with dynamic and complex types such as fashion and clothes. This problem is not only for the enormous product but also with the number of similar products in the same category. For example, suppose the author's brother saw someone wearing a checked shirt which he liked a lot. Going online and looking for the same T-shirt with complicated texture and color can take much effort because he does not know the skirt's exact name or category. Product attributes such as shape, texture, or material are difficult to explain. Another instance would be defining feature-based items, such as a T-shirt with a specific pattern or logo. As a result, users can take a picture of an item and recommend the same or similar products from the e-commerce platform they know. In this example, search by the images are employed, he need to pick up his phone, take a photo of T-shirt and feed it into an e-commerce website, the system will recommend a similar product that he needs.

Although visual search technology has been integrated in the search engines of large companies like Bing and Google for a while now, it has not been until recently that this

technology has been interested by e-commerce businesses to integrate in their website. For image search engines, users only need to upload the image of the product they are looking for to the search engine and the search results return similar products instead of having to enter the clear keyword phrase to get the desired results like how to search with keywords.

It can be said that image search technology is gradually becoming a popular marketing trend today to help businesses achieve business benefits and provide convenient experiences for customers. By 2021, retailers that support visual and voice search will increase their e-commerce revenue by 30% *(Gartner Top Strategic Predictions for 2020 and Beyond, n.d.)*, 62% of Millenials want CBIR to discover products on their mobile devices (*ViSenze*), 70% of online shoppers in the UK under 25-year-old plan to use visual search (*GlobalData*).

In this research, we study the visual search technology integrated in e-commerce websites to help increase the user's search experience when shopping online.

## 2. Background

Artificial Intelligence (AI) has revolutionized popular computing over the last few years. It has provided applications with various powerful capabilities in machine learning algorithms for computer vision and natural language processing that were previously unthinkable. With the introduction of these technologies, we have witnessed a slew of new developments, especially in e-commerce in the form of intelligent services.

To understand research on CBIR chronologically, the author will work on the mainstream research about Image Similarity Models and Image Retrieval in the industry. Firstly, image similarity through learned models on top of traditional computer vision features like SIFT and HOG has been studied (Dalal & Triggs, 2005; Lowe, 1999). However, the expressive power of these features limits these models because the variety of many data sources images led to the complex object. Recently, Deep CNNs have been used for object recognition with remarkable success (Jing et al., 2017), (Bhardwaj et al., 2013). The image is represented with increasing degrees of abstraction by successive CNN layers, as is well understood. The final layers contain the image's abstract descriptor vectors, which are resistant to changes in size, position within the image, viewpoint differences, occlusion, and other factors. However, these descriptors are not good at estimating visual similarity because the similarity is a function of even high-level abstraction as well as low-level details. For example, the hat matches another hat, not a t-shirt, a striped t-shirt will match with a striped t-shirt. The object recognition network generally focuses on standard features to all objects in that group while ignoring fine details that are critical for estimating similarity.

In 2018, Tzelepi et al. (Tzelepi & Tefas, 2018) proposed an advanced model retraining method for gathering data on convolutional representations using deep CNN in CBIR. In the absence of information, the completely unsupervised retraining approach was used, and in the presence of labels, the retraining with relevance information approach is used.

In business, image similarity is used to the commercial by Pinterest, Alibaba, JD.com, eBay (Jing et al., 2017; Li et al., 2018; Yang et al., 2017; Y. Zhang et al., 2018). According to the research of JD.com (Li et al., 2018) despite significant development has been made, such as Google Similar Images, Amazon Flows for Internet search, and Pinterest Lens and Google Lens for similar product search. Developing end-to-end internet-scale visual search systems for retailing services remains a challenging task for many reasons. Firstly, the number of product images on e-commerce sites is rapidly and steadily increasing. At JD.com, there are over 100 billion product photos. The visual search framework must be flexible enough to accommodate a large number of images. Secondly, since items on e-commerce sites are updated regularly, the related image collection must be updated quickly and efficiently. Every day, the e-commerce platform receives approximately one billion image updates. The freshness of data becomes a critical condition. The search results should provide the most current product or image updates. Unlike traditional internet or visual web search, which creates and updates indexes in minutes, hours, or days and accepts relatively obsolete data, visual e-commerce search places a much higher value on real-time and accuracy. For our work, this is a vital and unique challenge.

In conclusion, many online e-commerce platforms using the CNN models when they implement the visual search. However, we also see that the gap in their research is that the implementing cost. Because they have several customers and products, they need to deal with problems such as real-time indexing (J. Li et al, 2018). How to train deep models for effective feature representation without massive human annotations (Y. Zhang et al, 2018) or need 4 GTX Titan X GPUs with 3072 cores and 12 GB RAM per GPU to training the models (D. Shankar, 2021), it cost a thousand of the dollars. Back to our research, because our e-commerce shop has around 10.000 products, we do not need to update the indexing real-time, we can do it in a low-peak time and lend the balance server to training our model at midnight to saving cost. An example of the visual search architecture of the Alibaba, Pailitao website is shown in Figure 1.

**Figure 1: The visual search architecture of the Alibaba, Pailitao website**
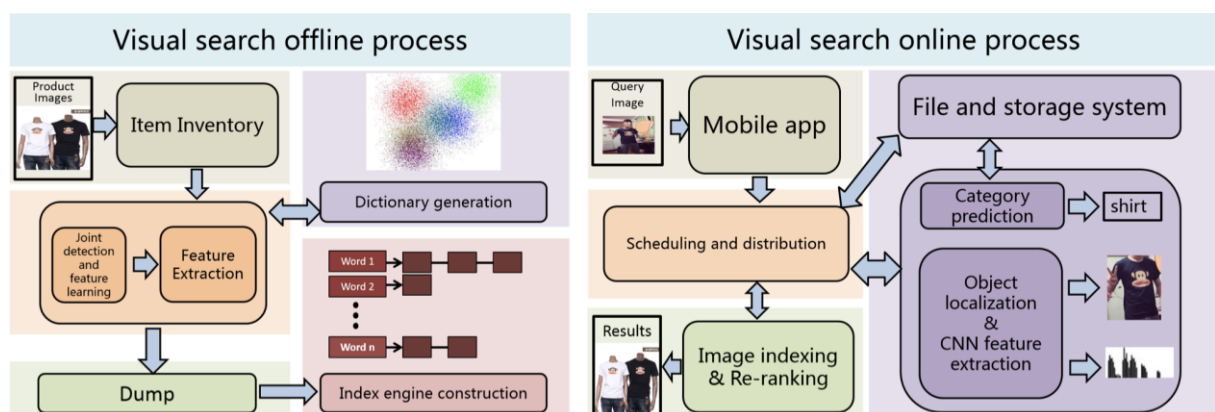
## 3. Visual search architecture

Visual search attempts to find images based on visual characteristics to provide users with a specific image collection; however, we always need to deal with some tradeoffs when implementing the visual search systems such as cost, performance, accuracy, and speed. The primary purpose of our project is to build systems that balance cost and performance for small and medium online shops in Vietnam. For this purpose, we proposed the processing flow in Figure 2.

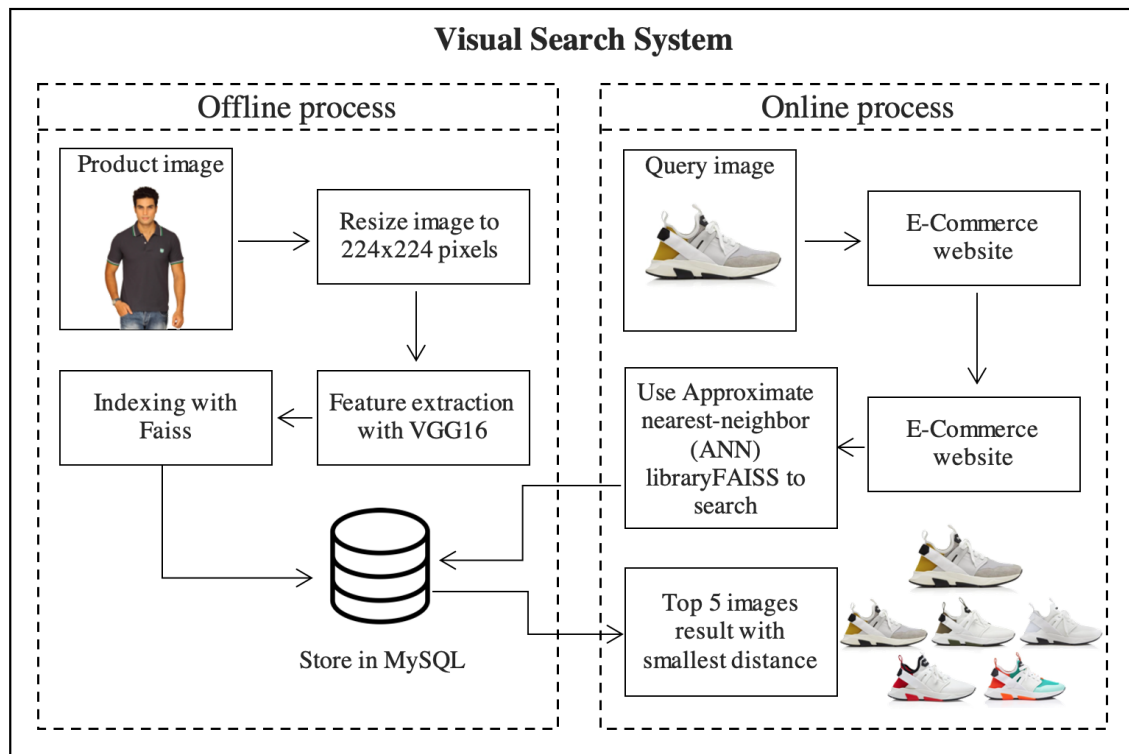**Figure 2: Overview of the visual search architecture**



Figure 2 illustrates the overall visual search process, divided into the offline and online process flow. The offline process mainly refers to the entire process of pre-processing, feature extraction, and indexing:

- In pre-processing, we resize the image from 1080x1440 pixels to 224x224 pixels, and it will improve the speed of the next step, resize the images, and reduce the image size from approximately 1,8 MB to around 200KB.

- We try to extract the feature from the image with VGG16 pre-trained models; using transfer learning can help the company saving resources.

- In the offline process, we decided to use MySQL server for deploying the production (web application), because MySQL is a free and open-source tool that is adequate with small online shop requirements.

On the other hand, the online process has a simple flow compared to other e-commerce websites. We implemented the online fashion shop with the Flask framework (based on Python language). Users will interact with the website via web browser, and they

can make an order, payment, and other functionalities of the traditional e-commerce website. Besides that, the website also contained the visual search; customers can easily input the image via local storage or webcam. Input image must be the product and enough information such as shape, color, texture. After receiving the input image, the system will extract features from the input, indexing with ANN library, namely Faiss. Finally, we will compare the L2 Euclidean distance from the query image with the product in the current database. As a result, customers will see the five products that mostly match the product they are looking for.

## 4. Experiments

### 4.1. Dataset processing

The main focus of the experiments was to design and implement the visual search system for small e-commerce shops in Vietnam. In this project, we suppose that our ecommerce platform will be a small fashion shop with approximately 50.000 products; this online shop has around 5000 visitors per day and makes around 200 orders per day. The dataset we will use is provided on Kaggle. It is a simulation of the fashion dataset from a small e-commerce shop with over 44.000 images with high-quality resolution; the image has a substantial resolution (1080x1440) and adequate size (around 200KB). Figure 3 shows a few product images from the dataset.

**Figure 3: Some product images of the dataset**



It makes sense in the e-commerce website that needs to provide good quality images for customers. However, it is hard to process with a deep learning model, and high-quality images will be time-consuming and spend several computer resources such as RAM, CPU, and GPU. Therefore, we decided to resize the images to 224x224 and implemented the zeros-padding algorithm to scale images without impacting the image ratio. The programming languages used are Python and library OpenCV. The image size 224x224 fitted with the input of the deep learning model VGG16 in the next step; the code is shown in Figure 4.

**Figure 4: Resizing and padding function using OpenCV**

```python
def resize_image(img, size=(224, 224)):
    h, w = img.shape[:2]
    c = img.shape[2] if len(img.shape) > 2 else 1

    if h == w:
        return cv2.resize(img, size, cv2.INTER_AREA)

    dif = h if h > w else w

    interpolation = cv2.INTER_AREA if dif > (size[0] + size[1]) // 2 else cv2.INTER_CUBIC

    x_pos = (dif - w) // 2
    y_pos = (dif - h) // 2

    if len(img.shape) == 2:
        mask = np.zeros((dif, dif), dtype=img.dtype)
        mask[y_pos:y_pos + h, x_pos:x_pos + w] = img[:h, :w]
    else:
        mask = np.zeros((dif, dif, c), dtype=img.dtype)
        mask[y_pos:y_pos + h, x_pos:x_pos + w, :] = img[:h, :w, :]
    return cv2.resize(mask, size, interpolation)
```

Besides the raw images, the dataset also has a description to clarify each image attribute. The Table 1 shows the description of each column of the image.

**Table 1: Dataset attribute description**

| Column Name | Description | Example | Note |
|---|---|---|---|
| id | id of image | 15975 | id mapping with image name (e.g: id 15975 will map with image name: 15975.jpg |
| gender | product appropriate for men or women | male | |
| masterCategory | show the category which product belong | Apparel | |
| subCategory | subcategory of the master category | Topwear | |
| articleType | product-specific type | Shirts | |
| baseColour | show the main color of product | Navy Blue | |
| season | give the season which product is suitable. | Fall | |
| year | the year that product was released. | 2011 | |

| Column Name | Description | Example | Note |
|---|---|---|---|
| usage | which kind of situation which product appropriate. | Casual | |
| productDisplayName | the unique name of the product. | Turtle Check Men Navy Blue Shirt | This is a name that shown on product page when it appear on e-commerce website. Product display name have a wide range (~44.000) |

### 4.2. Features extraction

The experiments were performed with two CNN models, feature engineering, which is VGG16 and EfficientNet B0. Because our research purpose is to find the best models that balance between speed and resource (CPU, GPU, and RAM). There are several opportunities to improve the speed of the similarity search step. We can use two strategies for similarity search: either reduce the feature-length or use a better algorithm to search among the features. Let us examine each of these strategies individually. Ideally, we would expect that the smaller the amount of data to search, the faster the search should be. Recall that the ResNet-50 model gives 2,048 features. With each feature being a 32-bit floating-point, each image is represented by an 8 KB feature vector. For a million images, that equates to nearly 8 GB. Imagine how slow it would be to search among 8 GB worth of features. To give us a better picture of our scenario, the table below gives the feature lengths from different models.

**Table 2: Top 1% accuracy and feature-lengths for different CNN models**

| Model | Bottleneck feature-length | Top-1% accuracy on ImageNet |
|---|---|---|
| VGG16 | 512 | 71.5% |
| EfficientNet-B0 | 512 | 77.1% |
| VGG19 | 512 | 72.7% |
| MobileNet | 1024 | 66.5% |
| InceptionV3 | 2048 | 78.8% |
| ResNet-50 | 2048 | 75.9% |
| Xception | 2048 | 79.0% |

According to the Table 2, we could see that the VGG16 has only 512 feature-length, and EfficientNet B0 also has high accuracy. So we decided to benchmark the result of two CNN models, which are VGG16 and EfficientNet B0. EfficientNet B0 is especially fast while

maintaining a high level of accuracy, so we benchmarked it in our project. Weights pre-trained on ImageNet's general dataset function well for a wide range of image types.

The Figure 5 shows that the step-by-step EfficientNet B0 models feature extraction. Firstly, if we are offline, we need to input the image on our database; the systems only accept the *.jpeg and &.jpg file format.

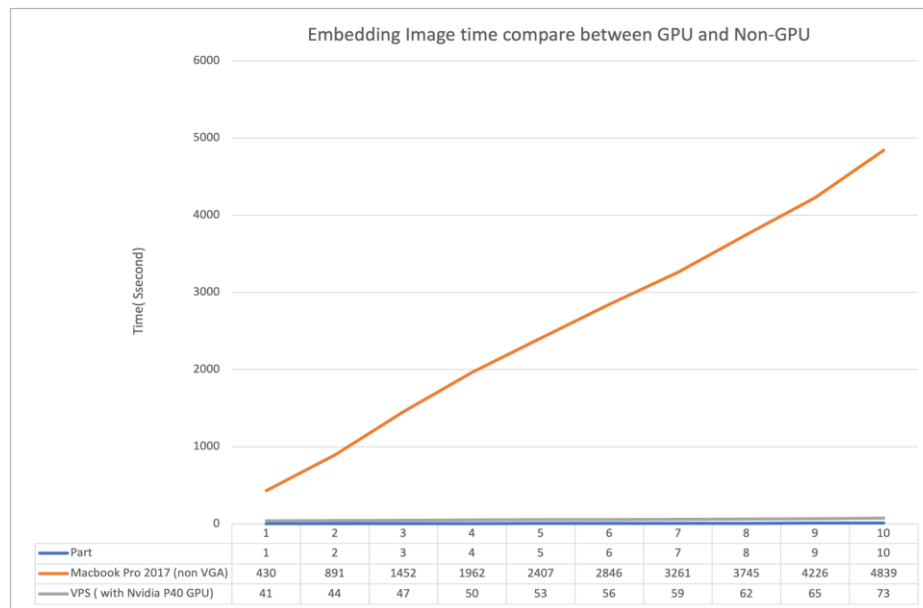**Figure 5: EfficientNet B0 Feature extraction process**
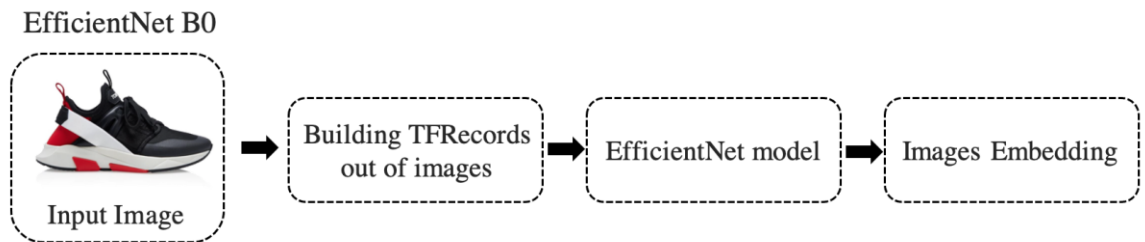


Input images will be converted to TFRecords format; TensorFlow can read and use TFRecords much faster than many small picture files. According to Google documentation, there are many ways to feed data to TensorFlow models. However, the most recommended method is TFRecord format, which stores byte arrays of our data ordered in maps. Each map can easily be interpreted as a function or an example, and they contain all of the necessary information for training and testing. On the other hand, in the online process where the customer will input their image, the system will convert the input image to TFRecord before.

After that, we will integrate the TFRecords in the previous step into the EfficientNet B0 model. It takes about a minute on the CPU for thousands of images. It is five times faster on GPU, particularly for large batches, on the GPU, we could calculate a million calculations. Millions of images can be processed in hours on a large computer. With PySpark and a large Hadoop cluster, it is shockingly possible to do it in an hour for datasets of a hundred million images. After this process, we will have ten files, namely part-00*.parquet with around 25MB per file. Essentially, we can see that the embedding image processing is efficient with our job; while the input image occupies 15GB storage, the output only occupies around 250MB (reduce 60 times). The Figure 6 shows that the feature extraction time (also known as embedding image time) compared between the machines have GPU and non-GPU. The machines that we benchmark are Macbook Pro 13,3" with non-GPU (Intel Core i5 7th gen, 8GB Ram and run on macOS). While the machine contained GPU is a VPS server has Nvidia P40 on GPU and 12GB RAM.

As a result, we can see that the embedding of 44.000 images is reduced 98% from 26059 seconds (with non GPU) to 550 seconds (with GPU Nvidia P40). While the conversion time from image to TFRecords type is the same (around 5000 seconds), it should be noted that conversion time only runs on the CPU because it is a process of converting images, not extracting any feature. At the same time, image embedding uses the GPU to calculate and extract the feature on the image. Therefore, it suggests that we need to balance between CPU

and GPU when using the EfficientNet B0 model; in case of converting time, we can use the server with a robust CPU performance, while GPU is needed to extract the feature phase.

**Figure 6: Image Embedding time of Efficient Net with 44.000 images**



|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Part | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Macbook Pro 2017 (non VGA) | 430 | 891 | 1452 | 1962 | 2407 | 2846 | 3261 | 3745 | 4226 | 4839 |
| VPS ( with Nvidia P40 GPU) | 41 | 44 | 47 | 50 | 53 | 56 | 59 | 62 | 65 | 73 |

Besides that, we ran the parallel model for feature extraction is VGG16 with more minor feature than EfficientNet while keeping the accuracy and speed. The Figure 7 gives that the flow of feature extraction of the VGG16 model.

**Figure 7: VGG16 Feature extraction process**
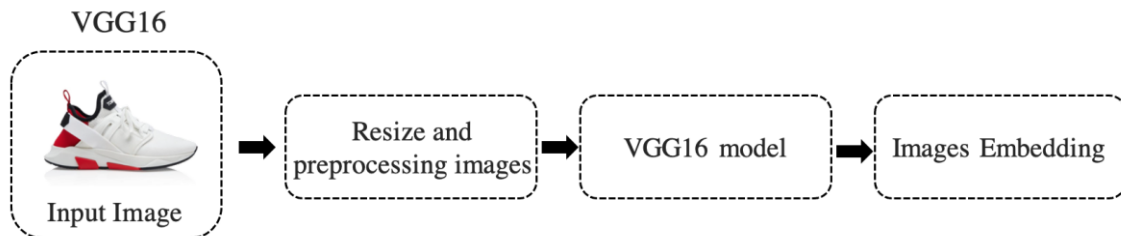


With the same process with EfficientNet B0, VGG16 accepts the input image with *.jpeg or *.jpg file type. After that, we need to resize the image from 1080x1440 pixels to 224x224 pixels (while keeping the ratio); we used the zero-padding algorithm. The image rescaled the resolution and reduced the image size from 1.8MB to 200KB per image. After that, the VGG16 model will extract the feature on the image to NumPy type, and each image will create each NumPy file; this process will consume approximately 6 hours and create over 44.000 NumPy files. In general, it takes time, but we should keep in mind that this process only happens for the first time; after that, when we want to update the image or add a new image, it will not take a long time. Figure 8 illustrates the image before and after resizing and padding by VGG16.

**Figure 8: Image before and after resizing and padding by VGG16**



### 4.3. Indexing and searching

For finding nearest neighbors of query features (features that reflect a query image), we will use Python's machine learning library, Faiss. To find the nearest five neighbors based on Euclidean distance, we train a nearest-neighbor model using the brute-force algorithm (to install Faiss on your device, use pip3 install Faiss). Faiss offers IVF and HNSW algorithms with significantly higher complexities at the expense of being approximate. Furthermore, in a method known as quantization, Faiss also offers ways to reduce the index size in memory. It allows KNN search to scale to millions or even billions of embeddings. We are implementing the Faiss algorithm for this project; after indexing, we can query the image in our database. In this study, we experiment with two popular CNN models, EfficientNet B0 and VGG 16.

To calculate the distance between two image, we used the Euclidean L2 distance (one of the common formulas used to measure image similarity).

### 4.4. Results

Using our dataset, we training on Google Colab for the image classification model. In the experiment, we train on the VGG16 model, the accuracy we got on this pre-train model was around 76.2%.

We have conducted tests for our product retrieval image service. We wanted to see how accurate findings based on visually identical images were. The top relevant products returned by the backend service based on the labels provided by the image recognition process for and query image are listed in the Figure 9. We can see that the models have an excellent accuracy while giving the relevant product in T-Shirt, Shirt and Shoes.

**Figure 9: Showing relevant results return from our CBIR system**



## 5. Conclusions

This research attempted to address our research question of creating a virtual shopping assistant using cutting-edge image recognition technology to enhance users' overall online shopping experience. We have proposed a novel method for providing users with appropriate product listings based on visual search. The proposed application has two main components, i.e., an e-commerce based user interface, a product retrieval service. Each of these elements is crucial to the application's effectiveness. On the other hand, the product retrieval service is the application's core functionality, allowing users to search the product by their image; it saves customer cost and improves the user's satisfaction.

People have been very interested in knowing about the trending things around them, thanks to the widespread use of social networking platforms such as Facebook and Twitter. They try to follow different people, such as their favorite celebrities. As a result, social networking has a significant impact on their buying decisions. As a result, creating a product search application that can identify relevant items based solely on a picture is highly beneficial. Users will now find goods that are ideal for them in a more efficient manner. They do not have to use conventional text-based search engines anymore. Instead, they can let this app find items that are important to them. All they have to do is provide a picture of the product they want.

While working on this project, we understood the importance of an efficient system for SMEs. Because we always need to balance between cost and effectiveness of the digital system on the company. Our project proposed an architecture that fits SME, but it also has some drawbacks, such as it can be wrong in some cases of low-quality input data.

The results of this project's experiments demonstrate the potential of computer vision and machine learning. In addition, the findings demonstrate the value of a visual or image-based search application in bridging the contact gap between humans and computers when it comes to identifying specific products online based on users' actual product intentions. This application, we believe, is a strong starting point for bringing the consumer shopping experience to the next level. We want to keep improving this solution in order to make it more reliable and effective for users.

We created a fully functional image-based search application with satisfactory results based on our study. However, due to the project's limited scope, we could not optimize it to achieve a successful result. As a result, as part of our future work, we would like to refine it and expand upon it by adding more functionalities. The following are a few of them:

- **Mobile Application:** with the trend of mobile devices, we have a trillion smartphone on the world, and mobile is always the best choice for taking and searching image.

- **Video Recognition:** Besides the image, we want to extract the product from video, because modern day, Gen Z likely to record the video and use it for social media such as TikTok or Reel.

- **Social Media Integration:** We will need to publish this application on various social networking platforms including Facebook Messenger, Slack, Skype, and others to increase user interaction, as real-world users are the ones who can help develop it by offering valuable feedback.

- **Hardware:** Image processing at a high speed necessitates more hardware resources and their optimal use. We used an 8 core CPU machine with 8GB of RAM for this project. Building and training a Convolutional Neural Network based on photos, on the other hand, needs significantly more energy. As a result, we'll review the current processing of images per second and use a GPU-based architecture to improve the computational results.

- **Use SOTA method:** We also have many state-of-the-art models for image classification task in computer vision such as RepVGG (X. Ding, X , 2021) EfficientNet V2 (Ma et al., 2018) can help our system achieve more accuracy and balance with the time of training data.

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# THE INFLUENCE OF LEADERSHIP STYLES ON TEAM EFFECTIVENESS: THE CASE OF STUDENT TEAMWORK IN DANANG UNIVERSITY – UNIVERSITY OF ECONOMICS

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**Abstract**

*With the rising popularity of teamwork in organisations, universities have provided students with teamwork projects. However, there has not been any study on the effectiveness of student teamwork in universities. This paper investigates the influence of different leadership styles on the effectiveness of teamwork in student projects at Danang University – University of Economics. The results show that Democratic and Altruistic leadership style best serve the well-being of the teamwork. The results have led to some implication for the students, lecturers, and further researches.*

***Keywords:*** *leadership styles, teamwork effectiveness, leadership.*

## 1. Introduction

With the Industrial Revolution 4.0, the world has been becoming more and more uncertain. As a result, team work has grown in popularity in organisations. Universities therefore have provided students with teamwork skills, leading to the fact that students participate in working groups constantly.

Leadership style relates to specific behavior of the leader and is influenced by the leader's aims, personality, and his/her relationship and interaction with the group (Simpson (2012) cited from (Fajardo & Fajardo, 2020). It plays an important role in teamwork. Team leaders are capable of impacting on achieving a vision and setting of goals, as well as motivating their group members to higher levels of performance through their strong rapport (Wen, Ho, Widarman, & Othman, 2019). Therefore, leadership style could bring direct and indirect impacts on team outcome and effectiveness. In addition, the influence of the style of leaders is more impactful than that of other members (Warrick, 1981). There have been some authors studying the influence of leadership styles on team work (Padauleng & Sidin, 2020; Beverborg, et al., 2015). However, there has been no study measuring how leadership styles affect the effectiveness of teamwork.

Furthermore, it was found there was almost no study on leadership styles that measures the effectiveness of learning groups. Meanwhile, for students, teamwork plays an important role not only to their learning results but also to the enhancement of work skills. For lecturers, knowing how student groups work is an important part of teaching and mentoring students. For researchers, such a study can contribute to the literature studying

leadership styles and team effectiveness, and provide suggestions for further related researches.

For the reasons mentioned, this study focuses on how different leadership styles lead to teamwork successful outcomes. As a means to achieve this purpose, the following research question was formulated: ***Which style of leadership of the group leader best serves the success of the team?***

To answer this question, the objectives of this research have been set as follow:

- To review the theoretical basis of leadership styles.

- To design a questionnaire that can be used to investigate the leadership styles of students and the effects of their leadership styles on the team effectiveness.

- To run a survey on students in DUE.

- To handle and process the data gathered from the survey.

- To make suggestions on how to improve the outcomes of the teamwork to the students and for further researches.

Because the authors aim at studying the students of DUE, this research is limited to investigating the student leaders of the teams learning different modules in the University.

## 2. Literature Review

### 2.1. Leadership

The development of leadership leads to various definitions. Wen, et al. (2019) stated that leadership was the capability to influence a group of people to achieve a vision or to set goals. Meanwhile, Koontz & Weihrich (1990) implied that leadership was the dynamic that referred to the ability to influence groups for purposes of goal accomplishment. According to Denis, et al. (2012), individual leaders are not the fundamental source of leadership, and leadership is an emergent property of interactions among people working together for collective outcomes. Leaders who have good leadership coach team members to become high performers (Saafein & Shaykhian, 2014), while poor leaders cause team member confusion, miscommunications, and interpersonal distrust that negatively affect team performance (Jarvenpaa and Tanriverdi, 2003; Goldfinch, 2007; Malhotra et al., 2007; Snellman 2014 cited from Van Wart, et al., 2017). In this paper, because the authors aim to investigate the impact of the behaviour of the leaders on the team, we would love to adapt Mitonga-Monga, et al. (2012)'s view that leadership is a pattern of managerial behaviour performed by the leaders to integrate the organisational or personal interest and the effects for achieving particular objectives.

Given that impact of leadership may vary according to the organizational characteristics, the relationship between the project leadership and the project outcome needs to be demonstrated by enormous experienced studies. While most previous researches concentrated on traditional leadership such as transformational leadership and transactional leadership (Oh, et al., 2019; Wen, et al., 2019), our research referred to more emerging leadership paradigms, which include Authoritative leadership style, Democratic leadership

style, laissez-faire leadership style, Bureaucratic leadership style, Innovative leadership style, Pacesetting leadership style, Affiliative leadership style, Coaching leadership style and Altruistic leadership style. This approach is an adaptation from the Toastmaster International (2016) project, which used the questionnaire developed by Berkeley University.

## 2.2. Team and role of leadership

There have been a lot of authors who try to define the term "team". Senaratne & Gunarwardane (2015) defined a team as a group of people with complementary skills and shared values who performed together to achieve common objectives. According to Mathieu, et al. (2019), teams are "dynamic systems elvolving in response to environement". In addition, Bommer, et al. (1995) stated in his study that teams play role to perform tasks, and team's perfomance is the most widely studied criterion variable to consider a success task or not. In sum, a lot of authors agree that a team is a functional collective. Therefore, the interaction between members should be one of the most crucial factors that contribute to the effectiveness of the team. In Viet Nam, where collectivism is focused, the role of how team members work together is increasingly concerned. Meanwhile, leadership is the decisive factor to help members connect and bring success to the team. Imam & Zaheer (2021) revealed that shared leadership motivate success of a team through sharing knowledge and collaborate. Wahab, et al. (2014) stated that, in the context of events, leadership is one of the factors that lead to a successful event, and that the absence of leadership would bring about unpredictable results for event managers (Mills, 2007 cited from Wahab, et al., 2014). The study of Giudici & Filimonau (2019) elucidates the role of managerial leadership in delivering a successful event, referring in particular to the influence of enabled communication across a team working in an event project. It can be seen that through the researches, the role of leaders in bringing a successful outcome of a project team is confirmed.

## 2.3. Leadership styles

Leadership style is viewed as a combination of the characteristics, traits and behaviours that leaders show or perform when they interact with their subordinates (Mitmonga-Monga, Coetzee, & Ciller, 2012). Leadership styles therefore determine the leadership of the team, while according to Mitonga-Monga, et al. (2012), leadership forms how a team meet its particular objectives.

In different contexts, researchers have different ways to name leadership styles. Some studies indicate that leadership style seems to be known only with three main categories including Autocratic leadership, Democratic leadership, and Laissez-Faire leadership (Lewin, Lippitt, & White, 1939). Other researchers argue that the "new leadership" theories that adapted from Bryman (1992) include theories of charismatic, visionary, and transformational leadership (Khatri, et al., 2012; Zhu & Goldberg, 2009). Simpson (2012) indicated that the two most commonly seen and used leadership styles are: Transformational and Transactional. However, the authors seek to follow an approach that focuses more in the interaction between

the leaders and team members. One such synthesis of leadership styles is recently used by a leading organization of communication, public speaking, and leadership, Toastmasters International (2016), to investigate its trainees. According to this survey, there are 8 leadership styles that are Bureaucratic, Authoritative, Innovative, Pacesetting, Democratic, Affiliative, Coaching, and Altruistic.

**Bureaucratic leadership style**

Leaders in this style prefer disciplined motivations and tend to compel others to comply. They also set and enforce strict rules. They believe that their decisions are absolute and not influenced by others. They engage in top-down interactions. This style is not effective when trying to lead highly skilled individuals, as they often become resentful of micromanagement. This style is most effective when a decision has to be made in a short amount of time.

**Authoritative leadership style**

These leadership styles are those with a long-term orientation and focus on the end goals. They are more experienced, skilful and knowledgeable than their teammates. Therefore, they know how to set clear directions, assignments, and standards. They insist on the vision to motivate team members. This style is less effective when explicit guidance is required. This style is most effective when a change of direction or vision is required.

**Innovative leadership style**

This stylish leader appreciates creative ideas. They promote effective teamwork by honouring members' creative ideas. These leaders share a vision of the future and pursue excellence. They are more inclined to communicate with other members than to give orders. This style can be less effective when risks taken make team members apprehensive. This style is most effective when solving complex problems.

**Pacesetting leadership style**

Pacesetting leadership style focuses on productivity. They expect a lot from members to speed up work performance. They set high standards and model for others to follow. They want the members themselves to understand and complete the task excellently without assigning too detailed and clear. This style can be ineffective if used over a long period of time. This style is effective when team members are self-motivated and highly skilled.

**Democratic leadership style**

Leaders in this style tend to create a democratic work environment. All efforts, contributions, and comments will be taken into consideration in creating team performance. The leader will make decisions based on the consensus of all members. They also value cooperation and input into decision-making. They often empower and listen to other members. This style is ineffective when time is limited or if team members do not have the knowledge or expertise to make quality contributions. This approach is most effective when the knowledge of the entire team is needed to solve a problem or find direction.

**Affiliative leadership style**

These leaders are collaborative and focusing on emotional needs to create an environment of active cooperation and conflict avoidance. The affiliative style is often used effectively alongside visionary leadership. This style is less effective when the leader has difficulty giving negative feedback and performance is not emphasized. This style is effective in increasing morale, repairing broken trust, and working through stressful circumstances.

**Coaching leadership style**

These leadership styles tend to focus on skills development for themselves and team members. They often boost team productivity with individual challenges while making positive statements. This style is less effective when those being coached are adverse to change. This style is most effective in a one-on-one setting when the person being coached is receptive to the close working relationship of this leadership style.

**Altruistic leadership style**

These leaders often focus on active listening, empathy, and commitment to building community. They often work adjusted to meet the individual needs of the group members. They believe that it is just as important for everyone to be satisfied with the collaboration as having high team performance. Sometimes these leaders have to work more than others without complaining. This style can be ineffective if not given sufficient time to apply a long-term perspective. This style is effective in creating a positive culture and high morale.

As can be seen from the synthesis, this approach of investigating leadership styles focuses on how the leaders interact with their subordinates. Toastmasters International's approach is rigorous, consistent with the development of psychological science and modern contexts. Besides, their survey scope and subject matters are the project teams and the leadership styles of the project team leaders. Moreover, Toastmaster International has cooperated with Berkeley University (ranked 30th in QS World University Rankings) in California, USA, to provide leadership skill training to the students, faculty, staff, and alumni of the University since 1987 (Toastmaster on Campus, 2020). Their questionnaire investigating leadership styles and team success of trainees is developed by Berkeley University (Toastmaster International , 2016) and therefore is suitable for studying project teams of students in universities, and in this case, students of DUE.

## 2.4. The effectiveness of teamwork

Regarding the studies on team effectiveness, one of the prominent ones is the Input-Process-Outcome (IPO) framework by McGrath (1964). According to IPO, the inputs including organisational, team and individual factors are processed into outcomes, imlying that team effectiveness is influenced by team external environment (e.g. organisational design features, environmental complexity, external leader influences), internal factors (e.g. members' competencies, personalities, task structure) and how they are transformed in the processes. Another significant model, which started out as a criticism against the IPO, is the Input-Mediator-Outcome (IMO) model. This is a more functional approach that indicates that team outcomes include Organisational – level performance, Team performance behaviours,

Role-based performance, and Performance composite (Ulrych, 2014). Meanwhile, J. Richard Hackman, in his researches that started in 1970s, discovered that team effectiveness relies heavily on whether the team has compelling direction, strong structure, and supportive context (Haas & Mortensen, 2016; Hackman, 1990; Koontz & Weihrich, 1990). Besides, the definitions of leadership mentioned earlier in 2.1 imply that how the team is led influences the direction, structure, and context of the team. Therefore, this approach best serves the purpose, which is to investigate the effects of leadership styles on team outcomes, of this paper.

According to Hackman (1990), the group effectiveness is defined as "the group's output meeting quality standard, the group's ability to work interdependently in the future, and the growth and the well being of team members". Figure 1 illustrates the dimensions of group effectiveness and the factors ifluencing group effectiveness.

**Figure 1. Hackman's model of work group effectiveness**
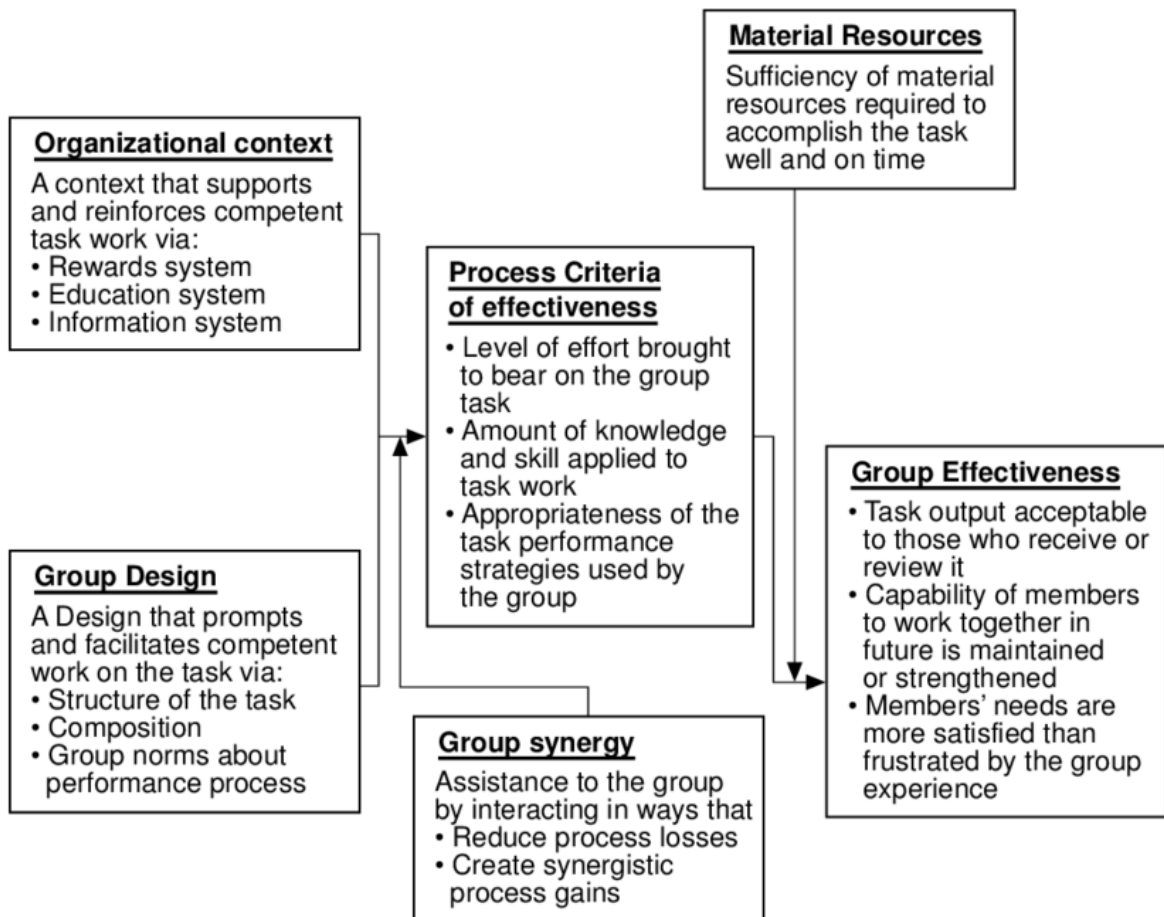


**Source:** Campbell 1988, p. 305

*(Cited from Appelbaum et al., 1999)*

As can be seen from this model, group effectiveness is composed of task output, capability of members to work to work together in future is maintained or strengthened, and the satisfaction of members while working together. Meanwhile, one of the dimensions of the Process Criteria of effectiveness, which directly affects Group Effectiveness according to the

model, is the appropriateness of the task performance strategies used by the group. In 2.3, we have already mentioned that leadership style affects how a team performs the tasks to meet the objectives. This implies that there could be a connection between the leadership styles and the effectiveness of teamwork. Moreover, Hackman (1990)'s approach focuses on not only the task output but also on whether team members are satisfied with how they interact within the team. This meets the authors' aim to follow an approach that focuses on the interaction between the leaders and team members beside how well the tasks are performed. As a result, testing how leadership styles influence team effectiveness using Hackman (1990)'s definition is relevant to the purpose of this study.

For the reasons mentioned, the authors would love to propose the research model for this paper as follow:

**Figure 2. Proposed Research Model**
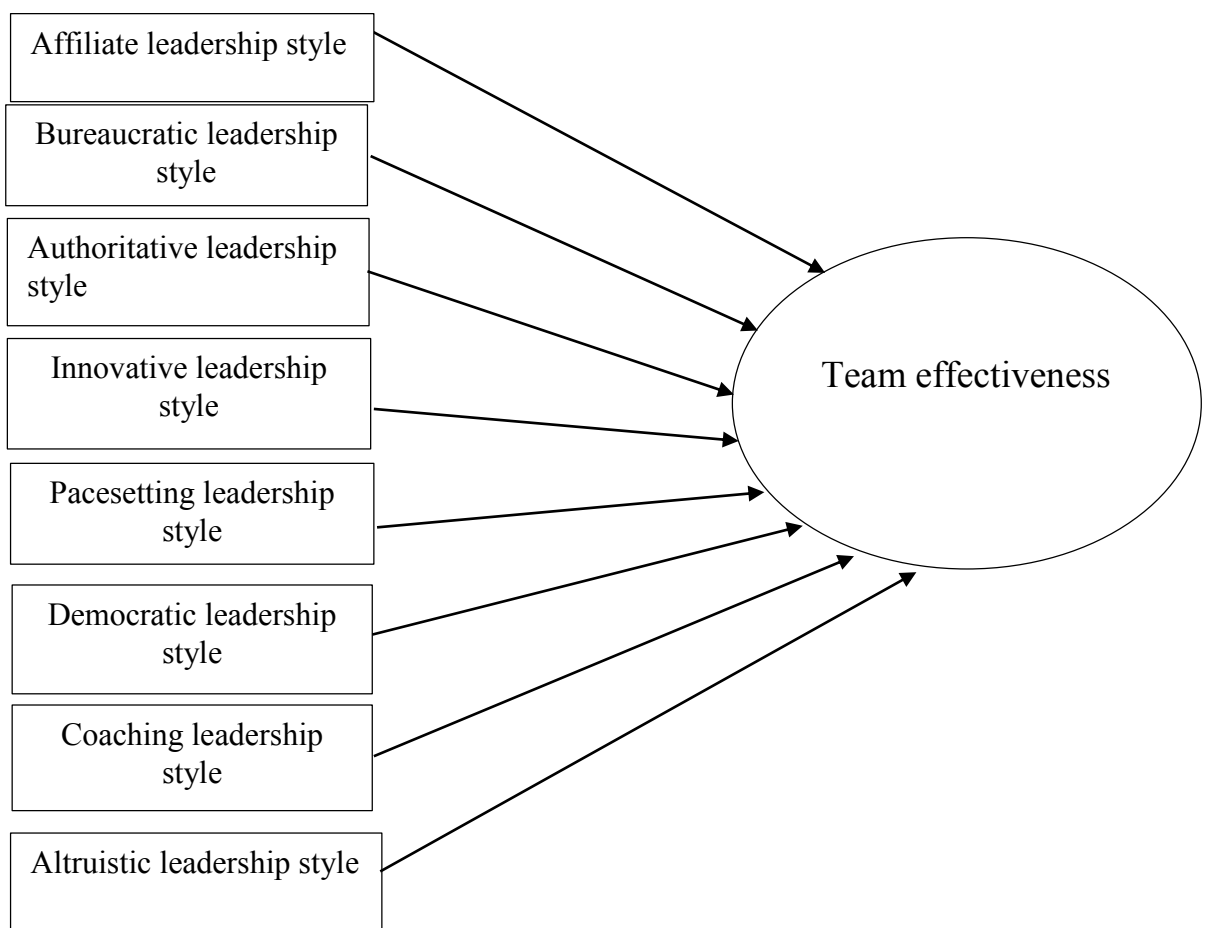


Along with the model, the authors would love to propose the following hypotheses:

- H1: Group leaders following Affiliate leadership style can create the best effective outcome
- H2: Group leaders following Bureaucratic leadership style can create the best effective outcome

- H3: Group leaders following Authoritative leadership style can create the best effective outcome
- H4: Group leaders following Innovative leadership style can create the best effective outcome
- H5: Group leaders following Pacesetting leadership style can create the best effective outcome
- H6: Group leaders following Democratic leadership style can create the best effective outcome
- H7: Group leaders following Coaching leadership style can create the best effective outcome
- H8: Group leaders following Altruistic leadership style can create the best effective outcome

## 3. Data and Methodology

### 3.1. Measurement Scales

The 48-item questionnaire was divided into two parts. The first part measuring leadership styles was adapted from Toastmaster International (2016). The second one measuring team effectiveness was developed from the definition of Hackman (1990). According to Hackman (1990), the three dimensions of team effectiveness are: (1) task output, (2) potential to work together again in the future, and (3) satisfaction of members of the teamwork experience. The items in the scales were therefore assigned in to such three groups. The questionnaire includes multiple-choice questions built on a 5-level Likert scale from 1 (Strongly disagree) to 5 (Strongly agree).

### 3.2. Data

The data used for this study is collected from respondents by means of the online questionnaire and the paper questionnaire. The authors adapted the systematic sampling method: the respondents were the leaders of the student teams from Danang University – University of Economics. To create the consistency for the data, the teams selected were those who run the projects under the same course of Principles of Marketing. Almost every student in Danang University – University of Economics has to take this course. One limitation of this data collection method is that the authors can only measure the team effectiveness through the perception of the leaders. 200 questionnaires were distributed, 163 of which were accepted for the research.

### 3.3. Tool of Analysis

By the Statistical Package for Social Sciences version 25.0 (SPSS 25.0), data analysis is carried through four methods: (1) descriptive statistic, (2) establishing scale reliability through computation of Cronbach's alpha; (3) Exploring factor analysis method (EFA) to reduce and summarize the type of variable in an objective way into factors according to how the variables' correlate to each other; (4) correlation regression test.

## 4. Results and Discussion

### 4.1. Descriptive statistics determining the most common leadership styles

The results illustrate that the democratic leadership style is the most popular leadership style of students in the DUE, with a rate of 39.6%. Innovative and bureaucratic leadership style together accounts for 9.4% and 9.9%, ranking 3rd and 2nd among mentioned leadership styles. The group of students with affiliative leadership style ranked third, accounting for 8.4%. It is followed by coaching and altruistic leadership styles, at 7.4% and 6.4%, and Authoritative leadership style at 5%. Pacesetting leadership style is the least proportion, only 5.9%.

In addition, the study uncovered two new and unnamed leadership groups. This stems from the fact that 1.5% of the student group has both democratic and altruistic leadership styles and 2.0% of the student group carries democratic - coaching leadership style.

### 4.2. The first Cronbach's Alpha test

#### 4.2.1 Cronbach's Alpha test for independent variables

Cronbach's Alpha's values above 0.6 are considered acceptable and those above 0.8 are considered creditable (Litwin, 1995). The Item-Total Statistics table is the most important in this testing. Normally, the value of Corrected item total Correlation should be above 0.3. The value of Cronbach's Alpha if Item Deleted illustrate the values of Cronbach's Alpha without an item in factor. When it is more than its total, it is reasonable to delete its item. Here is tables showing the results of Cronbach's Alpha's test of each leadership style factors:

**Table 1. Item-Total Statistics in the first Cronbach's Alpha test**
**for independent variables**

| Item-Total Statistics | | | | | |
|---|---|---|---|---|---|
| Factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha |
| Affiliative_1 | 18.2673 | 8.505 | .341 | .713 | |
| Affiliative_2 | 17.7723 | 7.052 | .603 | .628 | 0.718 |
| Affiliative_3 | 18.1485 | 7.301 | .524 | .656 | |
| Affiliative_4 | 18.4109 | 8.522 | .454 | .682 | |
| Affiliative_5 | 18.1733 | 8.482 | .390 | .697 | |
| Affiliative_6 | 18.4356 | 8.287 | .405 | .693 | |
| Bureaucratic_1 | 16.9257 | 9.193 | .259 | .681 | |
| Bureaucratic_2 | 17.1931 | 8.395 | .433 | .630 | 0.678 |
| Bureaucratic_3 | 18.1386 | 7.831 | .444 | .624 | |
| Bureaucratic_4 | 18.0990 | 8.100 | .371 | .651 | |
| Bureaucratic_5 | 17.3119 | 8.056 | .392 | .643 | |
| Bureaucratic_6 | 17.3564 | 7.514 | .559 | .584 | |
| Authoritative_1 | 17.2525 | 8.548 | .439 | .700 | |
| Authoritative_2 | 16.6931 | 8.194 | .562 | .664 | |
| Authoritative_3 | 16.7277 | 8.408 | .549 | .670 | 0.73 |

| Item-Total Statistics | | | | | |
|---|---|---|---|---|---|
| Factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha |
| Authoritative_4 | 17.2327 | 8.309 | .425 | .706 | |
| Authoritative_5 | 16.5446 | 8.866 | .505 | .685 | |
| Authoritative_6 | 17.0099 | 8.537 | .357 | .729 | |
| Innovative_1 | 17.7871 | 10.606 | .418 | .733 | |
| Innovative_2 | 18.6188 | 9.491 | .392 | .751 | 0.751 |
| Innovative_3 | 18.1683 | 9.375 | .612 | .683 | |
| Innovative_4 | 18.5545 | 9.532 | .498 | .713 | |
| Innovative_5 | 18.2030 | 9.307 | .630 | .678 | |
| Innovative_6 | 18.1485 | 9.988 | .437 | .729 | |
| Pacesetting_1 | 17.2772 | 9.744 | .419 | .743 | |
| Pacesetting_2 | 17.2822 | 8.970 | .594 | .698 | 0.758 |
| Pacesetting_3 | 17.2871 | 9.161 | .518 | .718 | |
| Pacesetting_4 | 17.3168 | 9.004 | .603 | .696 | |
| Pacesetting_5 | 17.7871 | 9.352 | .408 | .749 | |
| Pacesetting_6 | 17.3317 | 9.208 | .472 | .730 | |
| Democratic_1 | 20.3812 | 7.660 | .656 | .773 | |
| Democratic_2 | 20.3020 | 8.391 | .607 | .786 | |
| Democratic_3 | 20.4851 | 7.992 | .579 | .791 | 0.819 |
| Democratic_4 | 20.7327 | 8.575 | .506 | .806 | |
| Democratic_5 | 20.4752 | 8.370 | .571 | .793 | |
| Democratic_6 | 20.1238 | 8.258 | .584 | .790 | |
| Coaching_1 | 18.6782 | 6.488 | .545 | .682 | |
| Coaching_2 | 18.8465 | 6.469 | .580 | .673 | |
| Coaching_3 | 19.1584 | 6.850 | .383 | .731 | 0.739 |
| Coaching_4 | 18.8069 | 7.132 | .407 | .721 | |
| Coaching_5 | 18.9901 | 6.507 | .482 | .701 | |
| Coaching_6 | 18.6139 | 6.984 | .470 | .704 | |
| Altruistic_1 | 17.9752 | 7.507 | .336 | .703 | |
| Altruistic_2 | 18.1782 | 7.282 | .473 | .655 | |
| Altruistic_3 | 17.6634 | 7.598 | .489 | .653 | 0.706 |
| Altruistic_4 | 18.0446 | 7.316 | .503 | .646 | |
| Altruistic_5 | 17.8713 | 7.476 | .432 | .668 | |
| Altruistic_6 | 17.5198 | 7.425 | .414 | .674 | |

### 4.2.2 Cronbach's Alpha test for dependent variables

In the proposed model, the effectiveness of team outcome is the dependent factor measured by a questionnaire consisting of 16 items. Cronbach's Alpha test has been performed to see if these items exhibit the same effect. The experiment shows that the value of Cronbach's Alpha of this factor is 0.866, which is reliable. Therefore, there is no removement in these items.

**Table 2. Item-Total Statistics in the first Cronbach's Alpha test for dependent variables**

| | Item-Total Statistics | | | | |
|---|---|---|---|---|---|
| Factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha |
| Effectiveness_1 | 56.9158 | 63.510 | .336 | .865 | 0.866 |
| Effectiveness_2 | 56.8861 | 61.644 | .367 | .865 | |
| Effectiveness_3 | 56.8911 | 61.013 | .498 | .859 | |
| Effectiveness_4 | 56.7921 | 59.807 | .597 | .855 | |
| Effectiveness_5 | 56.7723 | 60.217 | .534 | .857 | |
| Effectiveness_6 | 56.9257 | 60.298 | .539 | .857 | |
| Effectiveness_7 | 57.1386 | 62.777 | .340 | .865 | |
| Effectiveness_8 | 57.5000 | 60.709 | .355 | .867 | |
| Effectiveness_9 | 57.0545 | 60.211 | .526 | .857 | |
| Effectiveness_10 | 56.8317 | 59.743 | .613 | .854 | |
| Effectiveness_11 | 57.2475 | 58.874 | .485 | .860 | |
| Effectiveness_12 | 56.8366 | 60.307 | .595 | .855 | |
| Effectiveness_13 | 57.0297 | 61.054 | .499 | .859 | |
| Effectiveness_14 | 57.2871 | 57.728 | .565 | .855 | |
| Effectiveness_15 | 57.0743 | 56.646 | .675 | .849 | |
| Effectiveness_16 | 57.0693 | 59.826 | .532 | .857 | |

### 4.3. The Exploratory Factor Analysis test (EFA)

#### 4.3.1. The Exploratory Factor Analysis test (EFA) for independent variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.799. The EFA test contributed to the classification of factors to complete the reliability of this study.

The results obtained after factor analysis to discover leadership style factors are shown when testing EFA. Accordingly, democratic, pacesetting and affiliate leadership styles are the leadership style factors with the tightest items. There are no items to be eliminated in these leadership styles factors. In addition, the items that measure the remaining leadership styles have some changes. However, to come up with the best recommendation for this leadership style scale, the authors decide to present after testing Cronbach's Alpha for the second time.

#### 4.3.2. The Exploratory Factor Analysis test (EFA) for dependent variables

As aforementioned, the EFA test with the dependent variable (effectiveness outcome) is controlled in 3 variables. The reason is that this study uses the result of Hackman's research. In his research model, Hackman has given 3 dimensions that are indicative of an effective outcome. 3 Hackman's definitions have been simplified and renamed in the study done by Tohidi (2011). Simply understood as:

- The group's output meeting quality standards
- The group's ability to work interdependently in the future
- The growth and well-being of team member

After conducting the EFA test, the results showed 3 groups of items (observed in the Rotated Component Matrix table) with the characteristic manifestations of the 3 factors mentioned in Hackman's model. Therefore, the empirical model proposed by the authors to test the relationship between leadership styles and outcome in the leadership of the group of DUE is as following model. Based on this model and the test results of Cronbach's Alpha in the next part, the authors propose 24 assumptions to test the relationship between leadership styles and the effective outcome of groups.

**Figure 3. New verification model based on Hackman's 3 factors (1990)**
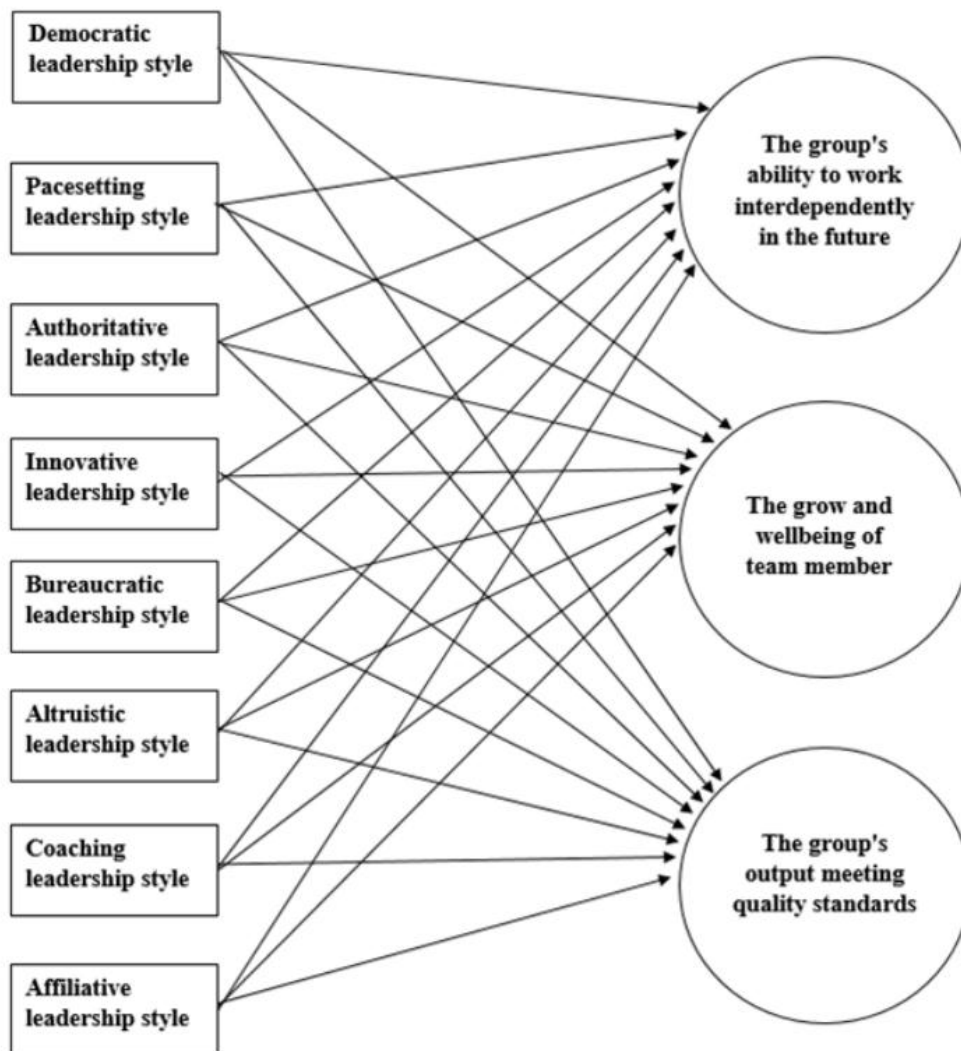


## 4.4. The second Cronbach's Alpha test

### 4.4.1. Cronbach's Alpha test for independent variables

After the type of items that do not show the correlation with the leadership style factors, the authors perform Cronbach's Alpha test to ensure the coherence of the items as possible. The results are presented with reading the same as the 1st test, as follows:

**Table 3. Item-Total Statistics in the second Cronbach's Alpha test for independent variables**

| Factors | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha | Number of items |
|---|---|---|---|---|---|---|
| **Item-Total Statistics** | | | | | | |
| Affiliative | No change | | | | 0.718 | 6 |
| Bureaucratic_3 | 10.2475 | 4.157 | .498 | .548 | 0.658 | 4 |
| Bureaucratic_4 | 10.2079 | 4.394 | .406 | .613 | | |
| Bureaucratic_5 | 9.4208 | 4.643 | .348 | .650 | | |
| Bureaucratic_6 | 9.4653 | 4.270 | .510 | .543 | | |
| Authoritative_1 | 13.9703 | 5.820 | .457 | .696 | 0.729 | 5 |
| Authoritative_2 | 13.4109 | 5.616 | .561 | .654 | | |
| Authoritative_3 | 13.4455 | 5.741 | .566 | .654 | | |
| Authoritative_4 | 13.9505 | 5.759 | .403 | .723 | | |
| Authoritative_5 | 13.2624 | 6.234 | .489 | .685 | | |
| Innovative_2 | 10.7624 | 4.560 | .405 | .724 | 0.713 | 4 |
| Innovative_3 | 10.3119 | 4.743 | .581 | .608 | | |
| Innovative_4 | 10.6980 | 4.590 | .535 | .629 | | |
| Innovative_5 | 10.3465 | 4.964 | .513 | .646 | | |
| Pacesetting | No change | | | | 0.758 | 6 |
| Democratic | No change | | | | 0.819 | 6 |
| Coaching_2 | 11.2129 | 2.895 | .494 | .561 | 0.662 | 4 |
| Coaching_3 | 11.5248 | 2.877 | .398 | .629 | | |
| Coaching_4 | 11.1733 | 3.219 | .371 | .640 | | |
| Coaching_1 | 11.0446 | 2.779 | .517 | .543 | | |
| Altruistic_3 | 6.9851 | 1.985 | .354 | .677 | 0.647 | 3 |
| Altruistic_4 | 7.3663 | 1.537 | .551 | .413 | | |
| Altruistic_5 | 7.1931 | 1.579 | .476 | .522 | | |

*4.4.2. Cronbach's Alpha test for dependent variables*

Testing items according to the 3 dimensions of Hackman shows that there is a certain consistency and correlation between these items. Therefore, the authors synthesized and proposed a new scale to measure the effective outcome of the group as follows:

**Table 4. Results in the second Cronbach's Alpha test for dependent variables**

| Factors | Cronbach's Alpha | Number of items |
|---|---|---|
| The group's output meeting quality standards | 0.566 (Acceptable) | 3 (M1, M3, M7) |
| The grow and wellbeing of team member | 0.735 | 4 (M8, M11, M14, M15) |
| The group's ability to work interdependently in the future | 0.834 | 9 (etc) |

Accordingly, the authors made 24 hypotheses based on these scale models.

### 4.5. Testing and regression analysis

*4.5.1. Correlations among leadership style and the group's ability to work interdependently in the future*

The value of Sig tested for t is in the Coefficients table of each independent variable, sig < 0.05 means that the variable has an impact on the dependent variable, whereas sig > 0.05 shows that independent variable does not affect the dependent variable. Observing the Coefficients table of this model shows that the values of Sig of Democratic and Altruistic leadership style factors are 0.000 and 0.039, mean that Democratic and Altruistic leadership style factors have an impact on the group's ability to work interdependently in the future.

In this model, the absolute value of Beta of Democratic leadership style factor is 4.46, the largest of the factors. Therefore, it can be concluded that Democratic leadership style can create the best group's ability to work interdependently in the future. In other words, Democratic leadership style can create the best outcome effectiveness.

*4.5.2. Correlations among leadership style and the group's output meeting quality standards*

Observing the Coefficients table of this model shows the values of Sig of Democratic and Altruistic leadership style factors are 0.001 and 0.002. That is, Democratic and Altruistic leadership style factors have an impact on the group's output meeting quality standards. The absolute value of Beta of Democratic 59 leadership style factor is 0.343, the largest of the factors. Therefore, it can be concluded that Democratic leadership style can create the best the group's output meeting quality standards.

*4.5.3 Correlations among leadership style and the growth and well-being of team member*

Observing the Coefficients table of this model shows the values of Sig of Democratic and Pacesetting leadership style factors are 0.004 and 0.009. That is, Democratic and Pacesetting leadership style factors have an impact on the growth and well-being of team members. In this model, the absolute value of Beta of Democratic leadership style factor is 0.251, the largest of the factors. Therefore, it can be concluded that a Democratic leadership style can create the best the growth and well-being of team members.

## 5. Conclusion

### 5.1. Contributions

This research contributes to a review of theories about leadership style and teamwork effectiveness. It reviews the definitions of leadership style, teamwork effectiveness, and indicates the relationship between these two factors. In addition, theories are flexibly applied to ensure they are suitable for the purpose of the research and specific research scope.

Additionally, this study tested the reliability of the scales measuring leadership styles of Toastmasters International. After the raw data analysis, the leadership style factors have been modified more closely, in line with the purpose of this study. Therefore, the proposed scales have higher reliability and can help future researches.

The most significant outcome relates to measuring the effect of leadership styles on the success of teamwork. The finding indicates that some leadership styles have a positive influence on the effectiveness of teamwork. More specifically, leaders who adopt democratic and altruistic leadership may enhance the willingness of team members to cooperate in the following subjects. It promotes the effectiveness of teamwork. Therefore, the study assists learning group leaders to find the appropriate leadership style to set goals and motivate their groups.

In the final analysis, lecturers would be benefited by this study in the way that they know better how to instruct their students to do teamwork and enhance the quality of teamwork. Lecturers should facilitate and guide teams into Democratic and Altruistic styles by encouraging communication among teams and orienting the team leaders. Additionally, according to this study, students should lean into Democratic and Altruistic style, while avoiding falling into the category of Autocratic and Bureaucratic one.

### 5.2. Limitations

The first limitation of this research is that the authors handed the questionnaires to the leaders of the teams, leading to the fact that this paper only determine the leadership styles and team effectiveness from the team leaders' point of view. This leaves a gap for future researches to investigate the team members to measure leadership styles and team effectiveness more comprehensively.

Because of the limited time and budget, the sample size of this research is also humble. Further researches should therefore increase the sample size. Moreover, there are some styles that are unpopular among students in Danang University – University of Economics. As a result, the data collected is inadequate to conclude whether such unpopular styles as Innovative and Coaching positively affect the team effectiveness.

Another limitation is that questions designed in the questionnaire are too obvious. Psychologically not a lot of people would perceive themselves as negative, therefore most of the respondents tend to rate themselves into the groups of styles that they perceive to be positive, not the styles that they really belong to. Further researches should therefore be subtler.

**APPENDIX**

**Questionnaire**

The question-statements below were used to obtain data. All question-statements were answered on 5-point Likert-type scale.

**Affiliative leadership style**

1. I focus on the professional development of others.
2. Maintaining team harmony is of equal importance to achieving results.
3. It is my responsibility to assist in resolving conflict between team members.
4. I create a collaborative environment where emotional needs are met.
5. I recognize the unique emotional needs of those I lead.
6. I take pride in my ability to keep employees happy.

**Bureaucratic leadership style**

1. I must take charge in order for things to get done.
2. When leading, I closely organize and monitor tasks.
3. I am most comfortable with convention and tradition.
4. Teams perform best when individuals repeat tasks and perfect them.
5. I expect nothing less than the best results from people.
6. Everyone should follow policy and procedures very closely.

**Authoritative leadership style**

1. I have more experience and information than the people I am leading.
2. I clearly communicate my expectations to my team.
3. I articulate the path to success.
4. I uphold my convictions when my values and beliefs are challenged.
5. I clearly articulate a vision.
6. I take full responsibility for my team's actions.

**Innovative leadership style**

1. I promote innovative problem-solving.
2. It is acceptable to miss a deadline if the extra time creates a better quality result.
3. I create an environment that allows others to think unconventionally.
4. I am comfortable taking risks.
5. I enjoy thinking about the future.
6. I have a passion for pursuing excellence.

**Pacesetting leadership style**

1. Getting things done quickly and efficiently is more important than getting them done perfectly.
2. I fill my team with highly skilled and self-directed people.
3. I model the actions I expect from my team.

4. I motivate others by setting a high standard of performance.
5. I would not expect others to do a task I am not prepared to do myself.
6. I expect people to perform at 100 percent regardless of circumstances.

**Democratic leadership style**

1. I allow every stakeholder to have a say in decision-making.
2. I ask others for their opinions before I make an important decision.
3. The combined knowledge and expertise of the team leads to the best results.
4. I am comfortable allowing others to occasionally take the lead.
5. I empower others by providing them the opportunity to contribute to the decision-making process.
6. Every team member needs to be heard and respected.

**Coaching leadership style**

1. I consistently provide others with positive feedback.
2. It is important to invest time to allow people to fully develop their skills.
3. The best way to motivate others is to invest time in them.
4. I give motivational feedback.
5. I take time to learn what others need from me.
6. I promote and support the success of others.

**Altruistic leadership style**

1. I would like to be remembered more for what I contributed than what I achieved.
2. I achieve results by giving priority attention to the needs of the team and to those I serve.
3. I demonstrate optimism and enthusiasm for organizational goals.
4. I succeeded in maintaining consensus in group.
5. I am committed to building community.
6. I accept and recognize people for their uniqueness.

**Team effectiveness**

1. The results of the task group are high (point group)
2. All team members are satisfied with the results
3. All members share responsibility together
4. All the members are satisfied with their assigned tasks
5. The task is clearly assigned
6. The members always obey the direction of the team leader
7. The members do not conflict with each other
8. The mission was completed on time
9. As a leader, you do not feel pressure when working with groups
10. The members respect each other
11. The members have a positive interaction during group work

12. The members are willing to support each other when needed
13. The members can learn the necessary skills from the tasks and teammates
14. The members have time to discuss and comment together after results
15. Your group has cooperated in the following subjects
16. The group members are willing to cooperate for the next course again

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# FACTORS AFFECTING THE ADOPTION OF
# DIGITAL TRANSFORMATION IN VIETNAMESE SMES

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## Abstract

*In accordance with the fast pace of technological advancements, the demand for digital transformation is progressively increasing in business. Therefore, it is of vital importance for Vietnamese small and medium enterprises to perceive the factors that motivates digital transformation within their businesses as well as the opportunities that arise in line, thereby considering necessary changes in business operations. This research, therefore, aims to cover several factors that influence the adoption of digital transformation of Vietnamese SMEs and to propose strategies to better utilize enterprise resources to create digital breakthroughs. Geared towards a more thorough understanding of this adoption, several theoretical frameworks and empirical studies on successful adaptation in other countries have been included to find potential factors. From a sample size of 371 Vietnamese SMEs being analyzed by IBM SPSS and IBM AMOS, the research emphasizes four factors that influence this strategic adoption: Relative advantages, Compatibility, Management support and Competition's pressure. Among these factors, Compatibility and Management support have the most positive influence on the adoption of digital transformation, meanwhile Government support and Organizational readiness display insignificant impact. Finally, research results are explained and compared with previous studies, succeeded by numerous recommendations in terms of digital transformation strategies for Vietnamese SMEs' owners to grow their businesses, contributing to the economic development of Vietnam.*

***Keywords:*** *SMEs, digital transformation, organizational change, top level managers.*

## 1. Introduction

It is undeniable that technology is playing a progressively crucial role in our business world, therefore 'digital transformation' is now regarded as one of the main concerns to almost every business owner. The foreseeable benefits of digital transformation include two-way communication between business and customers, real-time responses to market demands, facilitated and automatic business processes and reduced enterprise resources (Ulas, 2019). This transformation of business is not all about technological advancements that are utilized, but also about several advantages that involve changes of business models, which the managers ought to take into careful consideration. With respect to the engagement of small and medium enterprises (SMEs) specifically, the study of the factors that drive them towards digital transformation is so pivotal that it could help SMEs' owners identify the existing

enabling factors and the needed ones, thus thoroughly consider their own capacity for digital changes.

With regard to the economic situation of Vietnam, digital transformation is considered a powerful boost for Vietnamese businesses today that the top managers should not miss out on. Therefore, it is of great importance to identify the drivers of this organizational and strategic change in order to know why they should change and how they could do it successfully with regard to the socioeconomic context of Vietnam, which is definitely what this research aims to explore. Besides, by conducting this research, the author as well as other researchers of similar topics stand a chance of gaining a better insight into the mindset of Vietnamese entrepreneurs towards this technological movement.

## 2. Literature Review

There are numerous approaches to the term 'digital transformation', each of which conveys the specific perspective of the author.

**Table 1: Definitions of Digital Transformation**

| Common attribute | Definition | Sourced by |
|---|---|---|
| Digital Transformation as the 'use' of technological advancements | 'the use of technology to radically improve performance or reach of enterprises. | MIT Center for Digital Business and Capgemini Consulting, 2011 |
| | 'the use of new digital technologies that enables major business improvements and influences all aspects of customers' life' | Reis, Amorim, Melão and Matos, 2018 |
| | 'the application of technology to build new business models, processes, software and systems that results in more profitable revenue, greater competitive advantage, and higher efficiency' | Schwertner, 2017 |
| | 'a new development in the use of digital artifacts, systems and symbols within and around organizations' and 'a process that involves the diffusion of the Internet in both demand and supply sectors' | Ahmed Bounfour, 2015 |
| Digital Transformation as the 'change' resulting from technological | 'the changes that the digital technology causes or influences in all aspects of human life' | Stolterman and Fors, 2004 |
| | 'a change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more | Verhoef et al., 2019 |

| Common attribute | Definition | Sourced by |
|---|---|---|
| advancements | value for the firm' | |
| | 'the modification (or adaptation) of business models, resulting from the dynamic pace of technological progress and innovation that trigger changes in consumer and social behaviors' | Kotarba, 2018 |

*Source: Authors' summary*

Although perceptions towards the term 'digital transformation' are multitudinous, there is a set of conceptual elements that they share in common: the use of technological innovations and the aim of augmenting effectivity. In the author's viewpoint, the way that Gregory Vial clarified the term in his research in 2019 is seemingly the most appropriate one: *'a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies'*.

Multiple theoretical frameworks have been proposed and employed among empirical studies on the subject of digital transformation. The most ubiquitous and feasible frameworks are Technology Acceptance Model (TAM), Diffusion of Information (DOI) and Technology-Organization-Environment (TOE), among those, TOE framework is considered as the most appropriate model to apply for this research.

**Figure 1: TOE Framework**
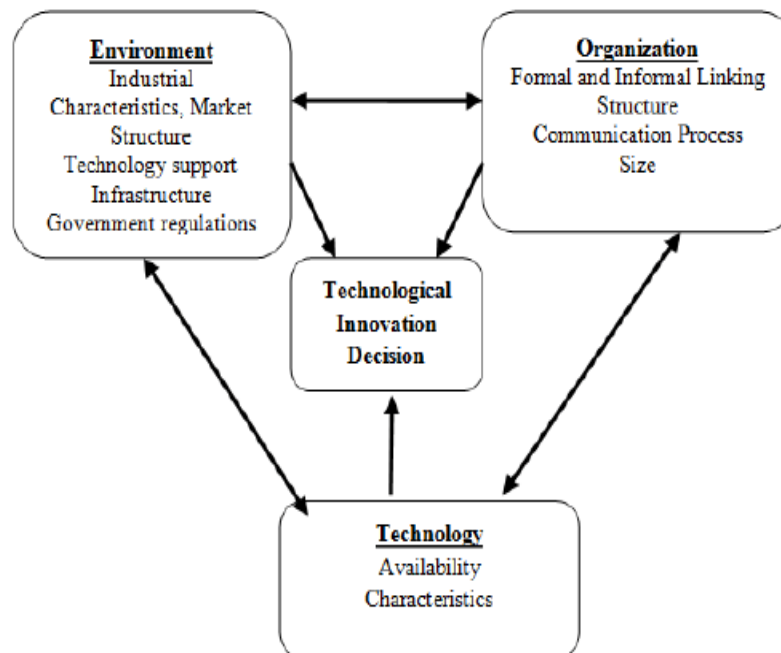


*Source: Tornatzky, L.G. and Fleischer, M., 1990*

Developed by Tornatzky, L.G. and Fleischer, M. in 1990, the commonly-applied conceptual model named TOE framework The model consists of three main parts, also three main groups of drivers of digital transformation adoption at firm level: Technological factors, Organizational factors and Environmental factors.

This conceptual model has proven its exactitude through plenty of empirical research regarding the adoption of technology in general.

*A case of rural Saudi Arabian SMEs*

This research extended the TOE framework by including the individual context that considers the adoption of ICT: the individual decision of owners/managers of SMEs in rural areas of Saudi Arabia. With data from over 137 sampled SMEs in Saudi Arabia, the author used Structural Equation Modelling to find the regression weights of the factors, the authors found positive influence of Relative advantages (β=0.305 at p-value=0.000), Top Management Support (β=0.061 at p-value=0.014), Organizational Culture (β=0.062 at p-value=0.020), Regulatory Environment (β=0.075 at p-value=0.015), Owner/Manager Innovativeness (β=0.043 at p-value=0.031) and Owner/Manager ICT Knowledge (β=0.566 at p-value=0.000) towards the adoption of ICT within the participating SMEs. As observed from the regression weights, Relative advantages and Owner/Manager ICT Knowledge are deemed to have the most significant impact. In contrast, with p-values greater than 0.05, the factors Compatibility, Complexity and Competitive Environment were regarded as insignificant towards the adoption of ICT in the study.

*A case of Canadian SMEs*

Another empirical study that applied TOE framework is the research conducted by Princely Ifinedo (2011) with 214 SMEs in the maritime region of Canada. The author used Partial Least Squares to analyze the collected data. The results show positive for the Relative advantage, Management support and Competition's pressure, negative for Lack of government support, which means Government support has strong influence. The strongest influence came from Relative advantages that were perceived by the SME owners, with the correlation coefficient of 0.287 at 99.9% significant level. The second greatest impact belongs to Competition's pressure, which is defined by the competitors' usage of technology in business operations. The data showed that the technological attributes of compatibility and complexity are insignificant in the adoption of IEBT for the sampled SMEs. Also, the other factors' impact on IEBT adoption in the sampled companies were not statistically confirmed.

Applying TOE framework and Ifinedo's research model, the author put forward three groups of influencing factors as below:

- *Technological context*: Relative advantages and Compatibility
- *Organizational context*: Management support and Organizational readiness
- *Environmental context*: Competition's pressure and Government support

### *Relative advantages*

It is common for the business owners to think immediately of the perceived benefits and advantages of making this change. The factor refers to 'the degree to which an innovation is perceived as being better than the idea it supersedes' (Rogers, 2003). Perceived benefits or Relative advantages stand out from almost other determinants in terms of influence on digital transformation adoption: Lin and Lin, 2008; Iacovou *et al.*, 1995; Sin Tan, Choy Chong, Lin and Cyril Eze, 2009; AlBar and Hoque, 2017; Chau and Hui, 2001; Hsu, Kraemer and Dunkle, 2006; Al-Alawi and Al-Ali, 2015; Voges and Pulakanam, 2011; Ifinedo, 2011 and Chwelos, Benbasat & Dexter, 2001.

### *Compatibility*

Following Roger's Diffusion of Information theory (2003), the term 'Compatibility' means 'the degree to which an innovation is perceived as consistent with the existing values, past experience, and the needs of potential adopters'. Several research share the positive finding on the relationship between perceived compatibility and the adoption of digital transformation, for example the coefficient of 0.37 at p-value < 0.01 (Zhu *et al.*, 2006), 0.146 at p-value 0.000 (Sin Tan, Choy Chong, Lin and Cyril Eze, 2009), 0.321 at p-value 0.000 (Shah Alam, 2009) and 0.121 at p-value < 0.001 (Le *et al.*, 2012).

### *Management support*

Management support refers to 'the active engagement of top management with Information System (IS) implementation', or more precisely the CEO's support and involvement in the process of IS implementation in the case of a small business (Thong, Yap and Raman, 1996). This determinant has been corroborated as a significant factor that influences the adoption of digital transformation, with β=0.193 at p-value less than 0.05 (Ifinedo, 2011) and path coefficient of 0.529 (Al-Alawi and Al-Ali, 2015). The role of top managers was proved to be positively correlated with the adoption of technology in the research of AlBar and Hoque (2017), DeLone (1988), Harrison *et al.* (1997), Slade and Van Akkeren (2002), Jeon, Han and Lee (2006), Le *et al.* (2012) and Giotopoulos *et al.*, 2017.

### *Organizational readiness*

According to Iacovou *et al.* (1995), organizational readiness could be regarded as 'the availability of the needed organizational resources for adoption'. Multiple studies also suggest that employees' IT knowledge and skills are considerably related to the adoption of technology (Giotopoulos *et al.*, 2017; Le *et al.*, 2012; Lin and Lin, 2008 and Jeon, Han and Lee, 2006). Slade and Van Akkeren (2002) demonstrated strong evidence that level of information intensity can 'play a significant role in the owner/managers' decision to adopt/not adopt IT and internet technologies'. Voges and Pulakanam (2011) also found a positive relationship between the number of Internet use, here referring to a part of the level of IT knowledge and capabilities, and the Internet adoption in SMEs. The culture, values and norms

of the business was supported as a positive determinant that enables the use of technology in the research of AlBar and Hoque (2017).

### *Competition's pressure*

Competitive pressure hereby denotes the peer pressure on using a new technology, and it has been regarded as a driver of new technology usage that pushes firms to sharpen their competitive advantages in the market by using new innovations (Gatignon & Robertson, 1989). Competitive intensity ranked first in terms of level of influence in the list of determinants of e-commerce adoption in Le *et al*.'s 2012 research, with the estimate of 1.228 at p-value < 0.001. Ifinedo (2011) also supported the similar impact of competition's pressure by providing the corresponding β=0.27 at p-value < 0.001. The identical results were also achieved by the empirical studies of Rao Kowtha and Whai Ip Choon (2001) and Lin and Lin (2008). At a less significant but still positive level of correlation, Raymond (2001), Jeyaraj, Rottman and Lacity (2006) and Zhu *et al*. (2006) affirmed via their research that competitive pressure can encourage the adoption of technologies in businesses.

### *Government support*

Government support signifies 'the assistance provided by the authority to encourage the spread of IS innovations in businesses' (Ifinedo, 2011). This factor appears to be greatly dependent on the political & economic context of each country. As a consequence, the empirical results are diversified: Jeon, Han and Lee (2006) suggest a positive impact of governmental support towards the adoption of digital transformation for the case of Korean SMEs; similarly, AlBar and Hoque (2017) found an equivalent pattern of correlation in Saudi Arabian context, findings of Le *et al*. (2012) endorse the favorable relationship between support from the authorities and the adoption of e-commerce in Vietnam; in the meantime, no significant relationship between these two elements were found in the research of Al-Alawi and Al-Ali (2015) for Kuwait and Chau and Hui (2001) for Hong Kong.

### *Adoption of digital transformation*

In the research by Giotopoulos *et al*., 2017), the adoption of digital transformation was assessed by the intention, the available infrastructure, the integration of Internet and the involvement of E-sales and E-procurement. Another empirical study shows four practices to justify the level of digital transformation adoption: the intensity of usage of digital transformation technologies, the frequency of using e-commerce/e-payment, the utilization of digital technologies in critical operations and the number of business activities requiring digital transformation (Ifinedo, 2011). The latter set of elements was considered the most sufficient to measure the adoption of digital transformation in this research since all enabling factors are adapted from the same author.

## 3. Methodology

The approach for this research could be either qualitative or quantitative, depending on different research purpose and authors viewpoint. While Dinh, Vo & Tran (2018) mentioned

qualitative research as an aim towards personal perspective and deep knowledge about behavior, Aliaga and Gunderson (2002) regarded quantitative as a more suitable method with thorough explanation from statistical analytics. This research follows the quantitative method with deductive approach, forming hypotheses and testing them based on the analysis of collected data. To make it clearer, quantitative analysis appeared in IBM SPSS and IBM AMOS are favored as a result of their diversity in the outcomes. The Scale Test, or also regarded as the Cronbach's Alpha, play a helping hand in analyzing the reliability of multi-dimensional level. In the same time, the Exploratory Factor Analysis (EFA) and the Confirmatory Factor Analysis (CFA) could find out, then verify the elements together with the indices for validity and model fit. And finally, the Structural Equation Modelling (SEM) will close the curtain when determining the relationship between observed variables. The chosen model was built based on the research 'An Exploratory Study of Factors Influencing Internet/E-Business Technologies Adoption by SMEs in Canada' conducted by Princely Ifinedo in 2011.

- *__H1__: The greater the relative advantages are perceived, the more likely Vietnamese SME owners are to adopt digital transformation.*
- *__H2__: The greater the compatibility of Digital transformation is, the more likely Vietnamese SME owners are to adopt digital transformation.*
- *__H3__: Management support positively influences Vietnamese SME owners' decision of adopting digital transformation.*
- *__H4__: Organizational readiness has a positive impact on the adoption of digital transformation in Vietnamese SMEs.*
- *__H5__: Competitive pressure has a positive impact on the adoption of digital transformation in Vietnamese SMEs.*
- *__H6__: Government support plays a significant role in the adoption of digital transformation in Vietnamese SMEs.*

Accordingly, the equation for the research model is supposed to be:

$$ADITRA = \beta_1 RELADV + \beta_2 COMPAT + \beta_3 MANSUP + \beta_4 ORGREA + \beta_5 COMPRES + \beta_6 GOVSUP$$

The adoption of digital transformation in Vietnamese SMEs is the main dependent variable in this research, calculated through 6 independent variables, including Relation advantage, Compatibility, Organizational readiness, Management support, Competition's pressure and Government support. Each of the independent variable is measured via a questionnaire generated from the empirical research of Ifinedo (2011). To be more specific, the questionnaire is divided into three sections, ranging from the demographic information of interviewee, to influence of aforementioned factors and to the adoption of digital transformation. All criteria are marked on a scale of 5, which also known as the Likert scale, to clarify the likelihood or the tendency of the SMEs representatives for each matter subjected to different factors.
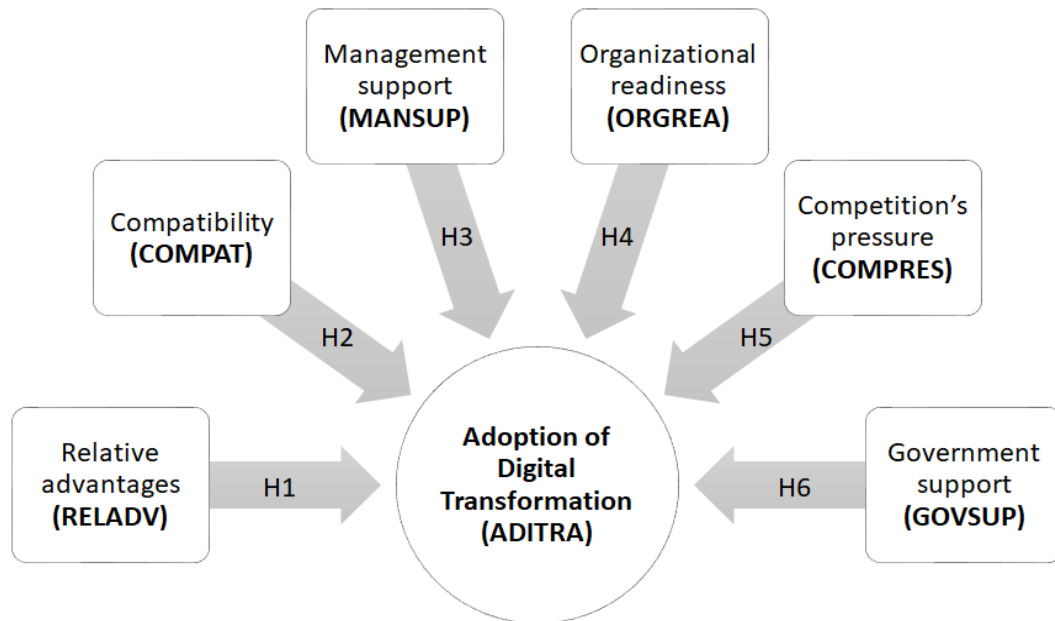
**Figure 2: Proposed Research model**

The whole project has successfully approached 371 Vietnamese SME owners within only 3 months of 2021 from April to June. The scale for chosen surveyed corporates is carefully determined before spreading the survey. In particular, interviewees must be the representative or within the top managers of their company, which is already identified by national law in case of small or medium sized firms. The data of a firm is only applicable if that firm satisfies both number of social insurance-covered staff and total revenue. This survey has covered a wide range of corporates, namely manufacturing company, trading and service company, focusing on the ones Hanoi or Ho Chi Minh city based.

In terms of choosing the sample size, according to Gorsuch (1988), the sample size must be five times of the total number of observed variables in scales for EFA analysis. According to Hoang Trong and Chu Nguyen Mong Ngoc (2005), the ratio can be 4 or 5. In the meantime, Kettinger and Lee (1995) distinguished between two situations when performing Chi-square/df test on structural equation model: if $\chi2/df < 5$ (with sampling size N > 200) or $\chi2/df < 3$ (with sampling size N < 200), the model is accepted. Deducing from the rules above, a sampling size of over 200 is regarded as acceptable when performing Structural Equation Modeling (SEM). The sample collected in the research has N = 371, which conforms to the requirement.

## 4. Data analysis

### 4.1. Reliability test on each variable

**Table 2: Reliability statistics**

| Construct | | Cronbach's Alpha | Corrected Item-Total Correlation |
|---|---|---|---|
| Relative Advantages (RELADV) | RELADV1 | 0.88 | 0.698 |
| | RELADV2 | | 0.689 |
| | RELADV3 | | 0.683 |
| | RELADV4 | | 0.748 |
| | RELADV5 | | 0.75 |
| Compatiblity (COMPAT) | COMPAT1 | 0.91 | 0.834 |
| | COMPAT2 | | 0.786 |
| | COMPAT3 | | 0.839 |
| | COMPAT4 | | 0.736 |
| Management Support (MANSUP) | MANSUP1 | 0.911 | 0.794 |
| | MANSUP2 | | 0.801 |
| | MANSUP3 | | 0.783 |
| | MANSUP4 | | 0.814 |
| Organizational Readiness (ORGREA) | ORGREA1 | 0.908 | 0.809 |
| | ORGREA2 | | 0.815 |
| | ORGREA3 | | 0.704 |
| | ORGREA4 | | 0.847 |
| Competition's Pressure (COMPRES) | COMPRES1 | 0.898 | 0.778 |
| | COMPRES2 | | 0.808 |
| | COMPRES3 | | 0.759 |
| | COMPRES4 | | 0.746 |
| Government Support (GOVSUP) | GOVSUP1 | 0.808 | 0.657 |
| | GOVSUP2 | | 0.689 |

| Construct | | Cronbach's Alpha | Corrected Item-Total Correlation |
|---|---|---|---|
| | GOVSUP3 | | 0.624 |
| Adoption of Digital transformation (ADITRA) | ADITRA1 | 0.869 | 0.652 |
| | ADITRA2 | | 0.794 |
| | ADITRA3 | | 0.72 |
| | ADITRA4 | | 0.688 |
| | ADITRA5 | | 0.615 |

*Source: IBM SPSS output*

Cronbach's Alpha reliability statistics of all constructs are greater than 0.8, in the interval of (0.8;0.95) and Corrected Item-Total Correlation of each item is greater than 0.3 at the same time, indicating that these dimensions are accepted and have internal consistency in each variable (Nunnally, 1978; Peterson, 1994; Dinh & To, 2017).

### 4.2. Exploratory Factor Analysis

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.909, conforming to the requirement to do EFA claimed by Hair *et al*. (2006) that when $0.5 < KMO < 1$, a sample is adequate to proceed with Factor Analysis. Moreover, Hair *et al*. (2006) required that the Significance of Bartlett's Test of sphericity is equal or under 0.05 in order to accept that there may be statistically significant interrelationship between variables. This requirement is satisfied since the significance of the KMO here is 0.000. Extraction of Communalities have to be greater than 0.2 to continue the EFA, according to Dinh & To (2017). Using Principal Axis Factoring, the Extraction of Communalities in this study meets this condition with the lowest extraction value of 0.458, which belongs to dimension ADITRA5.

There are seven factors extracted, having Total or Eigenvalue greater than 1 with cumulative percentage of variance of 66.566%, which is greater than 50%, satisfying the requirements of Gerbing and Anderson (1988). These 7 factors extracted explain 66.566% of the variability in variables, which is a fairly high ratio.

According to Gerbing and Anderson (1988), if the sample size of the research is greater than 350, the factor loading is required to be greater than 0.3, therefore the ones less than 0.3 need to be removed. Accordingly, no dimensions are removed in the Pattern Matrix because their factor loadings are all greater than 0.3. These dimensions will be accepted to run the next phase, Confirmatory Factor Analysis (CFA).

### 4.3. Confirmatory Factor Analysis (CFA)

The aim of Confirmatory Factor Analysis is to obtain estimate for each parameter of the proposed model that produce a predicted variance-covariance matrix that resemble as

much as possible the sample variance-covariance matrix (Singh, 2017). In order to fulfil this purpose, under the sample population of 371 respondents and continuous scales of observed variables, maximum likelihood method is utilized for its purpose of finding the parameter values that make the observed data most likely to be replicated, which means it maximizes the likelihood of the parameters given the data. Researchers are required to perform CFA for all latent constructs before clarifying the inter-relationships among them in a structural model. The unidimensionality assessment, however, should be conducted before assessing construct validity and model fit (Awang, 2012).

Unidimensionality requires all factor loadings to possess positive values and to be greater than 0.5 for newly developed items or equal or greater than 0.6 for established item (Awang, 2012). In the Measurement model shown in Figure 4.1, all items possess attached factor loadings higher than 0.6, with the minimum factor loading belonging to ADITRA5 at 0.67. This Measurement model, therefore, achieves unidimensionality as it completely satisfies the stated requirements.

The validity of the latent variables is analyzed in terms of Convergent validity, which is obtained when Average Variance Extracted (AVE) is higher than 0.5 and Composite Reliability (CR) is higher than AVE (Hair *et al*., 2013). Table 3 indicates the computed results for each variable. Compared to these conditions, the Measurement model achieves Convergent validity.

**Table 3: Convergent Validity of variables**

| Standardized Regression Weights | | | Convergent validity | |
|---|---|---|---|---|
| | | Estimate | AVE | CR |
| RELADV4 ← RELADV | | 0.803 | | |
| RELADV5 ← RELADV | | 0.809 | | |
| RELADV1 ← RELADV | | 0.759 | 0.597 | 0.881 |
| RELADV3 ← RELADV | | 0.743 | | |
| RELADV2 ← RELADV | | 0.747 | | |
| ORGREA2 ← ORGREA | | 0.869 | | |
| ORGREA1 ← ORGREA | | 0.868 | | |
| ORGREA4 ← ORGREA | | 0.902 | 0.719 | 0.911 |
| ORGREA3 ← ORGREA | | 0.744 | | |
| COMPAT3 ← COMPAT | | 0.894 | | |
| COMPAT1 ← COMPAT | | 0.888 | 0.726 | 0.913 |
| COMPAT2 ← COMPAT | | 0.842 | | |

| Standardized Regression Weights | | | Convergent validity | |
|---|---|---|---|---|
| | | Estimate | AVE | CR |
| COMPAT4 ← COMPAT | | 0.778 | | |
| MANSUP4 ← MANSUP | | 0.865 | 0.719 | 0.911 |
| MANSUP1 ← MANSUP | | 0.843 | | |
| MANSUP3 ← MANSUP | | 0.829 | | |
| MANSUP2 ← MANSUP | | 0.855 | | |
| ADITRA2 ← ADITRA | | 0.866 | 0.579 | 0.872 |
| ADITRA3 ← ADITRA | | 0.789 | | |
| ADITRA1 ← ADITRA | | 0.705 | | |
| ADITRA4 ← ADITRA | | 0.762 | | |
| ADITRA5 ← ADITRA | | 0.667 | | |
| COMPRES2 ← COMPRES | | 0.885 | 0.688 | 0.898 |
| COMPRES1 ← COMPRES | | 0.836 | | |
| COMPRES4 ← COMPRES | | 0.783 | | |
| COMPRES3 ← COMPRES | | 0.81 | | |
| GOVSUP2 ← GOVSUP | | 0.784 | 0.587 | 0.81 |
| GOVSUP1 ← GOVSUP | | 0.768 | | |
| GOVSUP3 ← GOVSUP | | 0.746 | | |

*Source: IBM SPSS output & Author's computed results*

The indices of model fit, shown in Table 4, present whether model's indices pass cut-off points recommended by previous research. This elucidates the extent to which the Measurement model fits the sample behavior (Singh, 2017).

**Table 4: Indices of model fit in the Measurement Model and Structural Model**

| Fit index | Adapted from | Recommended values | Measurement Model indices | Structural Model indices |
|---|---|---|---|---|
| **Parsimonious Fit** | | | | |
| Minimum discrepancy divided by degrees of freedom (Chi-square/df) | Bentler & Bonnett (1980); Schumacker & Lomax (2004) | Chi-square/ df $\leq$ 3: great Chi-square/ df $\leq$ 5: acceptable | 1.261 | 1.261 |

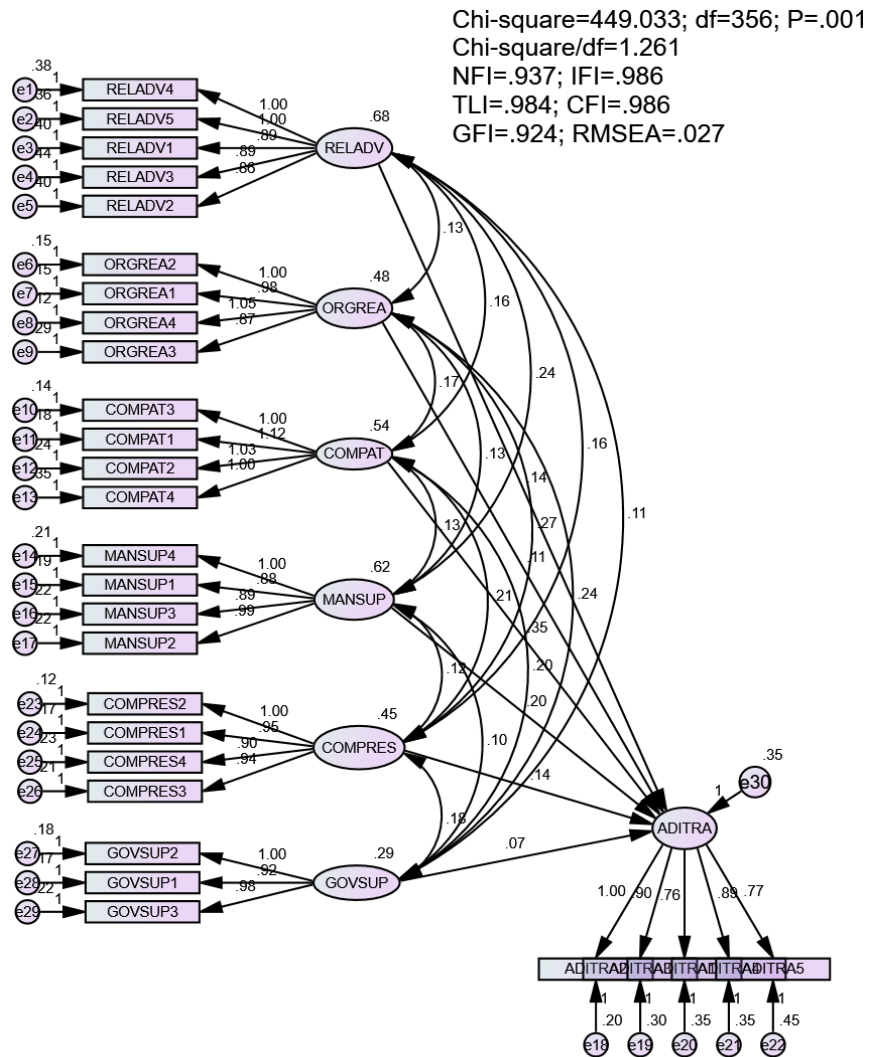| Fit index | Adapted from | Recommended values | Measurement Model indices | Structural Model indices |
|---|---|---|---|---|
| **Incremental Fit Indices** | | | | |
| Normed Fit Index (NFI) | Pituch & Stevens (2016) | NFI ≥ 0.9 | 0.937 | 0.937 |
| Incremental Fit Indices (IFI) | Pituch & Stevens (2016) | IFI ≥ 0.9 | 0.986 | 0.986 |
| Non-normed Fit Indexes (NNFI)/ Tucker-Lewis Index (TLI) | Garver & Mentzer (1999); Hair et al. (2006) | NNFI/TLI ≥ 0.9 | 0.984 | 0.984 |
| Comparative Fit Indexes (CFI) | Bentler & Bonett (1980); Hooper et al. (2008); Hu & Bentler (1995) | CFI ≥ 0.9 | 0.986 | 0.986 |
| **Absolute Fit Indices** | | | | |
| Goodness-of-Fit Index (GFI) | Pituch & Stevens (2016) | GFI ≥ 0.9 | 0.924 | 0.924 |
| Standardized Root Mean-Square Residual (SRMR) | Pituch & Stevens (2016); Singh (2017) | SRMR= 0: perfect fit SRMR<0.05: good fit SRMR< 0.08: acceptable | 0.0342 | 0.0342 |
| Root Mean-Square Error of Approximation (RMSEA) | Hair et al. (2006); Schumacker & Lomax (2004) | RMSEA< 0.05: close fit RMSEA< 0.08: adequate fit | 0.027 | 0.027 |

*Source: IBM SPSS output, IBM AMOS output & Author's summary*

Overall, as shown in the results in Table 4, the Measurement model fits the collected data as all Measurement model indices and Structural model indices satisfy the recommended values.

In the structural model, we have all latent constructs presented in ellipses, each of which has its own items in rectangular with corresponding questions symbolled in circles.

Also, the figures shown along the arrows indicate the correlation between the constructs, from which we could observe its significance.

**Figure 3: Structural Model**



Chi-square=449.033; df=356; P=.001
Chi-square/df=1.261
NFI=.937; IFI=.986
TLI=.984; CFI=.986
GFI=.924; RMSEA=.027

*Source: IBM AMOS output*

**Table 5: Regression coefficients**

|  |  |  | β | S.E. | C.R. | P | Hypothesis |
|---|---|---|---|---|---|---|---|
| ADITRA | ← | GOVSUP | 0.067 | 0.116 | 0.579 | 0.563 | H6 (rejected) |
| ADITRA | ← | COMPRES | 0.138 | 0.075 | 1.827 | 0.048 | H5 (accepted) |
| ADITRA | ← | MANSUP | 0.2 | 0.052 | 3.817 | *** | H3 (accepted) |
| ADITRA | ← | COMPAT | 0.349 | 0.064 | 5.483 | *** | H2 (accepted) |
| ADITRA | ← | ORGREA | 0.112 | 0.083 | 1.347 | 0.178 | H4 (rejected) |
| ADITRA | ← | RELADV | 0.143 | 0.051 | 2.798 | 0.005 | H1 (accepted) |

*Source: IBM AMOS output*

The final equation is supposed to be:

$$ADITRA = 0.143\ RELADV + 0.349\ COMPAT + 0.2\ MANSUP + 0.138\ COMPRES$$

According to the results of the research, there are four hypotheses that are accepted: H1, H2, H3 and H5, as their p-value(s) are equal or less than 0.05 and their critical ratios (C.R.) are all greater than 1.96. This acceptance indicates a positive influence of Relative advantages, Compatibility, Management support and Competition's pressure on the adoption of digital transformation in the sampled Vietnamese SMEs. Amidst all the accepted hypotheses, the p-values of H2 (Compatibility) and H3 (Management support) are less than 0.001 (significant at 99.9%) and their critical ratios are greater than 2.58, implying ideal significant factor covariance (Kline, 1998; Maccallum *et al*., Garver & Mentzer, 1999; Hair *et al*., 2006). In the meantime, H4 and H6 are rejected since their p-values are far greater than 0.05 (0.178 and 0.563, respectively) and their coefficients are the lowest among all constructs (0.112 and 0.067, namely) indicating insignificant correlations. This interpretation regards Organizational readiness and Government support as the least important factors that can affect the adoption of digital transformation in Vietnamese SMEs.

## 5. Implications

Overall, there is no utmost similarity between the findings of this research and that of any research. Nonetheless, there are two studies possessing a certain number of correlations that are, at the same time, consistent with this study:

- Ifinedo (2017): four identical correlations (Relative advantages, Management support, Organizational readiness and Competition's pressure);

- AlBar and Hoque (2017): four identical correlations (Relative advantages, Management support, Organizational readiness and Government support).

### *Compatibility*

Compatibility is observed as the strongest influencing factor among Vietnamese SMEs in this research. This implication is consistent with several research (Zhu *et al*., 2006; Sin Tan, Choy Chong, Lin and Cyril Eze, 2009; Shah Alam, 2009; and Le *et al*., 2012). This strong relationship could indicate the flexibility of SMEs in Vietnam in embracing new technological changes. Therefore, the proposed recommendation is supposedly maintaining the current business operations and working culture, as well as preparing for further changes in case of digital movements in the future.

### *Relative advantages*

Being one of the constructs with the highest path coefficient in numerous research (Lin and Lin, 2008; Iacovou *et al*., 1995; Sin Tan, Choy Chong, Lin and Cyril Eze, 2009; AlBar and Hoque, 2017; Chau and Hui, 2001; Hsu, Kraemer and Dunkle, 2006; Al-Alawi and Al-Ali, 2015; Voges and Pulakanam, 2011; Ifinedo, 2011 and Chwelos, Benbasat and Dexter, 2001), relative advantages prove its strongly positive influence towards the adoption of digital transformation in business. However, unlike these empirical studies, this enabler demonstrates

less impact compared to other factors in this research, though the correlation still appears positive. This outcome could be justified by the difference in the context or location in which those studies were conducted. To reinforce the perception of relative advantages among Vietnamese SMEs to drive towards digital transformation, the first step for the management board is to discuss the benefits that digital transformation could bring to their business, then to establish a detailed roadmap in which specific business plans and scenarios are designed to correspond to each perceived advantage discussed before. The remaining tasks are all about implementing the planned activities, evaluating the results and optimizing the process for better business outcomes.

### *Management support*

The support from the management board of the company has been proved as of crucial importance in this research when it comes to the drivers of digital transformation in Vietnamese SMEs. The relationship between management support and the adoption of digital transformation was also found very significant in Korea (Jeon, Han and Lee, 2006), Canada (Ifinedo, 2011), Kuwait (Al-Alawi and Al-Ali, 2015), Saudi Arabia (AlBar and Hoque, 2017), Greece (Giotopoulos *et al.*, 2017) and Australia (Slade and Van Akkeren, 2002). Therefore, it is predicted that management support is likely to affect the adoption of digital transformation regardless of existing differences in economic and social context. Being the most influential and inspirational individuals in the firms, especially SMEs where people works closely together, the managers are advised to acquire knowledge, capacities and, most importantly, attitude towards digital transformation since this change is not all about technology but also a breakthrough in terms of strategies, which obviously involves the role of business leaders.

### *Organizational readiness*

In Vietnamese context, the SME owners consider that the level of readiness of organization could hardly affect the adoption of digital transformation. This result is consistent with the findings of Iacovou *et al.* (1995), which claimed that 'the overall readiness of small organizations is not high enough for adoption' and that of Ifinedo (2011), highlighting the 'poor awareness level of Information system issues projected by owners and employees of small businesses'. Indeed, SMEs in Vietnam encounter enormous barriers regarding organizational characteristics that can enforce digital changes: the shortage of advanced and skilled employees in the field, unstandardized training programs and unrecognized certificates in the Information & Technology field (Tap Chi Tai Chinh, 2019). However, this results are inconsistent with other empirical research such as Giotopoulos *et al.* (2017); Lin and Lin (2008); Slade and Van Akkeren (2002); Voges and Pulakanam (2011) and AlBar and Hoque (2017). To enhance Organization readiness, Vietnamese SME owners should proactively foster enthusiasm towards digital transformation within their companies by more investment allocated in technological changes, especially in workforce. The suggested practices are: hiring IT experts, providing training sessions on IT knowledge and skills and

creating a tech-friendly working environment in terms of technology usage and attitudes towards technology

### Competition's pressure

Competitive pressure, though not being the most significant factor, also implies a positive influence on the adoption of digital transformation in Vietnamese SMEs. The positive impact of pressure from market and competitors was observed in copious empirical findings such as those of Le *et al*. (2012), Ifinedo (2011), Rao Kowtha and Whai Ip Choon (2001), Lin and Lin (2008), Raymond (2001), Jeyaraj, Rottman and Lacity (2006) and Zhu *et al*. (2006). This signifies the vital role of harsh competition among SMEs in thriving the growth of digital transformation in Vietnam market. To stay competitive in this market, where 98% of businesses are SMEs (Vietnam Chamber of E-Commerce), the seemingly reasonable reaction for an SME might be a thorough insight on their competitors and a clever strategic plan, including a perceived Unique Selling Point, to gain and better retain customers.

### Government support

The significance of Government support was endorsed in a few studies such as those of Jeon, Han and Lee (2006) and AlBar and Hoque (2017). Nevertheless, the findings of Al-Alawi and Al-Ali (2015) for the case of Kuwait and Chau and Hui (2001) for the case of Hong Kong show an insignificant correlation between this independent variable and the adoption of digital transformation. Specifically, in Vietnamese context, Le *et al*. (2012) found a positive influence of the government support on the adoption of e-commerce among domestic SMEs. Unfortunately, despite being in the same country, the perception of the sampled SMEs is that the lack of such support from the authority may be inhibiting their capability to adopt digital transformation. This inconsistency may be subject to changes in government law and policies during the gap of years between the two research (8 years from 2012 and 2020). This external support involves three aspects: Pressure from government agencies, government incentives and facilities. Relevant government agencies and local information & technology experts associations are recommended to provide training and coaching to SMEs in need of such kinds of services. Incentives and facilities (e.g: a legitimate crowdfunding platform for economically disfavored firms) could also be offered by the authority to assist SMEs' in their process of digital transformation. Also, a sufficient digital ecosystem with abundant resources where digital incentives and digital trends are incubated and encouraged should be developed for SMEs in Vietnam.

## 6. Conclusion

As the race for technological advancement is becoming progressively intense in emerging countries like Vietnam, Vietnamese SMEs owners are encouraged to grab this opportunity to grow their business with the assistance of information technology and innovation. In order to take advantage of this tendency, it is of crucial importance for these business owners to perceive the enablers of the adoption of digital transformation in their business as well as other related insights that help generate proper decisions. With a sample

size of 371 Vietnamese SME owners being analyzed by IBM SPSS and IBM AMOS, the research emphasizes four factors that influence the adoption decisions of the business owners – Relative advantages, Compatibility, Management support and Competition's pressure. Among these factors, Compatibility and Management support have the most positive influence on the decision of adopting digital transformation, meanwhile Government support and Organizational readiness display insignificant impact. Several empirical findings have been taken into account to make necessary comparisons and analysis, followed up by appropriate recommendations for the firms to better utilize internal and external resources to successfully innovate their business.

With some objective limitations pertaining to budget and time duration, the research still has some limits regarding the generalizability of the findings. Future research should devote attention to a larger number of SMEs, including those in other cities apart from Hanoi and Ho Chi Minh city. Additionally, time frames could greatly impact the experience and observation of the SME owners due to the rapid development of technology, which makes research results vary from time to time. Further research can use longitudinal data to address this limitation. Finally, future research can deploy both quantitative and qualitative research approaches to have deeper insights from the participating companies.

Overall, the study's findings enrich the discourses related to the adoption of digital transformation for business operations in Vietnamese SMEs. It is expected that the discussions and conclusions made in this study benefits practitioners and policy makers in the country. Furthermore, this effort contributes to the growing body of works researching the factors influencing digital transformation adoption in SMEs across regional contexts, and it strives to complement past research efforts in Vietnam.

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# ASSESSMENT OF USER SATISFATION OF INFORMATION SYSTEM IN THE PROCESS OF USAGE OF INFORMATION SYSTEM

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## Abstract

*The study was conducted to examine the impact of factors including top management support, system quality, facilitating condition on the usage of information system (IS) and the impact of usage of information system to the user satisfaction in the application environment of enterprise resource planning (ERP) systems in enterprises in Vietnam. Formal research samples of 110 subjects, including employees and managers involved in the usage IS. Research data were collected primarily through questionnaire survey (March, 2021 – May, 2021) and then it is used to analyze descriptive statistics and perform hypothesis tests. The result shows system quality affects usage of information system and usage of information system positively affects user satisfaction.*

***Keywords:*** *System quality, Top management support, Facilitating condition, Usage of Information System, User satisfaction.*

## 1. Introduction

In the field of information system (IS) research, the usage of IS is considered a new issue attracting the research interest of researchers. According to the Technology Acceptance Model (TAM) of Davis (1989), information system usage (IS) behavior is understood as the usage process of the system users when they realize the usefulness and the ease of use of a new system or technology. In addition, in DeLone & McLean's successful IS model, the use of the system is mentioned, which is the extent and way in which employees use the IS capabilities and to engage in behavior of usage IS need a quality IS. The usage IS played a crucial role which enhance company's value added by providing internally generated financial statements that would help the company to make better and efficient strategic plan.

ERP is a complex system and makes employees endure high pressure in the process of usage the ERP system, every person in the business from employees to managers, must undergo training for use, compliance, and experience for individuals. This puts a lot of pressure on people because of their changing routines over the years (Romney & Steinbart, 2018). In addition, the user's usage of IS is likely to lead to long-term IS user satisfaction (DeLone & McLean, 2016). Therefore, it is important to make users feel satisfied when using IS. The success of usage IS depends on significantly on user acceptance of its use. Therefore, it is important to explore the determinants of the acceptance of IS usage.

When users accept the IS, can lead to satisfaction during use. Some studies have demonstrated some factors affecting acceptance of IS usage from considering the Information system success model, but not many studies have considered combining some factors from the Unified Theory of Acceptance and Use of Technology (UTAUT). Therefore, to accomplish research goal and evaluate the factors influencing IS usage, this study considers a combination of the Unified Theory of Acceptance and Use of Technology (Vankatesh et al, 2003) and Information system success model (DeLone & McLean, 2016). Through the process of theoretical analysis, the authors select a number of factors that can affect and evaluate the impact of these factors on the IS usage and examine the influence of IS usage to User satisfaction. The selected factors in this research are: (1) top management support, (2) system quality, (3) facilitating conditions affecting to Usage of information system and User satisfaction.

## 2. Literature review and research model

### 2.1. Literature review

#### 2.1.1. Quality of Information System

According to DeLone & McLean, 2016, system quality is associated with success and they use a scale of quality of information system consistent with the developed model, including: ease of use, system functions, reliability, flexibility, data quality, portability, integration, and materiality. In the successful information systems model, DeLone & McLean (2003) proposed that the success of the information system is considered through six factors, namely: (1) system quality, (2) quality of information, (3) quality of service, (4) use of the system, (5) user satisfaction and (6) net benefit. Information system quality is concerned with measuring the desirable system characteristics: availability, validity, reliability, adaptability, and response time. In the study of Peter et al (2008) on measuring the success of information systems in relation to models, aspects, building scales and relationships, the author said that the quality of information systems shows desirable system properties such as ease of use, flexibility, reliability, ease of understanding, system sophistication and response time.

#### 2.1.2. Top management support

Top management support is defined as the ability of companies to grow and to have the support and commitment of managers to create and build knowledge within the organization (Akgun et al, 2007). Senior managers play an important role in developing and committing to a working environment within the organization. Through commitment and support, managers create a work environment that provides guidance, feedback, constructive criticism, and empowers employees to work and make decisions, become to part of IS usage (Goh, 2003). In addition, top management support meaned those managers are willing to provide additional resources, acquire new options, and make the necessary changes to promote employee use of the system. In this way, management can effectively build and support a work environment that helps their organization survive and sustain itself.

### 2.1.3. *Facilitating condition*

Facilitating condition refers to the personal belief that the technical environment and infrastructure exist to support the use of IS (Chan et al, 2010), a concept that influences using the technology identified by Venkatesh et al (2003). In this study, Venkatesh argues facilitating conditions do not affect behavioral intention but affect usage behavior. Facilitating involves the availability of sufficient resources and support for individuals to use technology (Neslin & Shankar, 2009). Lack of timely support, inadequate information and limited resources can prevent individuals from accepting the use of technology.

### 2.1.4. *Usage of information system*

The behavior of usage IS according to the TAM model is influenced by the perceived usefulness of IS (Davis, 1989). According to these theories, using IS is the behavior of the user to manipulate IS during the operation on a regular basis, repeating and expected to continue in the future. The view of usage IS has been inherited and used in many studies on choosing and using an ERP system (Nwankpa, 2019). Using ERP refers to how users use ERP features to perform tasks and run jobs (Nwankpa & Roumani, 2014). If the process of usage IS fails or the user does not use it correctly, the system will develop serious problems, usage IS is understood as a user using IS components and tools including using using software in processing, participating in using prodedures and processes in the system and under the supervision of system security control procedures. Usage Information system increased performances and operations efficiency especially in large companies and as well good management of resources and better control of expenditure, budgeting, and forecasting. Information systems also provide information on both actual and budgeted data which would help companies to establish, plan and control operations (Tilahun, 2019). Studying the usage IS in this topic and the factor affecting the usage IS to explain the actual usage IS in Vietnamese enterprises.

### 2.1.5. *User satisfaction*

System user satisfaction describes the user's feeling after interacting with the system, which is the degree to which users believe that a system available to them meets their expectations (Ives & Olson, 1984). This element describes an individual's attitude and perception towards the system they are using to perform a task. Besides, user satisfaction is the most common success measure to evaluate the success of IS (DeLone & McLean, 2016). Furthermore, empirical research showed a significant influence on user satisfaction on individual impact (Iivari, 2005; Petter & McLean, 2009; Urbach et al, 2010). Since user satisfaction is considered one of the main indicators when assessing the success of new system adoption, it has been widely used as a metric in the IS field (DeLone & McLean, 2016; Montesdioca & Macada, 2015). According to Xinli (2015), user satisfaction refered to the extent to which users perceive a system as useful and want to use it again. While Lin & Wang (2012) defined it as the satisfaction of system users in terms of speed, quantity of

functions, quality and format of the system. Several studies have shown that user satisfaction affects performance in many IT contexts and applications.

### 2.2. Theoretical basis

### 2.2.1. Unified Theory of Acceptance and Use of Technology (UTAUT)

Models in the theory of technology acceptance are useful for the assessment of technology acceptance and use. These models provide an explanation of the factors that predict adoption and usage (Sun & Zhang, 2006; Venkatesh et al, 2012). The Technology Acceptance Model (TAM) is one of the most widely used in technology acceptance researches (Davis, 1989; Ajzen & Fishbein, 1975). TAM and its citations have been frequently used in researches to investigate technology adoption (Sun & Zhang, 2006; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). However, TAM only predicts acceptance in less than 50% of cases related technology adoption (Venkatesh & Davis, 2000). To tackle the drawbacks of TAM, Venkatesh et al (2003) proposed the UTAUT model based on in-depth analysis of the literature on technology acceptance. UTAUT is a popular choice in papers so it is a unified model that integrates the different variables from many different prominent theories. This model includes four basic determinants of technology adoption: performance expectancy, effort expectancy, social influence, and facilitating conditions. Facilitating conditions is the degree to which people believe that an organization and technical infrastructure exists within the organization to support training in the usage of IS, and according to this theory, facilitating conditions are assumed as a determinant of usage IS.

### 2.2.2. Information system success model

Although user acceptance of the system is a prerequisite for IS success, this factor is not equivalent to IS success (Petter et al, 2008). Thus, DeLone & McLean developed a model that can deal with the complexity, interdependence, and multidimensional nature of IS and can assess the success of IS implementation. Aspects of success were identified as user satisfaction, intention to use, use, individual and organizational impact. Thereafter, individual, and organizational effects have shaped another aspect of success, that of net benefit (Delone & McLean, 2003). In the model DeLone & McLean (2016) identify six interdependent aspects of IS success: information quality; quality System; service quality; use the system; user satisfaction; net benefits. In which, the use of IS has a strong impact on the system user's satisfaction.

### 2.3. Reasearch model and Hypothesis

### 2.3.1. The relationship between Top management support and Usage of IS

In this study, top management support refers to the extent to which top management understands the importance of IS and the extent to which senior management is involved in system implementation. Drawing from previous research on IT implementation (Pijers et al, 2001; Ragu-Nathan et al, 2004), this study argues that the support of top leadership is crucial in enhancing the integration of technology into the business strategy, facilitating the

implementation of the system in different ways. First, the most difficult and challenging system implementation involves the major changes that need to be made in organizational and business processes (Davenport, 1998). These changes can be met with resistance from various interest groups in the organization unless there is absolute commitment from the top management (Grover et al, 1995). Second, system implementation involves a program of large-scale organizational preference-changing initiatives, not software installation efforts (Hong & Kim, 2002). Senior manager responsible for resolving deviations between the needs of the organization and the IS function. Third, given the widespread influence of system implementation on business processes and practices, senior management intervention is required to facilitate the allocation of necessary resources in the implementation IS. Ultimately, senior management cannot force organizational members to be satisfied with the use of new technology. User acceptance of an ERP system is critical to an organization performance. Top management support can be found to encourage positive user attitudes towards ERP system (Hirt & Swanson, 2001; Wang & Chen, 2006). Therefore, the level of senior management support can promote more successful usage of the system. From that result, the author gives the hypothesis:

*H1: Top management support has a positive effect on usage of IS.*

### 2.3.2. The relationship between system quality and usage of IS

System quality refers to the quality of the performance of the information system and its functionality (DeLone & McLean, 2016). System quality can be defined as the desirable characteristics provided by an information system (Petter et al, 2008). System quality is the key factor for the success of the information systems (Delone & McLean, 2016). From a different viewpoint, Hassanzadeh et al (2012) noted that the system quality affects learners' satisfaction and intention to use, leading to enhanced learner usage of the elearning system. Mohammadi (2015) found that system quality is the key predictor of satisfaction and intention to use. This leads to the following hypothesis:

*H2:* System *quality has a positive effect on the usage of IS*

### 2.3.3. The relationship between facilitating condidtions and usage of IS

UTAUT is an integrated model that acts as a valuable tool for researchers to assess the likelihood of a new technology being successful (Venkatesh et al, 2003). The proposed UTAUT model has been appropriately validated to provide a unified theoretical basis for advancing information systems (IS) research or IT adoption and dissemination. The four core parameters suggested by this model to directly determine IT behavioral intentions and usage include performance expectations, effort expectations, social influence and facilitating conditions. Several researchers have confirmed that IS usage is influenced and determined by facilitating conditions (Nistor et al, 2013; Tosuntas et al, 2015). Thus, the hypotheses offer:

*H3: Facilitating conditions has a positive effect on the usage of IS*

*2.3.4. The relationship between usage of IS and user satisfaction.*

According to DeLone & McLean (2016), actual usage is the extent to which an individual uses the capabilities of an information system in terms of frequency, nature, and duration of use. In an IS, actual use also reflects the frequency and duration of use (Kim et al, 2007). DeLone & McLean (2016) also point out that one of the most important directions in the use of technology is the need to assess the impact of system usage on IS success factors such as performance. Several studies have examined the effect of actual usage on performance and satisfaction (Hou, 2012; Son et al, 2012). Despite mixed results, it was determined that there is a significant relationship between actual usage and employee satisfaction levels (D'Ambra et al, 2013; Isaac et al, 2017; Makokha & Ochieng, 2014; Ramirez-Correa et al, 2017). This study examines the effect of actual usage on employee satisfaction. Therefore, the following hypothesis is proposed:

*H4: Usage of IS has a positive effect on user satisfaction.*

**Figure 1. Research model**
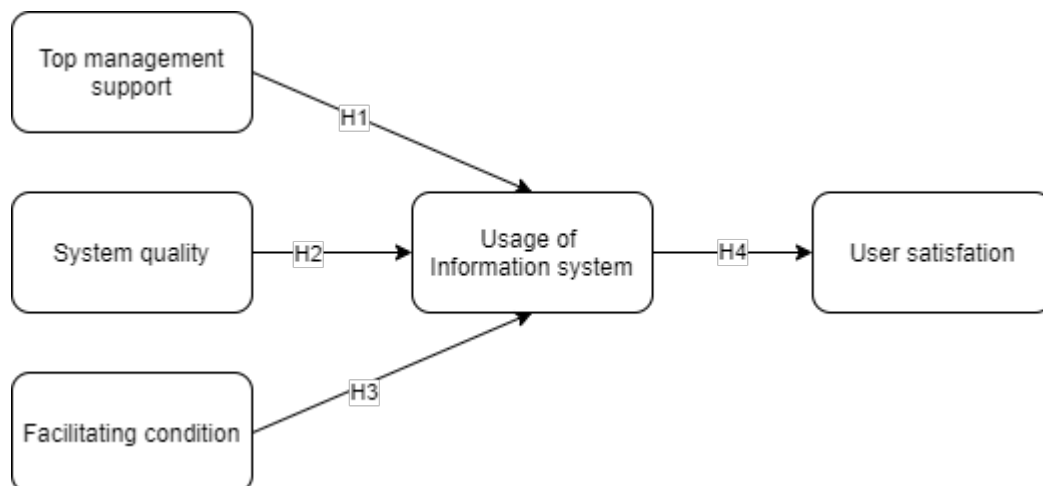


## 3. Research methodology

### 3.1. The instrument

In this study, the author carried out quantitative research method. The important content in quantitative research is a detailed questionnaire with information about the scales related to the measurement of facilitating conditions (FC) according to the scale of Chauhan & Jaiswal (2016) specifically, the FC scale includes 4 observed variables (FC1 to FC4), the top management support (TMS) scale includes 4 observed variables (TMS1 to TMS4) from the scale of Lin (2010), the usage of information system (UIS) scale includes 3 observed variables (UIS1 to UIS3) from the scale of Chang et al (2008); Schwarz (2003), the user satisfaction (US) scale includes 4 observed variables (US1 to US4) from the scale of Costa et al (2016). The scale system quality (SQ) variable is a result scale, including 6 observed variables (SQ1 to SQ6), measuring the quality of IS, selected by the author from the study of DeLone & McLean (2016). These observed variables are measured on a 5-point Likert scale (1: Strongly disagree; 5: Strongly agree).

### 3.2. Sampling

The data collection tool in the study is a questionnaire, the author conducts direct and indirect survey of individuals who using directly IS and individuals participating in using IS in the ERP environment. The research is mainly conducted in enterprises in Ho Chi Minh City and some other provinces from March to May 2021. Sample 110 was chosen according to the non-probability method, with this approach, the author has collected the necessary sample size for the study.

The sample of 110 surveyed individuals included: 72 employees (65.4%) and 38 managers who have used IS (34.6%), 54 male (49%) and 56 women (51%). Number of respondents aged from 30 to 40 accounts for the highest proportion of 68 people (61.8%). Professional qualifications accounting for the highest proportion are university (69.2%), followed by postgraduate (20.2%) and college 10.6%. Work experience of employees accounts for the highest rate from 5 to 10 years (43.3%), work experience of less than 5 years accounts for 29.4% and work experience over 10 years has the rate 27.3%.

## 4. Data analysis and Results

### 4.1. The measurement model

This paper used the partial least squares (PLS) technique in SmartPLS to analyze data. Following the two-stage analytical procedure of PLS, the measurement model was examined before analyzing the structural model. We assessed the reliability and validity of constructs in the measurement model by examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

One item (FC1) was eliminated due to insufficient factor loadings ($< 0.5$). Convergent validity is verified through assessing using average variance extracted (AVE). In PLS, it is comparable to the proportion of variance explained in factor analysis (value from 0 to 1). In this study, the loading of each item significant at the $p < 0.001$ level, shows good convergent validity. In addition, table 1 shows that the average variance extracted (AVE) of each construct excesses 0.5 (Fornell & Larcker, 1981), thus displaying sound convergent validity.

Table 1 shows two criteria for inside consistencies including composite reliability (CR) and Cronbach's alpha. As advocated by Hair et al (2016), all the constructs had a Cronbach's alpha over 0.7. A CR of all the constructs was also higher than 0.70, implying high internal consistency (Nunnaly & Bernstein, 1994).

**Table 1. Measurement model**

|  | Items | Loadings[a] | AVE[b] | CR[c] | Cronbach's Alpha [d] |
|---|---|---|---|---|---|
| Facilitating condition | FC2 | 0.760 | 0.652 | 0.848 | 0.742 |
|  | FC3 | 0.921 |  |  |  |
|  | FC4 | 0.728 |  |  |  |
| System quality | SQ1 | 0.830 | 0.629 | 0.910 | 0.886 |
|  | SQ2 | 0.811 |  |  |  |
|  | SQ3 | 0.792 |  |  |  |
|  | SQ4 | 0.807 |  |  |  |
|  | SQ5 | 0.786 |  |  |  |
|  | SQ6 | 0.728 |  |  |  |
| Top management support | TMS1 | 0.735 | 0.506 | 0.801 | 0.772 |
|  | TMS2 | 0.626 |  |  |  |
|  | TMS3 | 0.834 |  |  |  |
|  | TMS4 | 0.627 |  |  |  |
| Usage of Information system | UIS1 | 0.761 | 0.783 | 0.915 | 0.858 |
|  | UIS2 | 0.950 |  |  |  |
|  | UIS3 | 0.931 |  |  |  |
| User satisfaction | US1 | 0.704 | 0.635 | 0.874 | 0.806 |
|  | US2 | 0.845 |  |  |  |
|  | US3 | 0.838 |  |  |  |
|  | US4 | 0.791 |  |  |  |

Item removed: indicator items are below 0.5: FC1

a. All item loadings > 0.5 Indicates indicator Reliability (Hulland, 1999)

b. All Average Variance Extracted (AVE) > 0.5 as Indicates Convergent Reliability (Bagozzi & Yi (1998); Fornell & Larcker (1981)

c. All Composite reliability (CR) > 0.7 indicates Internal consistency (Gefen et al, 2000)

d. All Cronbach's alpha > 0.7 indicates Indicator Reliability (Nunnaly & Bernstein 1994)

The discriminant validity is justified by two pieces of evidence including the HTMT criterion, Fornell – Larcker criterion. Table 2 indicates that the square root of the AVE of each construct is higher than its highest correlation with any other construct (Fornell & Larcker, 1981). All HTMT of constructs are importantly smaller than 1 (Henseler et al, 2016) (Table 3). Those figures imply satisfactory discriminant validity.

*Source: Author's process from Smart PLS.*

**Table 2. Discriminant validity (Fornell and Larcker criterion)**

|  | Facilitating condition | System quality | Top management support | Usage of Information system | User satisfaction |
|---|---|---|---|---|---|
| Facilitating condition | **0.807** |  |  |  |  |
| System quality | -0.012 | **0.793** |  |  |  |
| Top management support | -0.14 | 0.422 | **0.711** |  |  |
| Usage of Information system | 0.035 | 0.236 | 0.162 | **0.885** |  |
| User satisfaction | 0.079 | 0.272 | -0.014 | 0.625 | **0.797** |

*Source: Author's process from Smart PLS.*

**Table 3. Discriminant validity (HTMT)**

|  | Facilitating condition | System quality | Top management support | Usage of Information system | User satisfaction |
|---|---|---|---|---|---|
| Facilitating condition |  |  |  |  |  |
| System quality | 0.111 |  |  |  |  |
| Top management support | 0.249 | 0.62 |  |  |  |
| Usage of Information system | 0.097 | 0.226 | 0.183 |  |  |
| User satisfaction | 0.16 | 0.286 | 0.163 | 0.746 |  |

*Source: Author's process from Smart PLS.*

### 4.2. The structural model

Results of the PLS analysis indicate the explanatory power of the model as coefficients of determination ($R^2$) of User satisfaction at 0.385, $R^2$ of Usage of Information

system at 0.036. The value of VIF <5 shows that the collinearity between the research variables is not a problem of the structural model.

The value Effect size ($f^2$) shows SQ weak effect to UIS (0.035), UIS has a strong effect of 0.642 on US.

The structural paths are reported in Figure 2. In the structural model, we utilize the bootstrapping technique with 5000 resamples to estimate the magnitude and significance of path coefficients (β) at the confidence level of 95%. System quality (β = 0.199, p < 0.05) influence to Usage of information system, confirming H2, Usage of information system (β = 0.625, p < 0.01) confirming H4 significantly influence the same direction to User satisfaction.

**Table 4. Hypothesis testing: Bootraping Direct effect result**

| Hypothesis | Relationship | Std Beta | S | t-value | P-value | f2 | Result |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| H1 | TMS → UIS | 0.052 | 0.139 | 0.372 | 0.71 | 0.006 | Unsupported |
| H2 | SQ → UIS | 0.199 | 0.102 | 1.96 | 0.04 | 0.035 | Supported |
| H3 | FC → UIS | 0.086 | 0.201 | 0.428 | 0.669 | 0.003 | Unsupported |
| H4 | UIS → US | 0.625 | 0.059 | 10.683 | 0 | 0.642 | Supported |

*Source: Author's process from Smart PLS.*

**Figure 2.** Results of PLS path modeling
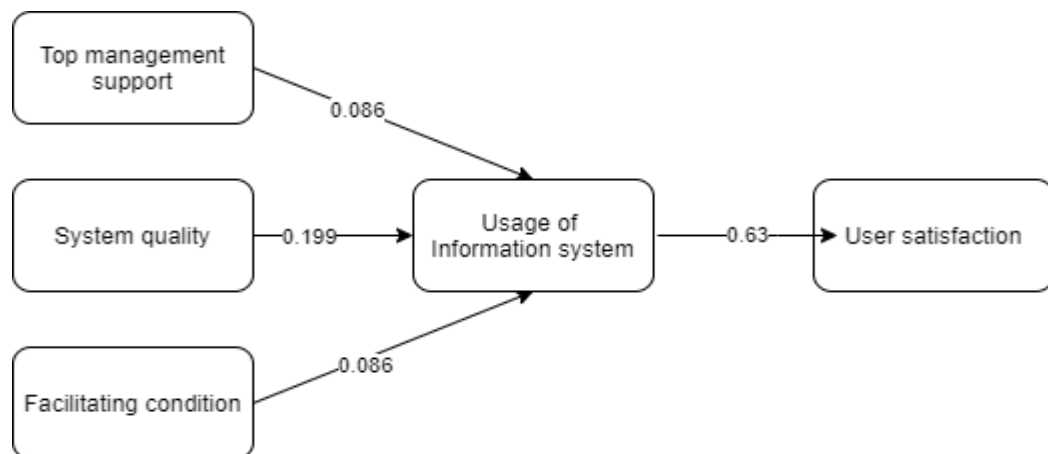


## 5. Conclusion and research implication

### 5.1. Conclusion

From previous studies on usage IS, applying the successful IS model of DeLone & McLean and UTAUT model, the author has built a relationship model between quality of Top management support, system quality, facilitating sondition, usage of information system and user satisfaction. The results show that the measurement scales of research concepts are

highly reliable. The accepted hypotheses include hypotheses H2 and H4, whereby the system quality has an impact on usage of information system and usage of information system affects the user satisfaction.

*5.2. Research Implication*

With the research results shows that the need to improve the quality of IS in enterprises. IS is now a system with the support of IT, mainly in the application environment of accounting software and ERP, so improving the quality of IS should focus on:

- Continue to improve processes and procedures in the process of collecting, processing, storing data and providing information to different users, creating ease of access and use the system. These procedures should be specific in writing and stored in the system with system documentation tools such as data flow diagrams and flowcharts for each of the different processing processes but have full approval.

- Increased IS connectivity in the enterprise through the help of processing software. Orientation and apply technology effectively in accounting and management, creating convenience and ease in using the system.

- Control the ERP software evaluation and selection process in IS, regularly update new software versions and suit business needs, to ensure flexibility, integration, and customization requirements and high control over software.

- Further improve the quality of data of enterprises and business operations of enterprises, create a diverse and scaled data warehouse to serve the needs of data mining and analysis to support more useful information for administrators.

- Improve the quality of IT infrastructure, regularly monitor and manage computer systems, peripheral devices, and communications to promptly detect problems and risks and take appropriate corrective measures. Strengthening network security solutions, especially in the case of information transfer on computer networks. When the IS on the computer platform has stable operation and effective management, the quality of IS will be enhanced.

- Improving the quality of IS will contribute to improving the quality of accounting information, currently most businesses have applied IT in accounting, although the level of IT application in accounting is not the same, but basically businesses are applying accounting software and ERP system in accounting work and enterprise management. The level of IT application will affect the way of collecting, processing data and providing accounting information, thus affecting risks as well as the management and control of IS. The awareness and assessment of the possibility of errors and frauds for IS in the computer environment, thereby having important control procedures, will contribute to improving the quality of IS. In IS control, it is necessary to focus on general control and application control, general control including control activities related to the entire processing system and affecting all processing application systems in business. Application control includes the implementation policies and procedures that affect a specific application system and performance in IS. These two controls

are established and coordinated will help ensure the entire IS operates effectively and efficiently.

### 5.3. Limitations and future research

Although the initial purpose of evaluating the impact of factors including top management support, system quality, facilitating conditions on the usage of IS and the impact of usage of IS to the user satisfaction has been achieved, this study also has some of the limitations.

First, the survey is mainly in Ho Chi Minh City and a neighboring province, so the generality of the study is not high and may be certain limited. In addition, the study used convenient sampling by sending questionnaires directly or via email to survey subjects. Therefore, further studies should conduct additional surveys in different regions of the country and have a classification of survey subjects.

Second, according to the UTAUT model, there may be many external factors influencing the usage of IS và user satisfaction. Further studies need to develop additional factors influencing the usage of IS such as performance expectancy, effort expectancy and social influence in the operation of the IS.

Third, it is possible to learn and apply more relevant background theories in IS to build research models and use some more moderating, mediating variables in relationships between research concepts, the usage of IS and user satisfaction.

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# AUTONOMY IN PUBLIC HIGHER EDUCATION:
# A CASE STUDY OF VIETNAM

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## Abstract

*This study focuses on assessing the context of autonomy in Vietnamese universities (the current situation and the issues) and suggesting the recommendations. Although the number of universities in Vietnam is large (237 ones in 2019), the number of high-ranking universities is very limited. In addition, in the context of international integration, these university should be in the requirement of autonomy, especially in term of finance. The desk research, interviews and surveys were applied to initially assess four issues: organizational autonomy, financial autonomy, human-resources autonomy and academic autonomy. The research results show that financial autonomy is an urgent requirement at present because it will affect other autonomy aspects. Finally, some policy implications are proposed to increase current university autonomy.*

*Keywords: Academic autonomy, financial autonomy, human-resources, organizational autonomy, university autonomy.*

## 1. Introduction

Education is one of the conditions to ensure the realization of Vietnam's equitable goals, a premise for the fast and sustainable socio-economic development, and a development opportunity for each individual in society (Trinh, 2014). When higher education grows in size and diversity in types and the role of higher education becomes more and more important in promoting socio-economic development, investment in higher education through policy programs plays more necessary role. However, schools should promote their own autonomy because it helps schools reduce their dependence on the state budget, increase their ability to provide high-quality educational services; even though this can affect the costs of learn, people's opportunities to choose and enroll in universities, students' ability to complete their studies, and their need for a high-quality higher education service and career opportunities (Tran, 2016).

Autonomy in higher education has been mentioned in a number of different studies (eg. Massen et al., 2017; Jo, 2016…), however due to differences in structure, nature as well as institutions, those studies are not really suitable for application in Vietnam. The typical characteristics of Vietnam (and some countries following the former socialist model) are: (1) Highly regarded universities in Vietnam are mostly public universities, therefore, the degree of autonomy is not much (at least in finance); (2) Vietnam is orienting universities to be

autonomous in order to meet market requirements and also reduce pressure on the state budget; (3) the enrolment method of Vietnamese universities as well as in some other countries in East Asia is based on entrance test scores. Thanks to this problem, public schools are attracting a big number of good students (with high entrance test scores or high-grade point average). But it is a fact that the rise of many private and financially autonomous universities indirectly competing with public universities causes pressure to reform.

It is precisely because of the status and importance of higher education autonomy in Vietnam, this study will first focus on the autonomy status of Vietnamese universities, clarify the main aspects of autonomy, point out the current issues of higher education autonomy and then, propose solutions. Therefore, the structure of the next sections of the article includes: Section 2- Theoretical basis and literature review; Section 3- Methodology; Section 4- situation of autonomy in Vietnamese universities. The last one will offer implications to promote university autonomy.

## 2. Theoretical basis and literature review

### 2.1. Literature review

There are many previous studies on university autonomy. However, these works mainly refer to the theories and concepts of university autonomy, and the situations of universities in the US (Taira, 2014), China (Pan, 2016), Malaysia (Chan, 2017), or make the comparison between countries in Europe, Asia, UK-US (Johnson, 2003). However, in the study of Hauptman (2007), the author used the "Four models of growth", showing the higher education institutions' the dependence in higher education autonomy in terms of finance on government. Then, Thomas et al. (2010) reported on university autonomy in 22 different European countries, analyzed the similarities and differences in university autonomy among these countries in the term of organizational autonomy, financial autonomy, academic autonomy and human resouces autonomy. In Vietnam, there are some studies on this topic such as Tran Van Nhung (2013), Banh Tien Long (2015), Tran Khanh Duc and Nguyen Manh Hung (2016), Tran Khanh Duc (2016). These studies have raised theoretical and empirical issues in the management of education and training. However, the content of university autonomy has not been paid much attention in the research scope of this topic. Research by Le Thi Kim Dung (2016) has made in-depth research on university autonomy. However, the issue of university autonomy has only been analyzed to a certain extent in the measures to improve the law on higher education in Vietnam. Therefore, in this study, inheriting the concepts and theoretical basis of the previous ones, the authors will analyse deeply Vietnam's higher education autonomy in the context of integration, based on the model of 4-factors in university autonomy.

### 2.2. Theoretical basis

Higher education is a process by which learners are trained, given chances to practice, and fostered with knowledge, skills, autonomy and responsibility. This process helps learners achieve the output goals of quality and competence according to the curriculum framework

and national university degree. Besides, it also creates conditions for learners to perfect themselves as well as contributes to the process of developing the society and country.

University autonomy is the right of a higher education institution to decide on its mission and operating program, the ways and means of carrying out that mission and operation program. In addition, these institutions have right to choose to be accountable to the public and the law for all its decisions and activities. This form of governance is suitable for organizations that do not belong to the administrative system (the system has superiors and subordinates; subordinates are appointed by superiors and must follow the decisions of their superiors).

For university autonomy, previous studies often divided into 4 major autonomy factors. In this study, the authors will use these 4 major autonomy aspects to build a research, analysis and evaluate model.

*Organisational autonomy*: means to decide on their own organizational structure and decision-making process (Serger et al, 2015; Liu, 2017). Organizational autonomy is mentioned a lot in (old) socialist countries and countries with economies in transition, where the Party organization (of the Communist Party) is higher than other organizations in terms of government. Organizational autonomy usually refers to the head; board of directors; training, scientific research, service and administrative units; for-profit/not-for-profit nature of school.

*Financial autonomy*: means to independently operate and allocate its own funds (Pruvot and Estermann, 2017; Pruvot and Estermann, 2018). For financial autonomy, there are usually 5 sub-factors: Duration of a public funding round, type of public funding; Borrowing and maintaining a surplus; The operation of facilities; Tuition fees for domestic and foreign students, graduate students, and graduate students. Roness et al (2008), Liu (2017), Pruvot and Estermann (2018) argue that for universities in countries with economies in transition, the issue of financial autonomy will have to be conducted first. When financial autonomy is achieved, it will reduce dependence on state funding, thereby becoming autonomous in terms of operation, staff and academics.

*Human resource autonomy*: that is to decide on the recruitment and management of human resources in accordance with their own interests (Cristi, 2014; Enora, 2017). Human resources are the most important resource in universities. After being financially autonomous, the recruitment requirements for the teaching and research units (for lecturers) and the supporting units (for officers) are set even higher to achieve the common goal of the university. In addition to autonomy in terms of recruitment, the above studies also mentioned two other issues: autonomy in job placement and salary; self-promotion, dismissal. Liu (2017), Enora (2017) assesses that when a university is autonomous in terms of human resouces, that is, it is able to recruit many lecturers to meet the increasing requirements of society (increasing the image of the university in , increasing applicability to teaching problems for students).

*Academic autonomy*: is self-management of their own training and scientific research (Budi, 2018). For some studies publishing in China, academic autonomy is only related to the number of enrollments, enrollment options, subject schemes and study programs (Liu, 2017). Other issues related to academic autonomy, whose focus is on political autonomy, are not addressed. This study uses Liu (2017)'s point of view as a basis for evaluation.

## 3. Research methodology

The main research methodologies used in this study include a systematic review of the scientific literature, subjective knowledge, inductive methods and logical inference from secondary data. At the same time, the authors also collect primary data through desk-research (in-depth interviews) and surveys to analyze and evaluate the status of higher education in Vietnam in the context of integration.

For desk study, reseachers assess the autonomy of Vietnamese universities through published documents. Reseacher chose the qualitative research method as in-depth interviews with a group of lecturers and managers in universities. Due to the pandemic, reseacher conducted online interviews on the following issues: (1) What is your opinion about university autonomy; (2) Your views on the issue of autonomy in the operation, financial autonomy, HR autonomy and academic autonomy; (3) views on factors affecting university autonomy; (4) other issues related to factors affecting university autonomy. In in-depth interviews, reseacher usually interview from 25 - 40 minutes, after asking the interviewer's permission, the recording can be saved. These recordings are un-recorded within 1 day. The total number of interviewees is 14 lecturers who are teaching at economics universities.

For survey, the questionnaire was sent directly to university representatives. The scale uses a 5-level Likert format, where 1 is completely absent, 2 is low, 3 is average, 4 is high and 5 is very high. Specifically, the Autonomy Scale (TCBM) - 03 indicators; financial autonomy scale (TCC) - 05 indicators; human resource autonomy scale (TCNS) - 04 indicators; Academic autonomy scale (TCHT) - 04 indicators. A total of 200 votes were distributed, but only 172 votes were collected. Out of 172 votes, 11 were rejected due to typing the same answer or not answering the entire questionnaire. Thus, the total number of satisfactory votes is 161 votes. Data processing: through the stage of collecting and synthesizing survey samples, the results collected from the questionnaire will be cleaned, entered into the database and encrypted based on Excel 2016.

## 4. The situation of Vietnamese higher education

### 4.1. Higher education institutions in Vietnam

Regarding the management structure of the higher education system, in 2019, there were 236 higher education institutions nationwide. For more detail, 5 universities, 90 universities are under ministries and ministerial-level agencies (excluding institutions of higher education such as academies, universities under the government, universities under the military and police system); 22 public universities are managed by the province; 65 non-

public higher education institutions in which there are a number of institutions with 100% foreign investment such as RMIT University, Fulbright University, British University in Vietnam, Tokyo Medical University... Thus, Vietnam has fulfilled early the target of *Decision 37* (Table 1).

**Table 1: Status of the system of higher education institutions in Vietnam up to 2018**

*Unit: Institutions*

| | School year of 2017 - 2018 | | | The target of Decision 37 |
|---|---|---|---|---|
| | Total | Public | Non-public | |
| Higher education institutions | 236 | 171 | 65 | 224 |
| Universities | | 5 | 7 | |
| Universities under ministries and ministerial-level agencies | | 90 | | |
| Provincial public-higher-education institutions | | 22 | | |

*Source: Mai (2019).*

The distribution of higher education institutions by region and territory in Vietnam shows that, except for the Northern Midlands and Mountains, the Central Highlands and the Mekong River Delta, the basic development indicators of higher education has been completed in all remaining economic zones under the standard of *Decision 37*. In which, the Red River Delta and the Southeast are the two regions with the largest number of higher education institutions nationwide. The Central Highlands is the economic region with the lowest number of higher education institutions. Although the number of newly established educational institutions in the Red River Delta region is the highest in term of comparing the present time with the target to be achieved in 2020 of *Decision No. 121/2007/QD- TTG*, however, the North Central and Central Coast regions have the highest growth rates of higher education institutions. In these two regions, the current number of higher education institutions is 3 times higher than the number of higher education institutions operating in 2004 (which is the period before the setting of higher education development goals to 2020 according to *Decision No. 121/2007/QD-TTG*).

For developing training sector, the objectives of developing training derived from *HERA* and *Decision 37* have been adjusted. According to *Circular 06/2018/TT-BGDĐT*, seven new training majors are established on the basis of merging and supplementing previously issued training disciplines. Among 7 majors at universities in Vietnam currently, the third and fifth majors have the highest number and percentage of students. Many "most favourite" international training programs have been researched and put into teaching in Vietnam in the context of the development of the industrial revolution 4.0 in addition to

popular training programs in economics, business, management and law in most Vietnamese higher education institutions.

**Table 2: Results of the implementing the target on distribution of university networks in Vietnam**

*Unit: Higher education institutions*

| Economic zones | Goals to 2020 (Decision No. 121/2007/QĐ-TTG) | Economic zones | Goals to 2020 (Decision 37) | Present |
|---|---|---|---|---|
| Northwest region | 3 | Northern Midlands and Mountains | 15 | 14 |
| Northeast region | 10 | | | |
| Red River Delta Region | 125 (61 universities and 43 colleges in 2004) | Red River Delta Region | 91 | 103 |
| North Central | 45 (11 universities and 11 colleges in 2004) | North Central Region and Central Coast | 38 | 43 |
| South Central Coast | 60 (10 universities and 21 colleges in 2004) | | | |
| the Central Highlands | 15 (4 universities and 6 colleges in 2004) | Central Highlands | 5 | 4 |
| Southeast region | 105 (47 universities and 43 colleges in 2004) | Southeast region | 55 | 55 |
| Mekong Delta Region | 70 (6 universities and 18 colleges in 2004) | Mekong Delta Region | 20 | 17 |

*Source: Mai (2019).*

### 4.2. Necessity of higher education autonomy in Vietnam

One problem with Vietnamese universities is that tuition fees are relatively low, compared to other countries in the world, but they are high compared to people's incomes (Mai, 2019). Although there are 237 universities, by 2020, Vietnam has only 8 educational universities ranked in the top 500 leading educational universities in Asia, and 7 of which are public education institutions, and the left 1 one is a private higher education institution. Also according to the QS ranking, by 2020 Vietnam will have 2 higher education institutions in the top 1000 universities in the world, which is less than the ranking of THE (with the addition of University of Science and Technology). According to the rankings of Shanghai Jiaotong University, there can also be Ton Duc Thang University of Vietnam in the top 1000 most prestigious universities in the world (QS world ranking 2020). Studies on university autonomy in Vietnam such as Anh et al (2020), Vo and Laking (2020) show that: if

universities could be autonomous, at least financially, they would have ability to promote their own capacity in finding funding sources, developing training programs as well as improving the ability to publish internationally. Relying on the state budget in too long time can reduce the capacity of schools, affect training development in the country, and also cause a waste of resources for society. Therefore, the government issued *Decision 77/NQ-CP* on the issue of university autonomy.

Since Resolution No. 77/NQ-CP was issued, up to now, there are 23 public higher education institutions under ministries and state department that have been approved by the Prime Minister for prolonging the project of renovating the school's operation mechanism under *Resolution 117/NQ-CP* at the regular Government meeting in October 2017. *Resolution 117/NQ-CP* affirms that the institutions Higher education and vocational education institutions that have been assigned to pilot implementation according to *Resolution No. 77/NQ-CP* dated October 24, 2014 of the Government will continue to implement until the Government Decree on regulations which define the autonomy mechanism of public higher education institutions and the Government's Decree providing for the autonomy of vocational education institutions takes effect. Participating in the pilot under *Resolution No. 77/NQ-CP*, the piloted higher education institutions are empowered to proactively associate with foreign universities, or use international training programs to build new universities, integration training program. International curricula are taught with the participation of domestic and foreign lecturers… without consulting the governing agens.

These higher education institutions have made great efforts to innovate the methods of school management and administration in order to increase savings, strengthen control over expenditures, implement accountability,... Besides, the social responsibility of higher education institutions is maintained through such contents as tuition fee exemption and reduction for policy beneficiaries; guarantee scholarships to students with excellent academic achievements.

### 4.3. Issues of higher education autonomy in Vietnam

#### Operational autonomy

Before the Law amending and supplementing a number of articles of the Higher Education Law officially took effect, the School Council was not completely established at all public higher education institutions participating in the autonomy pilot universities. For higher education institutions that already have a school council, the number of members of the school council is five in the prescribed number, with a minimum of 15 people and a maximum of 25 people. School Board members are established in a relatively modest number and proportion of women. Because there is no school council, the establishment of faculties, institutes, centers or departments depends on the decision of a few people. At the moment, the structure of the schools is still decided by themselves, not influenced by the higher authorities.

**Table 3: Results on the issue of operational autonomy in universities**

| Questions | Means |
|---|---|
| The degree of autonomy in the establishment, separation and merger of service units under the school | **3.57** |
| The degree of autonomy in the establishment, separation and merger of faculty units, institutes and subjects participating in training in the university | **3.12** |
| The degree of autonomy in the establishment, separation and merger of administrative units of the school | **4.27** |

*Note: 1 - completely absent, 2 - low, 3 - average, 4 – high, and 5 - very high.*

*Source: Authors' reseach.*

Among the answers, the most obvious of the reviews is that it is easy to set up units at universities, because the governing unit does not intervene, but merger or dissolution is not easy. Although there is a certain degree of autonomy, respondents all think that public universities are quite cumbersome, and that re-entry is not much of a problem from the government side, but there are obstacles from within. Policy on operation also does not have an appropriate assessment of the capacity of lecturers and researchers, so there is a phenomenon of job transfer of lecturers with good research ability. Therefore, this question only received 3.12/5 points, which is the lowest level of the 3 questions. Other questions, especially administrative issues, received a high rating, up to 4.27/5 points, because they are often not related to teaching, and can be outsourced.

*Financial autonomy*

Participating in the exercise of autonomy according to *NQ77/NQ-CP* dated October 24, 2014, public universities have the right to decide the average tuition fee of the mass program but not exceed the tuition fee ceiling set by the State and recurrent expenditures from the State budget on average for each public student in the whole country.

Accordingly, public universities have the right to decide on specific tuition rates for each discipline, training program according to learners' needs and training quality, and to decide on tuition fees for advanced and high quality training programs and specific programs; to publicize tuition rates for learners before enrolment along with conditions to ensure training quality in the 2014-2017 period such as: facilities, teaching staff, output standards and services which are included in the tuition fees that learners are entitled to. The ceiling of tuition fees for training systems are following: Master's degree is 1.5 times; Doctorate degree is 2.5 times; non-formal training systems are 1.5 times higher than the average tuition fee of the regular university training system of the mass program (Table 4).

**Table 4: Average monthly tuition fees of learners according to**
**mass training programs at various types of public higher education institutions**

| | | | |
|---|---|---|---|
| The average tuition fee of the school's mass formal training programs that have not yet participated in the autonomy (thousand VND/month/student) | 610-1070 | 810-1300 | 810-1300 |
| Average tuition fee of the school's mass regular training programs participating in the autonomous pilot (thousand VND/month/student) | 1750-4400 | 1850-4600 | 2050-5050 |

*Source: Mai (2019).*

In general, most of the revenue of higher education institutions in Vietnam today comes from tuition fees (students' contributions). In which, the schools participating in the autonomous pilot will not receive training funding from the State budget, while the schools that have not participated in autonomy will have a part of the training funding of learners supported by the state. Schools participating in the autonomy pilot are still receiving budget investment until the projects and programs that support the state for schools in the previous period end. While in addition to revenue from tuition fees, higher education institutions that have not yet participated in the university autonomy pilot are supported by the state budget to ensure investment and development expenditures of the university. The revenues from services or science and technology are still very modest whether the school is participating or not participating in the autonomy pilot.

**Table 5: financial autonomy in universities**

| Questions | Means |
|---|---|
| The degree of autonomy in budget allocation allocated by the state | 3.62 |
| The degree of autonomy in the distribution of residual income of the school | 3.87 |
| The degree of autonomy in accessing credit of the school | 2.65 |
| The degree of autonomy in using public property for business of the school | 2.77 |
| Degree of autonomy in determining tuition fees for training programs | 4.15 |

*Note: 1 - completely absent, 2 - low, 3 - average, 4 – high, and 5 - very high.*

*Source: Authors' reseach.*

Among the questions about financial autonomy, it can be seen that the problem encountered by most (public) universities is that they are not fully autonomous or not yet able to access credit, and then using public property for business of the school. These schools are usually quite specific schools (pedagogical, or not very famous, or in provinces rather than central cities). Therefore, the interview results show that although schools have achieved a

certain degree of autonomy in tuition fees (to some extent), they still rely on the state budget. The situation of self-generating is still not much. This is a hot issue right now.

*Human resources autonomy*

Human resources of universities are often recruited by the schools themselves. The governing bodies do not intervene and this problem. However, respondents said that at this time, because many schools are not financially self-sufficient, they cannot be autonomous in having a mechanism for recruiting highly qualified people with good international publication ability (The average score is 3.15/5 points). And because of that, the appointment and promotion are also difficult (the score is 3.67/5 points) (see Table 6). Other self-control issues are relatively high, above 4 points. The reason is that most of the respondents believe that the officers are not directly involved in the training process, so recruitment is quite easy. This is also the question with the highest score among the questions.

**Table 6: Survey response results on human resource autonomy in universities**

| Questions | Means |
|---|---|
| The degree of autonomy in recruiting lecturers | **3.15** |
| The degree of autonomy in recruiting officers | **4.65** |
| The degree of autonomy in reward and promotion with lecturers | **4.12** |
| The degree of autonomy in salary payment and income of lecturers | **3.67** |

*Note: 1 - completely absent, 2 - low, 3 - average, 4 – high, and 5 - very high.*

*Source: Authors' reseach.*

*Academic autonomy*

In order to develop in the context of integration and especially requirements of recruitment in the labor market, higher education institutions, whether participating in the autonomy pilot or not participating in the autonomy pilot, all strive to build, develop the suitable training programs to the HR needs of the labor market. The number of majors/programs in universities is therefore constantly increasing over the years at most of the public higher education institutions, whether affiliated to the ministry, or to the government, to the central government or to local governments, whether it is a single major or a multidisciplinary school. In addition to developing training programs in Vietnamese, higher education institutions have cooperation with foreign partners in implementing joint training programs in various forms. That is the affiliate program with fully trained in Vietnam; or with a haft-time in Vietnam, a haft-time abroad. Therefore, the degrees awarded to learners are also very diverse, depending on the signing and training funding built up during the program's formation (Table 7).

**Table 7: Growth of post-graduate training
in some higher education institutions in Vietnam**

| No | Higher education institution | Number of majors/undergraduate training programs over the years | | | |
|----|------------------------------|------|------|------|------|
|    |                              | 2016 | 2017 | 2018 | 2019 |
| 1  | National Economics University | 25 | 26 | 39 | 46 |
| 2  | University of Commerce | 15 | 17 | 24 | 26 |
| 3  | Hanoi University of Science and Technology | 35 | 34 | 53 | 53 |
| 4  | Thai Nguyen university | - | - | 134 | 141 |
| 5  | Vinh university | 42 | 49 | 51 | 54 |
| 6  | Agricultural Academy | - | - | 43 | 44 |
| 7  | Hanoi Medical University | 10 | 11 | 10 | 10 |
| 8  | National University of Civil Engineering | 19 | 19 | 18 | 23 |

*Source: Mai (2019).*

So, academic autonomy allows schools to be autonomous in terms of training programs and enrollment advice. Most of the questions agreed that universities have a high degree of autonomy, but because of limited funding, it is difficult to recruit personnel, then, it is difficult to develop new fields. This are often difficult to wait for major universities to develop to follow. Table 8 shows that the answers are all above 4, but also shows that one of the weaknesses is that the school has an enrollment plan, but has not given an idea of how to enroll students or develop the program.

**Table 8: Survey response results on academic autonomy in universities**

| Questions | Means |
|-----------|-------|
| The degree of autonomy in the number of enrollments | **4.28** |
| The degree of autonomy in having the school's own enrollment plan | **4.16** |
| Degree of autonomy in opening new programs | **4.23** |
| The degree of autonomy in developing training programs | **4.31** |

*Note: 1 - completely absent, 2 - low, 3 - average, 4 – high, and 5 - very high.*

*Source: Authors' reseach.*

## 5. Implications to autonomy in higher education in Vietnam

### *Operational autonomy*

Operational autonomy has a positive impact on university autonomy from an overall perspective. Thus, the results of this study are similar to previous studies. This shows that, to be able to develop universities in a competitive way, universities need to be able to independently establish units within the university (such as faculties, institutes, centers) or other units, training support staff (usually departments, functional departments). In the current conditions, the problem of the apparatus is also a big problem when public universities are quite cumbersome, and functional units are quite numerous. Therefore, authors have some recommendations for schools as follows:

*Firstly*, it is necessary to narrow down the administrative apparatus in universities. It is recommended to establish a one-stop department but not to recruit more staff, but to transfer human resources from other departments to this department to serve the school's public administration. In addition, staff or training support specialists also need to be reduced because schools are building electronic portals, providing online services.

*Secondly*, it needs to have appropriate policies for teaching or research units within the university. Some faculties may merge to increase specialization, especially for universities of a specialized nature (e.g. economics or engineering only) and thus to be specialized in the field of study which the school has strengths or aims to.

### *Financial autonomy*

Financial autonomy is the factor that has the strongest impact on university autonomy in general. This is consistent with the publishes of Roness et al (2008), Liu (2017), Pruvot and Estermann (2018). When the ability to operate on their own, universities can meet the requirements of input sources (mobilize capital for investment activities of the university), expand training programs and pay salaries to employees. This is also a general trend in the process of reforming Vietnam's higher education. The authors suggest that:

*Firstly*, universities need the right to decide on the specific tuition rates of each field, training programs according to learners' needs and training quality; decide the tuition rates for high-quality training programs, advanced and specific programs. They should publicize tuition fees for learners before enroling along with conditions to ensure training quality such as: facilities; teaching staff; output standards and services which are included in the tuition fees that learners are entitled to.

*Secondly*, it should expand the issue of creating resources for schools, including accessing financial resources from outside such as borrowing from banks. This can be done through the signing of strategic cooperation agreements between the parties: the university provides human resources; the banks provide capital. In addition, the expansion of resources from remote or semi-distance training (such as graduate teaching in the provinces) should also be considered.

### *Human resources autonomy*

It seems that the recruitment process of lecturers, researchers and experts in Vietnamese university has not been appreciated. Rewarding, disciplining, appointing or promoting lecturers is also not a major concern of the leader or the respondents. This is a problem that needs to be resolved in the near future for universities - especially public universities - in Vietnam. The authors make some policy implications as follows:

*First*, there is a policy to attract lecturers who are able to research or publish well in international journals. Universities can call for and use an incentive mechanism so that foreign and domestic lecturers and researchers, even though they are not full-time staff of the university. When they post international articles, put their school's name as one of the university's names, where the author has worked on the system. Or schools can implement incentive mechanisms, form strong research groups and provide financial support for international publication registration, or use incentives for members of the university who have articles in reputable journals belonging to ISI/Scopus system. It is the financial incentives that have increased the number of research papers published in these journals.

*Second*, there is a policy to narrow the apparatus of specialists, officers, dismissing lecturers who do not have much research ability or have problems arising. This can be done through requesting international publication, or receiving feedback from students. But the implementation needs a large and long roadmap, especially for public universities.

### *Academic autonomy*

Academic autonomy in this study mainly refers to the development of fields and programs, not to the issue of political dissent. The authors believe that in order to develop in the context of integration and especially from the requirements of recruitment in the labor market, higher education institutions efforts to build and develop training programs suitable to the human needs of the labor market. Schools should consider increasing the number of majors in line with market needs and the 4.0 era. At the same time, it needs to cooperate with foreign partners to deploy, build and implement high quality programs to meet the increasing needs of learners.

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