**MINISTRY OF EDUCATION AND TRAINING**

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# GRADUATION THESIS

## Majors: International business

## THE IMPACTS OF GLOBAL SUPPLY CHAIN SHIFT ON VIETNAM'S RETAIL INDUSTRY DUE TO THE COVID-19 PERIOD:

## VIETNAM'S OPPORTUNITIES AND SOLUTIONS

**Bachelor of International Business Thesis**

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*Ha Noi, August, 2020*

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Hoa Lac, August 21th, 2020

Authors of thesis.

# EXECUTIVE SUMMARY

In this thesis, the main research objective is identifying the factors affecting the success of Vietnam's retail supply chain during COVID-19. To reach this objective, a combination of qualitative research methods and quantitative research is used.

Qualitative research is done using the method of document and record. The authors examine the theory to detect factors affecting the success of supply chain from previous studies. The results of the qualitative research show that there are 7 factors affecting the success of the retail supply chain in Vietnam.

Quantitative research is performed by looking at the relationship between the 7 factors identified in qualitative research on the success of the supply chain. Regression model and SPSS analysis tool are used to confirm factors that have a strong influence on the success of Vietnam's retail supply chain during the COVID-19 period.

Cronbach's Alpha reliability analysis, exploratory factor analysis (EFA), correlation analysis and SPSS 20 software are used to evaluate the scale, check the distinction and convergence of the research model and test the research hypotheses. Research results show the importance of *Strategy and Transportation applying Information Technology*, *Inventory*, and *Information* to the success of Vietnam's retail supply chain during the COVID-19 period.

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# ABBREVIATIONS AND ACRONYMS LIST

| | |
|---|---|
| **CPTPP** | *Comprehensive and Progressive Agreement for Trans-Pacific Partnership* |
| **EVFTA** | *European-Vietnam Free Trade Agreement* |
| **COVID-19** | *Coronavirus disease of 2019* |
| **FPT** | *The Company for Financing & Promoting Technology* |
| **EFA** | *Exploratory Factor Analysis* |
| **SCOR** | *Supply Chain Operations Reference Model* |
| **ROI** | *Return On Investment* |
| **IT** | *Information technology* |
| **SCM** | *Supply Chain Management* |
| **E-risks** | *Electronic risks* |
| **EU** | *The European Union* |
| **NBSC** | *National Bureau of Statistics of China* |
| **WTO** | *The World Trade Organization* |
| **IKEA** | *Ingvar Kamprad Elmtaryd Agunnaryd - Swedish business* |
| **ITC** | *The International Trade Centre* |
| **PCS** | *Personal Communication Service* |
| **US** | *United States* |
| **USD** | *United States Dollar* |
| **VND** | *Vietnamese Dong* |
| **GDP** | *Gross Domestic Product* |
| **AEC** | *ASEAN Economic Community* |
| **TPP** | *Trans-Pacific Partnership Agreement* |
| **FTA** | *Free Trade Agreement* |
| **Q1** | *1st Quarter* |
| **Q2** | *2nd Quarter* |
| **CBRE** | *Coldwell Banker Richard Ellis* |
| **CBD** | *Central Business District* |
| **ICT** | *Information and Communication Technology* |
| **IoT** | *Internet of things* |
| **AI** | *Artificial Intelligence* |
| **EP** | *European patent applications* |
| **WO** | *World Intellectual Property Organization* |
| **LPI** | *Logistics Performance Index* |
| **WB** | *World Bank* |
| **LPT** | *Licensed Penetration Tester* |
| **RFID** | *Radio Frequency Identification* |

| | |
|---|---|
| **VLA** | *Vietnam Logistics Business Association* |
| **PwC** | *PricewaterhouseCoopers* |
| **LiFi** | *Light Fidelity* |
| **TBS** | *Turner Broadcasting System* |
| **WMS** | *Warehouse Management System* |
| **UN** | *The United Nations* |
| **EVFTA** | *The EU-Vietnam Free Trade Agreement* |
| **VKFTA** | *Vietnam-Korea Free Trade Agreement* |
| **ROI** | *Return on Investment* |
| **IST** | *Information and Software Technology* |
| **NFL** | *The National Football League* |
| **FBA** | *Fulfillment by Amazon* |
| **CCTV** | *Closed-circuit television* |
| **VECOM** | *Vietnam E-Commerce Association* |
| **GSO** | *Global Sales Office* |
| **B2B** | *Business-to-business* |
| **B2C** | *Business-to-consumer* |
| **C2C** | *Consumer to consumer* |
| **P&G** | *Procter & Gamble* |
| **USAID** | *United States Agency for International Development* |
| **SMEs** | *Small and medium-sized enterprises* |
| **JIT** | *Just In Time* |
| **JIC** | *Just In Case* |

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# CHAPTER 1: INTRODUCTION

## 1.1. TOPIC BACKGROUND

In recent years, Vietnam has always been ranked the most potential market in the world for the development of retail sector. Vietnam's retail market is attractive with a fairly low degree of saturation. With a population of over 96 million people (2019), income per capita and household spending is gradually increasing, and many free trade agreements were completed in negotiation and signing such as Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), European-Vietnam Free Trade Agreement (EVFTA), etc. Vietnam's retail market has become one of the six industries attracting the most investment inflows today.

In the context of globalization takes place quickly, competitive pressure is increasing in both domestic and foreign markets, competition between businesses is understood as competition between the supply chains. Especially for retail businesses, having an effective supply chain is one of the vital factors that help businesses assert their position as well as survive and develop in an international competitive environment in present.

For a long time, diversification of the supply was not paid enough attention. Most major economies depend on the market and supply from China. Therefore, any disruption in China will put global supply chains at risk. At the end of 2019, the Covid-19 unexpectedly appeared, starting in China and spreading to many other countries around the world, seriously affected every aspect and exposed gaps in the ability to respond to incidents in many areas. Retail is one of the most sensitive industries and suffered the most in the "Great blockade" period due to the epidemic.

The Covid-19 has created unprecedented chaos in the global supply chain. The supply of goods from China stopped suddenly or delayed, causing shortages, and inventory of companies quickly depleted. The companies are urgently seeking alternative sources outside of China as well as finding other transportation partners to secure orders. However, a survey conducted by CEL Consulting Company in late March 2020 showed that 83% of companies in the tangible

value chain (retailers, transportation, traders, manufacturers) in Vietnam had the problems of material supply. 47% of them have specific difficulties with supply from China, and mostly, there were a shortage of raw materials.

The Covid-19 made the economy and global supply chain in general and each country in particular has significant changes. The world in general and each country and businesses in particular are in the process of innovation, adaptation and self-arrangement of supply chains, production activities and new business directions to deal with the Covid-19. The disruption of global supply chains due to the impact of the disease has made businesses realize the urgency of diversifying their production catalog and supply chains to avoid being dependent on one country. Forecast for 2020, due to the impact of Covid-19, the trend of shifting production from China to the countries in Southeast Asia in which Vietnam is an important destination will continue to take place. Vietnam retail businesses will benefit when many manufacturing facilities are relocated from China to Vietnam.

Despite being one of the most sensitive industries and suffering the most severe losses in epidemic, retail will play an important role in forecasting of the positive recovery of Vietnam's economy after Covid-19. While Vietnam was identified as a "bright spot" with prospects of quick recovery after Covid-19, Vietnam's retail industry will be one of the most important drivers of this "revival" process.

## 1.2. PRACTICAL PROBLEM

The first months of 2020, in addition to being praised for the miracle of dealing with the epidemic, Vietnam has been also given the optimistic view about the prospect of economic recovery with more than 96 million people by the international organizations and the leading media channels. According to the Ministry of Planning and Investment, despite the outbreak of Covid-19, foreign investors continued to pay attention to the Vietnamese market with 12.33 billion USD of registered capital recorded in the first 4 months of 2020, equal to 84.5% compared to the same period in 2019. In terms of value, foreign capital inflows into Vietnam still increase over the same period of 2016 - 2018.

In forecasting of a positive recovery of the Vietnamese economy after Covid-19, retail will be an extremely important sector, although it is also one of the industries seriously damaged by the epidemic. The retail industry not only quickly copes with social change but also has a faster recovery speed than other industries thanks to the available potential and the prospects opening after the pandemic. Vietnam retail retains its attractiveness to foreign investors, adapting to changing consumer shopping habits and meeting the needs of domestic manufacturers, especially necessary commodity groups.

Since the pandemic, people's consumption habits have changed. Consumers are more cautious in spending. Through a survey of CEL, the companies operating in retail, distribution and logistics (excluding e-commerce, last-mile delivery) have recorded a decline in revenue, reduced by 25% compared to the target set in the first quarter of 2020 and is not expected to recover in 2020. However, the Covid-19 made the consumers to choose a more convenient and safer way of shopping for their daily needs. E-commerce and home delivery services became the center of this change. People are accustomed to home delivery and online purchases, so as the offline sales channel gradually recovers, the habits and needs of online shopping, home delivery service will continue. This is a new and fundamental trend in the consumer goods industry.

Originate from the above mentioned practice, the authors focus on studying the impact of global supply chain shifting trends due to Covid-19 on Vietnam's retail industry as well as analyze opportunities for the retail industry and then offer solutions to help retail businesses in Vietnam improve their competitiveness in this supply chain shifting trend. For that reason, the authors chose ***"The impacts of global supply chain shift on Vietnam's retail industry due to the Covid-19 period: Vietnam's opportunities and solutions"*** as the topic for the graduating thesis with the desire to be a reference base for retail businesses in Vietnam in order to enable them to survive and thrive in the context of fierce competition and the world economy is in serious recession caused by Covid-19.

### 1.3. RESEARCH QUESTIONS

**Question 1:** During the COVID-19 period, what are the important factors affecting the success of Vietnamese retail supply chain under the influence of global supply chain shifting trends?

**Question 2:** What are opportunities and solutions for Vietnamese retail supply chain?

## 1.4. RESEARCH SCOPE

This study is based on a survey of Vietnamese retail businesses that are doing business in the Vietnamese market. Because of limited resource, this thesis will focus on researching retail supply chain operations at grocery stores in Hanoi and the stores belonging to some large Vietnamese retail businesses operating in Hanoi, namely Vingroup's retail stores (Vinmart, Vinmart+), Mobile World Investment Joint Stock Company (Bach Hoa Xanh, Thegioididong, Dien May Xanh), Phu Nhuan Jewelry Joint Stock Company, FPT Digital Retail Joint Stock Company (FPT Shop).

Secondary data is collected from 2018 to the time of the study, including the reports of the Ministry of Industry and Trade, the General Statistics Office, newspapers, etc.

Primary data is taken from the survey tables of employees or owners working in a retail unit whose business chain is relevant to Vietnam’s supply chain operation (estimated the number of respondents is about 150) in 2020.

## 1.5. RESEARCH OBJJECTIVES

In this thesis, the main research objective is to identify factors affecting the success of retail supply chain in the context of Vietnam under the impact of global supply chain shifting trends caused by COVID-19 pandemic. It is the scientific reference base for providing solutions to help Vietnamese retail business units recover and develop after the pandemic.

Based on the research questions in the above section, the thesis should fulfill the following specific objectives:

· Identifying the factors affecting on the success of Vietnam’s retail supply chain under the impact of global supply chain shifts caused by COVID-19 pandemic.

· Determining the impact intensity of the factors which are focused on.

· Analyzing the strengths and weaknesses of Vietnam's retail industry, thereby giving solutions which are suitable for the supply chain operation in Vietnam's retail industry after the COVID-19 pandemic.

## 1.6. RESEARCH METHODS

### 1.6.1. Qualitative research methods

Qualitative research is carried out to discover factors affecting on Vietnam's retail supply chain operation during period of COVID-19. This will be a preliminary research to serve as a basis for conducting the next quantitative research.

· Using the method of synthesis and statistics from the available secondary data to compare, evaluate and analyze the contents that need to be focused on research.

· Using the method of systematizing research on Vietnam's retail supply chain operation in the past to detect the influential factors.

· Using the method of inference to argue and explain the factors affecting on the retail supply chain operation in the Vietnamese business environment during the period of COVID-19.

### 1.6.2. Quantitative research method

This method is done to give the values, reliability and suitability of the model to confirm the accuracy of the qualitative research above. The implementation of quantitative research aims to refine the factors found in qualitative research. This research is conducted to determine the factors affecting on the success of Vietnam's retail supply chain during the period of COVID-19 and their impact intensity.

Quantitative research is done through the following steps:

· Step 1: Collecting the data by using a questionnaire to survey employees working in the retail supply chain of the Vietnamese retail businesses. The size of the sample is expected to be 180 (N = 180) and is selected according to the method of convenience sampling.

· Step 2: Evaluating the reliability and value of the scale by Cronbach Alpha reliability coefficient, exploratory factor analysis (EFA) and correlation analysis to eliminate the observed variables that do not explain the research concept, at the same time, restructuring the

remaining observed variables into the appropriate factors (measurement components) to be a basis for editing research models and research hypotheses and the next contents analyzed and tested.

- Step 3: Performing regression analysis through sample data collection on the basis of adjusting the scale to test the theoretical model.

## 1.7. OVERVIEW OF THE RESEARCH FIELD

### a) The research of Michael Hugos

Hugos (2003) says that all businesses in a supply chain which operates efficiently need to consider the five elements that bring efficiency to the entire supply chain. Those five components are manufacturing, inventory, location, transportation and information. In which, information plays an important role in regulating the activity of the other four components.

### b) The research of David Blanchard

David (2011) points out that to perform operations in the supply chain well, we first need to pay attention to planning and forecasting. Next, it is important to perform the purchasing well (preparing the supply of input materials) to ensure the supply chain operates safely and efficiently. Then, we need to pay attention to five factors: manufacturing, inventory, location, transportation and information that Michael Hugos mentioned above.

However, Michael Hugos and David Blanchard built the theory on the large firms which are able to build supply chains themselves. Meanwhile, the majority of Vietnamese enterprises are small and medium and they still need to associate and cooperate with other partners to build a competitive supply chain in the current situation. Therefore, it is not enough to only pay attention to the five components above in developing the supply chain for enterprises in Vietnam. Every business organization is a part of at least one supply chain, and many are part of multiple supply chains (Stevenson, 2013).

### c) The research of Radall et al and Chopra & Medindl

There is a lot of research that has been done to find the right strategy for the supply chain operation in the specific business environment and show the importance of appropriate

strategic planning in the supply chain. Chopra & Medindl (2013) indicate that supply chain strategy is a combination of supplier strategy, operations strategy and logistics strategy.

When Randall et al (2011) research the leaders in leading 27 retail supply chains in the US, he finds that for the retail industry, the rational strategy applied by administrators to each chain is different and depends on the retail model that they are pursuing. Because the world economic situation is increasingly volatile, applying a flexible and balanced strategy will bring competitive advantages for retail businesses. Another result of this research is that supply chains are looking for a way to balance prices and services in order to achieve the highest satisfaction of customer.

**d) The research of Varma & Khan; Logan et al; Daxböck, Kröber & Bergmann**

The study of Varma & Khan (2017) discussed the role of Information Technology as an enabler in Supply Chain Management with vast benefits to organizations with a comprehensive IT implementation as well as curbing e-risks. According to Varma & Khan, IT plays an important role in integrating suppliers, manufactures, distributors and customers to satisfy the quantity and quality of products.

Logan et al (2018) aim to research the development of the supply chain by meeting the needs of the market rather than solving the internal problems in the supply chain. The research shows that enabling technologies provide opportunities to modify and improve the planning and control of grocery retail to effectively supply the market with grocery product. The research investigates the consumer trends and enabling technologies, and conceptualizes how certain aspects of planning and control of grocery retail supply chains will differ in the future.

The study of Daxböck, Kröber & Bergmann (2019) illustrates effects and potentials that digitization has on the supply chain. Digitization creates new possibilities for a closer interlinking of participants as well as wide-ranging potentials for optimization of supply chain planning and management.

**e) Summary of the previous research**

From the above researchers, the thesis has identified 7 factors affecting on Vietnam's supply chain operation, including: *Manufacturing, Inventory, Location, Transportation, Information, Strategy, Information Technology.*

## 1.8. CONTRIBUTIONS AND NOVELTY OF THIS THESIS

This thesis is based on supply chain theories previously done by researchers and on the actual situation of the retail industry in Vietnam. Problems about the supply chain operation in the retail business sector have its own characteristics and bring the features of the transitional economy like Vietnam, which is of little interest to researchers. In particular, researching on supply chain's activity under the impact of the COVID-19 pandemic is a topical issue in the current period. The results of this research will help Vietnamese retail businesses units' managers pay attention to the critical factors to survive and thrive in the COVID-19 pandemic as well as improve the competitiveness of the supply chain in which they are participating. This research is the reference basis for the next research on the supply chain operation under the impact of the COVID-19 pandemic, not only in the retail sector but also in other sectors.

## 1.9. STRUCTURE OF THE THESIS

In addition to the list of abbreviations, tables of figures, lists of figures, diagrams and charts, list of references and appendices, the structure of the study consists of 5 chapters as bellows:

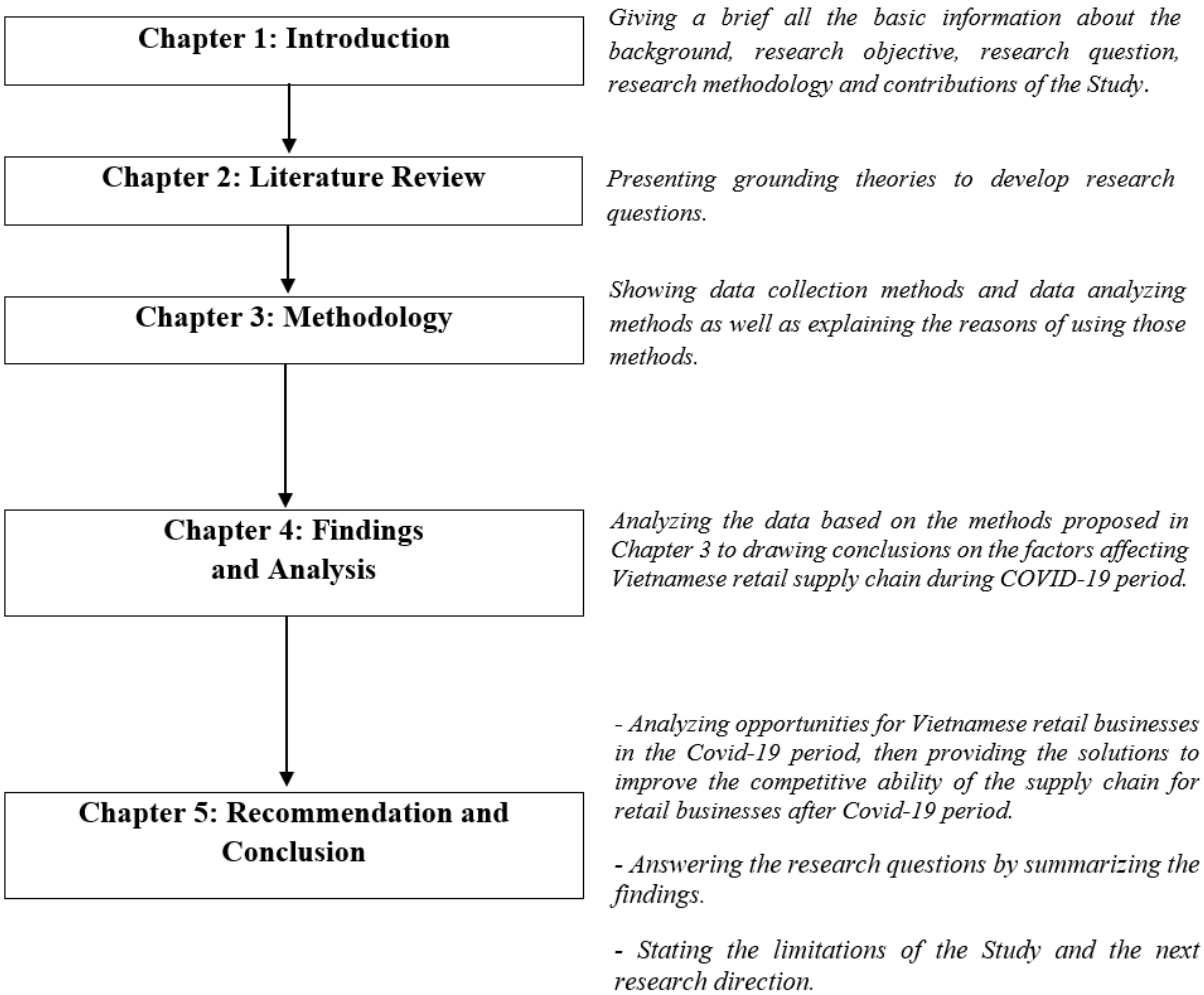



**Figure 1.1** Structure of the thesis

# SUMMARY OF CHAPTER 1

Chapter 1 presents practical and theoretical issues of the research problem in order to draw conclusions about the urgency to implement this thesis. Next, this chapter presents the research objective, and research scope. This chapter also presents an overview of the studies done by scientists in the past related to the topic of the thesis.

# CHAPTER 2: LITERATURE REVIEW

## 2.1. GENERAL THEORIES OF RETAILING

### 2.1.1. Definition and characteristics of retailing

Levy and Weitz (1998) defined retailing as *"a set of business activities that add value to the products and services sold to consumers for their personal or family use"*. According to Mukherjee et al (2005), retailing is *"all activities involved in selling goods or services directly to final consumers for their personal, non-business use via shops, markets, door-to-door selling, mail order or over the internet, where the buyer intends to consume the product through personal, family or household dues"*. Lewison and Delozier (1982) argued that a retailer is *"any business establishment that directs its marketing efforts toward the final consumer for the purpose of selling goods or services"*.

Based on the above concepts, some characteristics of retailing could be concluded as follows:

- Retailing involves a series of activities.

- Retailing provides not only goods but also services.

- Retailing is the sale of goods to the public in relatively small quantities for use or consumption rather than for resale.

As such, retailers are an important part of the supply chain in order for manufacturers to connect with end consumers.

### 2.1.2. The role of retailing

Retailing plays a role in both serving consumption and promoting production. Retailing takes responsibility for organizing the circulation of goods and supply all the services for social from that facilitate the development of commodity production. Retailing contributes to expand consumption, promote products, and expanding the social division of labor implementing the science and technology revolution in the sectors of the national economy. Radosavljević et al. (2009) stated that retail trade reflects the production motivation of the manufacturer and increase job creation.

Retail businesses are in the middle of connecting and strengthening cooperation among the members of a supply chain and effectively enhance the interaction between the members.

Retailing also represents the production level of the nation. The quantity of domestic goods in a retail distribution system shows the capabilities and qualifications of domestic manufacturing enterprises. When foreign businesses dominate the domestic retail market, the whole domestic production system will be weakened and Vietnam's retailing will increasingly depend on foreign supply.

### 2.1.3. Types of retailing

Minh (2018) categorized the retail types based on 2 criteria: ownership type and the way contacting with customers.

#### 2.1.3.1. Classification by ownership type

Forms of retail classified by ownership type include *independent stores, chain stores, franchises and cooperatives.*

- *Independent stores*: The owner only owns a single store. The majority of these independent stores are traditional grocery stores.

- *Chain stores*: Chain stores are a number of stores owned by a single owner, such as Vinmart stores, FPT Shops, etc.

- *Franchises*: Franchise is a form where the owner (franchisor) allows another business (franchisee) to use an entire business system in exchange for other compensation fees. An explicit contract will define the terms of this relationship. Franchise will help the franchisor quickly expand and develop the system at a low cost. On the other hand, franchisees do not need to build a brand and get help from the franchisee's management system and experience. Some samples of franchise stores are KFC, Starbucks, Ding Tea, etc.

- *Cooperatives*: Cooperatives have a large number of owners and operate within the framework of the provisions of the Cooperative law. In Vietnam, there are still many retail distribution

organizations operating in the form of cooperatives such as Dien May Xanh – The Gioi Di Dong store.

#### 2.1.3.2. Classification by the way contacting with customers

Forms of retail classified the way contacting with customers are *brick-and-mortar store* and *non-store.*

- *Brick-and-mortar store forms* include the following types:

· Grocery store: A small store that sells a small number of essential products for everyday life. Grocery stores often have no or few employees. The grocery stores are usually located in densely populated areas.

· Convenience store: A small scale retail business which provides a wide range of items that serve everyday life. There are diverse types of items and the quantities of goods are large. The convenience stores are usually located in densely populated areas or in urban areas.

· Supermarket: There are large categories and quantities of goods. Supermarkets are often located in large areas with convenient transportation networks. There are many supermarkets that are operating in Vietnam such as Big C, MM Mega market, AEON Mall, etc.

· Shopping mall: A type of multi-function business both in goods and services, including shops, including stores, halls, meeting rooms, offices for rent, etc arranged in a concentrated manner. According to the regulations of the Ministry of Industry & Trade, the shopping mall area must be more than 10000 square meters. Shopping malls are usually located in the center of urban areas.

· Traditional markets: mainly selling food, prices may vary depending on the quality of goods. It is possible for consumers to bargain.

- *Non-store forms*

· Vending machine: A machine that dispenses small articles such as food, drinks, or cigarettes when a coin, bill, or cash is inserted.

· Direct selling: consists of two main business models: single-level marketing, in which a direct seller buys products from a parent organization and sells them directly to customers, and multi-level marketing, in which the direct seller may earn money from both direct sales to customers and by sponsoring new direct sellers and potentially earning a commission from their efforts. In direct selling, personal relationship between buyer and seller is required.

· Online selling: A form of electronic commerce which allows sellers to directly sell goods or services to a buyer over the Internet using a web browser.

## 2.2. GENERAL THEORIES OF SUPPLY CHAIN

### 2.2.1. Definition of supply chain

A supply chain will exist at any time business is conducted. There are many ways to interpret and understand the term of supply chain:

· Supply chain is the *"sequence of organizations—their facilities, functions, and activities—that are involved in producing and delivering a product or service.*" (Stevenson, 2013).

· Supply chain is *"a set of three or more organizations linked directly by one or more of the upstream or downstream flows of products, services, finances, and information from a source to a customer.*" (Monczka, 2016).

· Supply chain is *"a network of organizations which have to deal with upstream and downstream linkages between each other. The linkages reflect different processes and activities that produce value in the form of products and services delivered to the end customer."* (Christopher, 2005).

The similarity in the above concepts is that there are more than two members in a supply chain. Besides, a supply chain involves a variety of processes. In other words, in a supply chain, the partners work together to get the product or service from its original state to the customer, including moving and transforming raw materials into finished products, transporting those products, and distributing them to the end-user.

Supply chain can be visualized as a chain. Different production and/or service operations such as factories, storage facilities, activities, and modes of transportation would be represented by the links of the chain. Each link is a customer of the previous link and a supplier to the following link. If any one of the links fails because of any reason, that can break off the flow in the supply chain.

Another view of a supply chain is as a tree with many branches. Key suppliers and transporters are the main branches of the tree. Main branches have side branches. Those side branches also have their own side branches. The tree view is helpful to seize the size and complexity that often exists in supply chains. An extension of this tree view is that each supplier (branch) has its own supply tree.
The components of a typical supply chain include customers, retail outlets, distributors, manufacturers, raw material supplier.

According to Stevenson (2013), supply chains are both external and internal to the organization. The external parts of a supply chain provide raw materials, parts, equipment, supplies, and/or other inputs to the organization, and they deliver outputs that are goods to the organization's customers. The internal parts of a supply chain are part of the operations function itself, supplying operations with parts and materials, performing work on products, and/or performing services.

### 2.2.2. Definition of retail supply chain

The supply chain in a retail company is different from a traditional manufacturing supply chain (Ray, 2010). The retail supply chain pays great attention to the quality and quantity of goods supplied from suppliers (i.e. inputs) while other manufacturing supply chains are concerned about the movement of raw materials. Minh (2018) suggested the concept of retail supply chain

as *"The supply chain includes activities of all related-parties from the input stage to the stage of delivering products or services to end consumers.*"

From the above concept, it can be seen that the similarity of retail supply chains and other supply chains is the combination of activities of many members in the supply chain. The difference between retail supply chains and other supply chains is that retail businesses do not necessarily have to be involved in converting raw materials into finished products.

### 2.2.3. Activities in supply chain

To build an effective supply chain, the first thing is to properly assess the activities in the supply chain. There are many studies and models developed by researchers to describe supply chain performance. However, Supply Chain Operations Reference Model (SCOR) is the most widely used model.

The SCOR model, which is built and developed by Supply Chain Council, providing framework guidance for developing the supply chain structure. SCOR integrates business concepts of process engineering, metrics, benchmarking, leading practices, and people skills into a single framework. Under SCOR, supply chain management consists of 5 processes: *Plan, source, make, deliver, and return*. SCOR also includes a series of *enable* elements for each of the processes. These processes spans from "the supplier's supplier to the customer's customer" - a network of organizations and companies connected by flows of goods, information and finance, created to meet the needs of end users.

· Plan: Processes that balance resources with requirements and determining communication along the entire chain to develop a course of action which best meets sourcing, production, and delivery requirements.

· Source: Processes that obtain goods and services to meet planned or actual demand.

· Make: Processes that transform products into final state and make them ready to meet planned or actual demand.

· Deliver: Processes being associated with delivering finished goods and services to meet planned or actual demand, including order, transportation, and distribution management.

· Return: Processes that involve in returning or receiving returned products for any reason, either from customers or suppliers. These processes extend to post-delivery customer support and follow-up.

· Enable: Processes that are associated with the management of the supply chain such as business rules, performance, data, resources, facilities, contracts, supply chain network management, managing regulatory compliance and risk management.

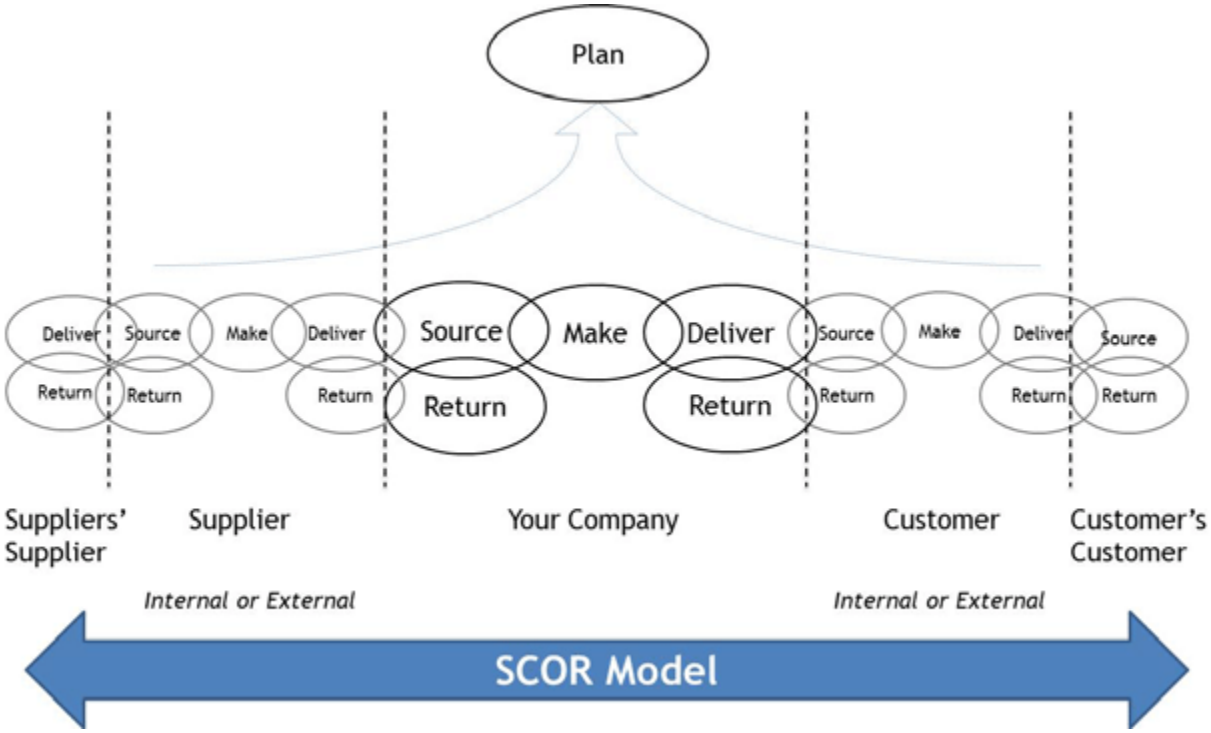



**Figure 2.1. The SCOR Framework**

***Source: Supply-chain Council***

SCOR Framework provides three levels of process detail:

· Level 1: Defining scope and content of SCOR, including geographies, segments and context. This level focus on the six main process configurations: plan, source, make, deliver, return and enable.

· Level 2: Configuration of the supply chain, including geographies, segments and products. At Level 2, metrics are high level and evaluated across multiple SCOR processes. This level includes subtype categories ("children" categories) that fall under the "parent" categories found in Level 1.

· Level 3: Process element details, identifying key business activities within the chain. At this level, any Level 2 process or subcategory could be associated with a Level 3 process.

· Level 4: Conducting the processes defined at previous levels in practice. This level is not contained in SCOR must be defined in order to carry out improvements and manage processes.

## 2.3. THE FACTORS IMPACTING ON VIETNAM'S RETAIL SUPPLY CHAIN

Establishing an environment of consistent supply chain visibility is important to avoid incidents of mismatch between supply and demand, establish more efficient manufacturing, and lower costs. To implement this visibility, businesses have to consider many elements.

### 2.3.1. Manufacturing

Manufacturing is the ability that a supply chain creates and stores products. Managers need to balance the ability to satisfy and meet customer needs with production efficiency of businesses. Businesses in the supply chain need to make accurate market forecasts and clearly determine the production goals of each member in the chain, either by focusing on products or on functions in order to divide the work effectively and avoid overlap or surplus/shortage situation.

### 2.3.2. Inventory

Inventory factor greatly affect the revenue and profitability of the businesses. Effective inventory management is important for the successful operation of most businesses and their supply chains (Stevenson, 2013). Because inventories may represent a significant portion of total assets, a reduction of inventories can result in a significant increase in Return On Investment (ROI), which is profit after taxes divided by total assets. However, reducing inventories has to be weighed against a possible risk of a decrease in customer service. The overall objective of inventory management is to achieve satisfactory levels of customer service while keeping inventory costs within reasonable bounds (Stevenson, 2013). This is a big challenge for businesses because reducing inventories often occurs in conflict with meeting customer service requirements. Businesses need to make decisions about when to order and how much to order.

### 2.3.3. Location

The efficient and effective movement of goods from raw material sites to processing facilities, component fabrication plants, finished goods assembly plants, distribution centers, retailers and customers is critical in today's competitive environment (Daskin, Sriyder & Berger, 2005). In order to build an effective supply chain, businesses in the chain need to answer the question of where factories and warehouses should be located to provide the best efficiency for the supply chain. Managers need to consider the related factors including factory costs, labor, human resources and infrastructure status in order to make a strategic decision about the location, then determine the circulation channels to bring the products to the end consumers.

### 2.3.4. Transportation

Transportation refers to the movement of product from one location to another as it makes its way from the beginning of a supply chain to the customer. Transportation plays a key role in every supply chain because products are rarely produced and consumed in the same location. Any supply chain’s success is closely linked to the appropriate use of transportation. Effective transport improves a supply chain by decreasing waste of materials and time. This helps businesses deliver products to the right location, and on time. Using flexible means of transportation will shorten transport time. However, transportation costs occupied a large

portion of a business's supply chain costs. Therefore, it is important to calculate the balance between flexibility and costs.

### 2.3.5. Information

Information is crucial to the performance of a supply chain because it provides supply chain visibility, allowing managers to make decisions to improve the supply chain's performance. Information is a key supply chain driver because it serves as the glue that allows the other supply chain drivers to work together to create an integrated and coordinated supply chain. To support effective supply chain decisions, information must have the following characteristics: Information must be accurate, must be accessible in a timely manner, must be of the right kind, and must be shared. The inherent challenges to the successful development and implementation of effective information are the sharing of information along supply chains and the discipline to ensure the integrity of the data collected (Coyle, Langley, Novack & Gibson, 2013).

### 2.3.6. Strategy

A supply chain strategy determines the nature of procurement of raw materials, transportation of materials to and from the company, manufacture of the product or operation to provide the service, and distribution of the product to the customer, along with any follow-up service and a specification of whether these processes will be performed in-house or outsourced (Chopra & Medindl, 2013). The supply chain strategy defines not only what processes within the firm should do well but also what the role played by each supply chain entity is. Supply chain strategy is a combination of supplier strategy, operations strategy, and logistics strategy. Supply chain strategy also includes design decisions related to inventory, transportation, operating facilities, and information flows.

Today, firms are rarely completely vertically integrated. This creates great challenges to integrate and coordinate the flow of raw materials and products from countless suppliers, intermediaries in the chain. On the other hand, usually, supply chains will operate around a central member and this member will control the entire supply chain. Therefore, it is necessary to have appropriate strategies for the members of the supply chain.

### 2.3.7. Information Technology

According to Varma & Khan (2017), Information Technology (IT) in Supply Chain Management (SCM) is playing critical role in optimizing decisions of the supply chain network flow for achieving organizational competitiveness, improving higher service level, lowering inventory, supply chain costs and reducing electronic risks (e-risks). Information Technology is also required in order to achieve integration and effective information sharing across and beyond the organizations. The organizations are moving towards the virtual supply chain with help of rapid changes in technology and IT applications.

Consumer trends are changing putting pressure on providing higher quality, availability, innovativeness and environmental performance. To meet these increased requirements, enabling technologies provide opportunities to modify and improve the planning and control of grocery retail in order to effectively supply the market with grocery products. (Logan et al, 2018).

## 2.4. THE HYPOTHESIS AND PROPOSED RESEARCH MODEL

Results from qualitative research, the thesis has identified 7 factors that managers of retail supply chains need to focus their attention on solving problems arising from them to help effective supply chain operations during the period of COVID-19. To accomplish the set objectives, in the next step, the thesis should determine the relationship between these factors and their impact intensity. This will be basis of identifying opportunities and solutions for Vietnam in Chapter 5. The following hypotheses are stated:

*H1: Manufacturing has a positive impact on the success of retail supply chain.*

*H2: Inventory has a positive impact on the success of retail supply chain.*

*H3: Transportation has a positive impact on the success of retail supply chain.*

*H4: Location has a positively impact on the success of retail supply chain.*

*H5: Information has a positive impact on the success of retail supply chain.*

*H6: Strategy has a positive impact on the success of retail supply chain.*

*H7: Information Technology has a positive impact on the success of retail supply chain.*

From the above research hypotheses, the thesis gives a proposed research model as shown in the figure 2.2 below. SPSS 20 software is used to analyze the results in determining the impact strength and to test hypotheses. All the hypotheses are assumed to have a relationship in the same direction, significant; the factors included in the model are assumed to have a resonance effect to increase the performance of these factors in the supply chain application. Improving the performance of one factor has the potential to make other operations complete and the supply chain to operate more efficiently.

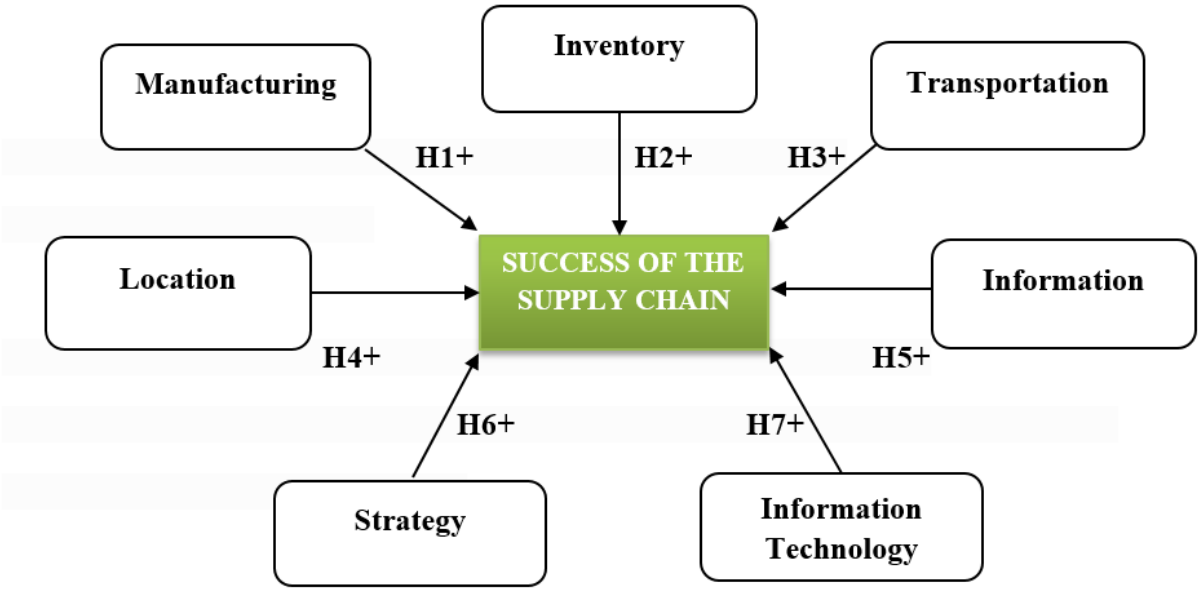



**Figure 2.2. Research model**

***Source: Proposed by the authors***

# SUMMARY OF CHAPTER 2

Chapter 2 introduces the concepts and theory of retail, supply chain and retail supply chain. Key activities in the supply chain are also covered in this chapter to give the reader an overview of the topic. SCOR model, which is built and developed by the Supply Chain Council, is used to describe supply chain activities. Next, research hypotheses are proposed. From these hypotheses, the research model of the thesis has been formed.

# CHAPTER 3: METHODOLOGY

## 3.1. SELECTING RESEARCH METHODS

### 3.1.1. Data Collection Methods

#### 3.1.1.1. Introduction

Data collection is a process of collecting data from all the relevant sources to find answers to the research problem, test the hypothesis and evaluate the outcomes. Data collected can be divided into two categories: primary data and secondary data.

***Primary data***

Primary data is collected from the first-hand experience and is not used in the past. The data gathered by primary data collection methods are specific to the research's motive and highly accurate. The sources of primary data are usually chosen and tailored specifically to meet the demands or requirements of a particular research. Also, before choosing a data collection source, things like the aim of the research and target population need to be identified (Blog, 2020).

***Secondary data***

Secondary data is a type of data that has already been published in books, newspapers, magazines, journals and online portals. There is an abundance of data available in these sources about your research area in business studies, almost regardless of the nature of the research area. Therefore, application of appropriate set of criteria to select secondary data to be used in the study plays an important role in terms of increasing the levels of research validity and reliability.

Secondary data is the data that has been used in the past. The researcher can obtain data from the sources both internal and external to the organization. The secondary data collection methods can involve both quantitative and qualitative techniques. Secondary data is easily available also less time of consuming and expensive as compared to the primary data. However, with the secondary data collection methods the authenticity of the data gathered cannot be verified.

### 3.1.1.2. Data collection tools

In this thesis, document and record is used to collect secondary data, and questionnaire and survey is used to collect primary data.

***Document and Record***

According to Babbie (2010), document analysis is "the study of recorded human communications, such as books, websites, paintings and laws". Document analysis is a method of data collection which involves analysis of content from written documents in order to make certain deductions based on the study parameters. The method is mainly used in qualitative research as a method of qualitative analysis. Using documents and records is efficient and inexpensive.

***Questionnaire and Survey***

A questionnaire is any list of questions used for data collection. A survey is defined as a method of measuring opinions, experiences and other phenomena to inform wider research or actions. Questionnaires and surveys can be used to ask questions that have closed-ended answers. Data gathered from questionnaires and surveys can be analyzed in many different ways.

### 3.1.1.3. Sampling method in data collection

There are two types of basic sampling technique which are: probability and non-probability (Saunders, Lewis and Thornhill, N.D.). Probability sampling is based on the fact that every individual of a population has a known and equal chance of being selected. In a non-probability sample, individuals are selected based on non-random criteria, and not every individual has a chance of being included.

Convenience sampling, which is a nonprobability sampling technique, is used in this research. Convenience sampling relies on data collection from population individuals who are easily accessible to researcher or conveniently available to participate in study. The outstanding advantage of convenience sampling is the saving of time and money.

### 3.1.2. Data Analysis Method

#### 3.1.2.1. Qualitative and Quantitative Analysis Method

*Qualitative analysis method* is an approach that aims to explore, describe, and explain based on the means of the survey such as Experiences, perceptions, intentions, behaviors, attitudes, motives, etc. They can direct the researcher to formulate hypotheses and explanations. Qualitative research method suitable for answering questions "How?", "Why?", Or "What?". In qualitative research, the data used can be qualitative or quantitative. Through these data, the researcher oriented, explores, and explains the hypotheses. Qualitative research requires a high level of thinking ability, reasoning, and flexibility in handling raw data of researchers.

*Quantitative research method* is to consider phenomena in a measurable way based on the objects of study. Quantitative research is often applied to phenomena that can be described and converted into data. Quantitative research often goes hand in hand with theoretical testing based on deductive methods. It is common practice to use different methods to quantify, measure, and reflect the relationship between variables when conducting quantitative research. Data in quantitative research are usually numbers, quantities, ratios, levels, etc. Quantitative data reflects the degree of inferiority through the data processed by the models and math to serve the research more accurately.

The difference between qualitative and quantitative research is a fundamental distinction within research practice. When collecting and analyzing data, quantitative research deals with numbers and statistics, while qualitative research deals with words and meanings. Both are important for gaining different kinds of knowledge.

| Items | Qualitative Method | Quantitative Method |
|---|---|---|
| Analytical Objectives | Description, exploration and discovery | Description, explanation and prediction |
| Reasoning | Inductive | Deductive |
| Interpretation | Subjective | Objective |
| Type of data collect | Non-numerical narrative and visual data | Numerical data |
| Data Collection Approach | Unstructured, free form | Structured responses categories provided |
| Sample | Small number, usually non-representative cases | Large number, usually representative cases |

**Table 3.1. Comparison of qualitative research method and quantitative research method**

***Source: Proposed by authors***

There are some obvious differences between qualitative research method and quantitative research method:

· Qualitative analysis is a subjective analysis that is more concerned with non-statistical data which cannot be computed to get a deeper understanding of why certain things occur whereas quantitative analysis is an objective one that quantifies data to test hypotheses or predict the future.

· Qualitative research method is associated with inductive reasoning while quantitative is associate with deductive reasoning. (Inductive reasoning is a type of reasoning that involves

drawing a general conclusion from a set of specific observations. Deductive reasoning is a type of logical thinking that starts with a general idea and reaches a specific conclusion).

· In qualitative analysis, the data is collected in an unstructured way in small samples which cannot be used to represent the whole population. In contrast, in quantitative analysis, data is collected in large, representative samples that can generalize the entire population.

· Qualitative analysis is exploratory. Quantitative analysis is conclusive.

Each of qualitative and quantitative research method has its own strengths and limitations. Combination of both methodologies can provide a better understanding of research problems than either by qualitative or quantitative research method itself. *Mixed method* is chosen in this thesis because of its strength of drawing on both qualitative and quantitative research and minimizing the limitations of both approaches.

According to Creswell (2018), mixed methods research is "an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the integration of qualitative and quantitative data yields additional insight beyond the information provided by either the quantitative or qualitative data alone." Tho (2011) classified the mixed-method approach into four types of designs in the table below:

| **Types of Mixed-Method Designs** | | **Characteristics** |
|---|---|---|
| **1** | **Multi-method Design** | Qualitative and quantitative research is conducted simultaneously but independently of each other in data collection and analysis, and both have the same role. Based on qualitative and quantitative results, researchers can compare and analyze in order to clearly understand the research issues. |
| **2** | **Concurrent Embedded Design** | The researcher uses both qualitative and quantitative methods, but one method has a major role and the another has a secondary role. Thus qualitative is associated with quantitative or quantitative is associated with qualitative. |

| | | |
|---|---|---|
| **3** | **Sequential Explanatory Design** | Quantitative methods are primary, and qualitative methods are used to interpret quantitative results. The first phase involves the collection and analysis of quantitative data. The second phase is to collect and analyze qualitative data. The main purpose is to use qualitative data to support the interpretation of quantitative results. |
| **4** | **Sequential Exploratory Design** | The first phase is to collect and analyze qualitative data and the second phase is to collect and analyze quantitative data. The main purpose is to use quantitative data to support the interpretation of qualitative results. |

**Table 3.2. Types of Mixed-Method Designs**

***Source: Proposed by authors***

This thesis is conducted by using Multi-Method Design.

### 3.1.2.2. Analysis Metrics

#### 3.1.2.2.1. Descriptive analysis

The descriptive analysis helps describe and understand the properties of a particular data by providing brief summaries of the sample and its statistics. The data collected from the answers including both valid and non-valid answers are analyzed through the mean, percentage, mode and variance of variables. After analyzing these data, the results can be used to describe the data obtained.

#### 3.1.2.2.2. Reliability analysis

Cronbach's alpha is a coefficient of reliability (or consistency). It is considered to be a measure of scale reliability. Cronbach's alpha can be written as a function of the number of test items and the average inter-correlation among the items.

The rules of Cronbach's alpha are shown as table below:

| Cronbach's Alpha | Internal consistency |
|---|---|
| **α ≥ 0.9** | **Excellent** |
| **0.9 > α ≥ 0.8** | **Good** |
| **0.8 > α ≥ 0.7** | **Acceptable** |
| **0.7 > α ≥ 0.6** | **Questionable** |
| **0.6 > α ≥ 0.5** | **Poor** |
| **0.5 > α** | **Unacceptable** |

**Table 3.3. Rules of Cronbach's Alpha**

The value of alpha (α) may be between negative infinity and 1. Only positive values, however, have meaning. In general, alpha coefficient ranges in value from 0 to 1, and the increase of this value means that the correlations between the items increase (Amit Choudhury, 2010). And in this study the Cronbach's Alpha coefficient greater than or equal to 0.7 will be accepted.

### 3.1.2.2.3. Exploratory factor analysis

In multivariate statistics, exploratory factor analysis (EFA) is a statistical method used to uncover the underlying structure of a relatively large set of variables. Overarching goal of EFA is to identify the underlying relationships between measured variables.

EFA is used to shorten a set of k variables into a set F (F <k) of more significant factors. In EFA, each measured variable is represented as a linear combination of the basic factors, and the variability of each measured variable is explained by common factors. The general variability of the measured variables is described by a small number of common factors plus a unique factor for each variable.

In this research, Varimax rotation will be used as a method to produce multiple group factors. The conditions necessary for a statistically significant rotation matrix results table are:

- Factor loading > 0.5
- $0.5 \leq KMO \leq 1$

- Sig. < 0.05
- Percentage of variance > 50%
- Eigenvalue ≥ 1

#### 3.1.2.2.4. Correlation analysis

The Pearson correlation coefficient (r) measures the degree of correlation between the two variables. The Pearson correlation coefficient has a value between -1.0 and 1.0. A calculated result greater than 1.0 or less than -1.0 means there is an error in the correlation measurement. The condition for a significant correlation is that the sig value is less than 0.05.

- r < 0 indicates that two variables have a negative relationship (absolute inverse when the value is -1)
- r > 0 indicates that two variables have a positive relationship (absolute covariance when the value is 1)
- r = 0 indicates that there are two independent variables.

#### 3.1.2.2.5. Regression analysis

Regression analysis is a set of statistical processes for estimating the relationships between a dependent variable and one or more independent variables. Regression analysis is widely used for prediction and forecasting. In some situations regression analysis can be used to infer causal relationships between the independent and dependent variables. Importantly, regressions by themselves only reveal relationships between a dependent variable and a collection of independent variables in a fixed dataset. The most common form of regression analysis is linear regression, in which a researcher finds the line (or a more complex linear combination) that most closely fits the data according to a specific mathematical criterion.

This study uses linear regression analysis to identify the strength of the effect that the independent variable(s) have on a dependent variable. There are 27 variables in total, of which 24 variables are comprised to measure 7 independent factors affecting the success of retail supply chain during COVID-19 period: *Manufacturing, Inventory, Location, Transportation,*

*Information, Strategy, Information Technology.* 3 remaining variables are used to measure the success of retail supply chain during COVID-19 period.

## 3.2. RESEARCH PROCESS

Figure 3.1 demonstrates specific research process of this thesis:

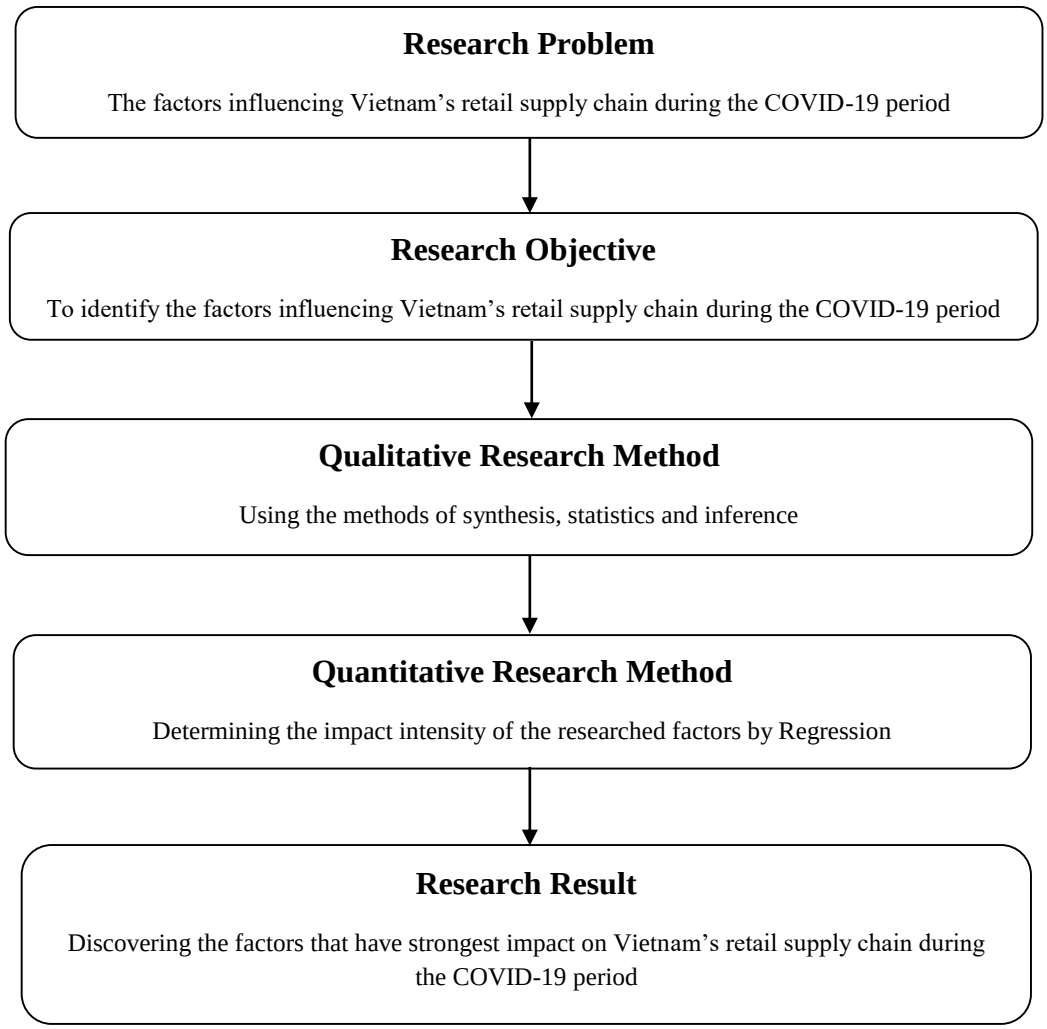



**Figure 3.1. Research Process**

***Research Problem:*** From answering 5 questions of What, Why, Who, Where, When, the thesis has identified the research issue is the factors influencing Vietnam's retail supply chain during the COVID-19 period.

***Research Objectives:*** Identify the factors influencing Vietnam's retail supply chain during the COVID-19 period. To complete the proposed research objectives, the thesis uses mixed research methods including qualitative research and quantitative research.

***Qualitative research methods:***

The thesis using the methods of synthesis, statistics, inference and systematization of theory to identify factors related to supply chain operations has been presented in previous scientific studies or from current problems in business practice in Vietnam. Based on the researches of some previous studies, the thesis gives some factors that affect the operation of the supply chain to serve as the basis for quantitative research to be carried out.

As a result, the thesis has identified 7 factors that affect the operation of the retail supply chain in Vietnam. However, the thesis needs to re-test this result and the regression analysis method is chosen to determine which of these 7 factors are really important to the operation of the retail supply chain Vietnam under the impact of the COVID-19 pandemic.

***Quantitative research method:***

The survey was proceeded in June and July 2020. The research was conducted with respondents who were employees / owners of grocery stores and the stores belonging to retail businesses in Vietnam such as Vingroup (Vinmart, Vinmart +), Mobile World Investment Corporation (Bach Hoa Xanh, The Gioi Di Dong, Dien May Xanh), Phu Nhuan Jewelry Joint Stock Company, FPT Digital Retail Joint Stock Company (FPT Shop).

In total, 141 valid survey questionnaires were studied and used SPSS software for regression model processing. Three factors were identified as the most important success factors in the COVID-19 pandemic. The results of the study will help the managers of Vietnamese retail business units have the basis to focus the resources of the unit on solving the problems that arise from these factors without spreading too much.

***The results of the research:*** Affirming the factors that strongly affect the operations of Vietnam's retail supply chain in the time of COVID-19 and raised several limitations to give directions for the next research. From these results, the solutions for retail supply chain operations are proposed.

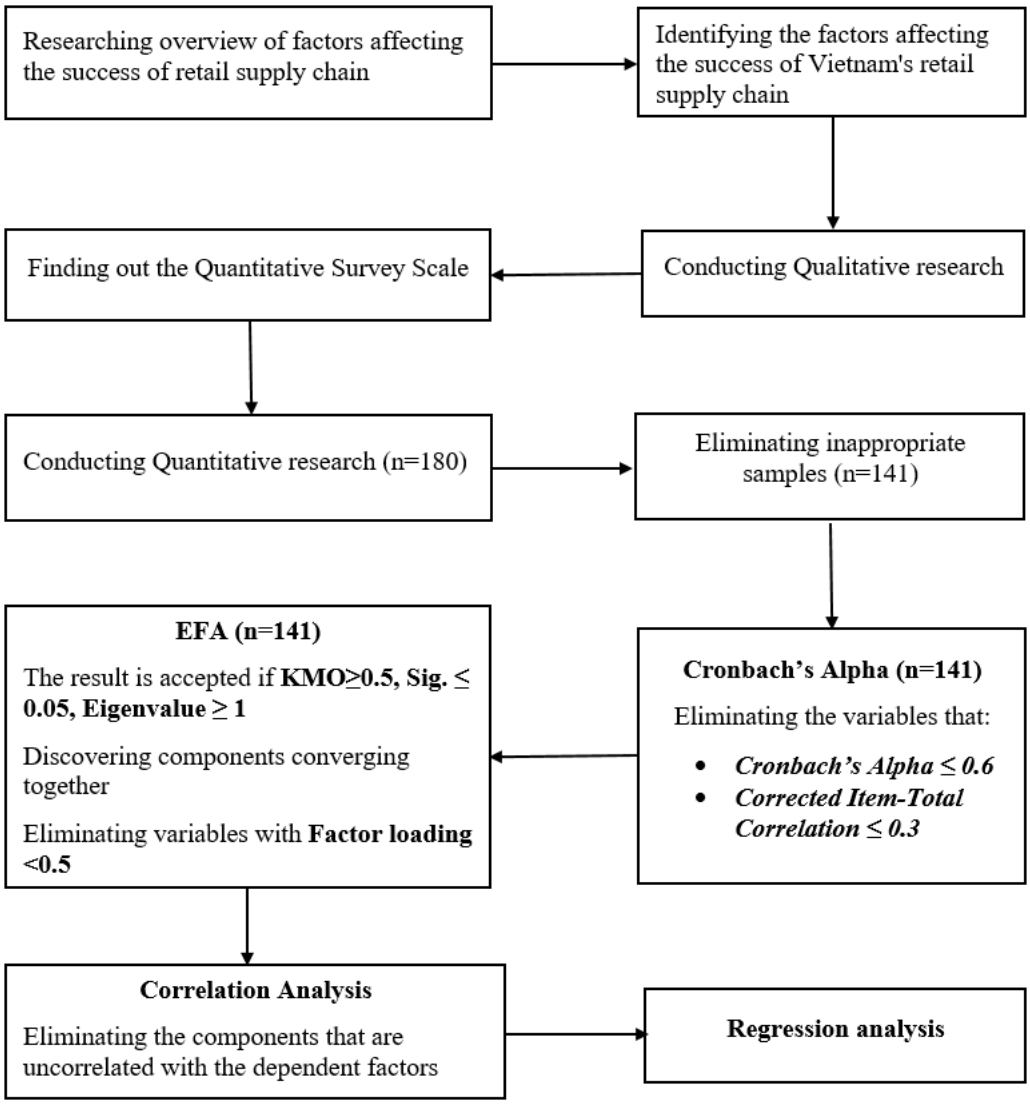



**Figure 3.2. Detailed Research Process**

## 3.3. DESIGN QUANTITATIVE QUESTIONNAIRES

The thesis uses 5-level Likert scale to measure research concepts in the proposed model. The rating levels on the scale are Total Disagree, Disagree, Neutral / Uncertain, Agree and Strongly Agree and are coded from 1 to 5 respectively.

Contents of observed variables in the scales of Manufacturing, Inventory, Location, Transportation, Information, Strategy, Information Technology are referenced research and inherit from research by Minh (2017) about the Factors affecting strategies for sustainable development of Viet Nam's retail supply chain.

### 3.3.1. The Manufacturing scale

The Manufacture Factor is primarily focused on by the retail supply chain on meeting the input standards set by the chain. Manufacturing Scale consists of 3 observed variables encoded as follows:

MA1: “During the period of Covid-19, the manufacture units in the supply chain always satisfy the correct quantity of the orders.” The lack of goods will make retailers unable to take initiative in the supply of goods for stores while the oversupply will put pressure on the warehouse and increase storage costs.

MA2: “During Covid-19 pandemic, the producers in the supply chain always responded to the timely delivery of the goods.” On-time delivery is also a quality requirement for a retail business. If this requirement is fulfilled well, the retail business can reduce the "out of stock" rate at its stores. From that, they can improve the performance of the entire supply chain.

MA3: “During Covid-19 pandemic, your business unit can distribute a wider range of products than your competitors’’. The variety of goods will help retail business units improve their ability to meet the needs of consumers. This is also a criterion that shows the retail supply chain is operating effectively.

### 3.3.2. The Inventory scale

“Inventory” is one of the five factors that are important to supply chain operations (Hugos, 2003). The Inventory Scale consists of 5 observed variables:

INV1: “During Covid-19 period, your store has a specific inventory plan for each type of goods”. Setting up a storage plan for each commodity will help the retail business understand its supply capacity. This also helps the unit to implement strategies pre-planned commodity development more easily.

INV2: “During Covid-19 period, there was enough inventory to supply the store you did business in when the market fluctuated”. Retail supply chains are vulnerable to fluctuations. The Inventory scale uses the INV2 observed variable to be able to more accurately assess the coping ability of the Storage function to the uncertainty of the business environment.

INV3: “During the Covid-19 period, your warehouse was operating efficiently”. This is a question to re-check the survey participants' feelings about warehouse operations of the unit they are working.

INV4: “During Covid-19 period, inventory costs increased”.

### 3.3.3. The Location scale

LO1: “Your store location is convenient for customers come to buy”. Convenience in customers' shopping is the "vital" factor of the retail business. Retail stores should be built in densely populated areas.

LO2: “Your store location near to the warehouse”. Building a store close to the warehouse will help the retail business unit reduce money and time costs due to shipping.

LO3: “Your store and warehouse location is convenient for all members of the commodity supply chain”. Convenience with other members of the retail supply chain is also something that should be considered by the Location factor.

### 3.3.4. Transportation scale

According to Hugos (2003), the transportation cost accounts for one- third of the operating cost of the supply chain. Therefore, all members of the supply chain must consider the factor of Transportation. There are 5 observed variables in this scale and they are coded as follows:

TR1: “Your company uses many flexible modes of transport”. Having many different modes of transport will help the retail business units not depend too much on one partner. It also helps the retail business units can deal with fluctuations better in the business environment.

TR2: “During the period of Covid-19, your company’s transportation cost is low”. If the transportation cost is low, the cost of the entire supply chain will decrease and the business unit’s profit will increase.

TR3: “During the period of Covid-19, your store still provides the goods to customers on time”. All members of the supply chain need to comply with the supply of goods on time.

TR4: “During the period of Covid-19, your company doesn’t have to deal with the situation of “cleaved”.” This observed variable can evaluate whether the ability to supply goods of the supply chain is good or not.

### 3.3.5. Information scale

Information Factor is the factor that connects to other factors affecting the supply chain operation (Hugos, 2003). There are 3 observed variables in the Information scale and they are coded as follows:

IN1: “The inventory data is shared with partners in the supply chain”. Sharing inventory data will reduce the Bullwhip effect. (The Bullwhip effect is the phenomenon of information about the market demand for a product being distorted or amplified through the supply chain, leading to the redundancy of inventory, affecting the price policy and creating the inaccurate reflection in the market demand.)

IN2: “The actual sales data is shared with partners in the supply chain”. The advantage of retail business units is to contact directly with the end customers. Therefore, these units have a huge amount of useful information of the end consumers. Sharing the actual sales data will help other members of the supply chain evaluate and predict the shopping trend in the market for an efficient production/ distribution planning.

IN3: “The demand forecast is shared across the entire supply chain”. The demand for goods forecast built and shared by the retail business will reduce the Bullwhip effect.

### 3.3.6. Strategy scale

There are 3 observed variables in the Strategy scale as follows:

STR1: “During the period of Covid-19, your store has a strategy to optimize the government’s subsidy package”. During the period of Covid-19, there is an economic crisis in over the world. The Government has given subsidy packages to help businesses overcome this difficult period. How to properly use that subsidy is very important to companies.

STR2: “During the period of Covid-19, your company focuses on trading the strategic products”. During the Covid-19 translation, consumer demand changed on each specific product. The companies need to plan their strategic products to match the needs of the market.

STR3: “During the period of Covid-19, your company has a strategy to cope with the economic crisis”. The economic crisis was apparent during this epidemic. The demand for some products decreased sharply. Companies need to plan strategies to cope with this economic crisis.

### 3.3.7. Information technology scale

In the Information technology scale there are 4 observed coded as follows:

IT1: “Your company or your store applies the information technology to its business”. Revolution 4.0 is happening rapidly all over the world. A new economic era is gradually created. Leading in information technology is a great advantage for businesses to be able to build a modern supply chain.

IT2: “Information technology helps your company reduce the management fees”. Information technology can systematize management functions, therefore functions are interrelated instead of managing each function independently, leading to cost reduction and increased efficiency of supply chain management.

IT3: “Information technology helps your store reduce the errors caused by actions of individuals in business and increase the accuracy at work”. Personal manipulation can lead to small mistakes that employees are hard to realize. Using information technology applications can ensure that errors are minimized.

IT4: “The digitization of the business operation, storage, transportation, customer records, etc helps your store control the business process easily”. Digitizing documents makes a difference in job performance.

### 3.3.8. Success scale of the retail supply chain

The success of the retail supply chain is reflected through the following criteria: Flexible and covering goods; cost control; products are welcomed by customers. Therefore, there are 3 observed variables in the Success of retail supply chain scale as follows:

SU1: Your store’s products are always welcomed by customers.

SU2: The cost of the store’s supply of goods is always controlled during the period of Covid-19.

SU3: The store’s supply of goods is flexible and covering during the period of Covid-19.

# SUMMARY OF CHAPTER 3

In chapter 3, the thesis presents the method of selecting research methods and research process. This chapter also presents analytical methods and how to evaluate analytical indicators depending on each method. Finally, this chapter presents how to design the questionnaire for all phases of quantitative research.

# CHAPTER 4: FINDING AND ANALYSIS

## 4.1. COVID-19 - IMPACT ON GLOBAL SUPPLY CHAINS IN WHICH VIETNAM IS A LINK

The COVID-19 pandemic has slowed global trade and disrupted supply chains. The virus, which first started in China, shut manufacturing facilities for an extended period of time. As China, known as the factory of the world, shut factories, it resulted in a ripple effect battering global supply chains with businesses struggling to source raw inputs.

China is currently the country that drives the largest economic growth in the world. According to the World Bank, China accounts for 35% of the total global economic growth (in US dollars) from 2017 to 2019, nearly double the rate of the United States (18%) and four times higher than the EU (7.9%). Therefore, when China's economy slows down, it will have a strong global impact.

It's still interesting to see how heavily the COVID-19 outbreak, and (above all) the aggressive measures taken to contain it, has affected the Chinese economy in the first two months of 2020, as it gives us an idea of the disruptive force of widespread shutdowns on economic activity. The National Bureau of Statistics of China released official data on industrial output in January and February (the two months are typically viewed as one period to eliminate the distorting effect of Chinese New Year), showing which industries have been hit hardest by the epidemic and the ensuing lockdown.

Considering that Wuhan, the epicenter of the outbreak, is often referred to as China's Motor City, it doesn't come as a huge surprise that the car industry has been hit most severely by the epidemic. According to the NBSC, value added in motor vehicle manufacturing was down 31.8 percent in January and February compared to the same period of 2019. Manufacturing of general machinery, textiles and railways, ships and airplanes were also among the industries heavily affected, while manufacturing of medicines, computers and communication equipment weren't hit as hard. Chart 4.1 provides an overview of output declines across all major manufacturing sectors.

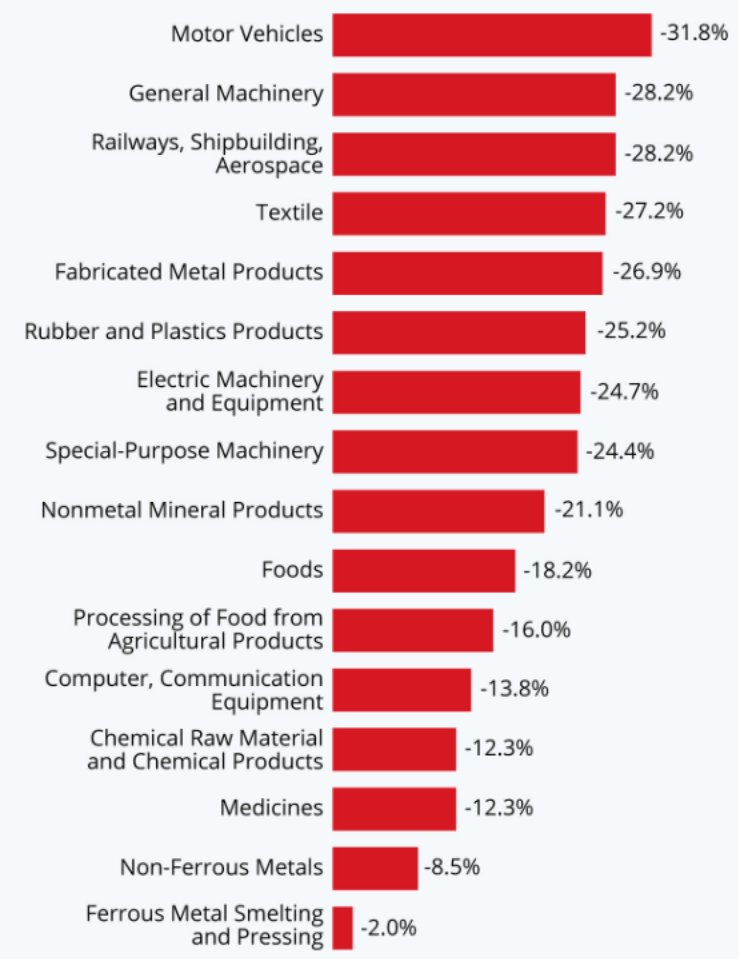



**Chart 4.1. Change in value added by selected manufacturing sectors of China in January-February 2020 vs. 2019**

***Source: National Bureau of Statistic of China***

China is the leading trade partner of many countries in the world. According to estimates by the Nikkei Asian Review and Japan's Center for Economic Research, if China's output decreases by 10 billion USD, the rest of the world output will decrease by 6.7 billion USD.

China is the world's largest exporter of components and electronic equipment, accounting for 30% of global exports. The COVID-19 pandemic pushed global manufacturing into a recession, especially electronics and computers.

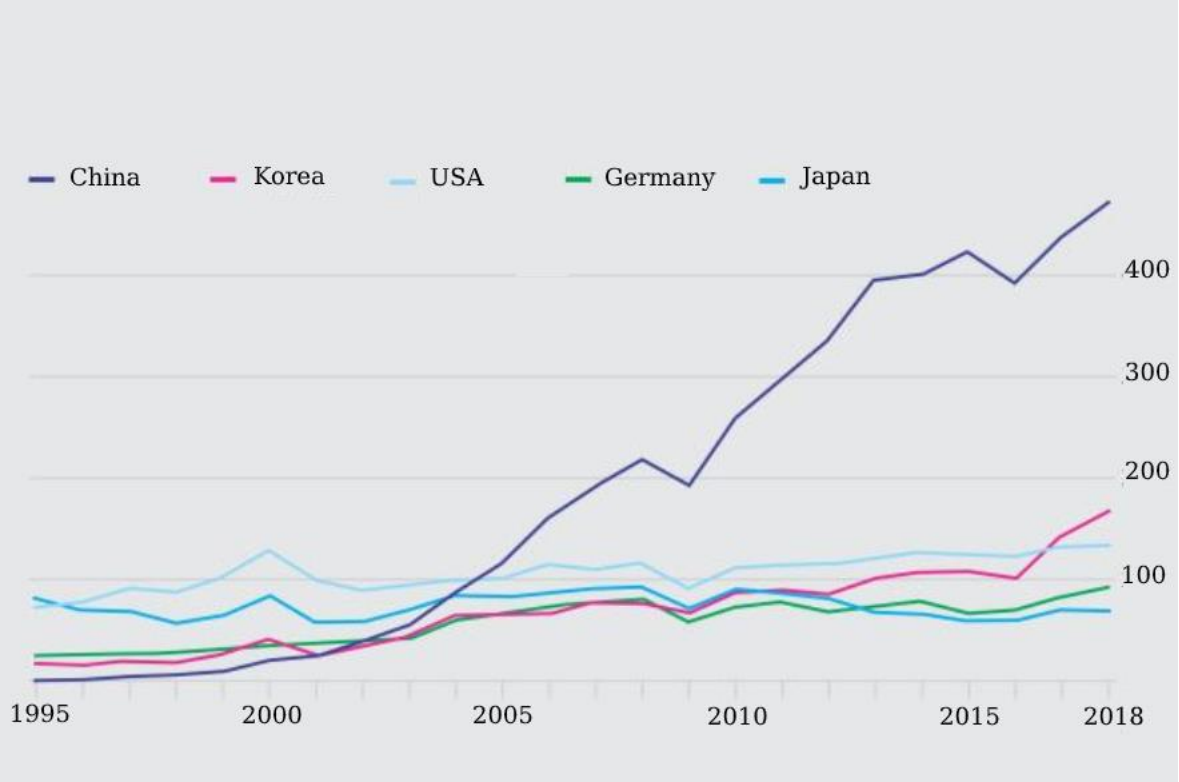



**Chart 4.2. Annual export value of electrical and electronic components from China, Korea, the US, Germany and Japan**

***Source: WTO Center***

Asia's newly developed economies suffered considerable losses. More than one- third of goods imported to Korea, Vietnam, Indonesia and the Philippines come from China. China holds a central position in the global supply chain, which means that disruption in China's economy will affect other countries.

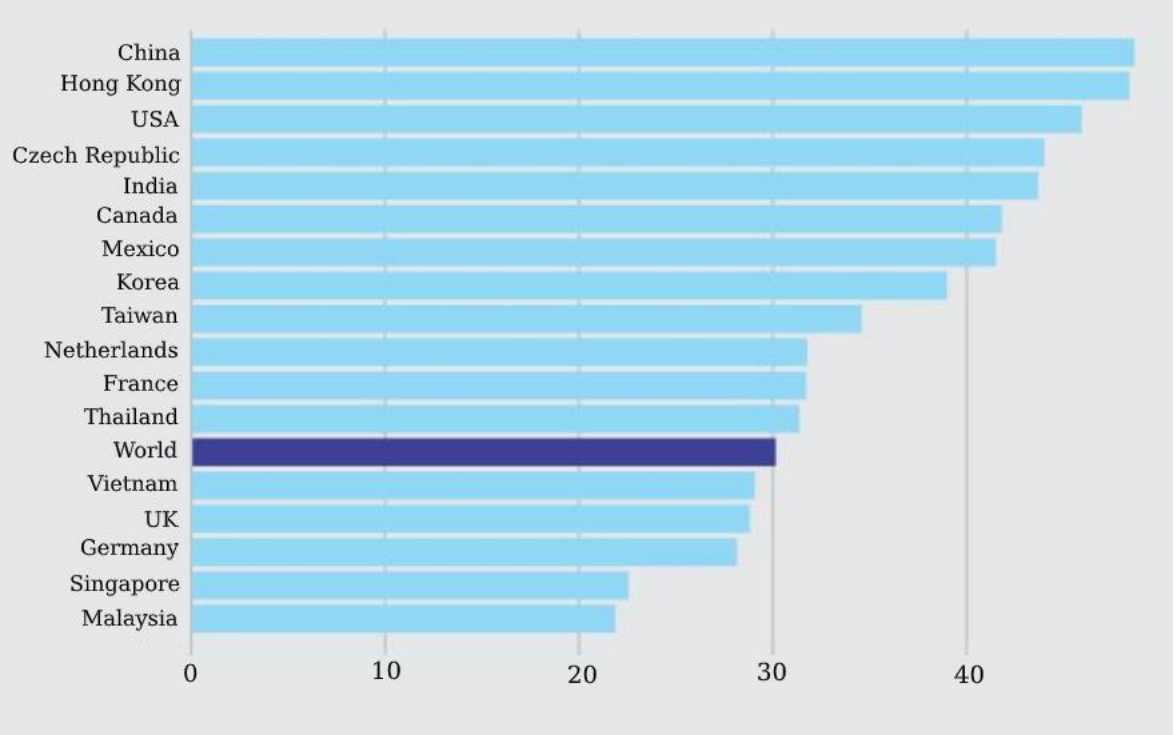



**Chart 4.3. The dependence of countries on electrical and electronic components imported from China in 2018**

***Source: WTO Center***

Manufacturing and the supply chains of many countries around the world such as Korea, Japan, the US and Taiwan have been seriously affected.

***Research in February 2020:***

· Korea's biggest car manufacturer - Hyundai announced to stop all the domestic car assembly lines due to a lack of supply of components from China. Hyundai Motors assembles about 34,000 cars per week at three facilities in South Korea. Hyundai's stopping production for a week could cost 700 billion won (equivalent to 587 million USD).

· Nissan has halted production at a factory in Japan due to a lack of supplies from China. Stopping operations could affect the production of about 3,000 pcs.

· Many large corporations in the world have had to slow down production such as Airbus S.A.S of Europe, Tesla Inc., or Apple Inc., of America.

· Google, IKEA, etc are in turn announced "temporarily closed" branches in China.

· Organization of Petroleum Exporting Countries had an urgent meeting because the largest market which is China had been temporarily “frozen”.

The Covid-19 pandemic showed that the global economy was too dependent on the machine of production of China. China’s production stoppage has affected the world’s production and supply chains.

China is also the world’s top importer. The International Trade Centre (ITC) estimates that the share of Chinese trade in the global share is 12 percent, exceeding the United States. The Chinese economy suffers heavy losses due to the effects of the Covid-19 pandemic, most other countries around the world will suffer, including Vietnam.

Vietnam is in the process of integration. Many industries manufacture according to the supply chain model such as telephones, electronics, computers, the textile and garment industry, shoemaking, agricultural products production and processing, automotive - motorcycle industry, iron - steel industry and oil refining and petro-chemistry.

The report of the Department of Industry, Ministry of Industry and Trade states that Vietnam’s processing and manufacturing industries currently depend heavily on the supply of raw materials and components imported from China and other countries which is affected by the Covid-19 pandemic. The industries most affected are electrical - electronic industry, the textile and garment industry- shoemaking, automotive manufacturing and assembly.

Specifically, in 2019, Vietnam imported 11, 52 billion USD of the textile and garment industry and shoemaking from China, accounting for 47.74% of the total import turnover of these items of Vietnam. Similarly, China is the largest supplier of chemicals and chemical products; plastic materials and plastic products for Vietnam, reaching 3.23 billion USD (accounting for 30.6% of the total turnover of this item) and 3.99 billion USD (accounting for 25.7% of the total turnover of this item).

For the electrical - electronic industry, according to the Department of Industry, in 2019, Vietnam imported about 40 billion USD of the electronic components, of which, import from China was 13.8 billion USD (accounting for 34%).

According to the economic experts, the over-reliance on Chinese raw materials has caused risks for Vietnamese businesses when this supply is interrupted. However, through this epidemic, it is possible to know the strengths, weaknesses, challenges and opportunities of the Vietnamese enterprises.

The impact of the Covid-19 pandemic also caused an increase in concerns about enterprises' inventories because major commodity markets become uncertain. In the first half of 2020, according to the statistics of the Ministry of Industry and Trade, the inventory index of most processing and manufacturing industries was at a relatively high level. Of these, six industries with the largest inventory index were the textile industry with 118.7%; wood processing and manufacturing products from wood, bamboo with 104.7%; chemical production and chemical products with 103.4%; motor vehicle manufacturing with 97.3%; other non-metal mineral products with 96.5%; food production and processing with 96%.

Under the negative effects of the COVID-19 pandemic, countries in the world have started to come up with many plans to diversify the supply sources and avoid the "shock" of the supply shortage which can be repeated in the future. For example, Japan has set aside more than US$2 billion in its coronavirus recovery package to help firms shift production out of China showing its reliance on China. China's central role in the supply chain may be reduced. The existing trend of lower-value-added manufacturing leaving China for other emerging markets or automated facilities in advanced economies may also accelerate. However, China's central role in supply chains is so important that it is unlikely to be reduced rapidly.

The COVID-19 pandemic will change how companies do business for years to come. In addition to diversifying supply, companies likely accelerate trends that were already underway, shortening and simplifying supply chains. They may be compelled to go from just-in-time to just-in-case strategies. (Just-in-time parts inventory management is a management system that orders parts and products from suppliers only as required to meet the immediate customer demand. Just-in-case inventory management is the strategy of maintaining large inventories to reduce the risk of back orders in the face of supply and demand uncertainties). Moreover, digital technology, including robotics, automation and artificial intelligence, is also making it

easier to bring back production onshore or shorten supply chains to lower the risk of abrupt stops in production.

## 4.2. CURRENT SITUATION OF VIETNAM'S RETAIL INDUSTRY

### 4.2.1. Overview of Vietnam's retail industry

Vietnam is one of the developing countries that following on the part of industrialization and modernization. Vietnam with an increasing economy, a young population, and a high proportion of the urban is a very potential market for the retail industry. The supply chain management of the retail industry is an essential solution to increase the competitiveness of Vietnam's commodity capacity in the period of revolution 4.0 is growing strongly. This lead to the enhancement quality and service of the product is the main mission of Vietnam enterprises. Vietnam needs to take chance by applying the new trend of the global economy in business and improve competitiveness in the retail market.

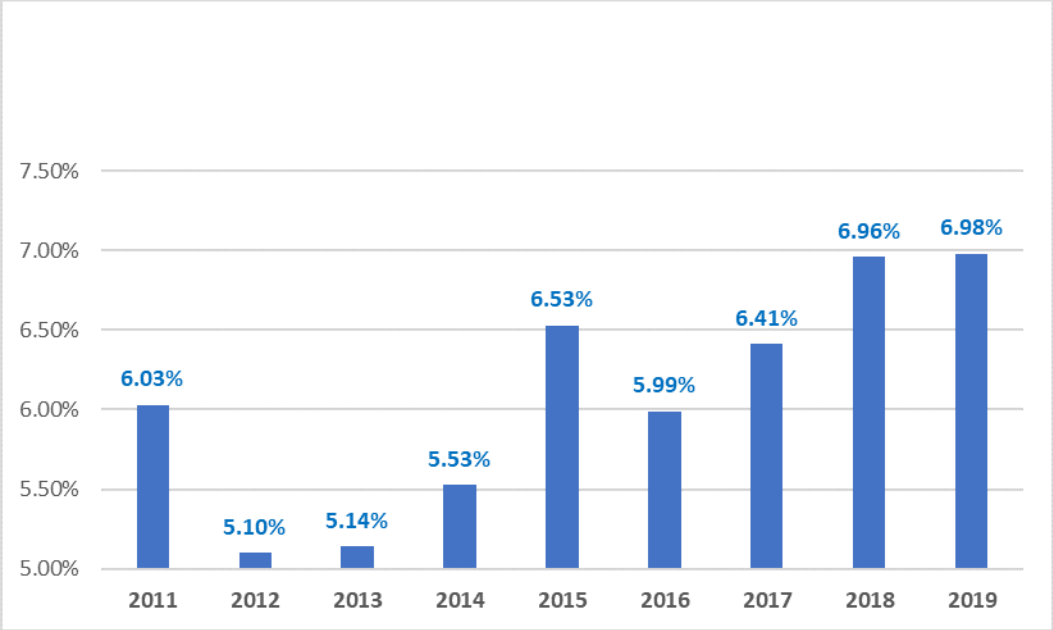



**Chart 4.5. Vietnamese cumulative GDP growth rate in the first 9 months of the year 2011-2019**

***Source: Kinh te & Do thi***

According to the General Statistics Office, Vietnam's retail sales of goods reached 3,751 billion VND in 2019, accounting for 75.9% of total revenue and up to 12.7% compared to 2018. Inflation is just only 2.79%, interest rates and exchange rates always remain stable in the financial markets. Vietnam's GDP per capita is over USD 2,700. GDP growth reached 7.02% in 2019. According to the Vietnamese Ministry of Industry and Trade, total online sales revenue reached $ 8.06 billion in 2019. Total retail sales of goods increased by 11.8% compared to 2018. Vietnam's retail industry has impressive growth, increases by 8.82% in the time of 2011-2019. Total revenue from merchandise retail activities in 2019 increase more than in 2018. It reached 3751.3 trillion VND, accounting for 75.9% of the total and increase up to 12.7% than 2018.

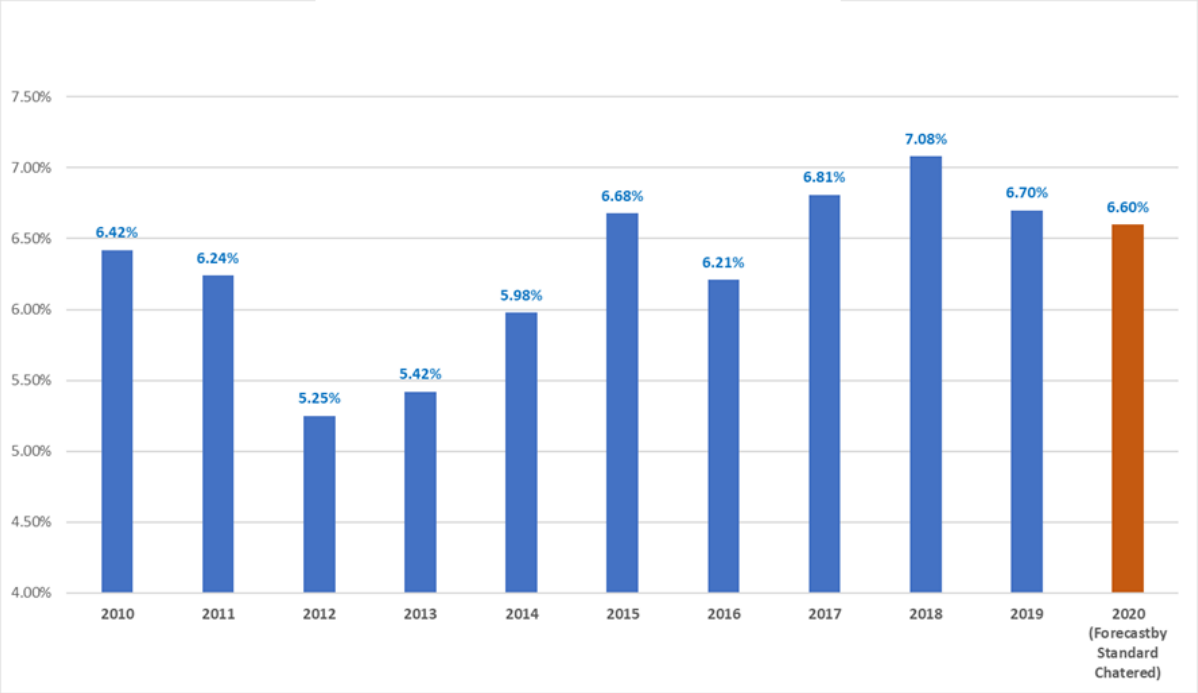



**Chart 4.6. Vietnamese GDP Growth Rate 2010-2020**

***Source: General Statistics Office***

The economic growth well and low inflation lead to the rise in per capita income. Government policies promote growth in the private sector as well as remove the barriers to investment in

the retail market, made the capital inflows become more copious. Vietnam market has the participation of both domestic and foreign capital. This will be a perfect combination of domestic and foreign enterprises. Vietnamese enterprises have the advantage of understanding local consumers while foreign enterprises have the advantage of technology and capital. All of these factors show that the Vietnamese retail market is one of the most attractive markets in the world. The fact that Vietnam receives a lot of investment from large retailers in the world, many international retail enterprises entered the market has opened good opportunities for consumers. In the trend of integration, the retail market in Vietnam will continue to open and develop. Realizing this, many multinational retail enterprises are ready to join the Vietnam retail market, which has many potentials and opportunities. However, it also created intense competitive challenges for domestic enterprises as well.

The expansion of foreign enterprises like Lazada and Shoppee has made domestic enterprises become more difficult to find customer markets. Many foreign enterprises have lots of outstanding advantages. They have their own capital, branding, high-quality staff, and large corporate governance model. Those are the factors that many domestic enterprises do not have. Vietnamese enterprises cannot compete with other foreign rivals and losing on the home field. The linkage of businesses in the retail supply chain is quite loose. Both suppliers and retailers in Vietnam often operate separately. The lack of direction for the operations in the supply chain causes the chaotic in supply chain operations.

Vietnamese retail businesses are currently in fierce competition with foreign businesses. The risk of losing market share always exists, especially when Vietnam joins in large trade organizations such as AEC, TPP, FTAs. Along with foreign investment attraction policies, large enterprises in the world such as AEON (Japan), Lotte (Korea), Central Group (Thailand) have massively invested in Vietnam's retail market. All of the foreign retail businesses have long-term experience and large capital. They always bring good quality products that have global brands and suitable prices when entering the Vietnamese market.

Moreover, Vietnamese people prefer to use foreign products and always give priority to Thai and Japanese products. For this reason, foreign enterprises are more dominant than domestic firms in the competition. Foreign enterprises hold most of the majority of the market share. For example, Thailand has 50% of the market share.

Also, the number of trained workers is very small and labor productivity is much lower than in other countries. Workers are lack professionalism and most of them do not have foreign language ability. The service style is not professional although has some improvement in recent years. The service quality still far behind from the foreign enterprises. The reason for this is that there just a few Vietnamese universities specialize in retailing. This is a difficult problem for Vietnamese retail enterprises.

Besides, online shopping has just begun it early stage of development. However, this trend has shown a steady growth rate. Economists are expected this will offer great potential for the retail industry in Vietnam. Truly, Vietnamese enterprises are focusing on e-commerce channels nowadays. The development potential of these channels is very large. However, this goal is facing many challenges such as the lack of trust from consumers. Controlling the sources of products is not really good either.

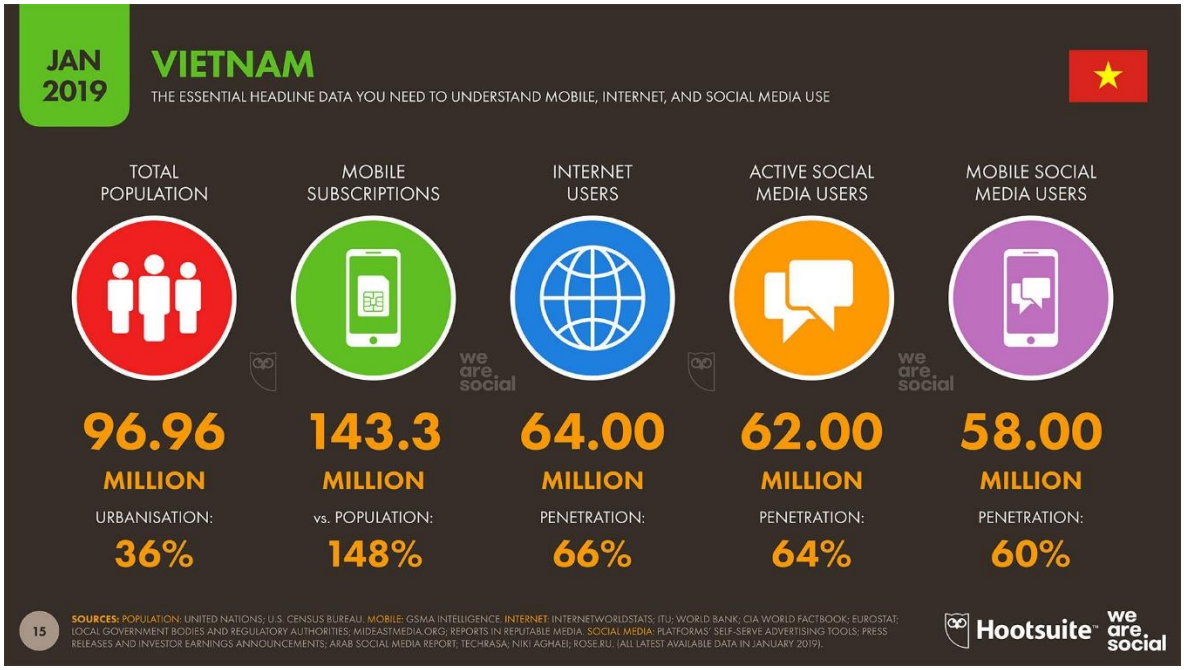



**Figure 4.1. Internet usage in Vietnam 2019**

***Source: VNETWORK***

According to the Vietnamese E-commerce Association, the growth rate of e-commerce in 2019 reached over 32%. The scale of retail e-commerce in 2019 reached 11.5 billion USD. More

than 70% of Internet users participate in online shopping at least once a year, 61% of users use the Internet for shopping purposes. The proportion of users having access to the Internet for 3 -5 hours a day up to 30%.

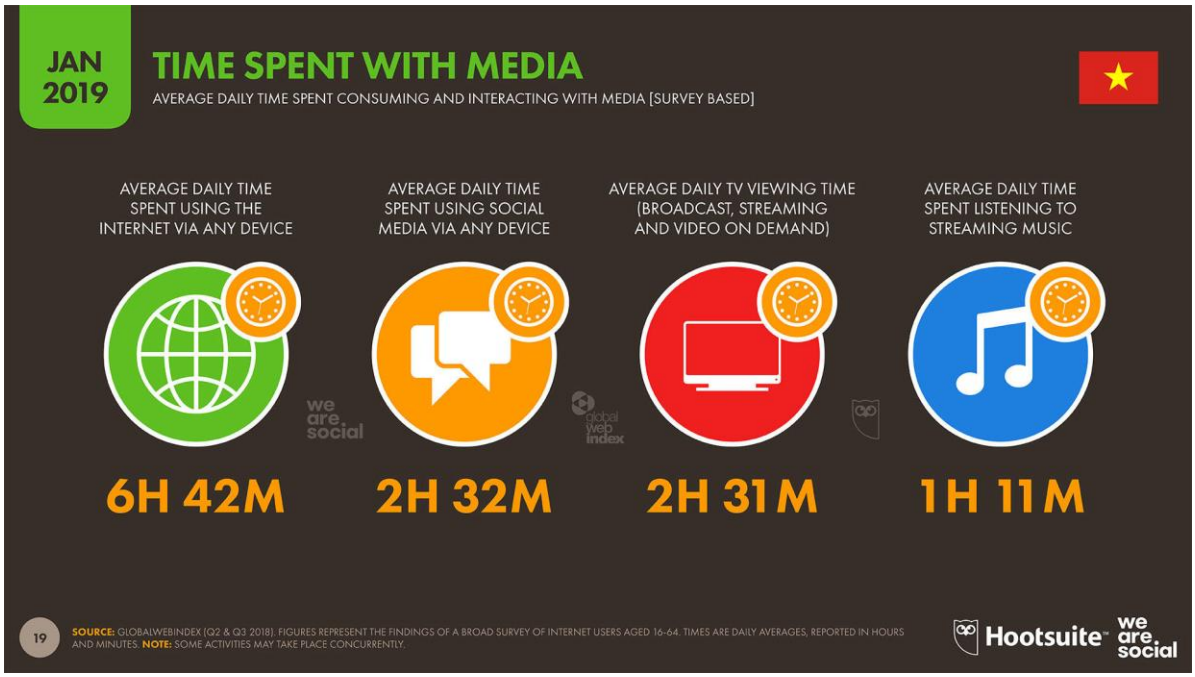



**Figure 4.2. Frequency of Vietnamese people use the Internet in 2019**

**Source: *VNETWORK***

The habit of Vietnamese consumers has some positive changes in recent years. Vietnamese consumers are gradually approaching and getting used to the trends of shopping online. Currently, the top choice is the products that good for health. Especially clean agricultural products and organic foods. Vietnamese consumers have a higher demand for using good quality of food products when they have more income. A sales channel that ensures all factors of product quality will quickly attract the attention of the community in Vietnam. More than that, the Covid-19 epidemic caused customers to hesitate to go out and purchase activities were often via online channels. These factors make domestic enterprises to change their selling strategy, focus on developing online sales channels.

**Vietnam's retail market has a great potential to growth.**

***Strengths of Vietnam's retail market:***

The strength of Vietnam's retail market is quite a lot. It can include the large population and the high urbanization rate in big cities such as Hanoi and Ho Chi Minh City. This helps the income per capita increase more, which leads to great consumer demand. Hanoi and Ho Chi Minh City have low rates of retail space per capita when comparing to other regional markets. This is a place for modern retail models to develop the advantages and increasingly it strengths. The urbanization is an important factor and plays a big role in creating a convenient environment for the development of the retail market. A positive note is that a number of foreign retailers are keeping their eyes firmly on Vietnam's retail market, especially Hanoi and Ho Chi Minh City due to the young population and consumer behavior spending.

Vietnam's retail market is more and more attractive to domestic businesses. According to the General Statistics Office, although the price of goods in October 2019 increased the market always remained stable so that the commercial activities continued to increase. In October 2019, the total retail sales of goods reached 425.7 trillion VND, increase up to 13.3%, higher than in 2018. A report by Nielsen Market Research Company shows that Vietnam's retail industry has a high growth rate because per capita income increases sharply. Through the free trade agreement (FTA) along with the development of the economy, the Vietnam market will bring more opportunities for both domestic and foreign retail enterprises.

During the Covid-19, the retail supply chain needs new strategies to cope with fluctuation of the market and e-commerce is the solution for that. In the past few years, e-commerce has made great progress in Vietnam. E-commerce continues to grow strongly thanks to the large population and the high urbanization rate in Vietnam. At the moment, Vietnamese people are getting more used to online shopping. This is the best condition for both domestic and foreign enterprises to develop their e-commerce in Vietnam during the Covid-19.

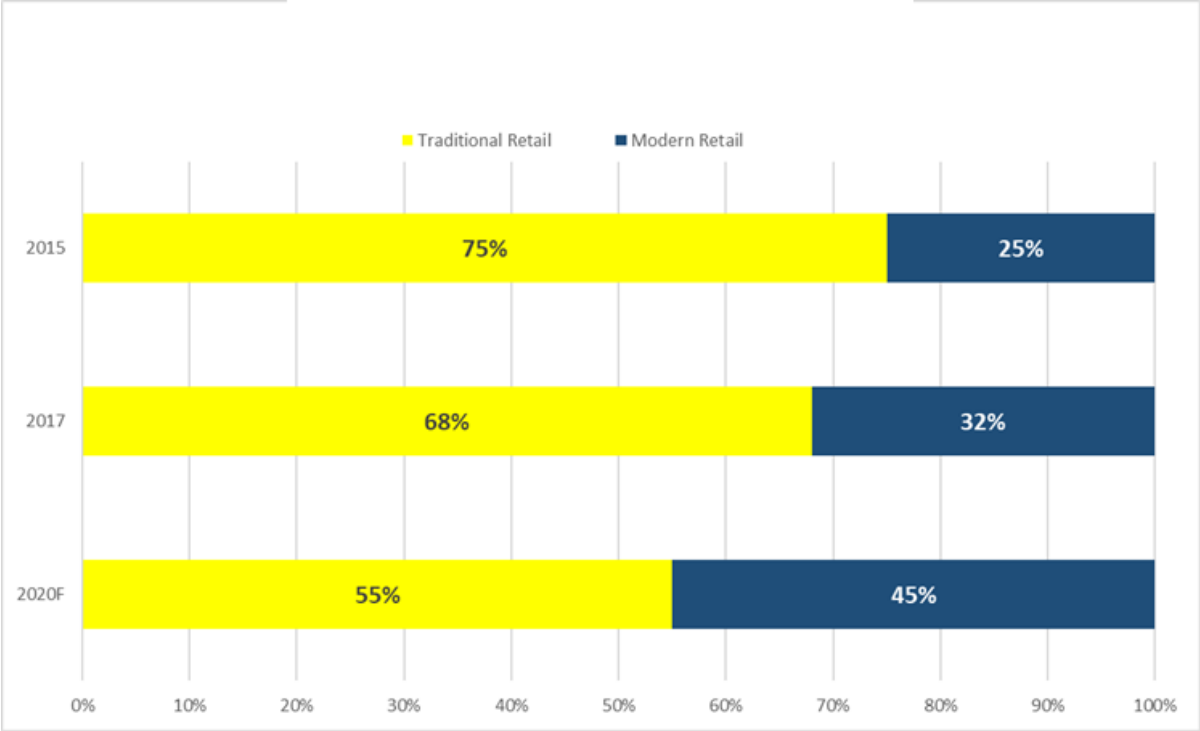



**Chart 4.7. The Prospects of Retail Industry in Vietnam**

***Source: Ministry of Industry and Trade, Speeda***

***Weaknesses of Vietnam's retail market:***

The weakness of the Vietnamese retail market is that the land costs are high in large urban areas. This requires a lot of investment and the slowness in return capital. The large supply of retail space and tightened policy will have an impact on the demand for retail properties. Demand for quality retail properties in Vietnam is fueled by factors that include urbanization, economic growth, the expansion of retail supply chains, and an increase in both domestic and foreign investments. In addition, Vietnam retail market still remains small. A modern retail business requires enterprises to have supporting tools in order to develop and compete with others. However, most of the domestic enterprises do not have this modern retail business. This is the reason why foreign retail chains with modern models and great financial potential always have a better competitive than Vietnamese businesses. Foreign businesses have gradually grasped the consumption habits of Vietnamese people. From that, they will come up with suitable business strategies to compete with Vietnamese enterprises.

E-commerce and online sales market in Vietnam are very potential but not really develop. E-commerce depends on many factors, one of them is the online payment system. In Vietnam, this kind of factor has not really improved yet. Vietnamese people usually stick with traditional payment. That is why there are so many international huge enterprises failed when entering into Vietnam market. The government takes a very long time to change the Vietnamese payment habits. Additionally, the facilities for the online and mobile payment method in Vietnam is not actually good. The knowledge about IT of employees in the domestic retail business is quite low so that the new technologies in the retail supply chain have not been applied in many enterprises.

### 4.2.2. The impact of Covid-19 pandemic on the retail industry in Vietnam

The mitigation measures focused at slowing the Covid-19 pandemic taken over the first half of 2020 have directly affected the supply, demand and daily operations of the retail sector. And Vietnam is not an exception. According to the Ministry of Industry and Trade of Vietnam:


**Chart 4.8. Retail Sales of Good & Services in Vietnam**

***Source: Ministry of Industry and Trade of Vietnam***

In Q2 / 2020, the estimated total retail sales of consumer goods and services is VND 1.154,9 trillion, falls at 5,8% compared to the previous quarter and dropped by 4,6% compared to the same period last year. Specifically, retail sales of goods reached VND 928.5 trillion, 4% decrease compared to the previous quarter and 1,2% increase compared to the same period last year.

In the first half of 2020, retail sales of goods reached VND 1.895,6 trillion, accounting for 79,6% of the total retail sales of consumer goods and services, increase by 3,4% compared to the same period last year, due to the plentiful supply of goods, the rapid development of e-commerce, especially during the social separation period, it meets the demands of Vietnamese people. Also, some localities had a fairly good increase in the retail sales of goods compared to the same period last year: Hai Phong increased by 10.4%; Ho Chi Minh City increased 10.1%; Hanoi increased by 9.9%; Dong Nai increased by 8.4%; Binh Dinh increased by 4.3%; Ba Ria - Vung Tau increased by 3%; Thanh Hoa increased by 0.9%.

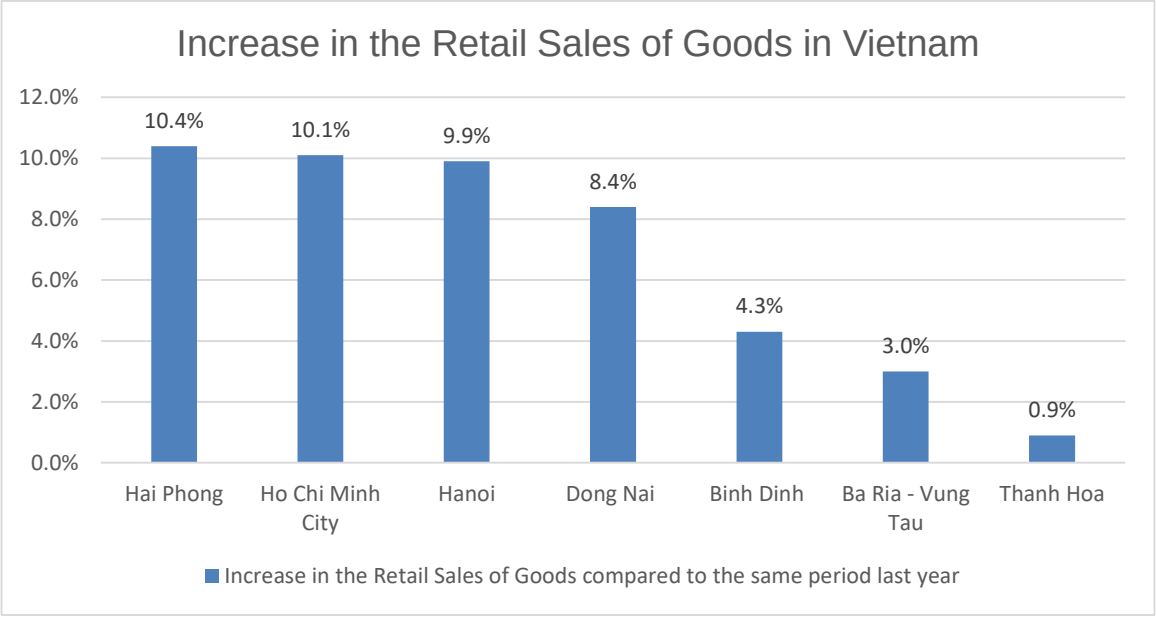



**Chart 4.9. Increase in the Retail Sales of Goods in Vietnam**

***Source: Ministry of Industry and Trade of Vietnam***

Lotte's February revenue decreased by about 50% compared to January 2020 and by more than 20% compared to the same period of 2019. In Aeon Vietnam, January 2020 sales decreased by 2%; February decreased by 6% compared to the plan. At Saigon Co.op, the retail sales in the first 2 months decreased by about 50% compared to the same period last year, it could be reduced by VND 1,000 billion if the epidemic is controlled in Q2 and 2,000 billion if the epidemic continues.

However, the advent of Covid-19 has changed many factors affecting the retail industry in Vietnam:

***Demand fluctuations:***

In "red zone" markets where the virus is spreading, virtually every retail outlet - except grocery stores and pharmacies - has shut their doors. Even those markets not under quarantine orders have seen a precarious drop off in physical footfall in retail outlets and malls. While some retailers are seeing demand fall away and customers shift channels, others are facing unprecedented spikes in demand. Grocery retailers, in particular, are dealing with significant out-of-stock situations on many key products as consumers hoover up supplies perceived to be essential.

According to a survey about the impact of Covid-19 to Vietnamese consumers of Nielsen VN, COVID-19 impacts not only general behaviors but shopping and out-of-home consumption. Moreover, 45% of respondents have said that they are stocking up with more food at home than before. Brick and mortar channels have been impacted, as more than 50% of people have reduced their frequency of visits to supermarkets, grocery stores and wet markets. Besides this, 25% of respondents said that they have increased their online shopping and have reduced their out-of-home consumption occasions.

In conclusion, the decline in the amount of international tourist has strongly impacted on the luxury retail market. Domestic retail spending may be temporarily reduced because consumers do not want to leave home. Non-essential goods and entertainment services are more affected than essential goods, which tend to hoard during the epidemic.

***Internal Factors:***

Demand fluctuations made a negative impact on all of manufacturing, inventory, price and transportation strategy. The retail supply chain is characterized by a large volume of goods, therefore it meets the worst effect compared to the others supply chain. The following are situations that businesses may encounter during the Covid-19 period:

- Supply shortages and increased prices: Until affected manufacturers can resume production, companies will need to rely on inventory stockpiles. However, these resources are limited and will run out eventually. When existing inventory runs dry, it can be expected to see shortages and/or price increases throughout supply chains if alternate sources aren't secured.
- Fulfilment delays: Quarantines, travel restrictions, and workforce shortages can make it difficult or impossible for impacted manufacturers to fulfill their contractual obligations to their customers. A shortage or delay of products can seriously impact a company's reputation and may result in lost customers or even legal consequences.
- Increased transportation prices: Once factories can resume production, companies will likely rush to get their operations back online and make up for a lost time, which could cause a sharp increase in transportation prices.
- Sales and operations planning: This crisis has changed demand in one way or another for nearly every manufacturer. Some have seen significant increases in demand for basic consumer goods, others have seen demand shift from various products or customer types, while others have seen demand fall with the uncertain economic environment.
- Staff cuts: During The Covid-19 epidemic, sales of most companies have been decreased, under the pressure of operating expense, Vietnamese retail businesses implemented policies to reduce employee salaries or cut off staffs. According to a survey of online recruitment company Vietnamworks, among nearly half of respondents okay with a pay reduction, 69% would only accept the cut to last three months at most. Six out of ten employers said they had cut staff salaries by at least 25%, some going as far as 80% percent or over. The pandemic has caused major disruptions in Vietnam's labor market, with 40% of employees saying they had lost their job, while 30% saw their income shrunk.

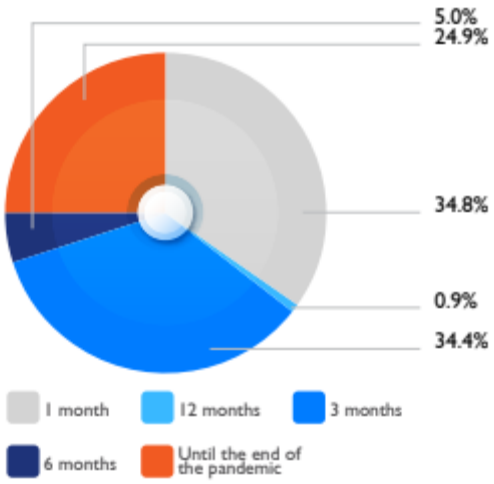


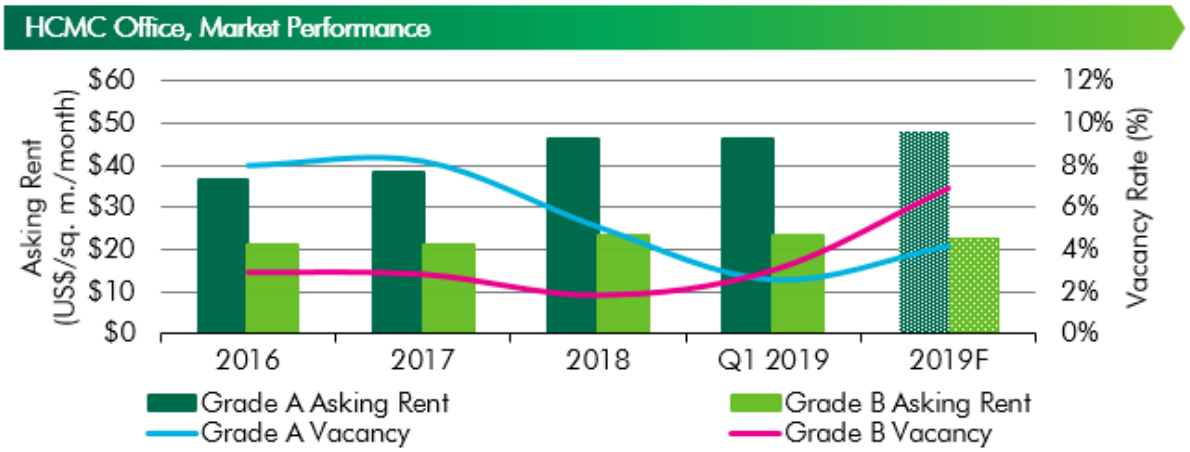

**Chart 4.10. Employee Pay Cut Duration**

***Source: Vietnamworks***

***Rental price:***

During the Covid-19 pandemic, many business owners in big cities have agreed to reduce rents by 10-50% to support business tenants in a difficult situation due to disease. However, a lot of business premises are not rented due to tenant's concern about the uncertain future of the Vietnamese economy.

According to CBRE, rental price in Q2/2020 in Ho Chi Minh city decreased by 1,5% compared to the same period last year that reaches USD79.4/m2/month in the Central Business District (CBD) area and USD38.5/m2/month in the non-CBD areas. As many tenants have been planning to either contract their office space in current buildings or relocate to buildings with lower cost, located at the edge of the CBD or sub-urban area, Grade B still recorded stable performance, especially buildings with rents of less than USD30/m2/month. In Q2 2020, the vacancy rate of Grade B was recorded at 4.7%, a slight increase of 0.4 percentage point year-over-year. Rent of Grade B reached USD25.3/m2/month, up 7.4% year-over-year. Grade-A buildings were impacted stronger than Grade-B buildings. The average rent of Grade A was USD44.4/m2/month, down 4.9% year-over-year and vacancy rate increased by 9 percentage point year-over-year, reaching 11.8%.




Asking Rent is quoted on NLA, exclusive of VAT and Service Charge.

Source: CBRE Vietnam, Q1 2019.

**Chart 4.11. Asking Rent is quoted on NLA, exclusive of VAT and Service Charge**

***Source: CBRE***

***E-commerce:***

Amid the complicated Covid-19 epidemic, e-commerce has a great opportunity to grow.

Tiki's website received 23.99 million visits per month this quarter, a slight decrease compared to Q4 / 2019, but is still enough to put them ahead of two major competitors of Lazada and Sendo in Vietnam.

Monthly visits to Lazada Vietnam's and Sendo's websites in Q1 respectively decreased by 7.3 million and 9.6 million quarter-over-quarter, giving them both the lowest numbers of website visits since Q4/2018.

The number of visits per month to Shopee Vietnam website in the Q1/2020 is 43.16 million ones. Shopee Vietnam is also the only one out of the 4 major players to see their website traffic increased quarter-over-quarter.

| Ranking | Name | Q1/2020 Monthly Web Traffic | QoQ | YoY |
|---|---|---|---|---|
| 1 | Shopee Vietnam | **43,156,667** | +14% | +36% |
| 2 | The Gioi Di Dong | **28,590,000** | +2% | -6% |
| 3 | Tiki | **23,990,000** | -2% | 0% |
| 4 | Lazada Vietnam | **19,763,333** | -27% | -7% |
| 5 | Sendo | **17,596,667** | -35% | -20% |
| 6 | Dien May Xanh | **11,180,000** | +8% | +15% |
| 7 | FPT Shop | **8,256,667** | +15% | -5% |
| 8 | Dien May Cho Lon | **7,016,667** | +8% | +228% |
| 9 | CellphoneS | **4,930,000** | -7% | -7% |
| 10 | Hoang Ha Mobile | **4,533,333** | +8% | -14% |

**Table 4.2. Vietnamese E-Commerce marketplaces' monthly website traffic Q1/2020**

***Source: CBRE***

***Trend change:***

The Covid-19 pandemic has changed the buying trend of Vietnamese people. Government's policy of social spacing has pushed the majority of consumers into shifting to online shopping. According to statistics of iPrice Group, due to the effects of the Covid-19 pandemic, in Q1/2020, customer shopping trends change continuously:

When the first-staged Covid-19 pandemic appeared in Vietnam, online demands for healthcare products such as facemasks and hand sanitizers shot up by 610% and 680% respectively compared to January, as recorded on iPrice.vn. By March, when more consumers stayed at home to avoid outbreaks, online grocery becomes the most popular product. Visits to online grocery retailer Bach Hoa Xanh's website increased by 49% quarter-over-quarter as a result.

In the first three months of the year, fashion retail websites experienced an average decrease of 38% in traffic compared to the previous quarter. Similarly, traffic to consumer electronics retail websites in February decreased by 17% compared to January. Luckily, by March, when people started looking for laptops, webcams, monitors, etc. to work from home, this category had recovered.

## 4.3. QUANTITATIVE RESEARCH

### 4.3.1 Survey analysis

The survey was proceeded in June and July 2020. The authors conducted a survey of 180 employees of retail stores in Hanoi city in the form of distributing survey sheets directly to employees. As a result, 141 valid responds and 39 invalid responds were obtained (because there were no answers or the same answers to the questions in the questionnaire). Therefore, the authors conducted analysis according to 141 valid survey questions.

#### 4.3.1.1. Respondent profile

The results of the survey of 141 research samples as follows:

| | | Frequency | Percent |
|---|---|---|---|
| **Gender** | **Male** | 47 | 33.3 |
| | Female | 94 | 66.7 |
| **Position** | Manager | 9 | 6.4 |
| | Employee | 132 | 93.6 |
| **Work Experience** | 1-3 year(s) | 28 | 19.9 |
| | 3-5 years | 87 | 61.7 |
| | More than 5 years | 26 | 18.4 |

**Table 4.3. Respondent profile**

***Source: SPSS analysis and authors' synthesis***

#### 4.3.1.2. Descriptive analysis

In overall, most of variables have mean approximately above 3 to 4, which is closed with neutral option. Therefore, it can be seen that none of these determinants are strongly evaluated.

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| | **N** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** |
| **IT1** | 141 | 1 | 5 | 4.02 | 1.010 |
| **IT2** | 141 | 1 | 5 | 4.21 | .906 |
| **IT3** | 141 | 1 | 5 | 4.14 | 1.060 |
| **IT4** | 141 | 1 | 5 | 4.00 | .941 |
| **INV1** | 141 | 1 | 5 | 3.76 | 1.189 |
| **INV2** | 141 | 1 | 5 | 3.69 | 1.096 |
| **INV3** | 141 | 1 | 5 | 3.87 | 1.043 |
| **INV4** | 141 | 1 | 5 | 3.72 | 1.083 |
| **IN1** | 141 | 1 | 5 | 3.70 | 1.139 |
| **IN2** | 141 | 1 | 5 | 3.57 | 1.002 |
| **IN3** | 141 | 1 | 5 | 3.79 | 1.182 |
| **TR1** | 141 | 1 | 5 | 4.28 | .911 |
| **TR2** | 141 | 1 | 5 | 4.28 | 1.008 |
| **TR3** | 141 | 1 | 5 | 4.36 | .980 |
| **TR4** | 141 | 1 | 5 | 4.07 | 1.113 |
| **TR5** | 141 | 1 | 5 | 3.77 | .921 |
| **STR1** | 141 | 1 | 5 | 3.48 | .946 |
| **STR2** | 141 | 1 | 5 | 3.74 | 1.005 |
| **STR3** | 141 | 1 | 5 | 3.82 | 1.053 |
| **STR4** | 141 | 1 | 5 | 3.82 | 1.110 |
| **MA1** | 141 | 1 | 5 | 3.52 | .915 |
| **MA2** | 141 | 2 | 5 | 4.25 | .871 |
| **MA3** | 141 | 2 | 5 | 4.17 | .774 |
| **MA4** | 141 | 1 | 5 | 3.81 | 1.014 |
| **LO1** | 141 | 1 | 5 | 3.54 | 1.422 |
| **LO2** | 141 | 1 | 5 | 3.40 | 1.398 |
| **LO3** | 141 | 1 | 5 | 3.14 | 1.654 |
| **SU1** | 141 | 1 | 5 | 3.81 | .978 |
| **SU2** | 141 | 1 | 5 | 3.89 | 1.029 |
| **SU3** | 141 | 1 | 5 | 4.18 | 1.091 |
| **Valid N (listwise)** | **141** | | | | |

**Table 4.4. Factors descriptive analysis**

***Source: SPSS analysis results***

### 4.3.2. Reliability analysis

The scales are tested reliability with Cronbach Alpha tool. Cronbach's coefficient is a statistical test of the degree to which the items on the scale are correlated, eliminating inconsistent variables and scales. Many researchers agree that when Cronbach Alpha is from 0.8 or more to nearly 1, the scale is good, from 0.7 to nearly 0.8 is usable. There is also research suggesting that Cronbach Alpha 0,6 or above is usable in cases where the concept of being measured is new or new to the respondent in the context of the study (Hoang Trong & Chu Nguyen Mong Ngoc, 2005).

In this study, the research context about Covid-19 is still new, the authors will test the reliability of the scale on the following basis:

- Index Cronbach's Alpha ≥ 0.6
- Index Item-Total Correlation ≥ 0.3

The results of testing the reliability of the scales show that all scales are reliable Table 4.5 so that all are used in the steps of EFA analysis and subsequent regression (see appendix for details).

| | **Scale Mean if Item Deleted** | **Scale Variance if Item Deleted** | **Corrected Item-Total Correlation** | **Cronbach's Alpha if Item Deleted** |
|---|---|---|---|---|
| **INFORMATION TECHNOLOGY scale: Cronbach's Alpha = 0.806** | | | | |
| **IT1** | 12.35 | 5.714 | .621 | .757 |
| **IT2** | 12.16 | 5.937 | .674 | .735 |
| **IT3** | 12.23 | 5.434 | .643 | .747 |
| **IT4** | 12.37 | 6.234 | .556 | .787 |
| **INVENTORY scale: Cronbach's Alpha = 0.788** | | | | |
| **INV1** | 11.28 | 7.002 | .557 | .758 |
| **INV2** | 11.35 | 7.228 | .592 | .737 |
| **INV3** | 11.17 | 7.142 | .661 | .705 |
| **INV4** | 11.31 | 7.345 | .580 | .744 |
| **INFORMATION scale: Cronbach's Alpha = 0.697** | | | | |
| **IN1** | 7.45 | 3.249 | .594 | .497 |

| | | | | |
|---|---|---|---|---|
| **IN2** | 7.48 | 4.065 | .446 | .685 |
| **IN3** | 7.38 | 3.408 | .508 | .615 |
| **TRANSPORTATION scale: Cronbach's Alpha = 0.849** | | | | |
| **TR1** | 12.71 | 7.079 | .664 | .819 |
| **TR2** | 12.71 | 6.593 | .680 | .811 |
| **TR3** | 12.62 | 6.308 | .784 | .767 |
| **TR4** | 12.91 | 6.321 | .638 | .834 |
| **STRATEGY scale: Cronbach's Alpha = 0.687** | | | | |
| **STR1** | 7.55 | 2.935 | .533 | .557 |
| **STR2** | 7.29 | 2.722 | .551 | .529 |
| **STR3** | 7.21 | 2.912 | .428 | .693 |
| **MANUFACTURE scale: Cronbach's Alpha = 0.614** | | | | |
| **MA1** | 8.10 | 2.333 | .453 | .470 |
| **MA2** | 7.34 | 2.498 | .436 | .499 |
| **MA3** | 7.81 | 2.227 | .385 | .577 |
| **LOCATION scale: Cronbach's Alpha = 0.895** | | | | |
| **LO1** | 6.54 | 7.822 | .857 | .800 |
| **LO2** | 6.68 | 7.905 | .865 | .796 |
| **LO3** | 6.94 | 7.646 | .686 | .960 |
| **SUCCESS OF RETAIL SUPPLY CHAIN scale: Cronbach's Alpha = 0.803** | | | | |
| **SU1** | 8.06 | 3.689 | .600 | .781 |
| **SU2** | 7.99 | 3.357 | .658 | .722 |
| **SU3** | 7.70 | 3.056 | .695 | .682 |

**Table 4.5. Reliability analysis result *(Source: SPSS analysis results and authors's synthesis)***

### 4.3.3. Exploratory factor analysis

Exploratory Factor Analysis (Exploratory Factor Analysis) is a statistical analysis method used to reduce a set of many observable variables that are correlated to a set of variables (called factors) are fewer so that they are more meaningful but still contains most of the information content of the original variable set.

***Exploratory factor analysis for factors affecting success of retail supply chain (independent factors):***

When the scale is reliable, the observed variables will be used in the EFA discovery factor analysis with the following requirements:

- KMO coefficient (Kaiser-Meyer-Olkin) ≥ 0.5 with significance of Bartlett test ≤ 0.05
- Factor loading ≥ 0.5 with sample size from 120 to 300
- The scale is accepted when the total variance extracted ≥ 50% and the Eigenvalue coefficient >1

When analyzing EFA with the scale of perceived value components, the authors used Principal Component Analysis method with Varimax rotation and the point of extracting the elements with eigenvalue >1.

Factor analysis results show that 24 observed variables of the 7 original factors are grouped into 5 new factors. With the factor load factor of the variable STR3 <0.5, it shows that the observed variable STR3 has a very small correlation with this factor, so the authors removed this observed variable and rerun EFA with 23 remaining observed variable. The results of the new factor analysis show that 23 observed variables are grouped into 5 new factors. KMO value of 0.860 is greater than 0.5; Sig value. is 0.000 less than 0.05, so the results of EFA analysis are consistent. The variance extracted 63.235% (greater than 50%) shows these 5 factors, explaining 63.235% variation of the data, so the scales are acceptable. The stop extracting the factors at factor 5 with Eigenvalue = 1.187. Factor load coefficients are both greater than 0.5 (the smallest factor weights fall into two observed variables IN2 and STR1 with factor loading 0.527 and 0.597, respectively). *(Specific results are presented in the Appendix B)*

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | **0.860** |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1606.962 |
| | df | 253 |
| | Sig. | **0.000** |
| **Total Variance Explained*Extracted*** | | |
| Component | Initial Eigenvalues | Extraction Sums of Squared Loadings |

| | Total | % of Variance | Cumulative % | Total | % of Variane | Cumulative % |
|---|---|---|---|---|---|---|
| 1 | **7.306** | 31.767 | 31.767 | 7.306 | 31.767 | 31.767 |
| 2 | **2.775** | 12.067 | 43.834 | 2.775 | 12.067 | 43.834 |
| 3 | **1.860** | 8.088 | 51.922 | 1.860 | 8.088 | 51.922 |
| 4 | **1.415** | 6.152 | 58.073 | 1.415 | 6.152 | 58.073 |
| 5 | **1.187** | 5.161 | 63.235 | **1.187** | 5.161 | **63.235** |
| 6 | .979 | 4.257 | 67.492 | | | |
| 7 | .850 | 3.696 | 71.188 | | | |

| **Rotated Component Matrix[a]** | | | | | | |
|---|---|---|---|---|---|---|
| | **Component** | | | | | **Component's name** |
| | **1** | **2** | **3** | **4** | **5** | |
| **TR3** | **.780** | | | | | **Transportation and strategy applying information technology** |
| **TR2** | **.747** | | | | | |
| **TR4** | **.741** | | | | | |
| **TR1** | **.724** | | | | | |
| **IT2** | **.671** | | | | | |
| **IT3** | **.657** | | | | | |
| **IT4** | **.642** | | | | | |
| **IT1** | **.642** | | | | | |
| **STR2** | **.634** | | | | | |
| **STR1** | **.597** | | | | | |
| **INV2** | | **.750** | | | | **Inventory** |
| **INV3** | | **.742** | | | | |
| **INV4** | | **.705** | | | | |
| **INV1** | | **.689** | | | | |
| **LO2** | | | **.934** | | | **Location** |
| **LO1** | | | **.923** | | | |
| **LO3** | | | **.836** | | | |
| **MA2** | | | | **.769** | | **Manufacture** |
| **MA1** | | | | **.763** | | |
| **MA3** | | | | **.691** | | |
| **IN1** | | | | | **.867** | **Information** |
| **IN3** | | | | | **.671** | |
| **IN2** | | | | | **.527** | |

**Table 4.6: Results of Exploratory factors analysis for independent factors**

***(Source: SPSS analysis results and authors' synthesis)***

❖ The first factor includes 10 observed variables as follows:

| | |
|---|---|
| **TR3** | During Covid-19 period, your store still supplied the goods to the customer on time |
| **TR2** | During Covid-19 period, your company's shipping costs are low |
| **TR4** | During Covid-19 period, your company did not have a "cleaved" situation. |
| **TR1** | Your company uses a variety of flexible modes of transport |
| **IT2** | Information technology helps to reduce corporate management costs |
| **IT3** | Information technology helps the shops reduce errors created by individuals in their business and increase the accuracy at work |
| **IT4** | The digitization of business operations, storage, transportation, customer records, etc makes it easier for the store to control the business process |
| **IT1** | The company or the store you apply information technology in your business |
| **STR2** | During Covid-19 period, the company was focused trading in strategic commodities |
| **STR1** | During the Covid-19 period, the company you have strategy to optimize government subsidies |

This factor is made up of 4 observed variables of the transport scale, 4 observed variables of the IT scale, and 2 observed variables of the strategic scale. The convergence of transport, information technology, and strategy dictates the strong links between these three factors. When information technology is applied well, supply chain strategy and transportation optimize efficiency. Therefore, the new element is renamed to **Transportation and strategy applying information technology** encoded **IST**.

This newly created factor was reevaluated reliability by the Cronbach alpha coefficient. The results show that IST's Cronbach alpha reached 0.903, the smallest total variable correlation was 0.884 (variable TR3).

| **Transportation and strategy applying information technology** scale**:** Cronbach's Alpha = **0.903** | | | | |
|---|---|---|---|---|
| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| **TR1** | 36.29 | 43.236 | .696 | .892 |
| **TR2** | 36.29 | 42.708 | .659 | .894 |
| **TR3** | 36.21 | 41.265 | .808 | .884 |
| **TR4** | 36.50 | 41.652 | .663 | .894 |
| **IT1** | 36.55 | 42.393 | .683 | .892 |
| **IT2** | 36.36 | 43.204 | .703 | .891 |
| **IT3** | 36.43 | 41.832 | .689 | .892 |
| **IT4** | 36.57 | 43.961 | .606 | .897 |
| **STR1** | 37.09 | 45.056 | .508 | .903 |
| **STR2** | 36.83 | 43.728 | .577 | .899 |

**Table 4.7: Reliability analysis result of new factor IST**

***(Source: SPSS analysis results)***

❖ The second factor includes 4 observed variables as follows:

| | |
|---|---|
| **INV2** | During Covid-19 period, the amount of inventories is enough to supply the your store when the market is fluctuated |
| **INV3** | During Covid-19 period, your store's warehouse was operating efficiently |
| **INV4** | During Covid-19 period, storage costs increased |
| **INV1** | During Covid-19 period, your store has a specific storage plan for each type of goods |

This factor is named **Inventory,** encoded **INV**

❖ The third factor includes 3 observed variables as follows:

| | |
|---|---|
| **LO2** | The location of your store close to the warehouse |
| **LO1** | The location of your store is convenient for business |
| **LO3** | The location of your store and your warehouse is convenient for all members of the commodity supply chain |

This factor is named **Location,** encoded **LO**

❖ The fourth factor includes 3 observed variables as follows:

| | |
|---|---|
| **MA2** | During Covid-19 period, production units in the supply chain always satisfy the need to deliver goods on time |
| **MA1** | During Covid-19 period, production units in the supply chain always satisfy the correct order quantity |
| **MA3** | During Covid-19 period, the company's source of goods satisfy the quality standards |

This factor is named **Manufacture,** encoded **MA**

❖ The fifth factor includes 3 observed variables as follows:

| | |
|---|---|
| **IN1** | Inventory data is shared among supply chain partners |
| **IN3** | The demand forecast is shared across the entire supply chain |
| **IN2** | Actual sales data is shared by supply chain partners |

This factor is named **Information,** encoded **IN**

***Exploratory factor analysis for success of retail supply chain (dependent factors):***

To ensure the reliability and cohesion of the factors of the Success of retail supply chain given in the theoretical basis, the authors will also have to conduct the factor analysis on Success of retail supply chain elements. Our expectation is that these factors will together form a factor (category) with an Eigenvalue greater than 1. That means that the three factors that measure Success of retail supply chain are highly cohesive and show the same category *Success of retail supply chain*.

After analyzing EFA, four observed variables of the Success of retail supply chain scale are grouped into 1 factor. There were no observed variables are excluded. EFA is suitable for coefficient KMO = 0.699, variance extracted is 71.776%; observed variables with factor load coefficients above 0.5, Sig value. is 0.000.

| KMO and Bartlett's Test | | | | | | |
|---|---|---|---|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | | **.699** | | | |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 135.568 | | | | |
| | df | 3 | | | | |
| | Sig. | **.000** | | | | |
| **Total Variance Explained** | | | | | | |
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.153 | 71.776 | 71.776 | 2.153 | **71.776** | 71.776 |
| 2 | .495 | 16.502 | 88.278 | | | |
| 3 | .352 | 11.722 | 100.000 | | | |
| **Component Matrix[a]** | | | | | | |
| Component | | | | | | |
| 1 | | | | | | |
| SU3 | **.875** | | | | | |
| SU2 | **.852** | | | | | |
| SU1 | **.813** | | | | | |

**Table 4.8. Results of Exploratory factors analysis for independent factors**

***Source: SPSS analysis results and authors' synthesis***

**ADJUSTABLE RESEARCH MODEL:**

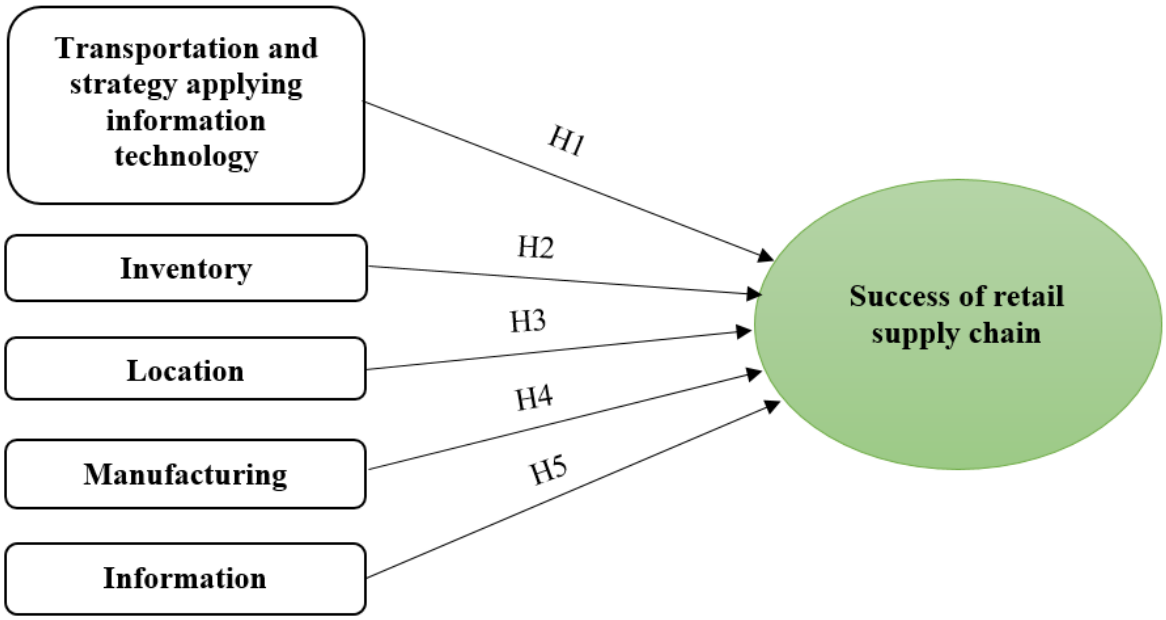



**Figure 4.3. Adjusted research model**

**Adjust hypotheses:**

*H1: Transportation and strategy applying information technology has a positive impact on the success of retail supply chain.*

*H2: Inventory has a positive impact on the success of retail supply chain.*

*H3: Location has a positive impact on the success of retail supply chain.*

*H4: Manufacturing has a positive impact on the success of retail supply chain.*

*H5: Information has a positive impact on the success of retail supply chain.*

### 4.3.4. Correlation analysis

According to Evans (1996), the strength of the Correlation can be described by values of Pearson Correlation (r) as following: 0.00 – 0.19 “very weak”; 0.20 – 0.39 “weak”; 0.40 – 0.59 “moderate”; 0.60 – 0.79 “strong”; and 0.80 – 1.0 “very strong”.

Furthermore, if Sig. value of Pearson's correlation coefficient is less than 5%, it indicates that variables have correlation with each other. The greater R-value is the stronger linear correlation has. In this test, all independent variables need to be considered to correlate dependent variable.

| **Correlations** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **SU** | **IST** | **INV** | **LO** | **MA** | **IN** |
| **SU** | Pearson Correlation | **1** | **.821**$^{**}$ | **.619**$^{**}$ | **-.017** | **-.033** | **.541**$^{**}$ |
| | Sig. (2-tailed) | | **.000** | **.000** | **.841** | **.695** | **.000** |
| | N | 141 | 141 | 141 | 141 | 141 | 141 |
| **IST** | Pearson Correlation | .821$^{**}$ | 1 | .590$^{**}$ | .036 | .063 | .553$^{**}$ |
| | Sig. (2-tailed) | .000 | | .000 | .668 | .459 | .000 |
| | N | 141 | 141 | 141 | 141 | 141 | 141 |
| **INV** | Pearson Correlation | .619$^{**}$ | .590$^{**}$ | 1 | .040 | -.047 | .389$^{**}$ |
| | Sig. (2-tailed) | .000 | .000 | | .635 | .578 | .000 |
| | N | 141 | 141 | 141 | 141 | 141 | 141 |
| **LO** | Pearson Correlation | -.017 | .036 | .040 | 1 | .072 | -.073 |
| | Sig. (2-tailed) | .841 | .668 | .635 | | .399 | .390 |
| | N | 141 | 141 | 141 | 141 | 141 | 141 |
| **MA** | Pearson Correlation | -.033 | .063 | -.047 | .072 | 1 | -.054 |
| | Sig. (2-tailed) | .695 | .459 | .578 | .399 | | .523 |
| | N | 141 | 141 | 141 | 141 | 141 | 141 |
| **IN** | Pearson Correlation | .541$^{**}$ | .553$^{**}$ | .389$^{**}$ | -.073 | -.054 | 1 |
| | Sig.(2-tailed) | .000 | .000 | .000 | .390 | .523 | |
| | N | 141 | 141 | 141 | 141 | 141 | 141 |

**Table 4.9. Result of Correlation analysis (*Source: SPSS analysis results)***

According to analysis results of correlation between the dependent variable SU and 5 independent variables (IST, INV, LO, MA, IN); the authors found that the two variables LO and MA had a negative Pearson Correlation (-0.017 and -0.033 respectively) with the Sig. values are greater than 0.05. This says that these two factors are unexplained for the Success of retail supply chain variable. With the remaining 3 independent variables: IST, INV, IN has a Sig index. (2-tailed) is 0.000 and the Pearson Correlation is relative. In which, Transportation and strategy applying information technology (IST) has the strongest correlation with Success of retail supply chain (SU) with r equals 0.821 and Information (IN) shows the weakest relationship with Success of retail supply chain (SU) with r equals 0.541.

Therefore, 3 independent variables **IST, INV, IN** can be put into the regression model to explain to the Success of retail supply chain.

### 4.3.5. Regression analysis

In order to find out the linear relationship between independent variables and dependent variables, regression analysis is applied through the entering method. Moreover, the hypothesis model can be tested and concluded after regression analysis. The multiple collinearity phenomena among variables are tested by using the variance inflation factor (VIF). The regression equation is established as the formula is below:

$$\mathbf{SU = \beta_0 + \beta_1 * IST + \beta_2 * INV + \beta_3 * IN}$$

*In which,*

**$\beta_0$:** Constant

**$\beta_i$:** Regression coefficients (i=1, 2, 3)

**IST, INV, IN:** the independent factors (Transportation and strategy applying information technology, Inventory, Information)

**SU:** the dependent factor (Success of retail supply chain)

After running the regression, the authors get the following results:

| Model Summary[b] | | | | | |
|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .845[a] | .715 | **.708** | .47270 | **1.664** |
| a. Predictors: (Constant), IN, INV, IST | | | | | |
| b. Dependent Variable: SU | | | | | |

| ANOVA[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 76.688 | 3 | 25.563 | 114.403 | **.000[b]** |
| | Residual | 30.612 | 137 | .223 | | |
| | Total | 107.300 | 140 | | | |

**Table 4.10. Success of Retail Supply Chain Model summary and Results of ANOVA Test.**

***Source: SPSS analysis results***

In Table model summary, Adjusted R-square value is 0.708 (greater than 50%), which indicates that 70.8% of the variance in Success of retail supply chain can be explained by these predictors (IST, INV, IN). Otherwise, Durbin-Watson statistic shows a value of 1.664 (which ranges from 1 to 2); that means there is no autocorrelation in the sample.

In Table ANOVA, sig. of F test is 0.000 less than 0.05. Therefore, the dependent factor can be explained by the variables of five independent factors.

| Coefficients[a] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -.380 | .238 | | -1.595 | **.113** | | |
| | IST | .762 | .076 | **.630** | 10.048 | **.000** | .530 | **1.886** |
| | INV | .194 | .058 | **.192** | 3.372 | **.001** | .645 | **1.551** |
| | IN | .139 | .055 | **.140** | 2.536 | **.012** | .683 | **1.464** |
| a. Dependent Variable: SU | | | | | | | | |

**Table 4.11. Regression Coefficients**

***Source: SPSS analysis results***

The regression coefficient is presented in two forms: (1) Unstandardized and (2) Standardized. Because with the Unstandardized regression coefficient (B), its value depends on the scale, the authors cannot use them to compare the impact of the independent variables on the dependent variable in the same model. The Standardized regression coefficient (β) is the coefficient that the authors have standardized the variables. Therefore, they are used to compare the impact level of the dependent variables. The independent variable has a large β value means that it has a strong impact on the dependent variable, which has meaning in economic research. Therefore, the authors take the Standardized regression results for the model.

According to Table 4.11, the Sig. value of three independent factors is less than 0.05. That means all elements in the research model have reliability of more than 95% and met the requirement. Moreover, the VIF score of these factors is lower than 2, so the multiple collinearity does not appear in this case.

These β values are the regression equation for predicting the dependent variables from the independent variable. From the result of the Coefficients, the linear regression equation is:

**SU = 0.63*IST + 0.192*INV + 0.14*IN**

After regression analysis, the authors gave the final model as follows:

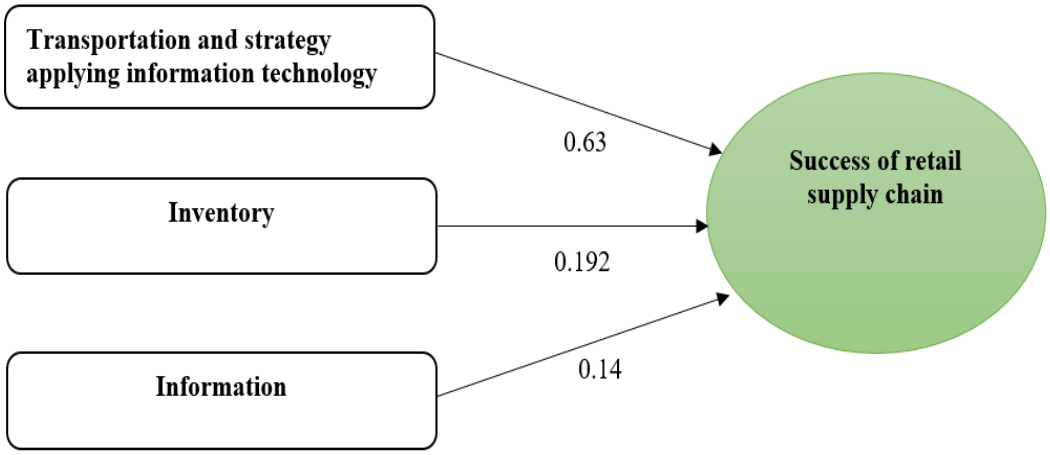



**Figure 4.4. Regression Analysis Result Model**

### 4.3.6. Conclusion

There are five hypotheses adjusted in section 4.1.4.2 and the table below shows the results of the tested hypotheses.

| **Hypotheses** | **Sig.** | **Result** |
|---|---|---|
| *H1: Transportation and strategy applying information technology has a positive impact on the success of retail supply chain.* | **0.000** | Confirmed |
| *H2: Inventory has a positive impact on the success of retail supply chain.* | **0.001** | Confirmed |
| *H3: Location has a positive impact on the success of retail supply chain.* | | Rejected because the Location scale was excluded when analyzing Pearson's correlation. |

| | | |
|---|---|---|
| *H4: Manufacturing has a positive impact on the success of retail supply chain.* | | Rejected because the Manufacture scale was excluded when analyzing Pearson's correlation. |
| *H5: Information has a positive impact on the success of retail supply chain.* | **0.012** | Confirmed |

**Table 4.12. Results of the tested hypotheses**

***Source: SPSS analysis results***

## 4.4. FACTORS THAT DEEPLY AFFECT VIETNAM'S SUPPLY CHAIN IN THE CONTEXT OF GLOBAL SUPPLY CHAIN SHIFTS

### 4.4.1. Transportation and Strategy applying Information Technology

The new factor of "Transportation and Strategy applying Information technology" (IST) is integrated by 3 factors: Transportation, Strategy and Information Technology. The IST factor demonstrates the importance of IT in the strategy and transportation activities of a retail unit.

When compared to other regions in the global supply chain, the application of information technology in the retail industry in Vietnam has many limitations. Most of Vietnamese retail enterprises and stores have not built automated processes, which matched international standards in the production, storage, logistics, and sales processes yet. Some large enterprises have deployed, developed and applied information technology to their retail business. However, the level of efficiency is not high. Most physical work in Vietnamese retail enterprises and stores need the participation of people. Meanwhile, when compared to other countries in the global supply chains, especially China, the human factor only plays the role of operating and monitoring, most physical work is done by machines or robots. Therefore, businesses and retail stores could work faster, more efficiently, lower costs and limit errors created by human factors.

Despite Vietnamese IT industry have not appreciated, however it is a country with rapid IT development in the region. In 2016, PC Magazine described the country as South East Asia's

Silicon Valley. Emerging sectors and fast-growing sunrise industries in Vietnam include finance technology (Fintech), telecommunications, electronics and computer manufacturing, and information and communications technology (ICT) services. In mid-2018, Vietnam was home to an estimated 30,000 businesses spanning IT hardware, software, digital content and ICT services. According to the Ministry of Information and Communications, ICT is one of the fastest-growing sectors in Vietnam. In 2018 the total ICT industry revenue was US$98.9 billion, 13 times the revenue in 2010 (US$7.6 billion).

| | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Hardware | 53 | 58.8 | 81.6 | 88 |
| Software | 2.6 | 3 | 3.8 | 4.3 |
| Digital content | 0.6 | 0.7 | 0.8 | 0.9 |
| Services | 4.5 | 5 | 5.4 | 5.7 |
| Total | 60.7 | 67.7 | 91.6 | 98.9 |

**Table 4.13. Revenue of Vietnamese ITC industry 2015-2018**

***Source: Ministry of Information and Communication***

There are great number of employees in the Vietnamese' IT industry and the amount tend to increase strongly in the following years; thanks to the State's human resource policies as well as the development in the education system. According to the Ministry of Information and Communications, Vietnam currently has 235 universities, including 153 universities providing IT training, about 50,000 IT graduated students annually. In additional, Vietnam was placed as the 23rd on HACKERRANK's chart and the 6th on TOPCODER's chart for programming skills.

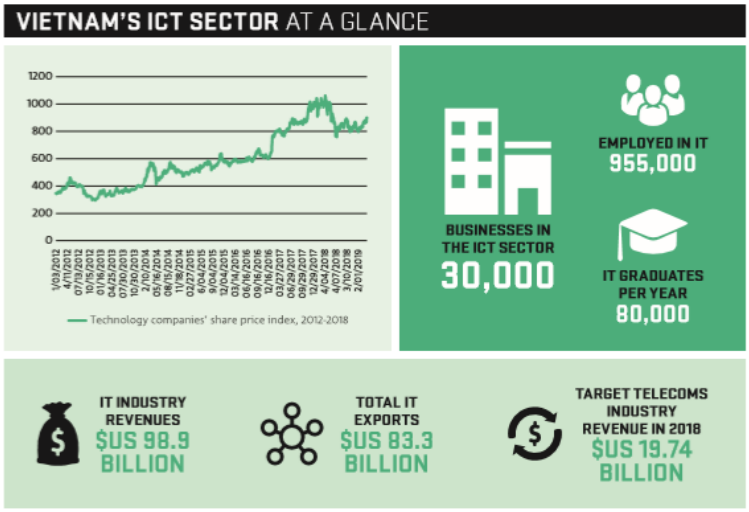



**Figure 4.5. Vietnam's ICT sector**

***Source: Ministry of Information and Communications (Source: stockbiz.vn)***

#### 4.4.1.1. Transportation applying Information Technology:

Dang, Thoai and Le (2018, p. 16) noted "As of December 2017, there are 5797 patents on research and application of IoT, AI and Big Data in transportation, which is published in 27 countries and 2 organizations (WO and EP). In the past 10 years (2007 - 2017), the number of patents published has increased dramatically. In the period of 2014 - 2017, the growth rate of published invention increased 2 times after each year. This proves that research and application of IoT, AI and big data in transportation are currently very focused in the world.

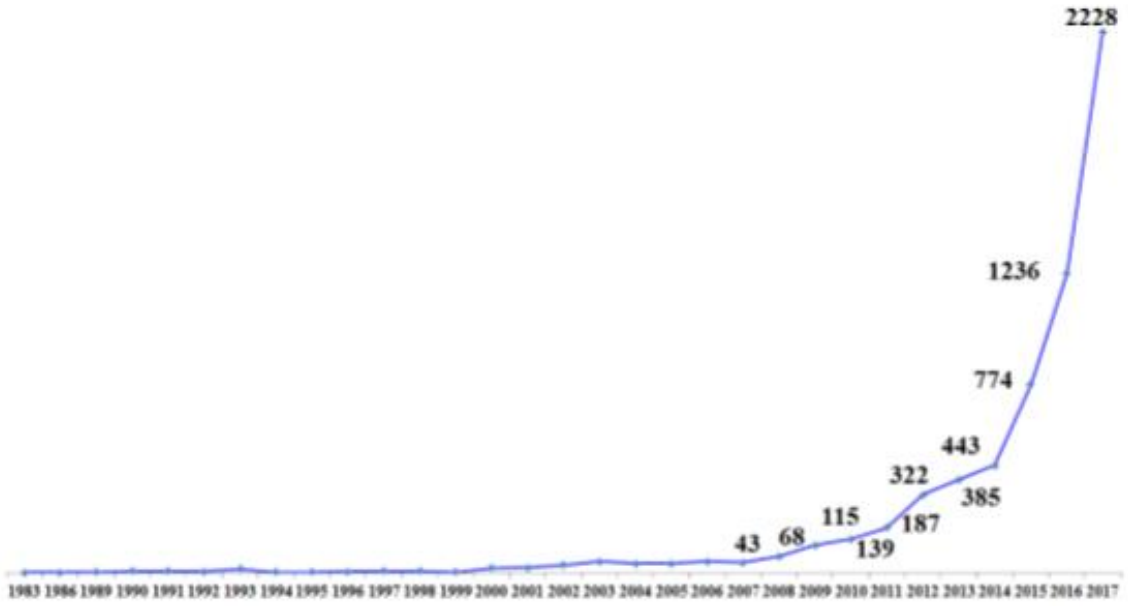



**Chart 4.12. Number of patents on research and application of AI, big data and IoT in Transportation over time**

***Source: Center for Information and Statistics of Science and Technology in Vietnam***

Among 27 countries, China leads with 3783 patents, accounting for more than half of all inventions worldwide. On the basis of the published patent database, it is found that research and application of AI, big data and IoT in current traffic are in 3 main topics:

- Data processing System/Method
- Digital data transmission
- Tracking and Tracing system

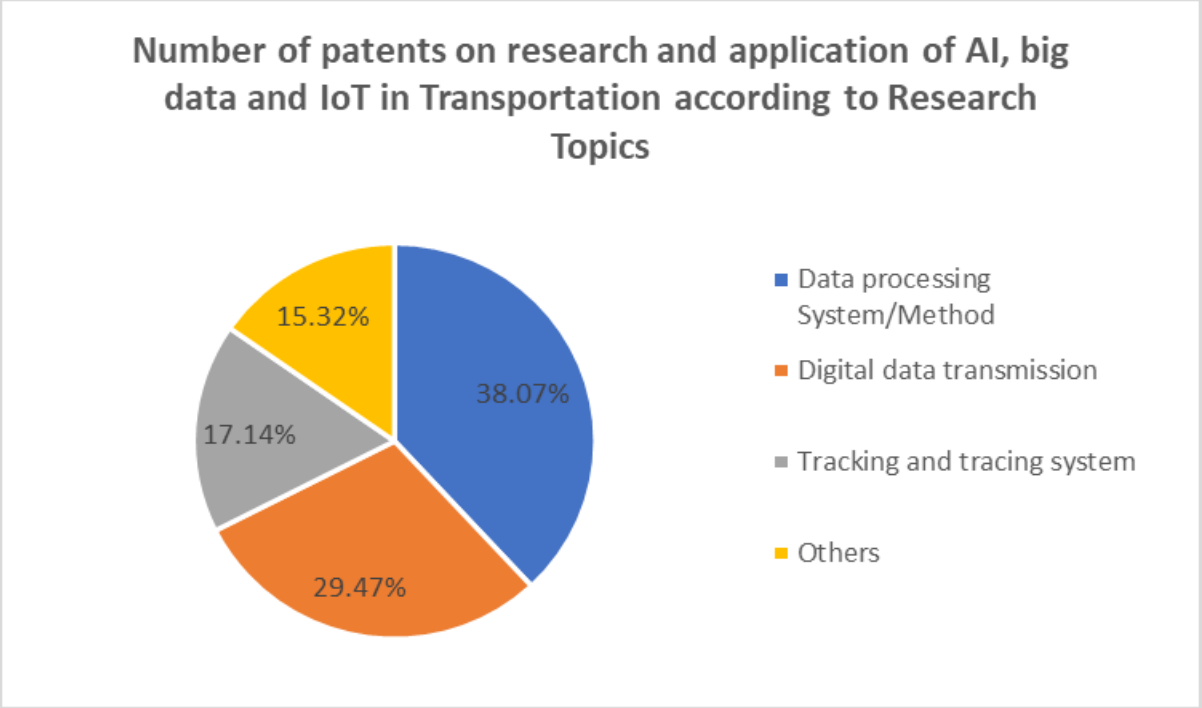



**Chart 4.13. Number of patents on research and application of AI, big data and IoT in Transportation according to research topics**

***Source: Center for Information and Statistics of Science and Technology in Vietnam***

Vietnam has not owned any patents on research and application of AI, Big Data and IoT in transportation. Most of the enterprises in Vietnam are buying or leasing products from abroad to implement to their transportation process. It leads to many problems that businesses cannot optimize operating costs, and in actual implementation there are still many obstacles.

LPI (Logistics Performance Index) is the national logistics performance index published by the World Bank (WB), evaluated on a 5-point scale with 6 parameters: Customs, Infrastructure (Infrastructure), International Shipments, Logistics Competence, Tracking & Tracing, Timeliness. Vietnam's logistics performance index (LPI) 2018 was published by the World Bank in its July 2018 report, whereby Vietnam was ranked 39 out of 60 countries participating in the survey, up 25 places from the 2016 ranking (64/160), with a score of 3.27 compared to 2.98 in 2016. In the ASEAN region, Vietnam ranked third after Singapore (ranked 7) and Thailand (ranked 32). Vietnam ranks first among emerging markets and the highest in the group of middle-income countries.

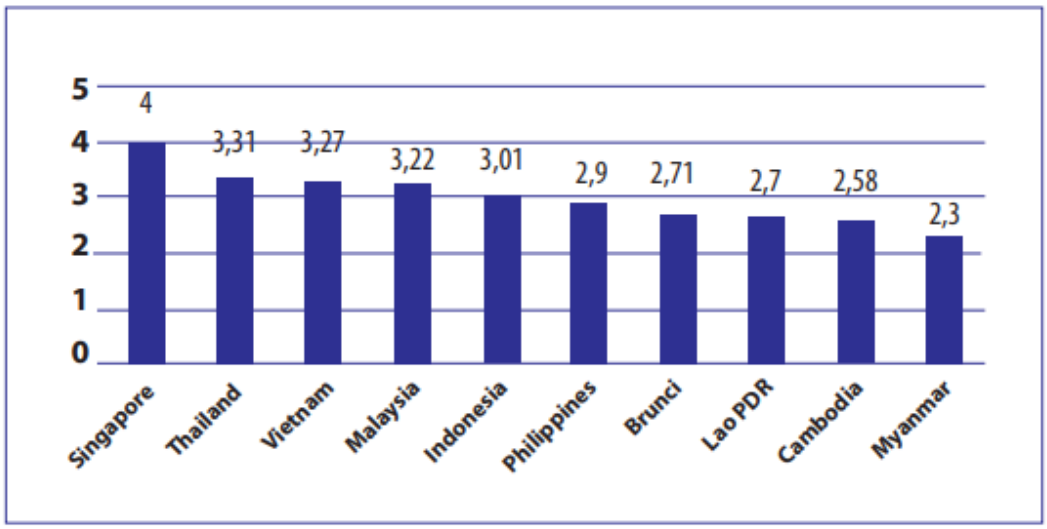



**Chart 4.14. LPI rankings of ASEAN countries**

***Source: VLA – White Book 2018***

All 6 parameters / criteria for LPI 2018 evaluation have increased dramatically, of which the highest increase is the Logistics competence & Service quality (ranked 33, up 29 places) and the ability to Tracking and Tracing (ranked 34, up 41 places). The rankings also recorded the increase of Customs (ranked 41, up 23 levels), Logistics infrastructure (ranked 47, up 23 ranks), Timeliness (ranked 40, up 16 places) and International Shipments (ranked 49, up 1 place compared to 2016).

| Index | 2007 | | 2010 | | 2012 | | 2014 | | 2016 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Score | Ranking | Score | Ranking | Score | Ranking | Score | Ranking | Score | Ranking | Score | Ranking |
| LPI | 2.89 | 53 | 2.96 | 53 | 3.00 | 53 | 3.15 | 48 | 2.98 | 64 | 3.27 | 39 |
| Customs | 2.89 | 37 | 2.68 | 53 | 2.65 | 63 | 2.81 | 61 | 2.75 | 64 | 2.96 | 41 |
| Infrastructure | 2.50 | 60 | 2.56 | 66 | 2.68 | 72 | 3.11 | 44 | 2.70 | 70 | 3.01 | 47 |
| International Shipments | 3.00 | 47 | 3.04 | 58 | 3.14 | 39 | 3.22 | 42 | 3.12 | 50 | 3.16 | 49 |
| Logistics competence & Service quality | 2.80 | 56 | 2.89 | 51 | 2.68 | 82 | 3.09 | 49 | 2.88 | 62 | 3.40 | 33 |
| Tracking & Tracing | 2.90 | 53 | 3.10 | 55 | 3.16 | 47 | 3.19 | 48 | 2.84 | 75 | 3.45 | 34 |
| Timeliness | 3.22 | 65 | 3.44 | 76 | 3.64 | 38 | 3.49 | 56 | 3.50 | 56 | 3.67 | 40 |

**Table 4.14. Vietnamese LPT Index 2007-2018**

***(Source: VLA – White Book 2018)***

However, the transportation infrastructure in Vietnam is not evenly developed. According to a report of World Bank, Vietnam's trade flows are concentrated at just ¼ of all international border gates, including 2 airports, 5 seaports and 5 land border gates. These border gates handle up to 82% of the trade value in 2016. In addition, the current domestic transportation system depends heavily on road transport, accounting for three-quarters of the total volume of goods. In big cities, traffic congestion also occurs frequently, negatively affecting the process of transporting goods. Vietnam has not yet taken advantage of the extensive network of rivers due to the port system is not suitable to accommodate a larger volume of cargo. The method of transporting goods in a container, allowing for multimodal transport, is still relatively limited.

To conclude, although there are still many limitations in Vietnamese infrastructure and customs management, transportation activities in Vietnam have been developed rapidly and achieved certain achievements. However, transportation applying IT in Vietnam is not as strong as most countries in the global supply chain. Most of enterprises in Vietnam have not

yet applied new technologies such as: Smart Logistics, RFID, IoT, Cloud Logistics, etc to the company's transportation activities.

#### 4.4.1.2. Strategy applying Information Technology:

Strategy in the retail industry will not change much after the shift in global supply chains. The strategy of each retail unit will serve the overall strategy of the company. Strategies in each supply chain will be divided into many levels and layers. Units in the supply chain also need to have appropriate strategies based on the company's general strategy. For example, the company's general strategy was to expand its business through e-commerce to maintain sales during the Covid-19 period. Retail stores also need to have the right strategy based on their situation to find the most suitable products and distribution channels. Each store, retailer is in different circumstances and conditions. Their task is to find the best, most effective strategy to serve the general strategy of the supply chain in which they participate in.

In addition, the development of Artificial intelligence (AI) has given marketers an effective tool to analyze insight about customers' shopping trends and customer care methods. According to Investopedia, AI was designed to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. Thanks to AI, people can find the buying habits and behaviors of potential customers, thereby planning the sales strategy of the Company. Moreover, AI also helps people in the process of making strategic strategy for product development, storage and logistics. However, up to now, there are just few retailers in Vietnam applying AI technology to their business. Some large e-commerce enterprises such as Shopee, Tiki, Lazada, etc have pioneered in using AI as a shopping behavior research tool and have achieved certain results. However, it is still modest when compared to other big enterprises in the world such as Amazon, Alibaba, Walmart, etc.

### 4.4.2. Information

The information factor will not be affected greatly after the movement of the global supply chain. Essentially, information must be shared continuously throughout all supply chain units. Lack of information leads to huge issues in the business operation and market forecast. When participating in the global supply chain, retailers also need to pay attention to time zone differences and language differences. These are obstacles that need to be overcome in order to improve the ability to exchange information between all components in the supply chain.

### 4.4.3. Inventory

According to a survey conducted by the Vietnam Logistics Business Association (VLA), over 30% of information technology applications currently used in logistics enterprises are basic applications such as Tracking and Tracing, Delivery management systems, Electronic data interchange, Transport management systems and Customs declaration (most used 75.2% to 100%).

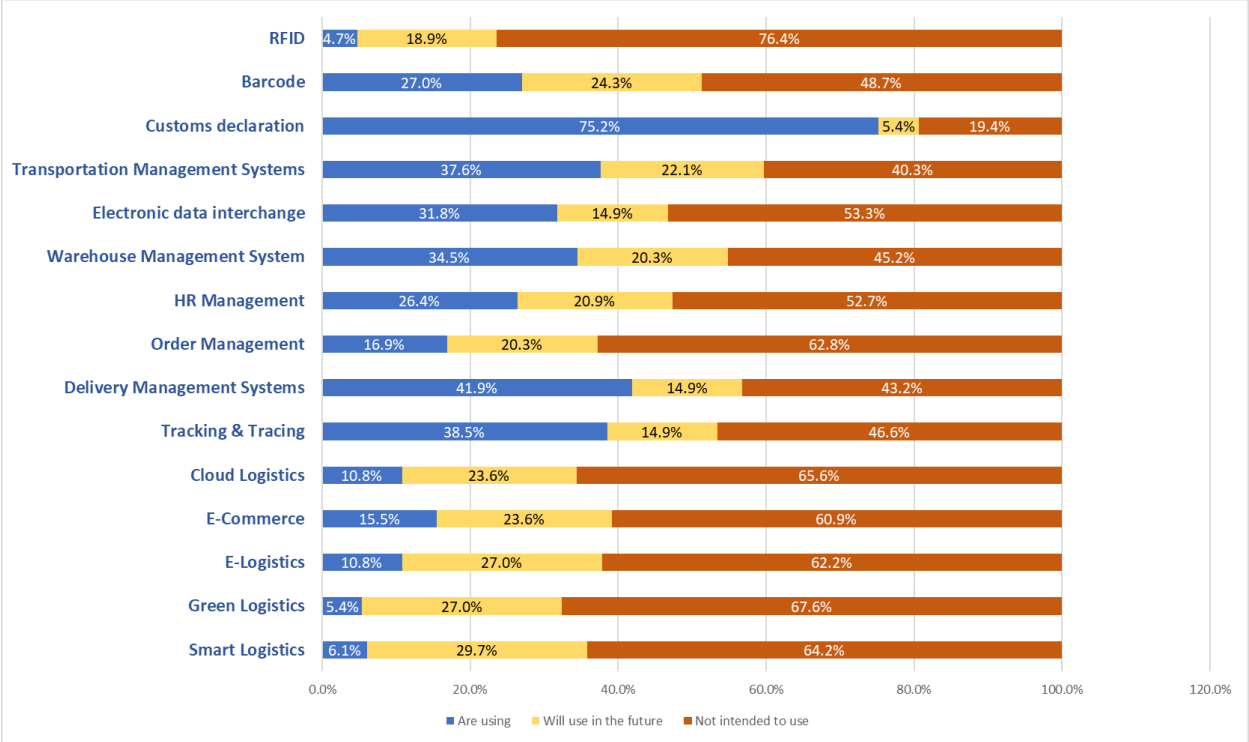



**Chart 4.15. IT application of Logistics enterprises (2018).**

***Source: VLA – White Book 2018***

Moreover, there are only a few enterprises in Vietnam apply new technologies in logistics: 6.4% of Logistics enterprises in Vietnam apply Smart Logistics system, 10.8% of businesses apply Cloud Logistics system and 4.7% of businesses use RFID technology. More than half of Logistics enterprises in Vietnam do not intended to use.

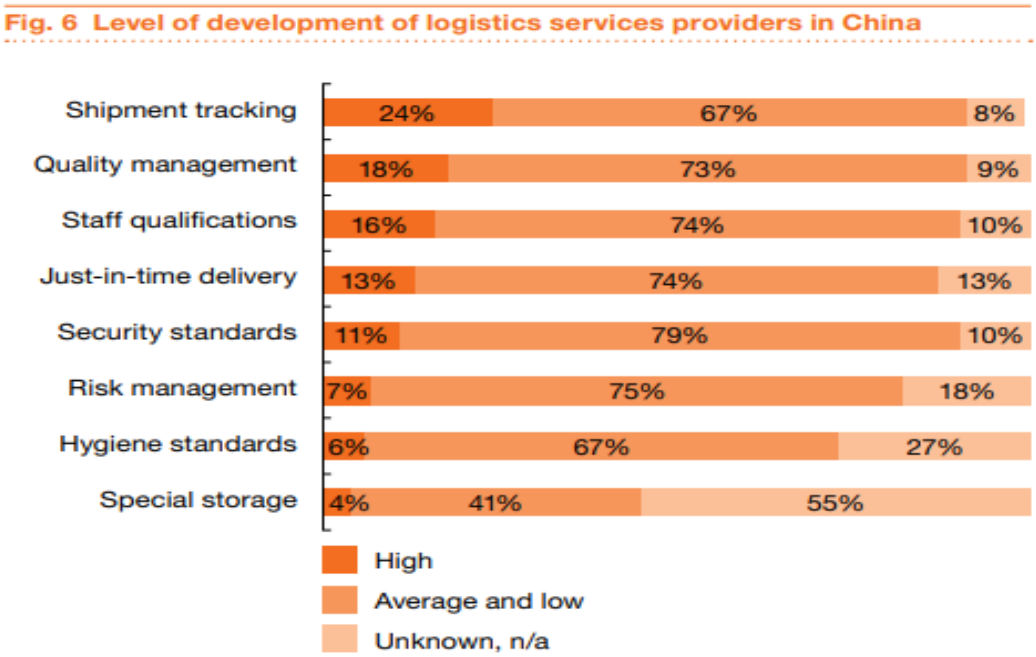



**Chart 4.16. Level of development of logistics services providers in China**

***Source: Logistics in China: An All-Inclusive Market – PwC***

When compared to other countries in the global supply chain, especially China, Vietnamese retailers have many limitations in applying technology to warehouse management. Most of large retailers in the world have applied new technologies such as: Radio Frequency Identification (RFID), Light Fidelity (LiFi), Barcode, Robotics Technology, Real-time Product Updates, etc to manage their warehouses effectively. According to statistics of PwC, more than 80% of Logistics enterprises in China have developed a warehouse service management system with an average level. However, according to the Ministry of Industry and Trade, until 2017, most of the Vietnamese small retailers do not have a warehouse management system,

the proportion with WMS is estimated to be less than 10%. There are only a few large companies specializing in the warehouse of distribution or operating in the logistics industry such as Gemadept Logistics, VINAFCO, U&I, TBS, Transimex, Sotrans, etc are developing WMS applications. These businesses often face difficulties when developing applications, they have to buy products from abroad, the installation and commissioning process encountered many difficulties, the connection between internally and with customers needed a better solution.

# SUMMARY OF CHAPTER 4

Chapter 4 presents the results of quantitative research that test proposed research hypotheses. Chapter 4 also gives the main results of the thesis is to identify 3 factors that Vietnam's retail supply chains need to pay attention to help operations in the chain run smoothly and efficiently during the COVID-19 period: *Strategy and Transportation applying Technology*, *Inventory* and *Information*.

# CHAPTER 5: OPPORTUNITIES AND SOLUTIONS

## 5.1. OPPORTUNITIES OF VIETNAMESE RETAIL SUPPLY CHAIN

### 5.1.1. Opportunities from the desire to restructure the global supply chain

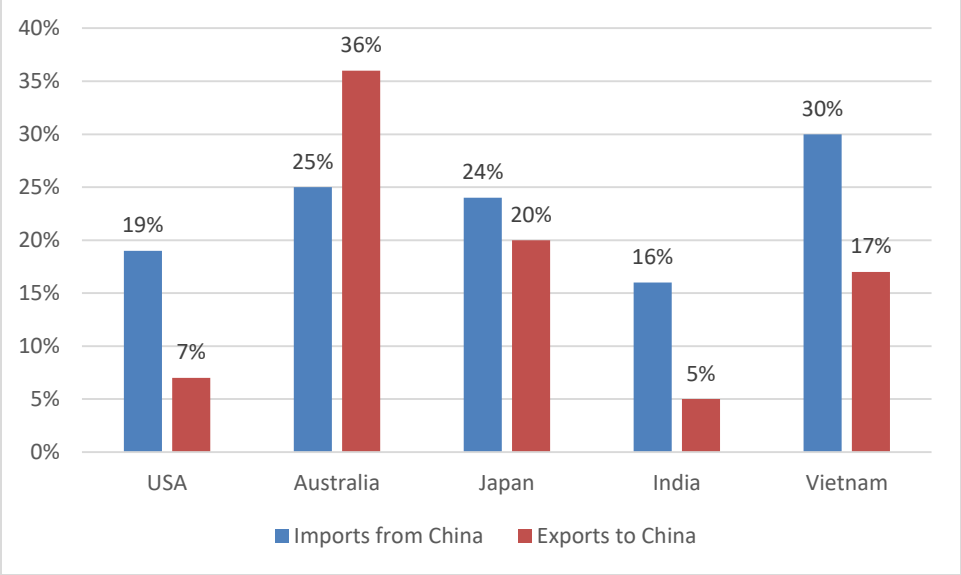



**Chart 5.1. Trade with China in 2019 (percentage of total trade)**

***Source: UN COMTRADE database***

According to Chart 5.1, the global manufacturing supply chain is heavily dependent on China. Therefore, any disruption in China will put global supply chains at risk. The disruption of global supply chains due to the impact of the disease has made businesses realize the urgency of diversifying their production catalog and supply chains to avoid being dependent on one country. The issue of shifting the supply chain out of China has been considered by some countries such as the US, Japan, etc to reduce dependence on supply from this country. For example, Japan has launched a program to encourage businesses to leave China, by spending $ 2.2 billion to pull businesses back to Japan or to other countries, especially Southeast Asian countries, including Vietnam. Besides, the plan of establishing "*Economic Prosperity Network*" initiated by the US is a great opportunity for Vietnam to take advantage.

There are several objective reasons to think that Vietnam has become one of the attractive destination for factories which will pull out of China. Firstly, labor costs in Vietnam are cheap. According to a report by the World Bank (WB), labor costs in Vietnam are $3 per hour (2019), less than half of China ($ 6.5 per hour). In addition, in recent years, Vietnam has signed many free trade agreements such as EVFTA, VKFTA, etc to create favorable conditions for foreign businesses to do business in Vietnam. The relocation of manufacturing factories to Vietnam will help Vietnam's retail supply chain to save transportation costs and inventory costs.

### 5.1.2. Opportunities from effective control of COVID-19 pandemic

During the time of COVID-19, Vietnam was one of the leading country in prevention and control of epidemic. Since, Vietnam has attracted the attention of international friends with its ability to maintain social order when upheaval occurs. This is an advantage to attract foreign investment capital into Vietnam and create favorable environment for the development of economic sectors as well as supply chains operating in Vietnam, including retail supply chains.

### 5.1.3. Opportunities for Vietnamese retail businesses to change the way doing business

The 4.0 revolution happening all over the world creates a changing trend of the global supply chain. Especially, in COVID-19 period, there were big market fluctuations that forced businesses to change their business models and strategies.

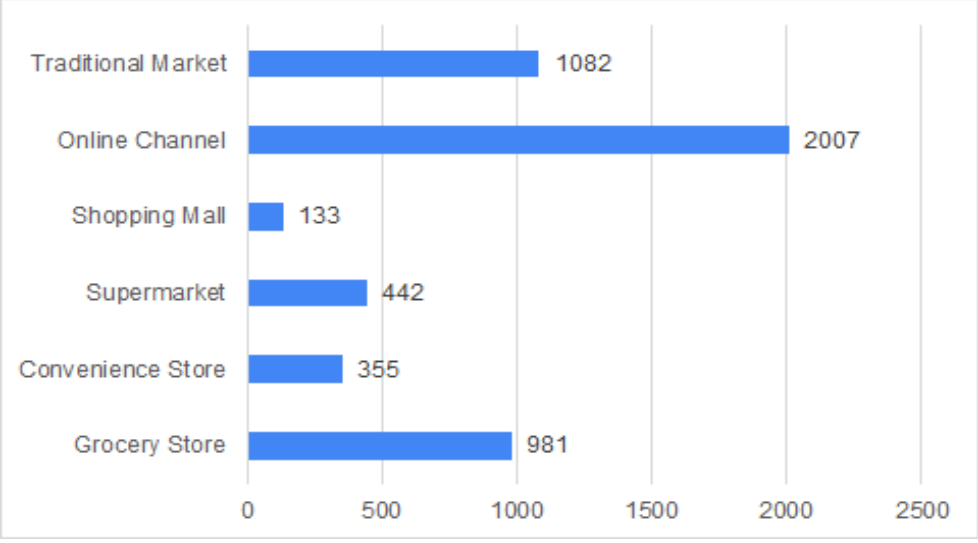


**Chart 5.2. The Customer's shopping channel during COVID-19**

***Source: Nielsen Viet Nam***

Chart 5.2 shows the customers' shopping habits during COVID-19, people buying goods through online channels accounts for the highest percentage. This is an opportunity for businesses to change their governance model and to adjust business methods towards digitization to keep up with the changing world trend.

## 5.2. SOLUTIONS FOR VIETNAM'S RETAIL SUPPLY CHAIN DURING COVID-19 PERIOD

The results of regression analysis show that *Transportation and strategy applying information technology* has the strongest impact on *Success of retail supply chain with* $\beta = 0.63$. Next are *Inventory* and *Information* with $\beta$ values 0.192 and 0.14 respectively. Therefore, in order to increase the competitiveness of Vietnam's retail supply chain in the COVID-19 period, the thesis proposes the following solutions for retail businesses.

### 5.2.1. Applying Information Technology in Strategies and Transportation

#### 5.2.1.1. Applying Information Technology in Strategies

The applying and implementing of a strategy in the supply chain depends heavily on the vision and sense of top management. During the Covid-19, the retail supply chain need new strategies to cope with fluctuation of the market. Through research results and current situation of Vietnam's retail supply chain, applying IT in the strategy is an important turning point to capture the future success of the businesses.

Firstly, during the COVID-19 pandemic, retail businesses need to promote sales through e-commerce platforms. Change in shopping behavior of consumers due to COVID-19 forces businesses to transfer their business models from offline to online. In order to ensure effectiveness when implementing online selling, it is necessary to link many different channels, models and functions. Retail businesses need to understand the changes in consumer needs and

research market trends, at the same time understand the roadmap to start with e-commerce and how to choose products and channels for sale to promote business operations on different platforms.

Secondly, applying Information Technology in building Strategies is an important factor in reducing costs for the whole chain, while it also can help manager to make decision. To improve building Strategies for Vietnam's supply chain, Big Data and AI are the two technologies that are being used by many big companies such as Amazon and Alibaba. Amazon collect and learn about customer behavior from the time of shopping to what customer "be keen on" or hate. As soon as customers visit Amazon, their information has been collected no matter it is online or offline. Whatever customer finding on the internet they all have been collected. Or in offline, when customer walks in Amazon Go, the system of hundreds of eyes is observing each of their gestures and behavior. The information is not only about what customer has bought, it can analyze what customer like the most what they hate, etc. Those information has been called "Big Data". After that the big data will be upload on the cloud, and learned by AI. From that, AI will suggest what product should be imported and predict the trending and help manager to solve many strategies problems. This is driving a new level of prediction capability and planning accuracy.

Thirdly, the managers need to build strategies to develop the IT level of the businesses. The IT knowledge of the employees working in the retail business in Vietnam is quite low, leading to the application of new technologies to business operations in the supply chain has not been efficient. Businesses need to invest in qualified IT human resources to change this situation. The improvement of IT will help retail businesses to quickly access advanced technologies, contributing to supply chain development.

#### 5.2.1.2. Applying Information Technology in Transportation

Logistics infrastructure system includes physical infrastructure (such as traffic system, wharf, etc.) and soft infrastructure (such as human resources, system of policies and laws, etc.) In order to develop and manage all that infrastructure system effectively, it is necessary to consider the application of Information Technology. Digital soft infrastructure plays a very

essential role in commerce in the 21st century because information about the movement of goods is very important today.

Currently, the application of IT in Vietnam's logistic businesses is still far behind the international level. Only in terms of website construction, it can be seen that most of Vietnam's logistic enterprises' websites simply introduce themselves and their services, and lack of utilities that customers really need such as order tracking, ship tracking, document tracking, etc. Vietnam's retail businesses need to choose the transport service providers which have a high level of IT application in order to easily control the delivery time and the status of the goods.

In addition, in the context of COVID-19, the e-commerce trend proved to be dominant and has brought into play a positive effect. Some supply chain like Amazon, Alibaba, Fedex, USP, etc has applied AI to plan delivery routes effectively. Some countries such as China and US have introduced self-propelled robots to deliver goods to prevent person-to-person contact and reduce the spread of disease. Although delivery services using self-propelled robots existed before the outbreak of the epidemic, COVID-19 boosted its popularity. Vietnam's retail businesses can also use the self-propelled robots to meet the needs of customers in this special period.

### 5.2.2. Solutions for Inventory

***From Just-in-time to Just-in-case inventory management:***

Over the last few decades, the fall in transport and communication costs, as well as the use of technology, has allowed firms to maintain very lean inventories – a just-in-time model of inventory management. The most outstanding advantage of JIT is that inventory holding costs (such as warehouse space) are minimized. However, there is a heavy reliance on suppliers - any failures in delivery can lead to stock-outs. During the outbreak of the COVID-19 pandemic, disruptions in supply chains occurred. Suppliers may fail to deliver on time and in correct amounts due to objective changes caused by COVID-19. It could seriously impact the ability of fully satisfying the end-consumers' demands of retailers if their suppliers' production/distribution are delayed.

Therefore, in the context of uncertainties not only over pandemics but also tariff wars, just-in-case inventory is more appropriate for the businesses, especially for retail businesses because scrambling to meet increased consumer is the top priority for retail businesses. Businesses need a buffer to deal with unexpected shifts in demand. By establishing a network of strategic warehouses around markets and transportation hubs, businesses can build a supply chain that meets the demand of consumers. On the other hand, retail businesses need to be able to forecast market demand and make specific storage plans for each type of goods to avoid excess or shortage.

***Applying information technology in inventory management:***

Effective inventory management is an important factor in reducing costs for the whole chain while increasing revenue by reducing shortages. To improve inventory management efficiency in Vietnam's retail businesses, RFID technology is the optimal choice. RFID uses electromagnetic fields to automatically identify and track tags attached to objects. An RFID tag consists of a tiny radio transponder; a radio receiver and transmitter. When triggered by an electromagnetic interrogation pulse from a nearby RFID reader device, the tag transmits digital data, usually an identifying inventory number, back to the reader. This number can be used to inventory goods.

In addition to RFDI technology, ERP (Enterprise Resources Planning) should also be used in businesses to identify items in stock that are too long or not suitable for needs and need to be eliminated.

Besides, the optimization of warehouse capacity also greatly affects inventory management. To solve this problem Vietnam’s warehouse can use "Quick Put Away Process" like Amazon rather than having a dedicated area for one types of product, that means it will take up a fixed space in your warehouse, and if that product is not in your inventory plan then there is an unused space will be wasted. With "Quick Put Away Process" when importing the goods into the warehouse, the worker can quickly put the goods in the first available spot they come across. Then workers use their handheld device to scan the barcode of the product and the shelf they put it in and the system will record the location of the package. This method helps Amazon

reduce ¼ the time of warehouse work compared to no robots and technology. Warehouses with Kiva robots can also hold up to 50% more inventory because the little guys take up less space.

### 5.2.3. Solution to improve the efficiency of Information sharing in the supply chain

For information to be effective in supply chain operations, retail businesses need to share useful information with the partners in the chain. The retail business is the one best understanding customer psychology and market trends because it is the last stage in the supply chain. Sharing information will help other members in the supply chain better understand the market and make adjustments to better serve customers. The timely sharing of information will help members reduce excess goods and improve the efficiency of businesses in particular and the supply chain in general.

On the other hand, the supply chain and especially Vietnamese retail businesses need to increase the application of information technology to help the flow of information circulating in the chain be more flexible and be used more effectively. Applying information technology to create a smooth communication channel between suppliers and customers will help eliminate factors that hinder profitability, reduce costs, increase market shares and win numerous of customers. Cooperation between Wal-Mart and Procter & Gamble is a prime example of applying information technology for sharing information in supply chain. When Procter & Gamble's products are about to be sold out Walmart's distribution centers, the system will automatically send reminder letters for them to ship more products.

Supply chains are growingly being expanded and the amount of information circulating in the chains is increasing. Without increasing the application of information technology, the massive amount of information cannot be managed well. This leads to inefficient supply chain operations.

It is not only for domestic enterprises, but also it is very important to develop information connections abroad. Due to the fact that many big corporations in Vietnam, such as Vingroup, FPT, or Viettel have their own connection channels to foreign enterprises, but the SMEs' information connection ability to foreign businesses is still limited. Even with the help from the government and many organizations for example is LinkSME project funded by USAID or many workshops created to help SMEs. But this old method is too passive, cost too much

money and times, SMEs still have to connect together via foreign channels. Alibaba exemplifies this situation, the top 3 shopping platforms of this group are Taobao, Tmall, and 1688. Those platform technologies created for China's supply chain a channel to communicate and share information. Alibaba divided into 3 models, Taobao is used for the C2C model, 1688 for B2B model and the final is Tmall, which is the combination of Taobao and 1688.

In conclusion, to be able to create an ecosystem for the Vietnamese supply chain, Vietnam's business needed a channel for exchanging information about buying or selling. To create such an information system network, it is not only the responsibility of high tech company it also needs the contribution from all the businesses.

### 5.3. LIMITATION OF THE RESEARCH

The first limitation of this research is that it was only conducted in Hanoi. Because Vietnam's retail systems are mainly concentrated not only in Hanoi but also in other provinces, Therefore, focusing only on researching in Hanoi will make the collected data not general and not representative of all retail businesses in Vietnam.

Secondly, due to limited time and financial resources, the authors only discovered 7 factors affecting the success of Vietnam's retail supply chain (qualitative research). There may be many other factors that need to be explored. Besides, the research used poorly reliable sample collection methods such as convenience sampling (quantitative research). On the other hand, respondents are mainly retail stores. Large retail businesses, foreign retail distributors and retail joint ventures have not yet been studied. These limitations make the study not provide an overview of Vietnam's retail industry.

Other researchers can conduct the researches by repeat researching retail businesses which are operating in other provinces of Vietnam. Another research direction is to investigate foreign retail businesses and retail joint ventures to compare and give a different perspective to this research.

Researchers can also expand the research by increasing the sample size or targeting highly qualified respondents to provide a deeper understanding of the Vietnamese retail industry.

Finally, research is conducted and completed when the COVID-19 pandemic is in progress. Therefore, there is no final official data on the impact of this epidemic on world supply chains in general and Vietnam's supply chains in particular, including Vietnam's retail supply chain.

## 5.4. CONCLUSION

The thesis "***The impacts of global supply chain shift on Vietnam's retail industry due to the covid-19 period: Vietnam's opportunities and solutions****"* is done to identify factors influencing the success of Vietnam's retail supply chain during the COVID-19 period. To achieve the above objectives, the research is based on a combination of qualitative research methods and quantitative research methods. The thesis is conducted in Hanoi. Because Hanoi is a major economic center of Vietnam and has a large concentration of retail businesses, the selection of Hanoi to conduct the study is appropriate and representative.

Qualitative research is conducted to explain and explore the factors that influence the success of the retail supply chain. By using the method of "document and record", the thesis conducts theoretical review and collect secondary data related research problem to identify the factors that need to be included in this research and build the scale to analysis those factors. The result of this qualitative research is exploring 7 factors that retail managers need to focus their attention on when developing the supply chain: *Inventory*, *Manufacturing*, *Location*, *Transportation*, *Information*, *Strategy*, *Information Technology*. The results of this qualitative research are input to quantitative research.

Quantitative research is conducted to determine the intensity of these factors on the success of the supply chain, with the respondents are low-qualified employees / owners working at the grocery stores and the retail stores belonging to some large businesses, such as Vin Group, PNJ, FPT Shop, Saigon Co.op, etc. Regression analysis method is used to analyze the survey data obtained. 141 responds were collected using convenience sampling method and were analyzed by SPSS statistic software. The results confirmed the importance of *Strategy and Transportation applying Information Technology*, *Inventory* and *Information* in the operation of a Vietnam's retail supply chain during the COVID-19 period.

Based on the results achieved, some solutions are proposed to improve the performance of Vietnam's retail supply chain during the COVID-19 period and even after COVID-19 pandemic. The thesis also provides the limitations and next research directions for other studies in order to complete this research direction. The theoretical contributions, research model and significance that this thesis brings will help Vietnam's retail businesses to take appropriate actions to improve the competitiveness of the supply chain.

# SUMMARY OF CHAPTER 5

Chapter 5 summarizes the research and research results. Then, the solutions, the limitations of the research and the next research directions are also presented in this chapter.

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# APPENDIX

**Appendix A:**

## BẢNG CÂU HỎI KHẢO SÁT VỀ CÁC NHÂN TỐ ẢNH HƯỞNG ĐẾN CHUỖI CUNG ỨNG BÁN LẺ

### THÔNG TIN CỦA NGƯỜI THAM GIA KHẢO SÁT

Xin vui lòng trả lời đầy đủ các câu hỏi bên dưới.

*Tất cả thông tin cá nhân đều được bảo mật, chỉ phục vụ cho mục đích nghiên cứu*

**1. Xin vui lòng cho biết tên của anh (chị): ……..**

**2. Xin vui lòng cho biết giới tính:**

☐ **Nam**

☐ **Nữ**

**3. Please give us the information about your work position:**

☐ **Quản lý**

☐ **Nhân viên**

**4. Bạn đã làm việc ở đây bao lâu:**

☐ **1-3 năm**

☐ **3-5 năm**

☐ **Hơn 5 năm**

## CÂU HỎI ĐÁNH GIÁ

***Vui lòng cho biết mức độ đồng ý của các bạn với những phát biểu dưới đây theo thang điểm từ 1 đến 5, với qui ước:***

1-Rất không đồng ý

2-Không đồng ý

3-Không ý kiến, bình thường

4-Đồng ý

5-Rất đồng ý

| No. | Encode | Description | Degree | | | | |
|---|---|---|---|---|---|---|---|
| | | **INFORMATION TECHNOLOGY** | **1** | **2** | **3** | **4** | **5** |
| **1** | **IT1** | Công ty, cửa hàng bạn áp dụng công nghệ thông tin vào hoạt động kinh doanh của mình | | | | | |
| **2** | **IT2** | Công nghệ thông tin giúp giảm chi phí quản lý của công ty | | | | | |
| **3** | **IT3** | Công nghệ thông tin giúp cửa hàng giảm các sai sót do thao tác của cá nhân tạo ra trong kinh doanh, tăng độ chính xác trong công việc | | | | | |
| **4** | **IT4** | Việc số hóa các hoạt động kinh doanh, lưu kho, vận tải, hồ sơ khách hàng, … giúp cho cửa hàng dễ dàng hơn trong việc kiểm soát quy trình kinh doanh. | | | | | |
| | **Encode** | **INVENTORY** | **1** | **2** | **3** | **4** | **5** |
| **5** | **INV1** | Trong thời gian Covid-19, cửa hàng bạn có kế hoạch lưu kho cụ thể cho từng chủng loại hàng hóa | | | | | |
| **6** | **INV2** | Trong thời gian Covid-19, lượng hàng tồn kho đủ cung cấp cho cửa hàng bạn kinh doanh khi thị trường biến động | | | | | |
| **7** | **INV3** | Trong thời gian Covid-19, kho hàng của cửa hàng bạn đang hoạt động hiệu quả | | | | | |
| **8** | **INV4** | Trong thời gian Covid-19, chi phí kho bãi tăng lên | | | | | |
| | **Encode** | **INFORMATION** | **1** | **2** | **3** | **4** | **5** |
| **9** | **IN1** | Dữ liệu về tồn kho được chia sẻ cho các đối tác trong chuỗi cung ứng | | | | | |
| **10** | **IN2** | Dữ liệu bán hàng thực tế được chia sẻ các đối tác trong chuỗi cung ứng | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **11** | **IN3** | Dự báo về nhu cầu được chia sẻ trên toàn bộ chuỗi cung ứng | | | | | |
| | **Encode** | **TRANSPORTATION** | **1** | **2** | **3** | **4** | **5** |
| **12** | **TR1** | Công ty bạn sử dụng nhiều phương thức vận tải linh hoạt | | | | | |
| **13** | **TR2** | Trong thời gian Covid-19, chi phí vận chuyển của công ty bạn thấp | | | | | |
| **14** | **TR3** | Trong thời gian Covid-19, cửa hàng bạn vẫn cung cấp hàng hóa cho khách hàng đúng thời gian quy định | | | | | |
| **15** | **TR4** | Trong thời gian Covid-19, công ty bạn không gặp phải tình trạng "đứt hàng" | | | | | |
| | **Encode** | **MANUFACTURE** | **1** | **2** | **3** | **4** | **5** |
| **17** | **MA1** | Trong thời gian Covid-19, các đơn vị sản xuất trong chuỗi cung ứng luôn đáp ứng được đúng số lượng đặt hàng | | | | | |
| **18** | **MA2** | Trong thời gian Covid-19, các đơn vị sản xuất trong chuỗi cung ứng luôn đáp ứng được yêu cầu cung cấp hàng hóa đúng thời gian | | | | | |
| **19** | **MA3** | Trong thời gian Covid-19, nguồn hàng của công ty đáp ứng các tiêu chuẩn chất lượng | | | | | |
| | **Encode** | **STRATEGY** | **1** | **2** | **3** | **4** | **5** |
| **21** | **STR1** | Trong thời gian Covid-19, công ty bạn có chiến lược để tối ưu hóa trợ cấp của chính phủ | | | | | |
| **22** | **STR2** | Trong thời gian Covid-19, công ty bạn tập trung kinh doanh các mặt hàng chiến lược | | | | | |
| **24** | **STR3** | Chuỗi cung ứng của công ty bạn lựa chọn thành viên dựa trên tiêu chi giá cả và chất lượng | | | | | |
| | **Encode** | **LOCATION** | **1** | **2** | **3** | **4** | **5** |
| **25** | **LO1** | Vị trí cửa hàng của bạn thuận tiện cho việc kinh doanh | | | | | |
| **26** | **LO2** | Vị trí cửa hàng của bạn gần với kho hàng | | | | | |
| **27** | **LO3** | Vị trí cửa hàng và kho của bạn thuận tiện cho các thành viên trong chuỗi cung ứng hàng hóa | | | | | |
| | **Encode** | **SUCCESS OF RETAIL SUPPLY CHAIN** | **1** | **2** | **3** | **4** | **5** |
| | **SU1** | Sản phẩm của cửa hàng bạn luôn được chào đón từ khách hàng | | | | | |
| | **SU2** | Chi phí trong cung ứng hàng hóa của cửa hàng luôn luôn được kiểm soát trong thời gian Covid-19 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **SU3** | Nguồn cung ứng hàng hóa của cửa hàng linh động và đảm bảo trong thời gian Covid-19 | | | | | |

***XIN CHÂN THÀNH CẢM ƠN SỰ HỢP TÁC CỦA ANH (CHỊ)!***

## Appendix B: EXPLORATORY FACTOR ANALYSIS

***Exploratory factor analysis for factors affecting success of retail supply chain (independent factors) first time:***

KMO and Bartlett's Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .860 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1674.953 |
| | df | 276 |
| | Sig. | .000 |

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 7.606 | 31.692 | 31.692 | 7.606 | 31.692 | 31.692 | 5.492 | 22.885 | 22.885 |
| 2 | 2.777 | 11.569 | 43.261 | 2.777 | 11.569 | 43.261 | 2.968 | 12.366 | 35.251 |
| 3 | 1.898 | 7.906 | 51.168 | 1.898 | 7.906 | 51.168 | 2.744 | 11.435 | 46.686 |
| 4 | 1.420 | 5.918 | 57.085 | 1.420 | 5.918 | 57.085 | 1.854 | 7.727 | 54.412 |
| 5 | 1.207 | 5.031 | 62.116 | 1.207 | 5.031 | 62.116 | 1.849 | 7.704 | 62.116 |
| 6 | .990 | 4.125 | 66.241 | | | | | | |
| 7 | .863 | 3.595 | 69.837 | | | | | | |
| 8 | .776 | 3.235 | 73.071 | | | | | | |
| 9 | .765 | 3.187 | 76.258 | | | | | | |
| 10 | .635 | 2.646 | 78.904 | | | | | | |
| 11 | .589 | 2.456 | 81.360 | | | | | | |
| 12 | .557 | 2.321 | 83.681 | | | | | | |
| 13 | .530 | 2.206 | 85.887 | | | | | | |
| 14 | .467 | 1.945 | 87.832 | | | | | | |
| 15 | .434 | 1.808 | 89.640 | | | | | | |
| 16 | .407 | 1.694 | 91.335 | | | | | | |
| 17 | .368 | 1.534 | 92.868 | | | | | | |
| 18 | .358 | 1.493 | 94.361 | | | | | | |
| 19 | .324 | 1.349 | 95.710 | | | | | | |
| 20 | .285 | 1.188 | 96.898 | | | | | | |
| 21 | .280 | 1.168 | 98.066 | | | | | | |
| 22 | .207 | .863 | 98.929 | | | | | | |
| 23 | .190 | .792 | 99.722 | | | | | | |
| 24 | .067 | .278 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

**Rotated Component Matrix[a]**

| | Component | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| TR3 | .766 | | | | |
| TR4 | .745 | | | | |
| TR2 | .736 | | | | |
| TR1 | .716 | | | | |
| IT2 | .661 | | | | |
| IT3 | .652 | | | | |
| STR2 | .648 | | | | |
| IT1 | .636 | | | | |
| IT4 | .629 | | | | |
| STR1 | .611 | | | | |
| STR3 | | | | | |
| INV3 | | .740 | | | |
| INV2 | | .736 | | | |
| INV4 | | .706 | | | |
| INV1 | | .698 | | | |
| LO2 | | | .934 | | |
| LO1 | | | .923 | | |
| LO3 | | | .837 | | |
| MA2 | | | | .761 | |
| MA1 | | | | .757 | |
| MA3 | | | | .695 | |
| IN1 | | | | | .861 |
| IN3 | | | | | .665 |
| IN2 | | | | | .549 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

***Exploratory factor analysis for factors affecting success of retail supply chain (independent factors) after STR3 was eliminated:***

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .860 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1606.962 |
| | df | 253 |
| | Sig. | .000 |

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 7.306 | 31.767 | 31.767 | 7.306 | 31.767 | 31.767 | 5.326 | 23.157 | 23.157 |
| 2 | 2.775 | 12.067 | 43.834 | 2.775 | 12.067 | 43.834 | 2.859 | 12.430 | 35.587 |
| 3 | 1.860 | 8.088 | 51.922 | 1.860 | 8.088 | 51.922 | 2.745 | 11.933 | 47.520 |
| 4 | 1.415 | 6.152 | 58.073 | 1.415 | 6.152 | 58.073 | 1.819 | 7.911 | 55.431 |
| 5 | 1.187 | 5.161 | 63.235 | 1.187 | 5.161 | 63.235 | 1.795 | 7.804 | 63.235 |
| 6 | .979 | 4.257 | 67.492 | | | | | | |
| 7 | .850 | 3.696 | 71.188 | | | | | | |
| 8 | .765 | 3.326 | 74.513 | | | | | | |
| 9 | .651 | 2.832 | 77.345 | | | | | | |
| 10 | .609 | 2.647 | 79.992 | | | | | | |
| 11 | .571 | 2.481 | 82.474 | | | | | | |
| 12 | .542 | 2.354 | 84.828 | | | | | | |
| 13 | .495 | 2.153 | 86.981 | | | | | | |
| 14 | .445 | 1.935 | 88.916 | | | | | | |
| 15 | .411 | 1.787 | 90.703 | | | | | | |
| 16 | .381 | 1.658 | 92.360 | | | | | | |
| 17 | .359 | 1.563 | 93.923 | | | | | | |
| 18 | .351 | 1.526 | 95.449 | | | | | | |
| 19 | .285 | 1.240 | 96.689 | | | | | | |
| 20 | .281 | 1.222 | 97.911 | | | | | | |
| 21 | .211 | .916 | 98.827 | | | | | | |
| 22 | .203 | .883 | 99.710 | | | | | | |
| 23 | .067 | .290 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

**Rotated Component Matrix[a]**

| | Component | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| TR3 | .780 | | | | |
| TR2 | .747 | | | | |
| TR4 | .741 | | | | |
| TR1 | .724 | | | | |
| IT2 | .671 | | | | |
| IT3 | .657 | | | | |
| IT4 | .642 | | | | |
| IT1 | .642 | | | | |
| STR2 | .634 | | | | |
| STR1 | .597 | | | | |
| INV2 | | .750 | | | |
| INV3 | | .742 | | | |
| INV4 | | .705 | | | |
| INV1 | | .689 | | | |
| LO2 | | | .934 | | |
| LO1 | | | .923 | | |
| LO3 | | | .836 | | |
| MA2 | | | | .769 | |
| MA1 | | | | .763 | |
| MA3 | | | | .691 | |
| IN1 | | | | | .867 |
| IN3 | | | | | .671 |
| IN2 | | | | | .527 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

## Appendix C: REGRESSION ANALYSIS

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| SU | 3.9574 | .87546 | 141 |
| IST | 4.0567 | .72391 | 141 |
| INV | 3.7589 | .86314 | 141 |
| IN | 3.7163 | .88096 | 141 |

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | IN, INV, IST[b] | | Enter |

a. Dependent Variable: SU

b. All requested variables entered.

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .845[a] | .715 | .708 | .47270 | .715 | 114.403 | 3 | 137 | .000 | 1.664 |

a. Predictors: (Constant), IN, INV, IST

b. Dependent Variable: SU

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 76.688 | 3 | 25.563 | 114.403 | .000[b] |
| | Residual | 30.612 | 137 | .223 | | |
| | Total | 107.300 | 140 | | | |

a. Dependent Variable: SU

b. Predictors: (Constant), IN, INV, IST

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -.380 | .238 | | -1.595 | .113 | | |
| | IST | .762 | .076 | .630 | 10.048 | .000 | .530 | 1.886 |
| | INV | .194 | .058 | .192 | 3.372 | .001 | .645 | 1.551 |
| | IN | .139 | .055 | .140 | 2.536 | .012 | .683 | 1.464 |

a. Dependent Variable: SU

**Collinearity Diagnostics[a]**

| Model | | Eigenvalue | Condition Index | Variance Proportions | | | |
|---|---|---|---|---|---|---|---|
| | | | | (Constant) | IST | INV | IN |
| 1 | 1 | 3.933 | 1.000 | .00 | .00 | .00 | .00 |
| | 2 | .031 | 11.260 | .01 | .00 | .40 | .70 |
| | 3 | .024 | 12.724 | .71 | .00 | .37 | .15 |
| | 4 | .012 | 18.015 | .27 | 1.00 | .23 | .15 |

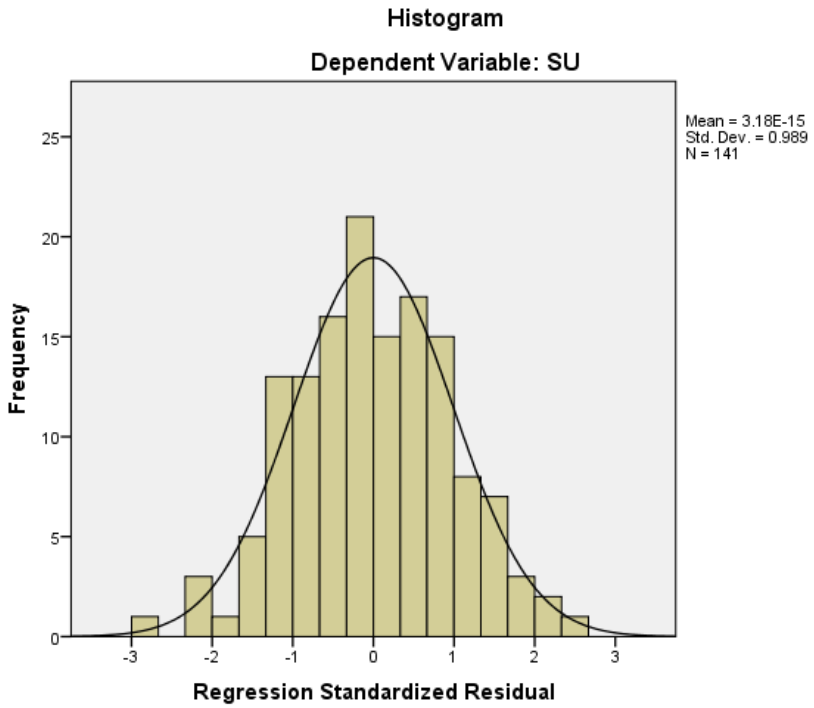
a. Dependent Variable: SU

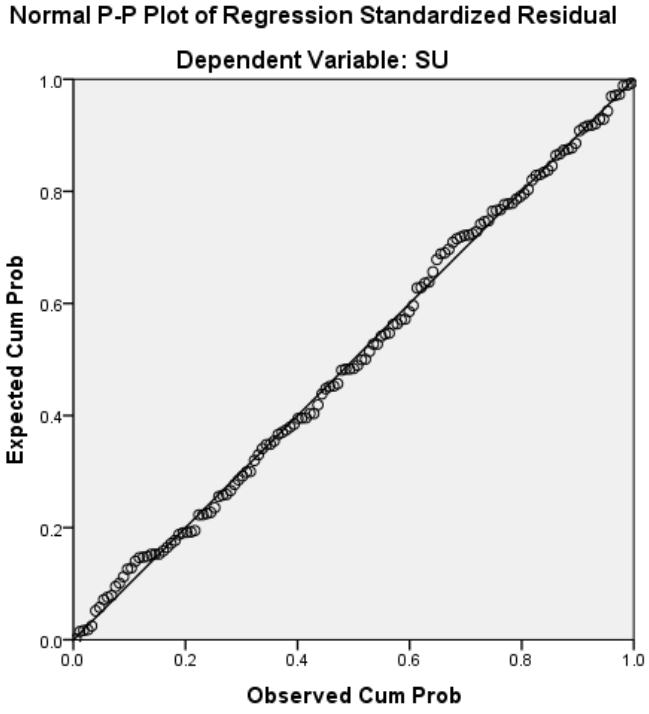
**Residuals Statistics[a]**

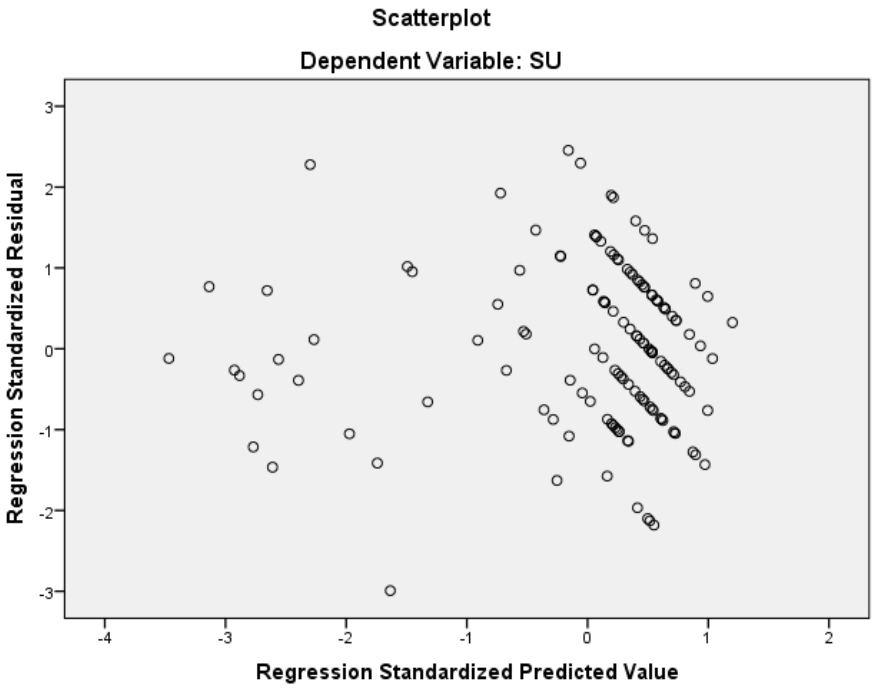
| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 1.3897 | 4.8462 | 3.9574 | .74012 | 141 |
| Residual | -1.41417 | 1.16051 | .00000 | .46761 | 141 |
| Std. Predicted Value | -3.469 | 1.201 | .000 | 1.000 | 141 |
| Std. Residual | -2.992 | 2.455 | .000 | .989 | 141 |

a. Dependent Variable: SU

## THE GRAPHS DETECTING VIOLATIONS OF REGRESSION ASSUMPTION




Scatterplot
Dependent Variable: SU
Regression Standardized Residual
Regression Standardized Predicted Value
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
0
1
2