



# **AN ANALYSIS OF FACTORS AFFECTING THE COMPETITIVENESS OF THE VIETNAMESE PANGASIU EXPORTING COMPANIES TO THE CHINA MARKET**

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**Bachelor of International Business Thesis**

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## **EXECUTIVE SUMMARY**

Export is the main activity in international exchange, and has a long tradition and continues to grow significantly in breadth and scope. Globalization also accelerated the growth of exporting practices across countries. Vietnam - a developing nation - is no exception, as shown by the pangasius industry's rapid development. With favourable natural environments and plentiful labour capital, Vietnam has leveraged its economic advantages to become one of the largest world-class pangasius exporters in recent years, contributing significantly to various aspects of the Vietnamese economy. Notably, for several years, China has been one of the largest and most competitive markets for Vietnamese pangasius. China's consumer size has increased significantly in recent years and is projected to become the largest market for Vietnamese pangasius exporters by 2020. However, due to COVID 19, the value of Vietnamese pangasius exports in this sector has lacked compared to the market's actual capacity, resulting in low and unpredictable profits for pangasius farmers. Indeed, pangasius export has been debated both internationally and domestically by several interested scholars, but most of these discussions are out of date. Thus, this study used a quantitative methodology based on the National Competitiveness Pyramid and a qualitative tool to comprehensively analyze the association between many variables and Vietnam's pangasius export turnover to China from 2016 to 2020. SPSS 26 was used to scrutinize a panel data set of 186 findings to provide explicit support for this paper's conclusion.

Following 186 survey answers, the study identifies seven major components that contribute to the competitiveness of Vietnamese pangasius in China: Business Environment, Physical Infrastructure, Knowledge Infrastructure, Product, Productivity, Price, and Labour Supply. It is discovered that these seven elements all have a strong correlation with competition, with Physical Infrastructure having the most significant effect on service efficiency. Following that, some recommendations were made to increase Vietnamese pangasius exports to China between 2021 and 2030.

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## **ABBREVIATIONS AND ACRONYMS LIST**

<b>ACFTA</b>	The ASEAN - China Free Trade Agreement
<b>ASC</b>	Aquaculture Stewardship Council
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>BE</b>	Business Environment
<b>CEE</b>	Central and Eastern European
<b>CFA</b>	Confirmatory Factor
<b>CFR</b>	Cost and Freight
<b>COVID 19</b>	Coronavirus pandemic
<b>CP</b>	Competitiveness of Vietnamese exporting pangasius companies
<b>EFA</b>	Exploratory Factor
<b>EU</b>	European Union
<b>FDI</b>	Foreign Direct Investment
<b>GDP</b>	Gross Domestic Product
<b>GNP</b>	Gross National Product
<b>HACCP</b>	Hazard Analysis and Critical Control Point
<b>HS Code</b>	Harmonized System Code
<b>KI</b>	Knowledge Infrastructure
<b>KMO</b>	Kaiser-Meyer-Olkin coefficient
<b>LS</b>	Labor Supply
<b>NCC</b>	National Competitiveness Council
<b>NRC</b>	National Research Council
<b>PI</b>	Physical Infrastructure
<b>PR</b>	Product
<b>PS</b>	Prices
<b>PV</b>	Productivity
<b>SEM</b>	Structural Equation Model
<b>SQF</b>	Safe Quality Food
<b>SWOT</b>	Strength, Weakness, Opportunity, and Threat
<b>TEU</b>	Twenty-foot equivalent unit
<b>US</b>	The United States of America
<b>USD</b>	United States dollar
<b>VASEP</b>	Vietnam Association of Seafood Exporters and Producers
<b>VIF</b>	Variance Inflation Factor
<b>WTO</b>	World Trade Organization

# 01

## INTRODUCTION

*Chapter 1 - Introduction* provides a brief of the research topic overview, practical problem, research objectives, research questions, research scope, methodology, and data overview.

# **CHAPTER 1: INTRODUCTION**

## **1.1. Background**

### **1.1.1. Topic background**

Pangasius is a species of catfish in the family Pangasiidae distributed in the Mekong basin. Pangasius is cultured in Vietnam, especially in the Mekong Delta. Vietnamese pangasius is very popular in the world market, which is considered the most suitable substitute for white fish scarcity. Vietnamese pangasius has become a major source of many important market areas. According to the Vietnam Association of Seafood Exporters and Producers (VASEP) (2019) information, pangasius is mainly raised in 10 provinces of the Mekong Delta of Vietnam. The provinces of Can Tho, An Giang, Dong Thap are the largest pangasius farming areas in the Mekong Delta, accounting for more than 75% of the total pangasius. The whole country currently has 200 establishments producing pangasius breeds, 3,000 ha of rearing, producing about 21 billion pangasius breeds, more than 2.1 billion pangasius breeds. Pangasius products are manufactured according to strict international quality management standards and strict food safety such as globalgap, ASC, BAP, etc.

Pangasius is increasingly popular in the world thanks to its nutritional value. In 2019, Vietnam exported pangasius to 131 markets. Those main markets include China, the United States of America, Europe, ASEAN, etc. Total pangasius export turnover in 2018 achieved a record 2.26 billion USD, up 26.5% compared to 2017. Due to the disease COVID 19, pangasius export in 2020 reached about 1.54 USD billion, down 23% compared to 2019 (VASEP, 2019). The information shows that Vietnam's pangasius export market fluctuates from year to year. For the Chinese market in the past 11 months of 2020, China continued to be the country with the largest proportion of Vietnam's pangasius exports. According to the incomplete statistics of VASEP, although down 20.6% over the same period last year, the total value of fish exports to Mainland China and Hong Kong (China) reached USD 385.9 million with 34.4 percent of the total pangasius export value. (Long, 2020)

### **1.1.2. Practical problem**

Competition in the economic sense is the competition between people producing goods, between traders in the economy to win the most favorable production, consumers, and market conditions. It is the same as export, in Vietnam, we are on growing momentum and consider our export operation as the development of the economy. So it is vital to raise the

competitiveness of Vietnam's exports. More specifically, the competition of exporting Vietnamese pangasius to the Chinese market.

According to VASEP, in early 2019, 33 aquatic items were confirmed by the Chinese side to import tax-free into China, including pangasius. When the US-China trade war broke out, Chinese businesses tended to import more pangasius products from Vietnam as alternative sources. Chinese consumers favor Vietnamese pangasius products. With the growing trend, these consumers tend to increase the demand for aquatic imports due to concerns about food safety, mainly foreign and new products. They are also willing to pay for products accepted by the US and European markets (Anh, 2019). A typical example is the pangasius product of Vietnam.

Exports increased gradually from 2015 to 2019, most in 2019, up to 663 million USD, far ahead of the US and EU. However, Vietnam's pangasius export turnover to the Chinese market in 2020 dropped sharply. As stated by VASEP, pangasius exports in 2020 sharply declined because goods at Chinese border gates were stuck waiting for sampling for COVID 19. Pangasius export to this market has been delayed.

As VASEP (2019) maintained, Vietnam's pangasius industry faces many Chinese market competitors, including India, Indonesia, and Bangladesh, etc. Both China and India have invested in high technology to raise pangasius actively. Along with that, Chinese pangasius import standards are no different from the US or EU standards. In the United States, Laws enacted to ensure food supplies' safety and establish the level of national protection as some critical laws and regulations related to seafood safety include CFR federal law, Federal law on food, medicine, and cosmetics. The EU ensures the implementation of the law on food safety and checks the compliance of production and business establishments with regulations on food safety at all stages of the production, processing, and distribution process. In terms of exporting pangasius to China, Vietnam's suppliers who want to export pangasius to China must have quality certificates such as HACCP Standards, SQF Standards, and globalgap Standards. Vietnam's export description has met the above criteria to enter the Chinese market. Due to the COVID 19 epidemic effect, depending on the Chinese market, the revenue and profits from pangasius exports of domestic enterprises have declined sharply in recent years.

Through the above, it is evident that businesses need to pay more attention to quality, traceability standards, and food safety requirements, which are becoming stricter like in the US or EU; many competitors proactively improve product quality by investing in high

technology to raise pangasius. As a result, it is urgent to determine the factors affecting Vietnam's pangasius export competitiveness, thereby offering solutions to improve competitiveness and help export businesses deal with immediate problems in this market.

## **1.2 Research question**

The topic needs to answer the following questions:

- What is the situation of exporting Vietnamese pangasius to China in the past five years (2016-2020)?
- What factors affect the competitiveness of Vietnamese pangasius exporting enterprises in the Chinese market?
- How is the impact of these factors on the competitiveness of Vietnamese pangasius exporting enterprises to China?
- Which direction is suitable for Vietnam to improve the competitiveness of pangasius exporting enterprises to the Chinese market?

## **1.3 Research objectives**

This research thesis's main objective is about factors affecting Vietnam's pangasius export competitiveness to the Chinese market. From that, the research has the following primary purposes:

*Objective 1:* Analyze the situation of Vietnam's pangasius exports to China in the period 2016-2020.

*Objective 2:* Identify and analyze factors affecting the competitiveness of Vietnam's pangasius exports to China.

*Objective 3:* Propose solutions to overcome the remaining limitations to help Vietnamese pangasius exporting enterprises to China improve their competitiveness in 2021-2025.

## **1.4 Research scope**

This topic will analyze factors affecting competitiveness in Vietnam's pangasius exports to the Chinese market. The methods used are interviews and surveys. We will focus on domestic exporters of the pangasius export activities to the Chinese market regarding the research subjects.

- Type of survey: An online survey and offline survey
- Expected number of survey units: 150 units
- Respondent: Companies having seafood export activities in the country.

## **1.5 Methodology and data overview**

In this research paper, many methods are used to collect and process data. The main research methods used here are quantitative and qualitative. Quantitative uses by direct and emails to survey subjects to assess the analyzed factors. We run an analysis of the data by the SPSS model. Besides, we also use qualitative methods to analyze and explain the influencing factors from the studies collected through online newspapers, research articles, and VASEP.

## **1.6 Conclusion**

Chapter 1 shows readers about exporting pangasius to the Chinese market from 2016 to 2020 and providing necessary information related to our research. It also shows the study's purpose, the research scope, and the research questions related to the topic.

## **1.7 Thesis outline**

The thesis consists of five chapters (excluding abstract, appendix, reference, list of tables and figures, abbreviations, and list of acronyms):

*Chapter 1 – Introduction* provides a brief of the research topic overview, practical problem, research objectives, research questions, research scope, methodology, and data overview.

*Chapter 2 – Literature review and theoretical model* assessment of further published research, thesis, and journals. Definitions and general export theories are indicated to support research as well. The literature gaps are also identified to highlight the research objectives, the theoretical framework, and the hypotheses outlined in this chapter.

*Chapter 3 – Methodology* discusses the approach to research, data collection and processing methods, analytical methods, regression model detections, ethical considerations, and limitations of the research project.

*Chapter 4 – Analysis and findings* first provide an overview of the pangasius export situation in Vietnam in general and the pangasius export situation in Vietnam to the Chinese market in particular, from 2015 to 2020. After that, the data are collected and analyzed using qualitative and quantitative techniques to determine factors influencing the competitiveness of Vietnam's pangasius exports to China in the research time.

*Chapter 5 – Conclusions and recommendations* answer the research questions by summarising the findings and proposing recommendations for improving the overall competitiveness of Vietnam's exports of pangasius.

# 02

## LITERATURE REVIEW

*Chapter 2 - Literature review and theoretical model* assessment of further published research, thesis, and journals. Definitions and general export theories are indicated to support research as well. The literature gaps are also identified to highlight the research objectives, the theoretical framework, and the hypotheses outlined in this chapter.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1. Overview of export**

#### **2.1.1 Definitions of export**

Export is the activity of selling goods to foreign countries. It is not an act of individual sales but an organized sales system both inside and outside to profit and promote the production of goods development. Trading activities in international scope is a single act of trading and a network of trading relationships in an organized trade both inside and outside to sell domestically produced products and goods abroad to collect foreign currency and promote commodity production development. (Luu, 2018)

The export of goods is in the distribution and circulation of goods in an extensive reproduction process to link production with consumption by one country and another. How strong the production base will be depended on this activity.

According to the Commercial Law import (Vietnam Governance, 1998), import, purchases and export goods with foreign countries, are goods trading activities between Vietnamese traders and foreign traders under goods sale and purchase contracts, including activities temporary import for re-export, quick export for re-import and transfer of goods.

#### **2.1.2. Importance of export**

For the economy, each exporting country is considered a matter of strategic significance for economic development. Exporting is a critical element of foreign trade, with a significant role in each country's economic development and the world. Due to different conditions, each country has strengths in one field but weaknesses in other areas. To be able to exploit the advantages, minimize disadvantages, create a balance in the development process, countries must exchange with each other, sell the products they produce smoothly and buy the products that we do not have.

Exports in the economy have the following leading roles. The first is that exports create a closely related capital source for exports and imports. Making the trade balance deficit too large can adversely affect the economy. Second, exports are the basis for expanding and promoting external economic relations. Promoting exports plays a role in strengthening international cooperation among countries, enhancing status and function in the international arena, contributing to the country's political-economic stability. Exports and external economic relations always have mutual interdependent effects. When export activities develop, other parts of the external economy will grow. Thirdly, exports contribute to



expanding markets for goods consumption. With scope beyond national borders, export activities open up a large consumer market with extremely diverse needs of all classes, all peoples worldwide, creating opportunities for goods, reaching the international market. In addition, export promotes inherent advantages. In the modern world, no other country like its closure policy sets. Exporting takes advantage of intrinsic benefits by utilizing developed countries' limited resources such as natural resources and labor. Finally, export contributes to the economic restructuring, promoting the development of production. Most countries in the world use the world market demand as the basis for production and export. That has a positive impact on economic restructuring, boosting production, and creating favorable conditions for developing related industries. (NEU, 2018)

For Vietnam, export has a mutually interdependent effect, making our economy closely links with labor's international division. Export is an external economic activity, facilitating foreign relations are developed. Strong export orientation is one of the critical economic development goals, thereby taking advantage of opportunities, applying modern science and technology, and shortening the gap in Vietnam's development level with the world. It is an important step forward of Vietnam's economy, helping Vietnam reach the international level.

## **2.2 Overview of pangasius export**

### **2.2.1 Definition of pangasius (including HS code)**

Pangasius is one of the most popular economic fish species in Southeast Asia. As a food containing healthy properties and various processing, pangasius is used as a dish in daily meals in Vietnam (Agriculture Promotion Newspaper, 2020). Pangasius is one of Vietnam's key export products and is favored by many markets around the world. In 2011, these products were exported to 163 countries, accounting for 95% market share of catfish fillets in the world (Duyen, et al., 2011). Each type of pangasius product has its own Harmonized System Code (HS code) to classify import and export goods worldwide. There are many kinds of exported pangasius products of Vietnam such as fillets, frozen pangasius, salted pangasius, dried pangasius and these items are mainly in HS code 0303, 0304, 0305. The table below is some main items are typically exported:

<b>HS Code</b>	<b>Description</b>
030324	Frozen pangasius
030462	Frozen pangasius fillets
030493	Pangasius fillets and other fish meat (whether or not minced), fresh, chilled or frozen.

030432	Pangasius fillets (fresh or chilled)
030552	Dried pangasius, other than edible fish offal, whether or not salted but not smoked.
030531	Pangasius fillets, dried, salted but not smoked

**Table 2.1 HS Code of pangasius (Source: Vietnam's Import-Export tariff)**

According to the Vietnam pangasius industry report 2015-2019, pangasius products mainly exported to China are listed in HS code 030462, 030324, and 030493. Therefore, in this thesis, the authors will focus on these three kinds of products.

## **2.2.2 The importance of fish export to Vietnam**

Fish is one of the most popular commodities in the world. They are rich in Omega 3,6,9; DHA; EPA; and natural vitamin E. In addition to being a nutritious and beneficial product, fish is also a very welcome export in the world, it has high commercial value and is stable. The export of fish contributes a lot to the national economy, creates jobs for many workers, makes life more stable and better, thereby improving the development of infrastructure as well as literature and national chemistry.

In general, the export of fish to Vietnam is very important and interested in other countries because it helps stabilize, increase relations between Vietnam and other countries, and create jobs economic development.

## **2.2.3 Characteristics when exporting pangasius**

### **2.2.3.1. The domestic market is untapped.**

Currently, pangasius is mainly used for foreign markets with around 140 countries such as the US, China, and EU. However, the domestic market with nearly 100 million people has not developed effectively. Businesses are paying too much attention to export markets because of immediate and high profits. There are about 50 items for pangasius export, but just 6-7 products for domestic market. To improve this situation, businesses must consider distribution activities, market segmentation, and market needs. We should not focus too much on exports and leave opportunities for the domestic market. (Bong Mai, 2018)

### **2.2.3.2. Other characteristics of fish export**

The weight of fish exported is influenced by natural conditions, climate, and geographical location. These impacts all affect the development of the species, thereby affecting export volume. However, Vietnam is favorably endowed with a favorable geographical position and suitable climate, with a coastline length of 3260km with a variety of fish and seafood

species, so it is possible to rely on this to develop. The stronger fish export capacity of the Vietnamese market.

## **2.3 General theory of competitiveness**

### **2.3.1 Theory of competition in business**

Competition is a huge term that takes place in all different social life fields, from daily life to economic, political, cultural, sporting, etc. In the export market, the competition is fierce because the competition is restricted not just to the nation but also to the world's competitors. Each nation should also pay more attention to its competitiveness. A strong understanding of rivalry, as well as competitiveness, is therefore incredibly important. Competition is described in several various forms as follows:

According to Karl Marx: "Competition is a rivalry, fierce struggle between capitalists to get favorable conditions in production and consumption of goods to gain excess profits"

The writers of the book "The legal issues of competition institutions and policies control monopoly business" under the VIE/97/016 project claimed that: Competition can be understood as competitive companies in the acquisition of certain factors of output or consumers in order to boost their position on the market, to attain a specific business purpose, such as profit, revenue or market share.

According to the American economists P. A. Samuelson and W. D. Nordhaus in their book "The Economics Book" (12th edition), competition is a rivalry between companies competing for customers or markets.

Michael E. Porter (1998) defines: Competition is to gain market share, to seek profit, to make a profit greater than the overall profit that companies have. The consequence of the market mechanism is the standardization of revenues in the sector in the path of profound change, which, in essence, results in lower costs.

From the concepts above, the competition is a rivalry among businessmen who are equally in the same area, in order to gain benefits on their side over their competitors.

### **2.3.2 Competitiveness definition**

The International Institute for Management Development (2014) defines: Competitiveness as an economic theory area that analyzes the evidence and strategies that form the nation's capacity to build and retain an atmosphere that sustains enhanced value production for its firms and greater wealth for its citizens.

According to strategic planner Michael Porter (1996): the competitiveness of a company can be understood as the ability of the company to control the customer market of goods of the same form (or substitutes) of that company. If the potential to win over and conquer the target market is strong, the company would be highly competitive. Michael Porter is not limited to direct rivals, but applies to future competitors and alternative goods.

Karl Aiginger et al. (2013) describes competitiveness as "ability of a country (region, location) to deliver the beyond GDP goals for its citizens"

World Economic Forum (2014) defines: Competitiveness is characterized as the collection of institutions, policies and factors that decide a country's productivity level. The productivity level in turn determines the sustainable level of the economy's prosperity. As a result, more prosperous economies are willing to pay their workers higher salaries.

According to Malaysia Productivity Corporation, the degree to which the region (nation) can generate products and services that satisfy the foreign market test, outperforming others, whilst its people have a living standard that is both growing and sustainable over long term.

In summary, the definition of competitiveness is still a controversial subject. These above definitions show, in the first place, competitiveness of enterprises must be based on the resources and capacity of enterprises. An enterprise is deemed to be successful if it dares to accept favorable conditions for the enterprise itself. Enterprises need to have the best ability to ensure that they are firmly in competition.

### **2.3.3 Levels of competitiveness**

The levels of competitiveness include:

*National competitiveness:* At the national level, the idea of competition has the sense of national efficiency. Competitiveness depends on the efficiency of a country's use of human services, resources and capital, since it is productivity that defines the sustainable standard of living expressed in incomes, the rate of return on capital, and on natural resources.

*Industry competitiveness:* Industry rivalry is competition between companies in various manufacturing industries for more productive investment and, as a result, the average rate of return and value of output. Sector-level competitiveness is also used for manufacturing within a region, demonstrating the ability of the industry to cope with the challenges presented by international competitors (IMD, 2014). The competitiveness of the industry is therefore determined not only by the internal factors of the industry, i.e. the competitiveness of the companies in the industry, but also by the factors of the government in the construction of the business climate. (Canada Industry 1995, OECD 1992 and Grossi 1990).

*Company/Firm competitiveness:* The productivity of the company is expressed in the profitability of the capital invested by the companies in development and business activities. At this level, the competitiveness index is expressed in factors such as profitability, prices, efficiency and market share. In addition, factors such as management skills, economics, knowledge of technology and the dynamics of the market also have a direct effect on the competitiveness of companies.

*Product competitiveness:* Mr. Le Van Duoc, representative of Ministry of Industry of Vietnam, said, "The competitiveness of a commodity is reflected by a comparative advantage for goods of the same kind. Comparative advantages of the products due to internal and external factors produced, such as production capability, cost of production, product quality and market size of the product. The competitiveness of the industry can be measured by the market share of those goods". (Vietnamese industry magazine, 2004)

### **2.3.4 The importance of improving competitiveness**

The importance of competition is reflected in the following key points:

For the economy, competition keeps the economy alive, stimulates productivity and puts pressure on enterprises to make productive use of capital, thus leading to the saving of the economy's common resources.

In external relations, competition tends to enable businesses to develop markets in the region and around the world, to explore new markets, to associate joint ventures with foreign companies, to engage deeply in the division of labor and international economic cooperation, and to enhance money, labor, science and technology exchanges with other countries.

In the case of manufacturing and business organizations, competition urges them to constantly explore, evolve, change production methods and coordinate business management, innovate technology, apply technological and technical innovations, produce new products, increase labor efficiency and lower product costs. This will boost the qualifications of staff and managers at all levels of the company. On the other hand, competition helps to critically track workers who are unable to adjust to the changing market.

For customers, rivalry generates relentless pressure on costs, pushing firms to find ways to reduce the cost of goods by selling products quickly, so that consumers can profit from competition between companies offering the same product or service. On the other hand, competition pushes companies to increase their production, diversify product styles and designs, so that customers have more flexibility in terms of their needs and tastes.

⇒ Improving competitiveness is to contribute to helping maintain and develop the positive effects of competition.

## **2.4 Recent studies related to thesis topic**

### **2.4.1 Foreign studies**

#### **2.4.1.1 In term of research method**

To fully understand how factors can influence the competitiveness of the seafood export industry in general and pangasius export, many authors in the world have conducted in-depth studies. Main methods used in those studies are qualitative and quantitative:

- Qualitative method

Qualitative research is expressed in terms. It is utilized to identify concepts, ideas or experiences. This method of study helps to gather in-depth perspectives on subjects related to the topic. Popular qualitative approaches include open-ended question interviews, words-described observations, and literature reviews that discuss concepts and theories. This method in time has become less efficient as the quantitative becomes more widely used to analyze. In recent years, qualitative methods have mostly used parallel with quantitative analysis. Examples of some studies related to the thesis are studied by Kitson, Michael, and Martin, Ron (2004) or 'Factor affecting the competitiveness of the food industry in Iran' (Eskandari, et al., 2015). These studies usually focus on non-quantitative factors such as social, institutional, culture, infrastructural and such.

- Quantitative method

The method of gathering and analyzing numerical data is quantitative analysis. It can help the author identify trends and averages, make forecasts, evaluate causal associations, and generalize outcomes to larger populations. In recent years, the quantitative method has been used more and more in the export industry studies. Regrettably, studies that are related to factors influencing the competitiveness of pangasius are rarely found lately.

In general, for fully understanding the effect of factors on pangasius export competitiveness, both methods should be used to cover more related ground. However, the author will focus more on quantitative method due to its rising popularity and efficiency. By concentrating more on quantitative variables, it is easier to make an in-depth assessment of each factor, analyze current trends, and predict future outcomes.

#### ***2.4.1.2 In term of research finding***

Foreign studies that specifically related to influence of factors on the competitiveness of pangasius export in the latest time are quite rare. Therefore, foreign studies which author consults are linked to the competitiveness factors of products, industries or countries.

Valentina Diana Rusu & Angela Roman (2018) conducted an empirical analysis of factors affecting the competitiveness of Central and Eastern European (C.E.E.) countries, which show that G.D.P., Tax, FDI, Trade, and Cost of chosen countries corporated positively with the nation's competitiveness. Delgado and Ketels and Porter and Stern (2012) studied the determinants of national competitiveness: macroeconomic (MACRO) and microeconomic (MICRO). In the study, authors state that higher levels of business environment, infrastructure, institutions and finance lead to higher levels of competitiveness. Besides studies focused on an entire industry or nation, studies by Akhtar et al., (2013); Ramadan et al., (2016) and Navghan and Kumar (2017) focus on specific products and analysis factors around products' characteristics to evaluate competitiveness.

The National Competitiveness Council (NCC) also built a competitiveness pyramid to assess the impact of factors on competitiveness. This model includes three parts: Policy input (business environment, physical infrastructure, and knowledge infrastructure) and Essential conditions (business performance, productivity, price, cost, and labor supply) support Sustainable growth in the top of the pyramid. Competitiveness pyramid has been used to determine factors that influence Ireland's competitiveness. Number of factors in Ireland such as business environment, infrastructure and labor supply associated significantly with country competitiveness. However, other factors (productivity, price and cost) discouraged Ireland's competitiveness compared to other European nations. To sum up, the different factors for each study were determined by type of commodities and scope of study.

#### **2.4.2 Domestic studies**

##### ***2.4.2.1 In term of research method***

To analyze the determinants of competitiveness of export in general and pangasius export in particular, studies in the domestic often use two main methods: qualitative and quantitative. As mentioned before, qualitative methods are utilized to identify concepts, ideas or experiences. Examples of some studies related to the thesis are studied by Kim Anh, Tram Anh, Lien Vi (2010). This study concentrates on seven main factors as: National conditions, seeds, labor force, social - economics conditions, pangasius processing industry, domestic demand, and government policies by applying the expert method and the Five Forces Model

introduced by Michael E. Porter. More examples of studies which utilized qualitative methods can be mentioned: Nguyen Thi Hoang Nhien (2016) used an integrated approach, methodology and statistical analysis, and comparative method to point out how main factors according to Porter's Diamond influence competitiveness; Improving the competitiveness of Vietnamese seafood products on the EU market since Vietnam joined the World Trade Organization (Bac, 2017) based on the methodology of dialectical materialism and historical materialism to measure several components of competitiveness.

The quantitative method of gathering and analyzing numerical data. Nguyen (2016) used the OLS regression model by using STATA 13 software to analyze the impact of these variables on firm dynamics. In recent years, qualitative methods have mostly used parallel with quantitative analysis. The study: "Factors Affecting the Competitiveness of Vietnam Aquatic Exporters: Empirical Evidence in An Giang Province." Of Nguyen Huu Phu, Le Duc Toan, Ho Thi Phi Yen, Doan Quoc Bao (2017), and the study: "Competitive assessment factors of seafood exporters in Vietnam" of Tran Huu Ai (2018) analyzed data using theoretical research, and structural equation modeling (SEM) analysis.

To conclude, most studies use different research methods, however, it can be seen that most recent studies incorporate methodologies to give a more general overview of each topic. At the same time, the combination of methodologies will help the authors to study more deeply into each raised issue.

#### ***2.4.2.2 In term of research finding***

In 2010, group of authors Kim Anh, Tram Anh, Lien Vi analysed factors affecting Vietnam Pangasius export in the world market. This study based on Michael E. Porter's Five Force Model points out these main factors: national conditions, seeds, labor force, socio-economic conditions, pangasius processing industry, domestic demands, and government policies. This analyzed the competitive advantages of Vietnamese pangasius, thereby recommending solutions to improve exports in many aspects.

Basing on Porter's Diamond Model, Nguyen Thi Hoang Nhien (2016) studied the competitiveness of Vietnamese coffee into the EU market with five primary factors. The thesis pointed out that the competitiveness of Vietnam's coffee products exported to the EU market is still lower than other countries. Based on the basis of forecast about the demand of the EU coffee market, SWOT matrix, this thesis has proposed a number of measures to improve the competitiveness of Vietnamese coffee products exported to the EU.



Hoang Hai Bac (2017) used dialectical materialism and historical materialism research methods to study these factors affecting the competitiveness of Vietnamese seafood products from two main facets: Exporting country and Importing country. This study clarifies the influencing factors using a variety of research methods while also delving into three competitors: China, India and Thailand. From there, the author draws outstanding results and weaknesses that need to be overcome.

The competitiveness assessment of seafood exporters in Vietnam was researched by Tran Huu Ai (2018). The author conducted quantitative research in Ba Ria - Vung Tau province from March to October 2017. The result showed that the 11 factors which are: management and operations, financial ability, prices, commercial dispute resolution, distribution channel, marketing, brand power, market overall, and infrastructure and supporting services he proposed based on the studies by Michael Porter (1990), Arthur A. Thompson et al. (2001), Mohammad Yusuf (2013), Muhammad Yusuf and Torbjørn Trondsen, (2014) are directly related to the competitiveness of the fisheries sector, all having a positive impact.

There is an empirical study of Nguyen Huu Phu, Le Duc Toan, Ho Thi Phi Yen, Doan Quoc Bao (2017) whose studies confirm Factors Affecting the Competitiveness of Vietnam Aquatic Exporters. This is a research based on Thompson - Strickland method to propose 10 factors affecting the competitiveness of Vietnam aquatic exporters. This study has found the impact level of the complementary factors, from the results, the group of authors gave specific recommendations to enhance the competitiveness for each factor.

### **2.4.3 Summary of literature review**

Overall, many studies analyzed the influence of factors on competitiveness, but the number of studies directly related to Vietnam pangasius exporting activities in China is quite modest. When discussing competitiveness, the most used theory and model is Michael Porter's theory, but NCC's competitiveness pyramid also proves to be a very efficient model to analyze. There are only a few studies that use the NCC's model. However, the competitiveness pyramid provides in-depth coverage of two closely related groups: policy inputs (business environment, physical infrastructure, knowledge infrastructure) and essential conditions (business performance, productivity, price and cost, labor). Furthermore, with already high positive statistics, exporting in general and pangasius export has many opportunities to increase even more when the global pandemic - COVID 19 ends. The chance to grab those opportunities is also boosted by free trade areas and cooperation between countries.

The table below shows key studies related to the thesis:

NO.	References	Title	Methods and data	Findings
1	Samar Verma (2002)	Export competitiveness of Indian textile and garment industry.	<ul style="list-style-type: none"> <li>- Competitive Performance - Operation:</li> <li>Market share &amp; Growth rate</li> <li>- Interview with exporters</li> <li>- Panel data: 1995 - 2000</li> </ul>	<i>Factor influence India textile and garment in US/EU market:</i> <ul style="list-style-type: none"> <li>- US import trends.</li> <li>- US import quota.</li> <li>- EU import trends.</li> <li>- EU import quota.</li> <li>- Growth rate and Market share of Indian in US/EU market.</li> </ul>
2	C. Pongpanich; P. Phitya-Isarakul (2008)	Enhancing the Competitiveness of Thai Fruit Exports: an Empirical Study in China	<ul style="list-style-type: none"> <li>- Micheal Porter's competitiveness theory</li> <li>- National Research Council (NRC) 's Brand and marketing work steam</li> <li>- Multidimensional scaling</li> <li>- Data of 2 cities in China: Guangzhou and Shanghai</li> </ul>	<i>Components for enhancing competitiveness process of Thai fruit:</i> <ul style="list-style-type: none"> <li>- Market development stages for Thai Fruit in China.</li> <li>- Brand position.</li> <li>- Consumption attributes in Guangzhou and Shanghai.</li> </ul>
3	Kim Anh, Tram Anh, Lien Vi (2010)	Recommendations to ensure the Vietnam pangasius sustainable export in the world market	<ul style="list-style-type: none"> <li>- Apply the expert method and the Five Forces Model introduced by Michael E. Porter.</li> <li>- Panel data: 2001-2008</li> </ul>	<i>The seven main factors affecting competitiveness of Vietnam pangasius in the international market:</i> <ul style="list-style-type: none"> <li>- Natural conditions</li> <li>- Seeds</li> <li>- Labor force</li> <li>- Social – Economic conditions</li> <li>- Pangasius processing industry</li> <li>- Domestic demand</li> <li>- Government policies</li> </ul>
4	NCC (2010)	Ireland's Experience with Measuring and Benchmarking Competitiveness	<ul style="list-style-type: none"> <li>- The Irish Competitiveness Pyramid</li> </ul>	<i>Irish's national competitiveness affected by following factors:</i> <ul style="list-style-type: none"> <li>- Ireland's GDP, GNP</li> <li>- FDI of Ireland</li> <li>- Ireland UN Human Development Index (economic, education and health)</li> <li>- Ireland's education system</li> <li>- Infrastructure system of Ireland</li> </ul>

				<ul style="list-style-type: none"> <li>- Ireland's regulation and policy</li> <li>- Expenditure investment of Ireland</li> <li>- Ireland's rate of change and inflation rate</li> <li>- Labor supply of Ireland</li> </ul>
5	Waqar Akhtar (2013)	Export competitiveness of Pakistani horticultural products	<ul style="list-style-type: none"> <li>- Comparative Advantage (RCA)</li> <li>- Relative Export Advantage Index (RXA)</li> <li>- Revealed Symmetric Comparative Advantage (RSCA)</li> <li>- Revealed Imports Penetration Index (RMP)</li> <li>- Relative Trade Advantage Index (RTA)</li> <li>- Panel data between 1990 and 2009</li> </ul>	<i>Comparative advantage for selected horticulture commodities in Pakistan:</i> <ul style="list-style-type: none"> <li>- Fruit and vegetable</li> <li>- Tangerines, mandarins and clemens</li> <li>- Onion</li> </ul>
6	Nguyen Thi Hoang Nhien (2016)	The competitiveness of Vietnamese coffee into the EU market	<ul style="list-style-type: none"> <li>- Porter's Diamond Model.</li> <li>- Method: An integrated approach, methodology and statistical analysis, comparative.</li> <li>- 2011-2015 period.</li> </ul>	<i>Main elements impact on Vietnamese coffee competitiveness in EU:</i> <ul style="list-style-type: none"> <li>- Production factor conditions</li> <li>- National conditions</li> <li>- Related and supporting industries</li> <li>- Firm strategy, structure and rivalry</li> <li>- The role of the government and opportunities</li> </ul>
7	Hoang Hai Bac (2017)	Improving the competitiveness of Vietnamese seafood products on the EU market since Vietnam joined the World Trade Organization.	<ul style="list-style-type: none"> <li>- Based on dialectical materialism and historical materialism.</li> <li>- Method: comparative, expert, general analysis, statistical analysis.</li> </ul>	<i>Factors belonging to the exporting country</i> <ul style="list-style-type: none"> <li>- The factors of production</li> <li>- The domestic demand conditions</li> <li>- Supporting and related industries</li> <li>- Business strategy, structure and domestic competition</li> <li>- The role of the government</li> </ul> <i>Factors belonging to the importing country</i>

			<ul style="list-style-type: none"> <li>- Data from the time Vietnam joined the WTO (2007) to 2015.</li> </ul>	<ul style="list-style-type: none"> <li>- The demand of the import market</li> <li>- Competitive in import market</li> <li>- Trade barriers of import markets</li> </ul>
8	Tran Huu Ai (2018)	Competitive assessment factors of seafood exporters in Vietnam	<ul style="list-style-type: none"> <li>- The studies: The Competitive Advantage of Nations by Michael Porter (1990), Arthur A. Thompson, Jr. &amp; A. Strickland (2001), Mohammad Yusuf (2013), Muhammad Yusuf and Torbjørn Trondsen (2014).</li> <li>- 3/2017 - 10/2017 period.</li> </ul>	<p><i>11 features have effect on seafood exporters competitiveness:</i></p> <ul style="list-style-type: none"> <li>- Managerial and operational abilities;</li> <li>- Prices;</li> <li>- Human resources;</li> <li>- Marketing;</li> <li>- The power of brand;</li> <li>- Distribution channel;</li> <li>- Production technology;</li> <li>- Finance;</li> <li>- Investments in research and development;</li> <li>- Being creative,</li> <li>- Commercial disputes' resolution.</li> </ul>
9	Nguyen Huu Phu, Le Duc Toan, Ho Thi Phi Yen, Doan Quoc Bao (2020)	Factors Affecting the Competitiveness of Vietnam Aquatic Exporters: Empirical Evidence in An Giang Province.	<ul style="list-style-type: none"> <li>- Basing on Thompson – Strickland method</li> <li>- Analyze Cronbach's Alpha accreditation, exploratory factor EFA, confirmatory factor CFA, structural equation model SEM</li> <li>- 10 elements (500 questionnaires)</li> <li>- 2010 -2013 period.</li> </ul>	<p><i>Captured main factors determine competitiveness of Aquatic exporters in Vietnam:</i></p> <ul style="list-style-type: none"> <li>- Capacity of marketing, administration, price, finance, brand name, products, human resources, business development relations, technology and logistics.</li> </ul>

**Table 2.2: Summary of key studies related to the thesis (Authors, 2021)**

#### **2.4.4 Literature gap**

There are already a variety of research papers on competition in general and export competitiveness in particular. However, the factors influencing the competitiveness of pangasius exports have not been analyzed in detail.

It is evident that most of the study has been conducted under varying spatial and temporal circumstances, because although the review is generally focused on the Porter model, the results of each determinant can vary. In reality, these studies may have several reasons that are not really appropriate for study into Vietnamese pangasius exports due to variations in commodities, conditions of output, market size, etc. In addition, while there is a combination of analysis approaches, several analyses have been done in previous years using out-of-date results, which indicates that the news is no longer current. Notably, the previous studies on competitiveness have almost no reports on pangasius exports in general and have overlooked the Chinese sector, one of the largest and most potential import markets of pangasius, for several years.

This is the first study on these factors that influencing competitiveness of Vietnamese companies in exporting pangasius to China from 2016-2020 combined with a qualitative and quantitative review in order to carry out a thorough, topical and systematic review of the determinants of pangasius exports in line with the actual conditions of Vietnam. Since then, the authors have built a system of solutions to increase productivity of Vietnam's pangasius exports over the duration 2021-2030.

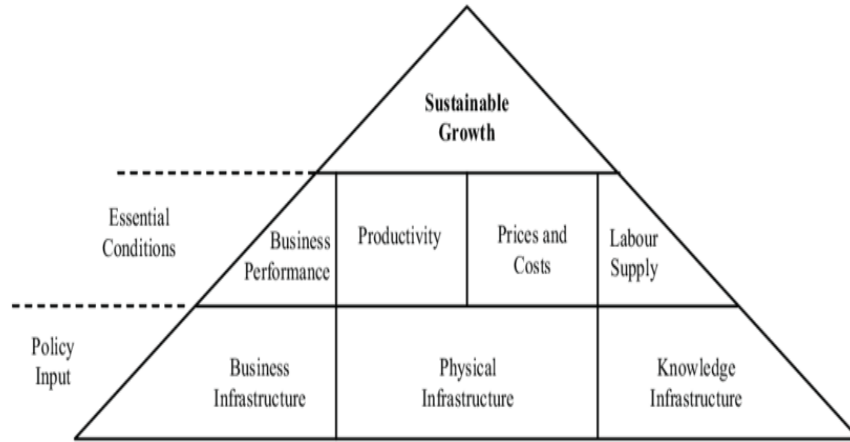
### **2.5 Proposed model**

#### **2.5.1 The original model**

The NCC uses the competitiveness pyramid to outline the framework within which it assesses Ireland's competitiveness:

- At the top of the pyramid is sustainable growth in living standards – the fruit of past competitiveness success;
- Below this are the essential conditions for achieving competitiveness, including business performance (such as trade and investment), productivity, prices and costs and labor supply. These can be seen as the metrics of current competitiveness;

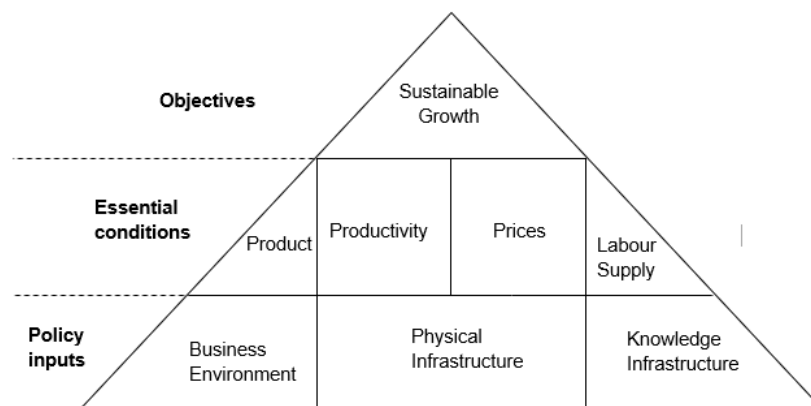
- Lastly, the policy inputs cover three pillars of future competitiveness, namely the business environment (taxation, regulation, finance and social capital), physical infrastructure and knowledge infrastructure. These are addressed in turn.



**Figure 2.1: The Competitiveness Pyramid (Source: NCC, 2010)**

### 2.5.2 The modified model

The selected model is based on NCC’s original framework (2010) with three groups: policy inputs, essential conditions, and objectives. Furthermore, the authors also reviewed and based on several reputable journals related to the study topic to develop variables and hypotheses. The particular model with a total of seven explanatory variables related to factors affecting the competitiveness of Vietnam’s pangasius exporting companies was investigated as follow:



**Figure 2.2: Factors affecting competitiveness of Vietnam’s pangasius exporting companies (Source: Authors, 2021)**

The modified model is changed, there are two new elements in the new model. The first one is Product. In the original, this element was Business Performance. As we can see, the factor Business Performance is a pretty general concept which is assessed through several facets as financial facet, social performance facet, etc. The authors want to analyze the effect on the competitiveness of companies more precisely and in more detail. Therefore, instead of considering business performance as a factor, the authors are looking at the influence of product factor on competitiveness. The second factor is Prices, which is a leading indicator for determining the size of the business. The authors find that it is difficult to cover all types of costs and the extent to which they affect competitiveness. Therefore, instead of considering both price and cost aspects, the authors decide to focus on the price factor and mention some of the costs involved in in order to come up with the simplest and most detailed approach.

### **Business Environment**

Business Environment is one of the most important aspects to any business in general and exporting pangasius in particular. It is a set of elements that are directly involved in the business activities. The business environment has a considerable impact on analyzing an industry's competitiveness. The indicators that are used in the thesis to measure pangasius export activities as follows: taxation, regulation, financial market, geography, size and COVID 19 pandemic.

Tariff: Tariff is a crucial consideration in exporting decisions when firms try to ship pangasius to a new foreign market. Tariff structure and tariff quotas in a country can directly affect a firm's profit, which will higher or lower firm competitiveness advantages.

Regulation: The rules and regulations that the government imposes on markets and businesses have long been a natural focus of the study of competitiveness (Ketels, 2016).

Scale: The size of the economy is a potential influence in the measurement of overall competitiveness. The point that the market size is a positive driver is that the broad market in its own right attracts foreign direct investment and allows businesses to export both factors that could impact productivity. (Ketels, 2016)

COVID 19 Pandemic: The COVID 19 pandemic is an infectious epidemic with the agent of the virus SARS-cov-2, happening globally. The COVID 19 pandemic is a phenomenon that directly impacts the world economy in general due to a shortage of supplies arising from: expanded use

of equipment worldwide to tackle epidemics, procurement of warehouses and factory operations, and destruction of logistics due to outbreaks.

In recent years, the China market has an increasing, expanding and ever-growing demand for new seafood products in general and pangasius in particular from Vietnam. As the second largest trading country in the world, China is also one of the most important trading partners of Vietnam. Vietnam and China, due to close borders and related history between two countries, have many similarities but also have various differences in political, economic and cultural climate. A thorough understanding of China's business environment is essential for Vietnamese pangasius exporters to gain competitive advantage on pangasius exporting practices in the China market.

- **H1: Business Environment has a positive correlation with competitiveness of Vietnam's exporting pangasius companies.**

### **Physical Infrastructure**

The availability of infrastructures in a country, such as transport infrastructure, energy infrastructure, telecommunications, waste, water, and related services, is essential for competitiveness. A built infrastructure improves mobility, reduces congestion, and increases the productivity of both labor and goods. Physical infrastructure also plays a critical role in determining the quality and attractiveness of export/import activities.

Over the past 2 decades, Vietnam has achieved sustained growth in overall infrastructure development in general and pangasius production and export infrastructure in particular. Physical infrastructure should always stay in good quality, and competitive cost to be able to sustain competitiveness. Beyond their role of providing essential utilities, pangasius companies need to expand their role into providing telecommunication and related services among the industry. Alongside having a favorable geography location and political stability, investment in physical infrastructure is the key point for the on-going fast expansion of pangasius enterprises, meeting the export demand of Chinese market and gaining a stronger indicator of competitiveness in pangasius competition.

- **H2: Physical Infrastructure has a positive correlation with competitiveness of Vietnam's exporting pangasius companies.**

### **Knowledge Infrastructure**



The availability of knowledge infrastructure involves deep-understanding of the industry, knowing and constantly adapting to the market trends, up-to-date knowledge of new technology and research. All are vital parts for generating knowledge and high-value business activities. Industry knowledge is a crucial part in competitiveness - serving as the first foundation of any company in any industry, while capturing trending of the market helps companies to evolve and stay sustainable for industry. Furthermore, ability of companies to keep up with pace of new technology and research developments significantly increases competitive advantage.

The high level of both human knowledge and industry knowledge accounts for a large portion of a Vietnam pangasius's competitive success in an increasingly globalized environment where physical and financial resources are highly mobile across countries. The availability of knowledge and talents for the pangasius enterprises is extremely important in the role of identifying the current and upcoming trends in Chinese and deciding valuable decisions. With in-depth knowledge of product and market, Vietnamese pangasius firms have the ability to develop their own system of producing and exporting, which may gain more popularity in Chinese market. Additionally, up-to-date technological advancement is one of the leading keys of enchanting enormous benefit in the Vietnamese pangasius. Knowledge investment helps companies to achieve higher sales, either through launching a new and better pangasius related product, through enhancing the quality of existing goods, or by the efficient use of resources-productivity enhancement which can result in cost reductions.

- **H3: Knowledge Infrastructure positively correlates with competitiveness of Vietnam's exporting pangasius companies.**

### **Product**

Product is one of the factors that directly affect the competitiveness of the business. A product is the item offered for sale. The product can be a service or an item. It can be physical or in virtual or cyber form. Therefore, to evaluate the competitiveness of an exporting enterprise related to pangasius products to the China market, the authors based on the following factors: seeds and quality of seeds, product line, product diversification, added value, product differentiation, and innovation in product manufacturing.

Standards for imported products of the Chinese market in the past few years are not as strict as the US or EU market, but it has changed more rigorously. There are some main standards such

as: HACCP Standards, SQF Standards, and globalgap Standards. Therefore, focusing on ensuring and improving product quality to meet the requirements of the import market is an issue that has a great impact on the export of enterprises.

- **H4: Product is positively correlated competitiveness of Vietnam's exporting pangasius companies.**

### **Productivity**

According to Paul Krugman (1994), productivity is generally defined as the ratio between output volume and the input volume. In other words, it measures how efficiently inputs from production, such as labor and capital, are used in the economy to produce a given level of output. The input unit can be labor hours (labor productivity) or all production factors, including labor, machines, and energy (total factor of productivity). Productivity is considered a key source of economic growth and competitiveness, and, as such, basic statistical information is used for many international comparisons and country performance assessments (Krugman, 1994). The point of productivity is not to work harder for less. It is about doing more intelligently to earn more. A business's ability to enhance its production efficiency over time is almost wholly dependent on its ability to increase its productivity per employee. Therefore, with companies that process pangasius, productivity is the value of output compared to the value of input resources used to produce a number of pangasius products for the business.

- **H5: Productivity is positively correlated competitiveness of Vietnam's exporting pangasius companies.**

### **Prices**

Price does not inherently mean money; it is what a customer must pay to purchase a product or service (Lumen, n.d.). In this report, the authors focus on the price of products made of pangasius and the amount of money that a company exporting pangasius has to pay to afford services or resources related to the labor supply, transportation, or pangasius farming. According to Mayuri K (n.d.), price shall decide the commodity's future, the value of the products to be manufactured, and product's acceptability to consumer. Thanks to the price of products, exporting pangasius businesses can understand the product's return and profitability, so they can make up for the product's perfect business strategy. The price must be suitable for a

business's characteristics and the customers' outcomes in the China market. The more reasonable the price of pangasius 'product is, the more customers are drawn to a company.

- **H6: Prices is positively correlated competitiveness of Vietnam's exporting pangasius companies.**

### **Labor Supply**

In many businesses, especially the businesses of exporting pangasius, to ensure success, labor supply or human resource is the most important factor. This is the key element in the competitiveness of delivering products and services to consumers most efficiently. Besides, human resources are a primary element in generating capital and promoting new ideas. Thanks to high labor efficiency, a business can have the reduction of prices, reduction of commodity costs, increase of the market competitiveness of companies.

Labor supply is demonstrated by the number and quality of the company's employees, such as the level of education, competence level, health, labor culture, etc. If a company of exporting pangasius has committed staff with high technical skills, it will have a potential labor supply. Therefore, a business (no matter how large or small) needs to concentrate on developing and encouraging the responsiveness of its human resources at all stages of the company's growth cycle in order to succeed in the long term. (SEMTEK Co.,LTD, 2021)

- **H7: Labor Supply is positively correlated competitiveness of Vietnam's exporting pangasius companies.**

## **2.6 Conclusion**

The purpose of this chapter is to provide an overview of the export concepts, the situation of pangasius exports and general theories, along with the theoretical context and the hypotheses that have been established as a solid foundation for our analysis. In addition, the literature related to this research is also contrasted and evaluated. There is also a void in the literature to ensure that this study is carried out outside the box. Analysis methodologies are identified in the next chapter to help investigate the relationship between variables.

# 03

## METHODOLOGY

*Chapter 3 – Methodology* discusses the approach to research, data collection and processing methods, analytical methods, regression model detections, ethical considerations, and limitations of the research project.

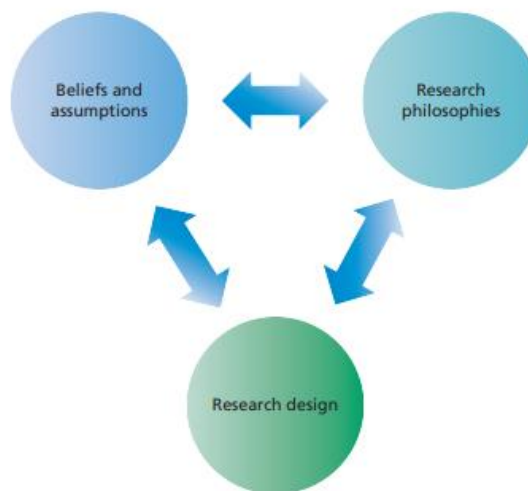
## CHAPTER 3: METHODOLOGY

### 3.1 Introduction

#### 3.1.1 Research philosophy

Business Research Methodology (n.d.) reported that the philosophy of research deals with the source, nature and development of knowledge. A personal view about the world or a research topic is closely related to what we perceive as reality. When we embark on research, this is precisely what we are doing: developing knowledge in a specific field. In simple terms, a research philosophy is a belief in the ways in which data about a phenomenon should be gathered, analyzed and used.

A study's philosophy will reflect the significant assumptions of the author and these assumptions serve as a foundation for the research strategy.



*Figure 3.1: Research philosophy (Source: Research methods, 2019)*

Research philosophy typically has many branches related to a broad range of disciplines. According to Saunders, Lewis and Thornhill (2019), within the scope of business studies, there are five major philosophies in business and management: positivism, critical realism, interpretivism, postmodernism and pragmatism as below:

- **Positivism:** promises unambiguous and precise knowledge and originates from the works of Francis Bacon, Auguste Comte and the group of philosophers and scientists known as the Vienna Circle at the beginning of the twentieth century. Positivism focuses strictly on a scientific empiricist approach that produces pure data and facts that are not

affected by human interpretation or bias. Positivist researchers see the dilemma from reality as they objectively study. These people are interested in the phrase "If - then" they always want to find invariant laws when they solve problems. Therefore, quantitative statistics are mostly used as the key tool to prove their concerns, but qualitative statistics can also be used.

- **Critical realism:** With relation to the underlying structures of reality that shape observable events, the philosophy of critical realism aims at explaining what we see and experience. Reality is seen as external and autonomous by critical realists, but not specifically accessible through observation and understanding of it.
- **Interpretivism:** Interpretivism emphasizes that humans, since they construct meanings, are distinct from physical phenomena. When the researcher notes that it is not easy to understand the social world on the basis of values, the theory of Interpretivist study notes that the social world can be viewed in a subjective way (Žukauskas, et al., 2018). Interpretive analysis has the goal of creating new and more rich understandings and representations of social meanings and worlds and has abstract descriptions of meanings, formed of human experiences. This means looking at companies from the viewpoints of various groups of people in business and management researchers.
- **Postmodernism:** Postmodernism highlighted the position of language and power relations, by challenging established ways of thinking and giving voice to alternative oppressed views.
- **Pragmatism:** The theory of pragmatist study deals with reality. The choice of research philosophy is primarily determined by the issue of research. Practical findings are considered significant in this research philosophy. (Žukauskas, et al., 2018). With pragmatism, researchers are "free" to choose the methods, techniques and procedures that best meet their needs and the objectives of scientific research.

In relation to factors influencing the competitiveness of the exporting companies of the Vietnamese pangasius to the China market, it is necessary to keep out quantifiable findings leading to statistical assessments with objective thinking. As a result, the philosophy of positivism is the most fitting for the subject and the method of data collection.

### 3.1.2 Research process

The research process is the process of a number of basic phases of research that have endeavoured to share the common goal of furthering understanding of a problem. It includes the identification, location, assessment and review of the information needed to support the research question, and then the formation and expression of ideas (The Research Process, 2020). According to Coventry University (n.d.), there are 3 stages of the research process: the preparation phase, the research activity phase and finally the presentation phase. These phases contain eight steps, which are illustrated in the table below:

<b>Research Proposal</b>	Step 1	<i>Identify and select the general research area</i>
	Step 2	<i>Choose the specific research topic</i>
	Step 3	<i>Formulate research aim, objectives and research questions or developing hypotheses, methodology</i>
	Step 4	<i>Conduct the literature review</i>
<b>Research Activity</b>	Step 5	<i>Selecting the method of data collection</i>
	Step 6	<i>Collect data</i>
	Step 7	<i>Process and analyze data</i>
<b>Written Content</b>	Step 8	<i>Complete the final findings and prepare for the report's presentation.</i>

**Table 3.1: The Research Process (Source: Authors, 2021)**

### 3.1.3 Research approaches

According to Business Research Methodology (n.d.), there are three types of Research approach: *Deductive research approach, Inductive research approach, Abductive research approach*; each research approach will be illustrated as the following:

- **Deductive research approach**

A deductive approach is to develop a hypothesis (or hypotheses) based on current theory, often based on the finding of researchers' academic literature, and then develop a research strategy to test the hypothesis (Wilson, 2012). This approach generalizes from the general to the specific.



*Figure 3.2: Deductive process in research approach (Sources: Dudovskiy, n.d.)*

- **Inductive research approach**

Bernard, H.R (2011) suggested that the inductive approach involves searching for observational patterns and the development of explanations and theories for these patterns through a series of hypotheses. This approach begins by collecting data to explore a phenomenon and to generate or construct a theory. The inductive approach generalizes from the specific to the general.



*Figure 3.3: Inductive process in research approach (Sources: Dudovskiy, n.d.)*

- **Abductive research approach**

Saunders et al. (2019) defined that the abductive research approach collects data to investigate a phenomenon, define trends and clarify patterns, create a new or change an existing hypothesis that then tests through additional data collection. This generalizes from the interactions between the specific and the general.

In this report, the authors determine the influencing factors on the competitiveness of Vietnam's pangasius exports to the Chinese market. From the first step of the research process, the concept and theory related to pangasius and the competitive advantage were developed. After that, research result was obtained objectively by conducting interviews and surveys on domestic exporters in relation to the research subjects of the pangasius export activities to the Chinese market, then examining the data denying or endorsing the previously believed hypotheses. Therefore, the deductive methodology is selected as the most effective form for the entire study.

### **3.1.4 Research methods**

According to Goundar (2012), the basic and applied research can be quantitative or qualitative or even both. Here is the illustration of these two research methods:



#### ***3.1.4.1 Quantitative methods***

Lotfi (2017) suggested that quantitative study is focused on quantity or amount calculation. The process is expressed or defined in terms of one or more quantities. By analyzing the relationship among variables, quantitative analysis is an approach to testing objective hypotheses. In exchange, these variables, usually on instruments, can be evaluated such that numerical data can be analyzed using statistical procedures. Here, there is a fixed structure in the final written report consisting of introduction, literature and theory, methodology, findings and discussion.

- **Benefit of using quantitative method:** Quantitative method creates reproducible data and can be used to systematically describe large sets of items. (An introduction, n.d)
- **Drawback of using quantitative method:** This approach calls for large data analysis samples and statistical preparation.

#### ***3.1.4.2 Qualitative methods***

Qualitative study is an approach to investigating and recognizing the importance of a social or human issue assigned to individuals or groups. Qualitative analysis is concerned with quality-related qualitative phenomena. It is descriptive, non-numerical, applies logic and uses terms. Its aim is to get the meaning, the feeling and the situation defined. This research method includes evolving questions and techniques, data typically collected in the setting of the participant, inductively constructing data analysis from specifics to general topics interpretations of the significance of the data by the researcher. (Creswell & Creswell, 2017)

- **Benefit of using qualitative method:** The author can be flexible to adjust methods often as we go to develop new knowledge. Besides, this method can be carried out with small samples. (An introduction to research method, n.d.)
- **Drawback of using qualitative method:** This approach cannot be statistically analyzed or applied to larger populations and study can hardly be standardized.

#### ***3.1.4.3 Conclusion***

Within the scope of the research, in order to identify factors that affect the competitiveness of Vietnamese pangasius' exporting companies on the China market, the study applies both qualitative and quantitative methods. With quantitative methods, the authors conduct the survey that is related to *Business Environment, Physical Infrastructure, Knowledge Infrastructure, Product, Productivity, Prices, Labour Supply* to collect 150 observations or primary data using

closed-ended questions (quantitative hypotheses). With the qualitative approach, the authors then use these primary data collected from the participants, begin to inductively construct the data analysis of the theory and the collections refers to the variables impacting the competitive advantage of Vietnamese pangasius exporting companies on the China market, and then make interpretation of the data meaning.

### **3.2 Data sources**

Data collection plays an important role in statistical analysis. Collected data can be distinguished into primary and secondary data. There are two main methods to collect data: secondary data collection method and primary data collection method.

#### **3.2.1 Primary data**

Primary data is collected by methods of investigating, surveying through questionnaires for business managers. Primary data is often reliable, authentic and objective to the extent that it was collected for the purpose of solving a particular research problem. It is usually free or inexpensive to obtain and can serve as a solid foundation for any research project - as long as you know where to find it and how to assess the value and relevance of it.

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 need to be identified.

#### **3.2.2 Secondary Data**

Secondary data is data that has been collected by others in the past but made available to others for use. Secondary data is often easily accessible for researchers and individuals as they are mostly shared publicly. However, this means that the data is generally general and not specific. According to Joop J.Hox and Hennie R.Boeijs (2005) Using secondary data presents researchers with a number of characteristic problems. First, researchers must locate data sources that may be useful given their own research problem. Second, they must be able to retrieve the relevant data. Third, it is important to evaluate how well the data meet the quality requirements of the current research and the methodological criteria of good scientific practice.

#### **3.2.3 Conclusion**

Secondary data is data that has been collected by others in the past but made available to others for use. Secondary data is often easily accessible for researchers and individuals as they are

primarily publicly shared. For example, with this topic resources will be found in VASEP, seafood information sites, seafood companies, websites, books and articles, etc. However, this means that the data is generally general and not specific.

### **3.3 Data collection methods**

#### **3.3.1 Questionnaire design**

There are 7 steps in the questionnaire design process: Identify data and audiences based on research objectives; Determine method of data collection; Define the question content; Determine the form of reply; Determine how to use words; Determine the order and form of the questionnaire; Interview and finalization. (Trung, 2018)

Following these steps, in the scope of this study, the questionnaire was designed in Vietnamese and English, and divided into 3 main parts:

*Part I* includes questions about business background information to classify types of participants.

*Part II* is designed to collect enterprises' assessment of Vietnam's pangasius exports to China according to the classified factors.

*Part III* includes open-ended questions asking businesses to give tips as well as methods to improve the competitiveness of Vietnam's pangasius export market to China.

This measurement is based on a 5-point rating scale corresponding to 1 = very disagree; 2 = disagree; 3 = normal; 4 = agree; 5 = totally agree.

#### **3.3.2. Sampling and collecting data**

##### **3.3.2.1 Sampling**

###### ***Sampling methods***

There are two main sampling methods that are probabilistic sampling and non-probabilistic sampling.

Probabilistic sampling method: the method using statistical probability theory to evaluate the results, this method helps each element of the population have an equal chance of being selected in the sample and thus have the advantage of ensuring objectivity.

Non-probability sampling method: Unlike probability sampling method, in the non-probability sampling method, elements will be selected to include in the sample.

###### ***Sampling design***

The purpose of the survey questionnaire design is to collect data from a specific sample and to determine correlations between the factors of the research model. The questions must be clear to avoid misunderstanding by the person doing the survey. Therefore, the scales need to be clarified to categorize different types of data. In statistics, there are four data scales: nominal scale, ordinal scale, interval scale, ratio scale.

*Nominal scale:* is a scale used for attribute data that the manifestations of the data have no less or less, hierarchical difference.

*Ordinal scale:* A scale with a higher level of measurement than nominal scale. On a hierarchical scale, all observations are assigned to one of the categories which are then ranked according to a particular characteristic.

*Interval scale:* This scale provides hierarchical relationships such as hierarchical scales, and the difference between values between ratings of equal scales.

*Ratio scale:* is measure scale which represents the highest of the scales, having all the characteristics of the three scales listed above. The scale provides rankings and equal differences between ranks and also has a true zero base.

The nominal scale and interval scale are chosen to measure data in this study. This research aims to analyze and improve the competitiveness of the pangasius export market of Vietnam to the Chinese market through enterprises that have exported pangasius to the Chinese market. Thus, the scales above are the most suitable scales for this study.

### ***Sampling size***

This study has 28 total variables. According to research, the sample size should have at least 5 responses per observed variable. In order to obtain at least 5 responses per observed variable, it is necessary to collect a minimum of 140 responses. To obtain this sample size, about 500 questionnaires were presented to the respondents.

#### ***3.3.2.2 Data collection***

Data for the study was collected using email surveys method. The goals are shown below:

Survey type: Online survey

- Estimated number of respondents: 150 units

- Answer: pangasius exporting enterprises in Vietnam published information on Vietnam Association of Seafood Exporters and Producers website.

### **3.4. Data analysis methods**

#### **3.4.1. Definition of SPSS**

According to Berg (n.d.), SPSS means “Statistical Package for the Social Sciences”. This is a software package used for the analysis of statistical data. Although the name of SPSS reflects its initial usage in the field of social sciences, its use has since spread into other data markets. SPSS is widely used in healthcare, marketing and education research.

Advantages of SPSS: Firstly, SPSS can open data from any source such as scientific research, a customer database, Google Analytical and all file formats that are commonly used for structured data such as spreadsheets from MS Excel or open office, plain text files (.txt or .csv), relational (SQL) databases, Stata and SAS. Secondly, it is an extremely perfect method for processing and deciphering survey results and it helps analyze and better understand information, and solve complex business and analysis problems through a user friendly interface. Last but not least, SPSS can comprehend broad and complex data sets easily with sophisticated statistical methods that help ensure high accuracy.

#### **3.4.2. Data analysis of SPSS**

##### ***3.4.2.1. Descriptive analysis***

Descriptive statistics are single descriptive coefficients summarizing a whole population or sampled set of data. Some main types of descriptive statistics that are widely used to describe a set of data measures of central tendency and measures of dispersion.

Mishra (2019) stated that: “Data are commonly described as the observations in a measure of central tendency, which is also called measures of central location, and are used to find out the representative value of a data set”. The 3 major types of measures of central tendency are mean, median and mode. Measures of central tendency will provide us with one value, such as the mean or median, and this value reflects the entire distribution. Comparisons between different groups are made between the appropriate numbers in each distribution. Value (mean or median) of measures of central tendency is further used in many other statistical analysis such as measures of dispersion, ANOVA, *t*-test, correlation and skewness. A mean, or median value, is

considered good when it is measured for all observations and not influenced by extreme values since these values are used to calculate for more steps.

#### **3.4.2.2 Reliability test**

Reliability is the trust level an instrument offers by answering following questions: whether the variables in the scale are accurate; whether their meanings correctly reflect the material to be measured; ways to improve scale. These questions can be answered by Cronbach's Alpha tests. The researcher can be constructed by considering a group of questions. However, theoretical possibilities and realistic opportunities are remained unanswered. To evaluate this, Cronbach's Alpha is employed, and total variable correlation coefficient is also performed. Cronbach's alpha coefficient is used to determine the appropriateness of observed variables which are part of a research variable. Hair et al. (2006) gave the following rules to rate the coefficient:

- ❖  $< 0.6$ : The factor scale is not appropriate (maybe in the research environment, the subject does not have a perception of that factor)
- ❖  $0.6 - 0.7$ : Acceptable with new research
- ❖  $0.7 - 0.8$ : Acceptable
- ❖  $0.8 - 0.95$ : Good
- ❖  $\geq 0.95$ : Acceptable but not good. In this case, there is potential for an excess variable and the variable should be removed.

The total correlation coefficient shows the relative intensity and direction of the relationship between one observed and other variables. It represents the extent to which a particular observed factor contributes to the underlying construct of a research variable. To assess how important a variable is, we must analyze its association with other variables, and the total coefficient should be greater than 0.3. If the observed variable has a correlation coefficient of less than 0.3 with all other variables, it cannot be included in the evaluation factor.

#### **3.4.2.3 Exploratory factor analysis (EFA)**

- **Definition**

Exploratory Factor Analysis (EFA) is a multivariate statistical method that attempts to determine the smallest number of hypothetical constructs that can carefully explain the observed covariance between a set of metrics measurement. The discovery factor EFA helps us to evaluate two important values of the scale: the convergent value and the discriminant value.

- ***The criteria in the EFA analysis***

*Factor loading*: Defined as factor weight, this value indicates the correlation relationship between observed variables and factors. The higher the factor load factor, the greater the correlation between that observed variable with the factor and vice versa.

According to Hair et al. (1998), factor load factor or factor weight is the criterion to ensure practical significance of EFA:

- ❖ If Factor loading  $> 0.3$  is shown as minimum.
- ❖ If Factor loading  $> 0.4$  is shown as important.
- ❖ If Factor loading  $> 0.5$  is shown as practical significance.

However, the standard value of the Factor Loading coefficient needs to be dependent on the sample size.

*Bartlett's test of sphericity* is a statistical quantity used to consider hypotheses that the variables have no correlation in the population. In case this test is statistically significant (Sig.  $< 0.05$ ), the observed variables are correlated with each other in the population.

*Kaiser-Meyer-Olkin coefficient (KMO)* is an index used to consider the appropriateness of factor analysis. If the value is less than 0.5, then factor analysis is likely not appropriate for the study data set. The value of KMO must reach 0.5 or more ( $0.5 \leq \text{KMO} \leq 1$ ) is a sufficient condition for factor analysis.

*Total Variance Explained*  $\geq 50\%$  shows that the EFA model is suitable. Considering the 100% variation, this value shows how much% of the factors are extracted and how much% of the observed variables are lost.

*Eigenvalue* is a commonly used criterion to determine the number of factors in EFA analysis. With this criterion, only factors with Eigenvalue  $\geq 1$  can be retained in the analytical model.

#### ***3.4.2.4 Correlation analysis***

The coefficient of correlation is a statistical indicator of the frequency of the relationship between the relative movements of the two variables. Pearson correlation coefficient (symbol  $r$ ) measures the linear correlation between two variables. It is measured as follows:

- ❖  $-1.0 < r < 1.0$  indicates that there was an error in the calculation of the correlation.

- ❖  $r < 0.0$  shows that two variables have an inverse relationship or negative correlation (absolute inverse when the value is -1.0)
- ❖  $r > 0.0$  value indicates a positive relationship or correlation (absolute positive when the value is 1.0)
- ❖  $r = 0.0$  indicates that there is no linear correlation. It can be a non-linear correlation or no relationship between the two variables.

#### ***3.4.2.5 Regression analysis***

In the thesis, authors use regression analysis to study the value of a variable based on one or more values. The variable authors want to evaluate is called dependent variable (pangasius exporter competitiveness) and variable used to evaluate is called independent variable (business environment, physical infrastructure, knowledge infrastructure, product, productivity, price, and labour supply). By using the regression technique, authors will be able to identify the trend in data, assess how each independent variable has an effect on dependent variables and make predictions about the change in the value Vietnam pangasius competitiveness in Chinese market.

### **3.5 Ethical Consideration and Limitation**

#### **3.5.1 Ethical Considerations**

Ethical Considerations are identified as one of the most important parts of the research. Researchers should always evaluate ethical considerations seriously since it plays a critical role in all research; thesis can be viewed as failure if this ethical part is missing. According to Bryman and Bell (2007), Code of Ethic includes ten points representing principles to serve as a guide for determining ethical course of action in any paper. In summary of ten principles, researchers need to maintain high levels of competence, recognize limitations of their expertise, and undertake tasks for which they qualified for. Additionally, authors must be integrity and conduct research in the way that inspires trust and confidence, avoiding making false, misleading and deceptive claims. Furthermore, authors must prioritize the research participants' rights, dignity and diversity. Appropriate levels of confidentiality of the research data and anonymity of participants will be ensured in the thesis. All types of communication related to the thesis will be done with honesty and transparency.

Alongside the marked importance of ethical considerations, authors also need to accept responsibility for conducting research and its result. Moreover, it is shown that an ethical



researcher should understand the interests of his fellow researchers, and the society at large. Authors also value the public trust and are concerned that ethical behaviors might compromise that trust. While always trying to deliver the best outcomes possible, researchers must never let the desire overwhelm mutual commitment to ethical conduct.

To sum up, authors have included all above of the ethical consideration in the current research. References collected and data information of the thesis can be accessed from various research papers and academic journals, with the author's best endeavor to check for data's validity, reliability, and accuracy but also guarantee all has been cited correctly. All participants participated on the basis of informed consent and their data kept confidential. Respondents also have the right to communicate with authors at any time of the study to ask for more information. In addition, biased and negative feedback were not included in the thesis outcome, and in order to avoid these, authors carefully built surveys to construct a legit and trustworthy thesis.

### **3.5.2 Limitations of the research project**

Although the authors have made great efforts, it is unavoidable that there are still some drawbacks to this study. The time restriction is the first limitation of the study. Regularly, researchers are required to engage with this study for a long time to achieve the best outcome. The research was conducted between January 2021 and April 2021. The time to collect data through surveys and observations was limited, affecting the quantity and quality of the data collected. The second shortcoming of this study was the lack of prior empirical research on determinants affecting the competitiveness of pangasius export company using the pyramid model that the authors used as our literature in this study. Lastly, due to the COVID 19 pandemic, the world economy has many fluctuations, the data is not updated promptly, leading to most of the data found are quite old. This makes it difficult for the authors to search and evaluate data based on the actual situation.

### **3.6 Conclusion**

To sum up, Chapter 3 makes it obvious about the thesis' Research Methodology, including implementing process and procedures, data analysis methods as following:

Firstly, there are eight stages of the research process, which are divided into three phases: Research Proposal, Research Activity, Written Report. To perform these steps, the authors

choose the deductive method to construct the analysis from the general theory to the specific data. The authors also use positivism as research philosophy to have statistical evaluations critically for the result of the surveys.

Secondly, both qualitative and quantitative approaches are used as the research methods. The authors first make surveys related to 7 factors affecting the competitiveness of Vietnam's exporting pangasius companies from 150 participants. Then with these collected data, the authors make more explanations and thorough analysis for each factor.

Last but not least, the study uses SPSS as the method of data processing. Thanks to SPSS, the statistical analysis is realistic and the authors can understand broad and complex data sets easily with advanced statistical techniques that help ensure high accuracy and quality decision making. The outcome and interpretation of each factor will be shown in the next chapter of the study.

# 04

## ANALYSIS & FINDINGS

*Chapter 4 – Analysis and findings* first provide an overview of the pangasius export situation in Vietnam in general and the pangasius export situation in Vietnam to the Chinese market in particular, from 2015 to 2020. After that, the data are collected and analyzed using qualitative and quantitative techniques to determine factors influencing the competitiveness of Vietnam's pangasius exports to China in the research time.

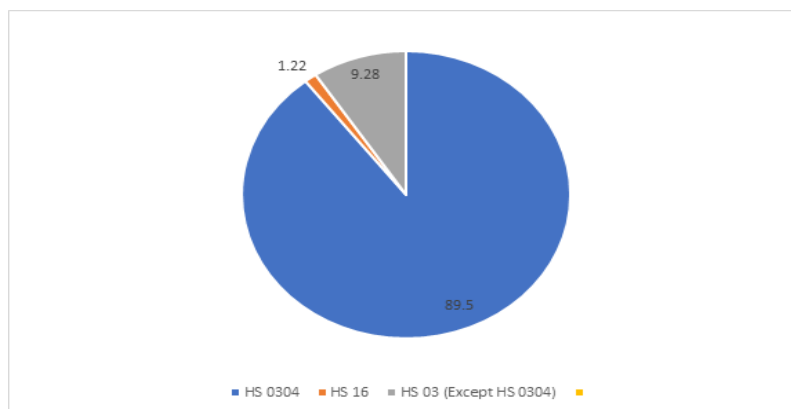
## CHAPTER 4: ANALYSIS AND FINDINGS

### 4.1 Overview of Vietnam's Pangasius export

Pangasius is one of the top export items of Vietnam. These export enterprises have contributed a considerable part to the total export turnover as well as the GDP of Vietnam, making Vietnam one of the leading pangasius exporting countries in the world. From 2016-2020, pangasius accounted for 21-25% of the total seafood export value. In these 5 years, 2018 was the most successful year when the export value reached 2.26 billion USD (VASEP, 2020).

#### 4.1.1 Pangasius export turnover

Pangasius export in recent years focuses on some main types such as: frozen whole pangasius, non-pangasius frozen pear, and processed pangasius products. Regarding the proportion of frozen pangasius fillet products (belonging to HS 0304 group), accounting for 89.5%, processed pangasius products (under code HS 16) accounted for 1.22% and the rest belonging to pangasius products under code 03 (except 0304 types), accounting for 9.28% in 2019. (VASEP, 2020)



**Chart 4.1: Structure of pangasius exported by HS code in 2019 (Source: VASEP, 2020)**

Revenue from pangasius exports always accounts for a high proportion of the total seafood export value of Vietnam. Vietnam can be said to dominate the international supply of pangasius. Revenue has continuously increased from 2016-2018 and decreased slightly in 2019 as many domestic markets have begun to raise and supply pangasius by themselves. Particularly in 2018, Vietnam's pangasius export value reached a record 2.26 billion USD when both raw material prices and export prices increased (VASEP, 2020). However, the past 2020 was an unsuccessful period for the pangasius export market in Vietnam in particular and the world in general. The

farming area is about 5700 ha, down 9% compared to 2019 and the export turnover is about 1.5 billion USD, down 25% compared to 2019 (H.Mi, 2020).

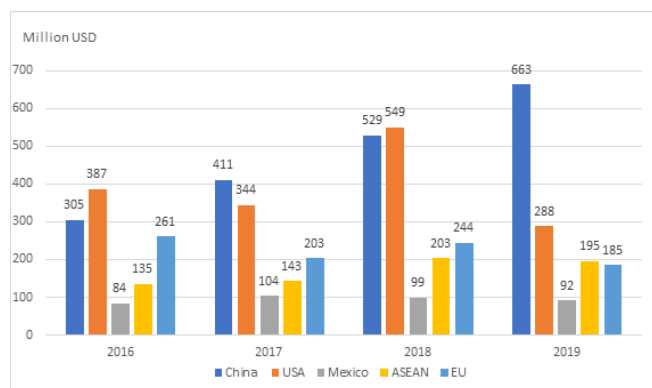


**Chart 4.2: Pangasius export turnover of Vietnam 2016-2020 (Source: VASEP, 2020)**

#### 4.1.2 Main markets

At its peak, Vietnam used to export pangasius to 151 markets around the world. Over the past 5 years, the 5 largest markets are China, the US, the EU, ASEAN, and Mexico, which contributed to the 28% growth in Vietnam's pangasius exports. Especially, there are 2 potential markets: China (up 310%) and ASEAN (up 44%). The strong development of these two markets compensated for the decline in the EU (down 35%) and the US (by 8.8%) (VASEP, 2020).

China and the US are two markets that are always competing for the first position in importing Vietnamese pangasius. In 2016, China surpassed the EU for the first time to rank 2nd in the export markets of Vietnamese enterprises, and 3 years later China always competed for the top position with the US in importing fish. In particular, in 2019, the export value of pangasius to China was 2.3 times higher than that of the US.



**Chart 4.3. Top 5 pangasius export markets of Vietnam (Source: VASEP, 2020)**

## **4.2 Overview of China market**

### **4.2.1. Introduction to China market**

China is the largest pangasius consumer market in Asia of Vietnam. Pangasius export to China has increased, partly because pangasius's demand has risen continuously over the years. Vietnam has many advantages in exporting, especially in terms of short transportation time, low cost, plus exemption from pangasius export tax to the Chinese market.

According to VASEP, if in 2014, the export value of pangasius to China market only accounted for 6% of the total pangasius export value, by 2019, the export value had reached 662.5 million USD, average 5-year growth reached 44% - this market has the highest average growth rate in Vietnamese pangasius's top 10 largest export markets. Once ranked 4th after Russia, the US, and Norway, with a breakthrough in exports to the Chinese market, since 2018, Vietnam has become the second-largest supplier of whitefish to the Chinese market after Russia. In the past five years, the average price of pangasius imports into the Chinese market has fluctuated from 1.94 - 2.87 USD / kg.

### **4.2.2. Main rivals**

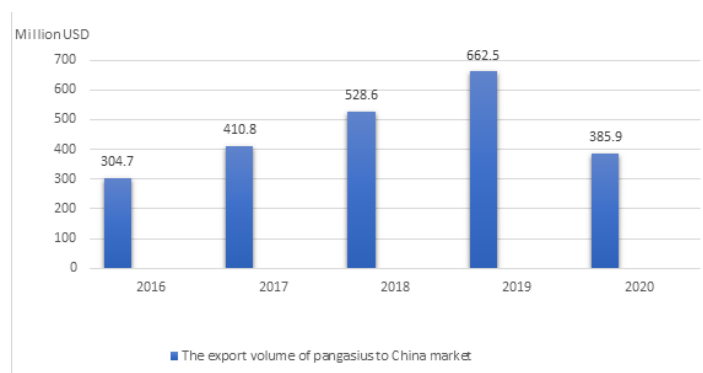
According to VASEP, the Vietnamese pangasius industry faces many competitors in the international market, including China, India, Indonesia, and Bangladesh, which account for about 15 - 20% of the total global pangasius production. The pangasius farming industry in India is growing over the years and has become one of the most popular occupations. India's pangasius production is about 400,000 – 425,000 tons per year and increases by 8% to 630,000 tons by 2020. Meanwhile, China also cleared the way for pangasius to serve the domestic, but due to some difficulties in feed and breeding to date, Chinese pangasius production has only ranged from 25,000 - 40,000 tons. Indonesia's pangasius production in 2018 increased by 22.2% to 391,151 tons compared to 2017 (Đan Linh, 2020). By the end of 2019 Bangladesh pangasius production is 450,000 tons, and Indonesia 110,000 tons (Danviet, 2019).

As of 2019, 20 pangasius processing factories in China have a production capacity of about 30,000 tons/year. This fact shows that China can become a significant competitor of Vietnam in the pangasius industry soon. China is now a tiny pangasius farming country, but it is developing rapidly. This country is thriving on pangasius farming because they realize the great demand for domestic market consumption, while the supply is mostly from Vietnam. Although

our competitors are occupying a small market share and most pangasius products from Indonesia, Bangladesh or India are consumed domestically, in the future, they are going to invest in increasing production, which will cause great competition. (Tien Phong, 2019)

#### 4.2.3 Situation of Vietnam's pangasius export to China from 2016 to 2020

According to VASEP, in 2016, the export volume of pangasius to China market grew by 89%, reaching 304.7 million USD, an improvement of 89 percent over 2015. The net volume of exports in 2017 was 410.8 million dollars, up 34.8 percent from the year before. Pangasius exports to China continued to rise in 2017, with the most significant increase of 161.4 percent in February 2017. The overall amount of pangasius exports to China in 2018 was USD 528.6 million, up 28.7% from 2017. In this market, Vietnamese pangasius can be found in all provinces, in low-end markets, mid-range markets, high-end markets, and Chinese restaurants. The overall volume of exports in 2019 was USD 662.5 million, up 25.3% from 2018. China provided tax exemptions for imported fisheries in 2019 as a result of the ongoing US-China trade war. Apart from Vietnam, this nation raised imports from important Asian sources such as India in the previous year. Despite a strong perception of the uncertainties and obstacles that come with the Chinese sector's prospects, several Vietnamese pangasius exporting companies are aggressively encouraging export to this market in 2019. Consumers in China currently favor Vietnamese pangasius as a white fish food with low prices and the potential to process a range of alternatives with good nutritional value.



**Chart 4.4: The export volume of pangasius to China market 2016-2020 (Source: VASEP, 2020)**

According to VASEP, in the first 11 months of 2020 (Ha, 2020), the total value of pangasius exports to China reached 385.9 million USD, accounting for 34.4% of total pangasius export value. From late November to mid-January, Chinese businesses increase imports of seafood

products to prepare for the Lunar New Year every year. However, due to the COVID 19 epidemic, the number of orders to China decreases significantly. Currently, China is tightening control activities of imported frozen food in major trading cities with the pretext of preventing COVID 19. This causes an overloaded situation, congestion from designated quarantine warehouses waiting for COVID 19 inspection. All frozen food products, when entering China, must have all of the following four certificates (Customs declaration, quarantine certificate for export, certificate of isolation and sterilization, and satisfactory report on the Nucleic Acid Coronavirus test) before they can be sold. (Ta Ha, 2020)

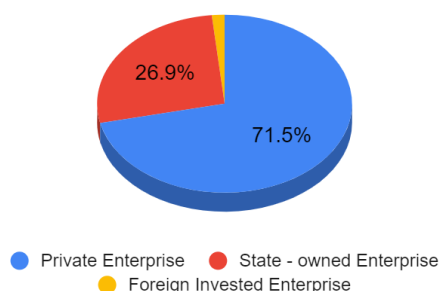
### 4.3 Analysis of factors influencing Vietnam’s pangasius export

#### 4.3.1 Survey analysis

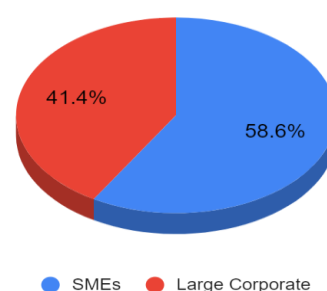
The survey was collected in 3 months (from February to April 2020). Total of collected sample is 186 online survey samples. The number of pangasius exporting enterprises eligible to export to China is about 145 enterprises. However, the business contact with many difficulties. The authors decided to expand the enterprise survey based on VASEP's list of nearly 500 seafood exporters. After rejecting invalid samples, there are 186 samples are accepted for analyzing.

##### 4.3.1.1 Respondent information

In 186 collected samples, there are 50 samples by respondents from a stated-owned enterprise, 133 samples came from private enterprise and 3 samples were foreign invested enterprise (accounted 26.9%, 71.5% and 1.6% respectively). Size of business was divided into two groups of large corporate and SMEs (small and medium enterprise). Total numbers of business accounts for respectively 41.4% and 58.6%. Otherwise, about 32% of respondents has less than 3 years of experience and more than 33% comes from the quality department.



**Chart 4.5: Type of business**



**Chart 4.6: Size of business**

(Source: survey result)



#### 4.3.1.2 Descriptive analysis

The table below illustrates the result of 186 observations from some of the about 145 companies exporting pangasius to China and nearly 500 companies are eligible to export seafood to China. In overall, it is clear that the highest mean of these factors is labor supply and most of the variables have mean approximately above 3 to 4, which is closed with a neutral option. Therefore, it can be seen that none of these determinants are strongly evaluated.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
BE1	186	1	5	3.48	1.030
BE2	186	1	5	3.37	1.033
BE3	186	1	5	3.14	1.304
BE4	186	1	5	3.13	1.099
PI1	186	1	5	3.48	1.111
PI2	186	1	5	3.95	.807
PI3	186	1	5	4.11	.673
PI4	186	1	5	3.76	.785
KI1	186	1	5	2.87	1.305
KI2	186	1	5	3.39	1.269
KI3	186	1	5	3.27	1.179
PR1	186	1	5	3.60	.893
PR2	186	1	5	3.94	.945
PR3	186	1	5	4.08	.835
PR4	186	1	5	3.81	.873
PR5	186	1	5	3.65	.921
PV1	186	1	5	3.36	1.122
PV2	186	1	5	3.16	1.240
PV3	186	1	5	2.90	1.321
PV4	186	1	5	2.89	1.230
PS1	186	1	5	3.59	1.032
PS2	186	1	5	3.64	.927
PS3	186	1	5	2.92	1.230
LS1	186	1	5	3.31	1.090
LS2	186	1	5	3.71	1.111
LS3	186	1	5	3.55	1.190
CP1	186	1	5	3.87	.788
CP2	186	1	5	3.29	.800

CP3	186	1	5	2.72	.783
Valid N (listwise)	186				

**Table 4.1: Factors descriptive analysis (Source: SPSS analysis results)**

**4.3.1.3 Reliability analysis**

Cronbach's alpha is a measure of the inter-item correlation. This speaks to two ideas: (a) the association between the independent and dependent variables, and (b) the ratings of each respondent on both independent and dependent variables.

Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Business Environment Cronbach's Alpha = .786			Physical Infrastructure Cronbach's Alpha = .812		
BE1	.581	.741	PI1	.740	.724
BE2	.519	.769	PI2	.696	.735
BE3	.662	.699	PI3	.583	.792
BE4	.627	.717	PI4	.578	.788
Knowledge Infrastructure Cronbach's Alpha = .852			Price Cronbach's Alpha = .816		
KI1	.717	.801	PS1	.689	.728
KI2	.737	.779	PS2	.723	.712
KI3	.718	.800	PS3	.628	.814
Product Cronbach's Alpha = .799			Productivity Cronbach's Alpha = .829		
PR1	.648	.738	PV1	.653	.788
PR2	.601	.754	PV2	.673	.777
PR3	.626	.747	PV3	.667	.781
PR4	.502	.784	PV4	.639	.792
PR5	.531	.776			
Labour Cronbach's Alpha = .850			Competitiveness Cronbach's Alpha = .845		
LS1	.680	.827	CP1	.669	.823
LS2	.742	.770	CP2	.767	.728
LS3	.740	.772	CP3	.698	.795

**Table 4.2: Reliability result (Source: SPSS analysis results)**

The table 4.3 shows that all scales of 8 factors are reliable with the Cronbach Alpha coefficient value meeting the requirement (greater than 0.6). Moreover, 29 observed variances all have

Corrected Item-Total Correlation greater than 0.3. With the result above, all observed variance and factor are included in the next analysis.

#### 4.3.1.4 Exploratory factor analysis

After establishing the data's reliability, the next step is to conduct an EFA analysis to determine the convergence of the factors and the number of factors derived from the data. It is important for factor analysis results to meet the following requirements: KMO coefficient (Kaiser - Meyer - Olkin) = 0.5, Bartlett test significance level = 0.05. If the factor load factor is less than 0.50, every observed component will be disqualified. When the total variance derived is 50%, the scale is approved. The Eigenvalue coefficient must be a positive integer.

#### Exploratory factor analysis for factor that affecting competitiveness (independent factor)

KMO and Barlett's test							
Kaiser-Meyer-Olkin Measure of Sampling Adequacy					.820		
Bartlett's Test of Sphericity			Sig.		.000		
Total Variance Explained							
Component	Initial Eigenvalues			Extraction sums of Squared loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	7.559	29.073	29.073	7.559	29.073	29.073	
2	2.579	9.919	38.992	2.579	9.919	38.992	
3	2.138	8.222	47.214	2.138	8.222	47.214	
4	1.767	6.797	54.010	1.767	6.797	54.010	
5	1.585	6.095	60.106	1.585	6.095	60.106	
6	1.330	5.117	65.223	1.330	5.117	65.223	
7	1.077	4.140	69.363	1.077	4.140	69.363	
8	.855	3.287	72.650				
9	.772	2.970	75.620				
Rotated component matrix							
	Component						
	1	2	3	4	5	6	7
PR3	.819						
PR1	.749						
PR2	.739						
PR5	.606						
PR4	.602						
PI2		.849					
PI1		.825					
PI3		.729					
PI4		.653					

PV2			.820				
PV3			.787				
PV4			.739				
PV1			.612				
BE3				.767			
BE4				.764			
BE1				.734			
BE2				.644			
KI1					.804		
KI3					.760		
KI2					.712		
LS3						.870	
LS2						.867	
LS1						.705	
PS2							.844
PS3							.774
PS1							.758

**Table 4.3: Results of Exploratory factors analysis for independent factors (Source: SPSS analysis results)**

Table 4.4 above shows the value of KMO is 0.820 (greater than 0.5) with the Sig. value of .000 (smaller than 0.05). The two values of KMO and Sig. mean that the exploratory factors meet the requirement to analysis and the observed variables are correlated with each other in factors. The cumulative % variance explained for 7 factors is 69.363% (greater than 50%), which means that 7 factors given by analysis can explain 69.363% of the variance of the survey data. The factor loading of all observed variables is greater than 0.5, which means that correlation relationship between observed variables with factors meet the analysis requirement. In conclusion, all of 7 factors meet all requirements for the analysis.

**Exploratory factor analysis for competitiveness factor (dependent factor)**

KMO and Barlett's test						
Kaiser-Meyer-Olkin Measure of Sampling Adequacy					.710	
Bartlett's Test of Sphericity			Sig.		.000	
Total Variance Explained						
Component	Initial Eigenvalues			Extraction sums of Squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.289	76.311	76.311	2.289	76.311	76.311
2	.431	14.382	90.693			
Rotated component matrix						
Component						

	1
CP3	.905
CP2	.867
CP1	.848

Component Matrix	
	Component
	1
CP3	.905
CP2	.867
CP1	.848

**Table 4.4: Results of Exploratory factors analysis for dependent factors (Source: SPSS analysis results)**

As can be seen from the table 4.5, the competitiveness factor has the KMO value of .710 (greater than 0.5) and the Sig. value of .000 (smaller than 0.05), proving the relation between observed variable with the analysis factor. All three observations are suitable for the analysis by having factor loading more than 0.5. The cumulative variance is also greater than 50% (76.311%), which means that the competitiveness component can explain 76.311% of the competitiveness variance. In summary, after conducting exploratory factor analysis, the competitiveness scale consists of three observed variables that have been extracted to a single component – CP.

#### 4.3.1.5 Correlation analysis

According to Evans (1996), the strength of the Correlation can be described by values of Pearson Correlation (r) as:  $|r| < 0.1$ : very weak;  $|r| < 0.3$ : weak;  $|r| < 0.5$ : average;  $|r| \geq 0.5$ : strong.

Pearson's correlation results will be shown in the Correlations table. The explanation of Pear Correlation, Sig. (2-tailed), and N have been mentioned detailly in chapter 3.

Correlations									
		CP	BE	PI	KI	PR	PV	PS	LS
CP	Pearson Correlation	1	.538**	.570**	.572**	.471**	.605**	.551**	.366**
	Sig.(2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	186	186	186	186	186	186	186	186
BE	Pearson Correlation	.538**	1	.361**	.358**	.357**	.471**	.355**	.219**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.003
	N	186	186	186	186	186	186	186	186

PI	Pearson Correlation	.570**	.361**	1	.297**	.349**	.291**	.289**	.075
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.308
	N	186	186	186	186	186	186	186	186
KI	Pearson Correlation	.572**	.358**	.297**	1	.338**	.437**	.448**	.515**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
	N	186	186	186	186	186	186	186	186
PR	Pearson Correlation	.471**	.357**	.349**	.338**	1	.285**	.333**	.253**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	186	186	186	186	186	186	186	186
PR	Pearson Correlation	.605**	.471**	.291**	.437**	.285**	1	.410**	.233**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.001
	N	186	186	186	186	186	186	186	186
PS	Pearson Correlation	.551**	.355**	.289**	.448**	.333**	.410**	1	.235**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.001
	N	186	186	186	186	186	186	186	186
LS	Pearson Correlation	.366**	.219**	.075	.515**	.253**	.233**	.235**	1
	Sig. (2-tailed)	.000	.003	.308	.000	.000	.001	.001	
	N	186	186	186	186	186	186	186	186

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

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

**Table 4.5: Results of Correlations analysis (Source: SPSS analysis results)**

According to the result, all the independent variables have correlation with the dependent variable with Sig. (2-tailed) value of .000 (smaller than 0.05). In which, Productivity (PV) has the strongest correlation with Competitiveness of Vietnamese exporting pangasius companies (CP) with r equals 0.605 and Labor supply (LS) shows the weakest relationship with Competitiveness of Vietnamese exporting pangasius companies (CP) with r equals 0.366.

#### **4.3.1.6 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 is tested by using variance inflation factor (VIF). The regression equation is establish as following:

$$CP = \beta_0 + \beta_1*BE + \beta_2*PI + \beta_3*KI + \beta_4*PR + \beta_5*PV + \beta_6*PS + \beta_7*LS$$

In which:

B0: Constant

Bi: Regression coefficients (i=1, 2, 3, 4, 5, 6, 7)

LS, PS, PR, PV, KI, BE, PI: the independent factors (Labor Supply, Prices, Product, Productivity, Knowledge Infrastructure, Business Environment, Physical Infrastructure)

CP: the dependent factor (Competitiveness)

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.822	.675	.663	.40110	1.639

a. Predictors: (Constant), LS, PS, PR, PV, KI, BE, PI

b. Dependent Variable: CP

In Table model summary, Adjusted R-square value is 0.663 (greater than 50%), which indicates that 66.3% of the variance in competitiveness can be explained by these predictors (LS, PS, PR, PV, KI, BE, PI). Otherwise, the Durbin-Watson statistic shows a value of 1.639 (which ranges from 1 to 2); that means there is no autocorrelation in the sample.

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.572	7	8.510	52.897	.000
	Residual	28.637	178	.161		
	Total	88.209	185			

a. Dependent Variable: CP

b. Predictors: (Constant), LS, PS, PR, PV, KI, BE, PI

**Table 4.6: Competitiveness model summary and Results of ANOVA test (Source: SPSS analysis results)**

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 seven independent factors.

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		$\beta$	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.208	.220		-.945	.346		
	BE	.098	.041	.124	2.385	.018	.678	1.476
	PI	.308	.049	.307	6.323	.000	.774	1.292

KI	.093	.036	.149	2.591	.010	.554	1.806
PR	.109	.050	.106	2.161	.032	.757	1.321
PV	.180	.036	.261	4.982	.000	.664	1.505
PS	.139	.038	.184	3.614	.000	.705	1.419
LS	.076	.035	.109	2.150	.033	.714	1.400

a. Dependent Variable: CP

**Table 4.7: Competitiveness Coefficients (Source: SPSS analysis results)**

According to Table 4.10, the Sig. value of seven independent factors is less than 0.05. That means all elements in the research model have reliability more than 95% and meet the requirement. Moreover, the VIF score of these factors is lower than 2, so the multiple collinearity does not appear in this case.

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

$$CP = 0.124*BE + 0.307*PI + 0.149*KI + 0.106*PR + 0.261PV + 0.184*PS + 0.109*LS$$

The positive coefficients indicate that Competitiveness has a positive relationship with independent variables. As a result, all the proposed hypotheses are confirmed.

Otherwise, following the standardized coefficients, Physical infrastructure has the strongest influence on competitiveness (with Beta = 0.307). Other factors impact on competitiveness in the following order:

Productivity, Prices, Knowledge infrastructure, Business environment, Labour supply, Product (with Beta equals 0.261, 0.184, 0.149, 0.124, 0.109, 0.106 respectively).

#### 4.3.1.7 Conclusion

There are seven hypotheses which are indicated in Chapter 2, and the table below will show the result of hypotheses tested.

Hypotheses	Sig.	Coefficient	Result
<b>H1:</b> Business Environment has a positive correlation with competitiveness of Vietnam's exporting pangasius companies.	.018	0.124	Confirmed
<b>H2:</b> Physical Infrastructure has a positive correlation with competitiveness of Vietnam's exporting pangasius companies.	.000	0.307	Confirmed



<b>H3:</b> Knowledge Infrastructure positively correlates with competitiveness of Vietnam's exporting pangasius companies.	.010	0.149	Confirmed
<b>H4:</b> Product is positively correlated competitiveness of Vietnam's exporting pangasius companies.	.032	0.106	Confirmed
<b>H5:</b> Productivity is positively correlated competitiveness of Vietnam's exporting pangasius companies.	.000	0.261	Confirmed
<b>H6:</b> Prices is positively correlated competitiveness of Vietnam's exporting pangasius companies.	.000	0.184	Confirmed
<b>H7:</b> Labor Supply is positive correlated competitiveness of Vietnam's exporting pangasius companies.	.033	0.109	Confirmed

**Table 4.8: Hypotheses tested result (Source: Authors, 2021)**

### **4.3.2 Findings - Achievements and Limitations**

Through the above research results, the authors have found out the impact level of the factors. Therefore, based on research results and model of factors affecting competitiveness, the authors analyze the current situation of each factor as follows:

#### **4.3.2.1 Business Environment**

According to the quantitative analysis, "Business environment" factor has a positive correlation to the competitiveness of exporting pangasius companies ( $\beta = 0.124$ ). The business environment is the macro factor when considering how competitiveness is being influenced. In recent years, China holds the position as the largest market to import Vietnamese pangasius due to the Vietnamese pangasius advantage and many beneficial policies offered by the Chinese government.

- ASEAN - China Free Trade Agreement (ACFTA)

The ASEAN - China Free Trade Agreement (ACFTA) is expected to establish a raise for Vietnamese pangasius products to increase exports to China. However, only products with specific criteria on product quality and of goods can receive incentives.

Up to now, many trades and investment frameworks between Vietnam and China have been created so far. Currently, the community of pangasius products exports has numerous advantages due to ACFTA's zero import/export tariff rate. Pangasius enterprises have significantly benefited from this zero import/export tariff rate by increasing profit margins and promoting the product's export to China through official channels particularly. Furthermore,

China is growing and encouraging imports of pangasius products as well as having a high demand for foreign pangasius goods.

Over the last few years, China has improved the management and monitoring of imported products by implementing laws, specifications, and rules on quarantine and tracking. Furthermore, the Chinese government is compelling export companies to use official channels. This has affected the growth of pangasius products in the Chinese market.

Vietnam is also not the only country that benefited from ACFTA, subjected to stiff competition from pangasius products of the same type from ASEAN countries. As stated by the Vietnam Directorate of Fisheries, the most notable competitor among ASEAN countries is Indonesia, which successfully exported 300 tons of pangasius to the Middle East market and is planning to infiltrate other markets. From 2018 to 2020, Indonesia avoided direct competition with Vietnam in pangasius export activities in China due to Vietnam's low, competitive price. However, as the COVID 19 overturning the pangasius market, Vietnam pangasius have to deal with numerous problems, which lead to heavily reduced pangasius export turnover. This will allow many countries in ASEAN to take advantage of ACFTA benefits and attempt to enter the Chinese pangasius market. To remain competitive, Vietnamese exporters need to continuously update quality, design, and brand names and gather information about the market, import and export policies, and regulations on pangasius quality.

Since signing ACFTA, in the last five years, pangasius exports consistently achieved high growth, averaging 44% per year. Only from the start of 2018 through the middle of May, pangasius exports to China had a total value of 174,268 million USD, which is the seafood item with the most significant export value to this market. (Vietnam Economic News, 2019)

#### *Regulation and export standard of pangasius to China*

A critical factor that impacts the amount of pangasius export is government policies. To maintain and enhance the level of competitiveness of Vietnamese pangasius, Decree 05/2017/NĐ-CP was issued in May 2017 and regulated in which companies are allowed to breed, process, and export pangasius products. Regulations in Decree 05/2017/NĐ-CP include:

- Firstly, it requires companies to meet the requirements for business investment conditions in Article 21 of the Government's Decree 66/2016 /ND-CP dated July 1, 2016, on business investment conditions in plant protection and quarantine type of seafoods.

- Secondly, businesses also need to meet food safety standards in seafood production; furthermore, traceability meets the requirements of law and farm traceability need to be assured.
- Next, to comply with pangasius export requirements, pangasius’s facility must be overseen by a competent state management agency.
- Lastly, the pangasius export good needs to meet the requirements of the importing country. If the regulation of an importing country is different from Vietnam's regulation, then pangasius companies must follow the requirements of the importing country.

Chinese market also needs high-quality goods and requires that Vietnam pangasius meet US and EU standards requirements, including Best Aquaculture Practices Standards (BAP), Aquaculture Stewardship Council (ASC), and Global GAP. As stated in the VASEP (2020) report, Vietnam currently has 20 companies that meet the requirements of BAP, 53 companies meet the requirements of ASC, and 8 meet Global GAP requirements. The list of companies meet the GAP requirements as follow:

1	Bentre Aquaproduct Import and Export Joint Stock Company
2	HungCa Co.
3	Vinh Hoan Corporation
4	Hung Vuong Corporation
5	To Chau Joint Stock Company
6	Phuoc Hoa Aquaculture Co.,Ltd
7	Vinh Quang Fisheries Corp.
8	Nguyen Chi Tam Farm

**Table 4.9: List of pangasius companies certified by GlobalGap (Source: VASEP 2020)**

Most of benefits for pangasius companies in Vietnam come from National Government's support policies toward seafood in general. From 2010-2020, there were 3 notable national government policies: Decision 540/QĐ-TTg in 2014 (credit policy), decree 36/2014/NĐ-CP, and 55/2017/NĐ-CP (administration, processing, and exporting of pangasius products policy). Additionally, most of overall strategies for future pangasius export come from the region's government; the national government has not devised any long-term approach or solution to

help pangasius companies. Vietnam also lacks policies to support linkages between exporters, fish farmers, and businesses providing food with quality food, causing low competitiveness.

- COVID 19 pandemic

VASEP states that the impact of COVID 19 in pangasius exporting activities to the China market has a severe consequence since China is the largest market. With the situation of COVID 19, Vietnamese pangasius exporters have prolonged tests of improving competitiveness. Before the pandemic, the Chinese market's share value took account of 35% of total Vietnamese pangasius export, but since the COVID 19, the trade circuit is broken, and demand is slowdown. During the first season of 2020, pangasius export value in China took a significant downturn due to all trade being delayed. According to VASEP, pangasius exports value in the Chinese market were reduced 52% compared with the same period last year. The total export of pangasius in the first two months of 2020 is only 210 million USD, down by 32%. Restaurants, seafood markets, and companies in China mostly closed and stopped ordering new purchases in order to prevent the spread of the pandemic. Vietnamese enterprises barely maintain production activities; however, without new purchase orders and many frozen pangasius containers cannot unload in China, they suffer grant loss in revenue and can only maintain orders in the retail segment.

However, unlike European and North American countries, the Chinese government proved to be more efficient in dealing with and controlling the COVID 19. This makes Vietnamese pangasius rely heavily on the recovery of the Chinese market and create many new regulation-related quarantine activities that apply to the pangasius. Those new regulations include the requirement of 4 new certifications for frozen goods: Customs declaration; export quarantine test certificate; certification of isolation and disinfection; satisfactory report on the Nucleic Acid Coronavirus assay. This further increases the export process of already unable unloading containers of frozen pangasius in border trade. (Anh, 2020)

- US - China trade war

Trade war between the first and the second-largest economy in the world definitely significantly impacts Vietnam; this war has brought many "gains-losses" to Vietnam's pangasius supply. Many positive signals for Vietnamese pangasius can be seen in the US market, as the US imposing a 25% tax for Chinese tilapia makes it nearly impossible for China to export to the

US. However, in the Chinese market, this trade war caused Vietnamese pangasius to face many difficult problems.

Firstly, seafood export activities, especially pangasius to the Chinese market, will face many difficulties when China's Yuan has decreased and at some point was at a record low level. As the Yuan falls, Vietnamese pangasius's price to this market will become more expensive for Chinese consumers, making them consider when buying the product. Secondly, due to Chinese tilapia suffering heavy losses in the US market, many Chinese enterprises gradually shifted investment to farming pangasius domestically to meet domestic consumption demand. In 2018, VASEP reported that the Chinese have 20 factories, allocated in south China, processing pangasius with a production of 30,000 tons/year. Being a domestic product and having a great advantage from the Chinese government, Chinese pangasius will be able to compete directly with Vietnamese pangasius and potentially become the most significant competitor.

#### ***4.3.2.2 Physical Infrastructure***

“Physical infrastructure” is the strongest factor that positively correlates to the competitiveness of exporting pangasius companies ( $\beta = 0.307$ ) as being analyzed in quantitative part.

First, farming conditions play an important role in the physical infrastructure of producing pangasius products. Businesses or pangasius farming organizations in Vietnam have developed a homemade or industrial food system in this pangasius captivity. Fresh trash fish, rice bran, cornstarch, soybean meal, green vegetables, and other common raw materials used in the processing of pangasius food, etc. Furthermore, with meeting the aforementioned habitat and feed requirements for pangasius, pangasius farming companies have been achieved as follows: In ponds, 50 fish per m<sup>2</sup> can be raised; in rafts, the number may be higher, around 90 - 120 fish per m<sup>2</sup> (Farmvina, 2021). However, some aquaculture areas still have difficulty in water supply and there is a risk of environmental pollution in the pond.

According to FOODNK (2021), pangasius has been cultured and developed primarily in ten Mekong Delta provinces, including An Giang, Dong Thap, Tien Giang, Can Tho, Vinh Long, Ben Tre, Hau Giang, Soc Trang, Tra Vinh, Kien Giang, and two provinces (Tay Ninh and Quang Nam), with a total cultivated area of 5,400 ha (in 2018), which was expected to increase to 7,600 - 7,800 ha by 2020. VASEP (2019) identified that there are currently more than 130 pangasius factories in Vietnam, with the majority of them concentrated in the Mekong Delta. The majority of these facilities are equipped with cutting-edge equipment and technologies that enable the

automation of certain stages of the production line and the production of value-added products. Furthermore, boats and fishing equipment are becoming more and more advanced. Fisheries services and seafood processing industries are growing rapidly.

Second, when considering the physical infrastructure factor, the technology resource is a key aspect that affects the Vietnamese pangasius exporting companies. Coordination of scientific research and technology transfer programs in the fisheries sector at all levels has been implemented in Vietnam. Government and private-sector science & technology resources have also been mobilized and effectively deployed. Some technological and scientific advances in aquaculture include: Circulating culture, running water farming, indoor farming, Biofloc technology, and other cutting-edge technologies that are finding widespread application. (Biofloc is a pond nitrification technology, which uses shrimp manure, excess food, unicellular algae, multicellular algae, and floating organic substances in the pond, etc. Biofloc particles will bind to the secreted bacterial slime, transforming it into a food source. This is excellent nutrition for shrimp and fish. At the same time, this technology can help clean the pond's environment without necessitating changing the water). Currently, this technique has been transferred and applied to over 2,000 aquaculture establishments in nearly 50 provinces and cities across the country. Farming productivity increased by an average of 5.6 times per year, particularly from 2016 to the present. Furthermore, gender control technology has been used in Vietnam. The recirculating farming system (RAS) has been used successfully in a number of brackish water shrimp and fish, including those of CP Vietnam Joint Stock Company, Vietnam - Australia Fisheries Group, Hai Thanh Company Limited, and so on. Besides, clean farming technology, which does not use antibiotics or prohibited substances, has been widely used to create clean and safe products for users.

In particular, promoting the application of science and technology in aquaculture also has the participation of enterprises in scientific research and technology transfer more and more frequently and substantially. Typically, leading enterprises such as Minh Phu Seafood Group, Vietnam - Australia Seafood Corporation; Vinh Hoan Joint Stock Company, Nam Viet Joint Stock Company, etc. have created momentum and connected networks of research and innovation in the farming, processing, and seafood exporting community in recent years.

In spite of the fact that many positive results have been obtained, scientific and technical activities in field of aquaculture in our country are generally ineffective, and the number of

products related to applied science is also limited. For example, scientific products developed with State funds are rarely commercialized, and their practical application remains limited, etc. Businesses' access to loans remains limited, despite the critical need for initial funding to invest in technical infrastructure to meet the requirements of science and technology applications, particularly high technology. (Hoa, 2019)

Third, the geography of Vietnam has brought not only benefits but also drawbacks to the Vietnamese pangasius exporting companies. Vietnam is located in an area where natural conditions are ideal for aquatic species, seafood to congregate, multiply, and develop. Since Vietnam shares a more than 1400km long border with China and has a long-standing trade relationship with China, it is easier for Vietnamese seafood exporting businesses to grasp and appreciate the Chinese people's characteristics and needs. Most of Vietnam pangasius production activities happen in Cuu Long River Delta in the south of Vietnam, so export pangasius through sea route is the main method of transportation for Vietnamese enterprises. Due to being close neighbours, time to transport goods from Vietnam to China is relatively short (maximum of only more than 2 week) and no need for store products in any intermediate port. This offers Vietnam a great edge in competitive advantage compared to other countries that also export pangasius to China. Quality of Vietnamese pangasius will likely be preserved and the cost for transportation and storage is significantly reduced. (Hoa, 2019) However, Vietnam has 3260 km seaside and around 270 seaports throughout the coastline, but there are only 10 ports that are eligible to receive medium-sized ships in the world (ships of 30000 DWT or more).

Vietnam is also on the Trans-Asian railway route, which runs from Singapore through Malaysia, Myanmar, Thailand, Laos, Cambodia, Vietnam, and Kunming (China). The Trans-Asia Railway, which connects 28 countries and is approximately 114,000 kilometers long, is regarded as one of ASEAN's main transport projects to promote the region's strong economic, cultural, and tourism development. The Trans-Asian Railway will connect China to Southeast Asia, the Middle East, and Europe. This railway route would bring a lot of benefits for seafood exporting from Vietnam to China, especially pangasius (Goldensea logistics, 2018). To make it more specific, some logistics companies provide railway transport services for seafood exporting such as Ratraco Solutions Logistics, Best Cargo Vietnam, etc. They have many ideal policies to make it easier for Vietnamese seafood enterprises to export pangasius to China. Ratraco Solutions, for example, has collaborated with Chinese, Russian, and Kazakhstan railway partners to organize

international container shipping on the Asia-Europe railway route. Electronics, textiles, leather goods, cosmetics, frozen seafoods, fruits, and so on are examples of goods in transit. Ratraco Solutions can ensure that goods and materials are delivered to importing countries on time. They organize 3 pairs of container ships weekly, specializing in the Dong Anh, Yen Vien routes to Nanning - China and vice versa, with a monthly output of over 1,200 TEU.

On the other hand, Mr. Hoang Van Hoan, General Director of TMS Trading Joint Stock Company, stated that Vietnam is suffering from weaknesses in logistics, particularly railway. He emphasized that railways must reduce their prices by half in order to compete with Chinese goods. For example, with the same quality goods are available, China has a greater logistical advantage, then Vietnamese goods cannot compete. Thailand's seafood and agricultural products reach the global market as well, thanks to low logistics costs. The Thai government also supports this industry in order to make it easier to ship goods around the world. As a result, unless logistics improve, Vietnamese goods will struggle to compete with those of other countries in the region. Furthermore, railway transportation necessitates an excessive number of transshipments, so the quality of goods is not highly guaranteed. Besides, the state of technology for preserving seafood in Vietnam via railway transshipment is poor, making rail transport difficult. (Vietnam Logistics, 2021)

#### ***4.3.2.3 Knowledge Infrastructure***

As the hypotheses tested result, “Knowledge infrastructure” factor has a positive correlation to the competitiveness of Vietnam exporting pangasius companies ( $\beta = 0.149$ ).

To start with, if Vietnam wants to export seafood to China, the suppliers must have a thorough understanding of the quality certificate standards, the requirements from both Vietnam and China governments and how to obtain them. For example, the Chinese market demands high-quality goods, so pangasius products exported to China from Vietnam are gradually manufactured to strict standards as follows: **HACCP Standard** (Hazard Analysis and Critical Control Point - This is the principle used in food safety management systems), **SQF Standard** (Safe Quality Food Standard define the essential requirements in a quality management system that identifies hazards to food safety and quality as well as verification/monitoring of control practices), **GlobalGap Standard** (GLOBALGAP Aquaculture Standards have been in use as part of a global food certification scheme for agricultural products for more than ten years. Its criteria for feed, hatcheries, and farming operations cover food safety, environmental, social,



and animal welfare concerns), **BAP** (Aquaculture Best Practices refers to a group of aquaculture farms that have met GAA's aquaculture development standards. BAP is a social and environmental standard, as well as food safety and traceability standards for shrimp, tilapia, and catfish hatcheries and farms, and also seafood processing plants), **ASC** (Aquaculture Stewardship Council, this is an independent, non-profit organization co-funded by the World Wildlife Fund (WWF) and The Sustainable Trade Initiative (IDH) to manage responsible fish farming certification around the world. According to the ASC standards, farm performance must be measured against both environmental and social requirements. Certification is accomplished through an independent third-party process, and (draft) reports are made public on the ASC website. The ASC logo on the packaging assures consumers that the fish they buy has been farmed with minimal environmental and social impact), etc. With the expectation of meeting these standards, 100% of pangasius farms in the Mekong Delta region are controlled for food safety under the Food Safety Law, of which 70% of the premises acreage are GAP certified farms (Yen, 2020), etc. However, even till 2021, about 145 Vietnamese pangasius exporting businesses are involved in the trade of exporting pangasius, there were only 53 ASC-certified establishments and 8 Global Gap certified establishments. (VASEP, 2020) The small number of ASC & Global GAP-certified enterprises is due to a lack of knowledge of farm safety and food safety in accordance with international standards among all farmers who supply fingerlings to businesses. Besides, fisheries organizations or associations are not well-connected, resulting in limited and ineffective access to international regulations and business-supporting solutions. Furthermore, all companies in a product's supply chain (e.g., processor, trader, importer, retailer) must be certified in order to bear the ASC eco-label. However, many households' farming scales are still fragmented and small, and the water supply and drainage systems have not been built synchronously, making it difficult to meet ASC and Global Gap standards. As a result, it would become a big challenge for Vietnamese pangasius exporters to be ASC certified if any of the companies during the exporting process in this supply chain fails to meet the standards.

Besides, due to COVID 19's influence, Vietnamese exporting pangasius companies to China must follow regulations from China governments for frozen food in major trading since 2020 under the guise of preventing COVID 19. For consumption, all frozen products for export must have all four types of certifications mentioned below: (1) Customs declaration, (2) Export quarantine test document, (3) Certificate of isolation and disinfection, and (4) Report on

Coronavirus Nucleic Acid testing qualified. Furthermore, frozen seafood shipments, especially pangasius fillets, must be sampled at the port for COVID 19 inspection. As VASEP (2021) proposed, China continued to issue new hygiene certificate (HC) standards for seafood exporting companies by early 2021. The HC must include the name of the plant, the fishing vessel, the cold storage, the manufacturing site, and the storage, as well as the entire supply chain. To avoid the spread of the COVID 19 virus, means of transportation & delivery must be thoroughly disinfected. The packaging of the products must also be able to withstand sterilization drug procedures. In such circumstances, understanding about these new requirements is very necessary. In fact, many exporters of Vietnamese pangasius in particular, and seafood in general, have tightened real safety checks on their own products and farming process. Although this is a significant challenge for businesses that are only doing small quotas when it comes to meeting domestic and international standards on food safety and farm, as well as meeting all anti-covid-19 requirements, it is also leverage for large-quota businesses that strictly adhere to food hygiene and safety standards, allowing them to increase export output.

Last but not least, in this period, China has been an important market of Vietnam's pangasius exporting. Therefore, Vietnam's seafood exports have increased their deep understanding of this market. Businesses can now easily obtain market information online by visiting the websites of associations and electronic newspapers of seafood organizations in general, and pangasius in particular such as: VASEP, ASF (Asian Seafood), VINAFIS (Vietnam Fisheries Society), VINAPA (Vietnam Pangasius Association), etc. These associations and organizations frequently post a lot of news about the association's operations, markets and international integration, etc., on their official websites, making it easy for businesses to update information. Alternatively, businesses can stay up to date on legal and commercial developments in China and Vietnam by visiting the websites of the VCCI (Vietnam Chamber of Commerce and Industry), Cong Luan online newspaper, and so on. Aside from information pages on online platforms, businesses can also update market information offline through seminars and association events. However, at the moment, there are not many organisation seminars or activities to introduce market and customer, or if there is, it is not extensive, leaving certain businesses unable to access all details about market characteristics and consumer preferences. Besides, because China is a developed country, the trade and market financial sector will change from day to day, which is difficult for companies to immediately update market characteristics.

Actually, the Chinese economy is expanding at a rapid rate so China's demand for seafood also rises as the quality improves. According to a study conducted by the World Seafood Network in Shanghai, seafood consumption among Chinese citizens continues to rise year after year, in line with the trend of rising imports and increasing household incomes. In 2020, China's per capita seafood consumption was projected to hit 35.9 kilograms, with per capita consumption in urban areas reaching 40 kilograms. With such a high demand for seafood and China being the world's most populous country, this must be a large and growing market for Vietnamese pangasius exporters. (Duong, 2020) Recognizing the characteristics of this potential market, Vietnamese businesses are promoting the production of a variety of products that appeal to Chinese tastes, as well as continuously improving and increasing product quality to sustain their lead in pangasius export volume to China.

#### ***4.3.2.4 Product***

According to the survey analysis, “Product” factor is identified that having weakest impact on the competitiveness of Vietnam exporting pangasius companies with  $\beta = 0.106$ .

The current demand for pangasius is about 1.8 to 2.4 billion fish per year. The Mekong Delta currently has about 200 farms producing pangasius and 4,000 breeding fish. The production of fingerlings in the whole region has reached around 2 billion fish per year, basically meeting the farming needs. However, due to the unstable pangasius market with the increase of competition among farming households, many households do not really pay attention to the quality of seed, production and business conditions have not met the regulations. For examples, in pangasius farming, there are some stages that still use manual labor, while mechanization can be replaced to increase productivity. Besides, recommendations for improving the quality of farming are still in the early stages of implementation. From there, causing loss in the farming process, the loss rate sometimes exceeds 30% of the fish stocked.

To start with, each broodstock can only spawn twice a year, but in recent times, because of more quickly increasing productivity and making more profits from pangasius, the hatcheries force the broodstock to spawn many times a year, leading to poor fish seed quality. Declining quality of fingerlings is a worrying situation, contributing to reducing farming efficiency. As a result, currently, the rate of nursing from fry to fingerlings is only about 10%, the disease on cultured pangasius appears more than previous year, and farming time is also longer. (Hien, 2012)

Secondly, scientific and technical advances have had a positive impact on pangasius farming. The application of new technology in pangasius production is an inevitable direction today, it not only contributes to increase the added value of pangasius, but also gradually brings the strength of production to a more sustainable development. Foreseeing this trend, over the past time, some large enterprises have bravely invested in modern equipment, applied science and technology in farming such as nano aeration technology and bakture catalyst for water treatment. There is no need to discharge pond water into the environment, and to dredge the pond bottom with the same mechanical methods as before, etc. (Anh, 2020) It can be mentioned as the Nam Viet pangasius export group in An Giang, they have been applying modern technology with a full range of certifications and ensuring safety for the surrounding environment as well as ensuring the supply of raw materials with high quality, food hygiene. Besides, Vinh Hoan Corporation, one of the leading enterprises in pangasius export in Vietnam, has also successfully applied the model of "circular economy". This model is being chosen by many leading countries and businesses to protect this earth as well as save scarce resources.

Thirdly, in addition to the familiar products exported such as frozen pangasius fillets, pangasius slices of fish skewers, frozen fish organs, businesses also developed unique product lines such as, 100% cooking oil from pangasius, pangasius butter, crispy fish skin, etc. All create the diversity of the pangasius product ecosystem. On the other hand, this also shows the breakthrough of domestic producers who know how to exploit the great values of typical seafood in a timely manner and modern consumption orientation in the world. In June 2020, a fair "Connecting domestic production and consumption of pangasius products" took place in Hanoi with the participation of about 300 businesses operating in this field. (TN, 2020)

Next, pangasius products currently being exported to China are primarily popular products such as: frozen pangasius fillets, and frozen pangasius. (VASEP, 2020) Most of these products are mainly raw products that have been preliminarily processed and do not have much added value in order to increase product value. Consequently, the competitiveness of Vietnamese pangasius in the Chinese market will show signs of weakness if Vietnam does not take any action aimed at adding value. China gradually becomes a challenging market, which requires quality, origin, or standards. In addition, although Vietnam is the market that dominates the international pangasius supply, the growth in output silently in some other manufacturing countries such as Indonesia, Bangladesh, India, China, and more, also contributes a fair proportion to the broader

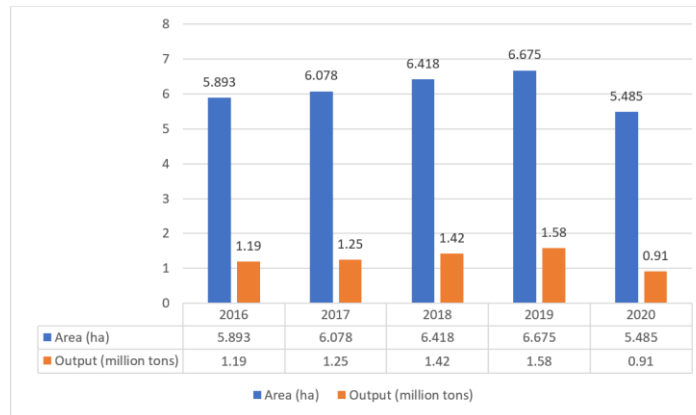
distribution of pangasius products not only in Asia. As Indonesian pangasius has scoped the Middle East market, or Myanmar pangasius fillet has appeared on many fixed shelves at major supermarkets in China. At the end of 2018, China is also actively investing and building, and expanding pangasius farming for this country's domestic market. It is estimated that there are more than 20 pangasius processing factories in southern China. Several other Asian countries also began to breed pangasius. This affirms that pangasius Vietnam will face competition with other countries is inevitable within the next five years.

Lastly, according to VASEP's information, as of 2020, nearly 145 enterprises and cooperatives exporting pangasius to the Chinese market, which is a considerable number to meet this market demand. Many people still think that China is an easy market. But in fact, China increasingly requires more stringent quality, traceability, packaging must follow Chinese regulations and standards such as BAP, GlobalGAP, ASC, and more. From the beginning of 2020, faced with the COVID 19 epidemic, many pangasius exports are congested at the destination port due to the new Chinese quarantine policy. The authorities at the Chinese border gate start to apply the control regime like fumigation and traceability of 100% frozen seafood shipments. Under the current situation, Vietnamese pangasius exporters are concerned that their export activities are at risk of slowing down despite the Chinese market reopened. (Xuan Anh, 2020)

#### ***4.3.2.5 Productivity***

The quantitative analysis points out that the factor “Productivity” has positive impact on competitiveness of Vietnam exporting pangasius companies with  $\beta = 0.261$ .

To begin with, in Vietnam, the farming area was nearly 5.9 thousand hectares, and output reached 1.19 million tons in 2016. By 2018, the area continued to increase by 6.4 thousand hectares, output increased to 1.42 million tons, and in 2019, the site grew to 6.6 thousand hectares, output also increased to 1.58 million tons. In 2020, COVID 19 and an unusual climate had a certain impact on productivity. As of October 2020, a strong typhoon named Molave went straight into Da Nang, with strong winds of 11-12, gusts of 13-14, causing a small impact on the pangasius farming area Mekong Delta. Those two caused the pangasius farming area in 2020 plummet to 5,485 hectares, the production of farming also decreased to more than 900 tons.



**Chart 4.7: Pangasius area and production in the Mekong Delta from 2016 to 2020 (Source: VASEP, 2020)**

To conclude, according to data in 2019, there are five key provinces raising fish, accounting for 82% of the country's output, including Dong Thap (34%), An Giang (19%), Ben Tre (11%), Can Tho (11%) and Vinh Long (7%). In 2019, while the area of growing pangasius increased by 4%, the 22%. In 2020, enterprises have been interested in investment, selecting seedlings quite closely. In fact, today, large enterprises such as Vinh Hoan, have started to invest strongly in large-scale pangasius breed production projects with a scale of 48.3 hectares to provide more than 30 million pangasius breeds/year, enterprises also invest in technical issues for high-tech farming, as well as processing or exporting products in a closed and qualified environment. However, the large number of pangasius breeds comes from farming households, the number of families in fish farming is quite large but still scattered distribution in many parts of the region should lead to uneven breed quality which greatly affects economic efficiency.

Application of 4.0 technology in fisheries helps manage data very conveniently, applies automatic control and related equipment based on measurement results to maintain water quality. Solutions for intelligent monitoring and control of feeding equipment to maximize growth and minimize feed costs also is a solution to help ensure the water environment because with less food leftovers, water will be less polluted, remote monitoring and control can be made and data collected during the production process for traceability. Adoption of 4.0 technology can reduce electricity costs by 20%, reduce labor costs by 50%, and increase output by 5-10%. (Anh, 2020)

On the other hand, some Indian enterprises have made efforts to process pangasius fillets for export. However, so far, most of India's pangasius export efforts have failed because the color of fish meat is still light yellow, so it does not attract consumers in the international market.

Currently, the price of pangasius varieties in China is still high, while the survival rate is low. Many farmers still use tilapia feed to feed pangasius or use homemade meals that make 95% of harvested fish have yellow meat, so Chinese pangasius's export door is far away.

#### 4.3.2.6 Prices

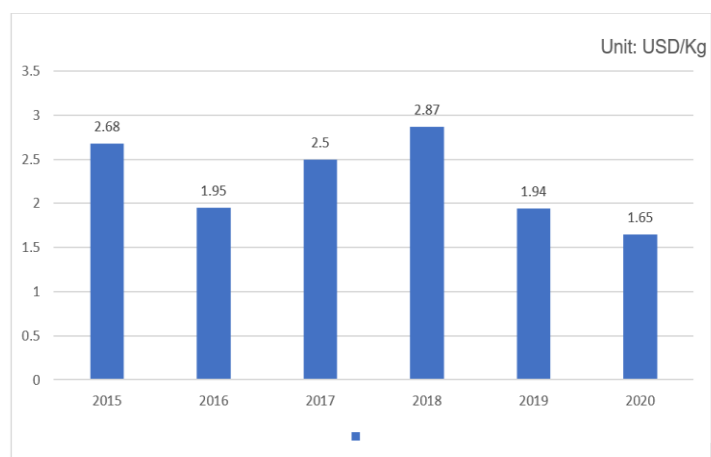
The “Price” factor is assessed that correlating positively on competitiveness of Vietnam exporting pangasius companies ( $\beta = 0.184$ ). Price is one of the critical factors that directly affect the competitiveness of pangasius in the international market and the Chinese market.

Because demand for export markets is high, and export prices are reasonable, pangasius prices have been rising continuously due to the shortage of raw fish for export processing. Fish area of self-stocking raw materials of enterprises is not much, so businesses are forced to go outside to buy pangasius from farmers, pushing up prices to buy fish. In 2015, cost of pangasius raw materials was 23,500 – 26,800 VND/kg. By 2016 the price of pangasius was about 20,600 – 23,500 VND/kg. In 2017, the cost of pangasius raw materials sharply changed from 20,500 – 28,000 VND/kg. Because farmers constantly have to go through precarious periods of the consumption market, they have much stocking experience. This year, the source of raw materials of fish is lacking, the production of farming decreases, quality of breeding fish is not high. The upward trend continues to increase higher in 2018, peaking at 30,200 – 36,500 VND/kg, but by 2019 the price of pangasius raw materials decreased to 20,400 - 24,600 VND/kg. The basic reason is that the production of the stocking is constantly increasing, leading to over-demand supply. By 2020, the domestic pangasius market has shown signs of slowing down due to the impact of COVID 19. Pangasius wholesale price ranges from 18,000-18,500 VND/kg, which is the lowest price in 10 years.



**Chart 4.8: Prices of raw pangasius in Vietnam 2015 -2020 (Source: VASEP, 2020)**

The average price of importing pangasius into the Chinese market ranged from 1.94 – 2.87 USD/kg. In March 2015, the average imported pangasius price was 2.68 USD/kg. In September 2016, the price of imported pangasius decreased to 1.95 USD/kg. By November 2017, imported pangasius's price increased to more than 2.5 USD/kg because pangasius was the cheapest compared to other species on the Chinese market, low prices are the most significant reason the food industry has increased the use of pangasius. Meanwhile, the price of other fish in China, such as tilapia, is relatively high. In 2018, pangasius prices soared because Vietnamese pangasius is prevalent in all provinces, from affordable, middle-class to high-end markets, in Chinese restaurants and hotels. Vietnamese pangasius processing enterprises enhance and diversify pangasius products exported to China, such as frozen pangasius fillet products, sliced pangasius fillet, and so on. As of November 2018, the price of pangasius increased to 2.87 USD/kg. By November 2019, pangasius's price decreased to about 1.94 USD/kg due to the prolonged US-China trade war, causing China to issue preferential tariffs for imported seafood and increased imports from other significant supplies in Asia, such as India. At the beginning of 2020, due to the effects of COVID 19, pangasius prices decreased to 1.55 – 1.65 USD/kg.

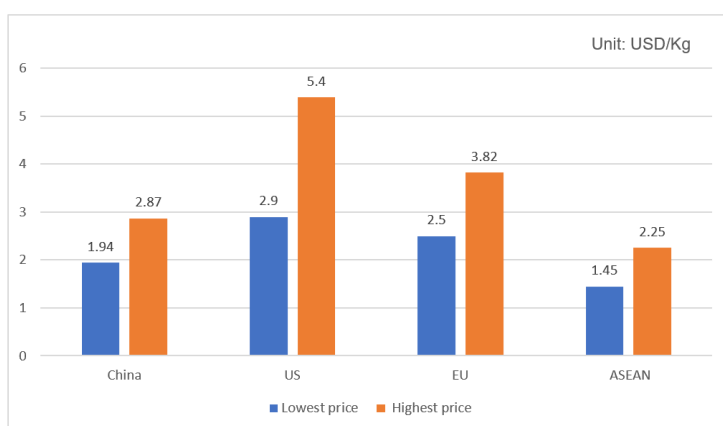


**Chart 4.9: Pangasius price imported to China market year 2015-2020 (Source: VASEP, 2020)**

In comparison to other exporting markets, for example - the US market, the average price of importing pangasius ranges from 2.9 - 5.4 USD/kg, much higher than the cost of fish in the Chinese market (from 1.94 - 2.87 USD/kg). China and the US are the two largest export markets of Vietnamese enterprises. In particular, 2016 was the first year that China surpassed the EU to become the second-largest import market for pangasius from Vietnam after the US. The price



of fish in the two countries is significant because of Vietnam's geographical location near China. Transportation does not cost too much, but for the US, because the geographical location is far apart, the transport and preservation costs higher. For the EU market, the average price of importing pangasius ranges from 2.5 - 3.82 USD/kg lower than the price of fish in the US market but still stands above the Chinese market price, but this market's cost is more stable than the US market. In 2016 and 2017, two years of Vietnamese were negatively affected by the media in some countries in the EU. After that, many supermarkets in Europe announced to stop selling pangasius, plus the intense competitiveness of many native whitefish products, so the value of exporting fish to many EU single markets decreased. By 2019 the export of pangasius to the EU plummeted, causing this market to lose third place in the top of Vietnam's primary fish import market after ASEAN. In 2019, ASEAN surpassed the EU to become the third-largest export market of Vietnamese pangasius (after China and the US), the average export price of frozen pangasius to ASEAN from 1.45 – 2.25 USD/kg, the lowest price compared to the above three markets (China, USA, EU). However, due to the hot growth in 2018, 2019 the cost of exporting fish to this area decreased to 1.45 USD/ kg.



**Chart 4.10: Vietnam's pangasius export price in international market (Source: VASEP, 2020)**

#### 4.3.2.7 Labour Supply

According to the quantitative analysis, “Labor supply” factor has a value of  $\beta = 0.109$ .

In Ho Chi Minh City, many seafood processing enterprises still fall into a shortage of workers. Despite the continuous posting, businesses are still struggling to recruit enough.

Firstly, in recent years, the number of highly skilled workers has continuously increased. However, jobs in the seafood processing industry are mostly handcrafted. The working

environment is cold, wet, and stinking, so most workers do not want to participate in this industry. This leads to a shortage of skilled workers in the entire fisheries sector. Unskilled workers will not be able to meet industry requirements or take a long time to train. According to Ms Tran Thi Hanh - deputy general director of Wind New Seafood Co., Ltd. (Tan Thoi Hiep Industrial Park) - said that the shortage of seafood processing personnel started in the last 3-4 years and is the general situation of many companies despite increasing bonuses and benefits for workers. But still cannot attract processing workers. (Hien, et al., 2019)

Secondly, low wages are also one of the reasons why workers quit their jobs. According to the TUOITRE newspaper interview in 2019, Ms. Nguyen Thi Nhien said that as a worker with nearly nine years working in the seafood processing factory of MP Fishery Group, her current income is just enough to live. After deducting all kinds of insurance, her basic monthly salary is more than 4.2 million dong, plus overtime salary is 6.5-7.5 million dong. Therefore, there should be good remuneration policies to retain workers, such as building dormitories for workers in the distance, supporting cars to let workers return to their hometown on holidays. Every month in addition to salary, workers will receive additional allowances, or have skills training sessions for workers to improve their skills so that they can get a raise. The shortage of workers has been going on for many years, the most serious one is the seafood processing industry. Thus, we see the alarming situation of labor shortage in pangasius production enterprises in Vietnam. (Hien, et al., 2019)

#### ***4.3.2.8 Evaluation***

With the aforementioned factors influencing the competitive advantage of pangasius exporters to China, the authors would then conduct a SWOT analysis in order to clarify the strengths and issues that affect, both positively and negatively, the competitiveness of Vietnamese pangasius.

##### ***Strength:***

- Geographical advantage: Since Vietnam shares a border with China and has a long-standing trade relationship with China, it is easier to grasp and appreciate the Chinese people's characteristics and needs. As a result, Vietnamese exporters can save the time and cost of delivering.
- Product: Types of Vietnamese pangasius products are abundant in China market, and have a high nutritional content. The amount of omega 3 in this fish is not inferior to that

of freshwater fish with high nutritional indexes such as sturgeon and salmon (Thu Hung, 2018). With a wide range of products and a high nutrient content, Vietnamese pangasius can meet strict requirements of the Chinese market while also providing customers with a variety of options.

- At all stages, there has been a collaboration of scientific research and technology transfer programs in the fisheries field. Science and technology capital from both the public and private sectors have been integrated and successfully deployed. Biofloc technology is implemented in many pangasius farms, which help saving time and cost for food sources. The recirculating farming system (RAS) has been used successfully in a number of brackish water shrimp and fish.

***Weakness:***

- About knowledge infrastructure: Only a small number of pangasius exporting companies can meet the regulation and certificate demand. (only 53 businesses have ASC-certified establishments and 8 businesses has Global Gap certification)
- Scientific and technical activities in the field of aquaculture in our country are generally ineffective, and the number of products related to applied science is also limited. Ships and fishing facilities are being renovated slowly, and the fishing port system is not meeting the requirements.
- Some aquaculture areas continue to have water supply issues, and there is a chance of contamination in the pond.
- With the transportation system in Vietnam, the railway transport requires numerous transshipment steps, which would reduce the quality of the goods. Furthermore, the cost of Vietnam logistics, particularly the railway, remains high, making it uncompetitive with other countries in the region.
- Many seafood processing businesses continue to struggle with a labor shortage. Due to the hard characteristics of the pangasius processing industry (working environment in a frozen factory, standing all time, etc.), with seafood processing companies, the workforce has focused through all industries of leather, footwear, and textiles, causing difficulties for pangasius processing enterprises. (Chi Quoc & Buu Dau, 2019)
- In terms of pangasius export products, Vietnam continues to export preliminarily processed goods, primarily frozen products, and deeply processed products (with added

value) but failing to meet demand because Vietnam's value-added products are still limited to a small number of types, only frozen seafood and a few others of fried, boiled, steamed products.

***Opportunities:***

- In terms of market characteristics: With such a high demand for seafood and China being the world's most populous country, this must be a large and growing market for Vietnamese pangasius exporters.
- Food safety requirements: The fact that China is tightening food safety checks will be a leverage for large businesses, even if it will make it difficult for businesses that only do small quotas. The food safety requirements from China will help Vietnamese businesses do business methodically, strictly adhere to food hygiene and safety standards, and assist in increasing the exports in the future.
- The trade war between the United States and China is becoming tenser and tenser, causing China to reduce imports of high-quality pangasius from the United States, and Vietnam may become a more ideal supplier instead.
- ACFTA with a 0% basic tax rate will create more favorable conditions for commercial transactions in the pangasius industry, benefiting both exporters and consumers. As a result, Vietnamese pangasius exporting companies will have a competitive advantage over pangasius from those of other exporting countries.

***Threat:***

- Currently, under the influence of COVID 19, China is increasingly taking strict control of frozen food products. Because of the complicated procedures and the wait for the results of COVID's test, the time it takes for goods to be released from customs takes 20-30 days or longer. This has an impact on the cost of storing pangasius and the check fee. As a result, all the cost has increased from \$2,000 to \$3,000, putting a strain on pangasius exporters in Vietnam as well as importers in China.
- ACFTA not only benefits Vietnam, but also other countries in ASEAN can take advantage of and have attempted to enter the Chinese pangasius market. Vietnamese exporting pangasius companies therefore would have to face up with many competitors such as Indonesia, Myanmar, and even China as well.

- Following the US-China trade war, Chinese tilapia exported to the US market was highly taxed, causing many Chinese businesses to return to the domestic market while also planning to expand pangasius farming. There are large tilapia farming areas in some areas that have begun to raise pangasius. As a result, China has emerged as a formidable competitor in the pangasius consumption market.
- Indeed, with a growing middle-class population, China is no longer a low-quality product market, but rather a growing market highly concerned about food safety and hygiene. The fact that Chinese consumers are looking for imported products that are accepted in European and American markets, including Vietnamese pangasius, demonstrates how demanding quality of the product China is. Furthermore, in addition to accepting tax cuts, Chinese agencies are becoming more stringent in terms of quality, traceability, and packaging compliance with Chinese regulations and standards.
- The growth of pangasius exporting output in some other manufacturing countries such as Indonesia, Bangladesh, India, China, etc., affirms that pangasius Vietnam will face competition with other countries is inevitable within the next five years.
- Farmers suffer a loss of 3.000 - 5.000 VND/kg at the current price of raw pangasius materials, which leads to a concern with the expansion of new farming areas.
- Chinese customers have begun to re-import pangasius, primarily for stocking purposes. However, due to impact of COVID 19, Chinese people are afraid to eat out, and with many restaurants closed as a result of the pandemic, consumption of pangasius is sluggish.

#### **4.4 Conclusion**

In this chapter, the authors illustrated briefly Vietnam's pangasius export situation in general and more in-depth about Vietnam's pangasius export situation to the China market in the period of 2016-2020. After that, the data was then collected and analyzed using both qualitative and quantitative techniques to evaluate how given factors influence the competitiveness of Vietnamese pangasius exports to the Chinese market. Influences of the factor include both positive and limitation; from then, the authors discussed in detail the cause of limitation and provided effective recommendation for the problem. Moreover, authors used SPSS to test and confirm all proposed hypotheses of the conceptual model conducted in Chapter 2.

# 05

## CONCLUSION AND RECOMMENDATIONS

*Chapter 5 – Conclusions and recommendations* answer the research questions by summarising the findings and proposing recommendations for improving the overall competitiveness of Vietnam's exports of pangasius.

## CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

### 5.1. Summary of findings – answer the research questions

In chapter one, the authors mentioned a set of questions to find out issues related to the competitiveness of Vietnamese companies exporting pangasius to China. All issues have been resolved in chapters 4 and 5 as follows:

**Question 1:** What is the situation of exporting Vietnamese pangasius to China in the past five years (2016-2020)?

In general, Vietnam's pangasius export turnover to the China market continuously fluctuated sharply from 2016 to 2020. This fluctuation came from many circumstances: changes in the domestic pangasius market, US-China trade war, the increase in the conditions of quarantine of China, etc. The detailed export analysis was detailly mentioned in Chapter 4.

**Question 2:** What factors affect the competitiveness of Vietnamese pangasius exporting enterprises in the Chinese market?

According to the data analysis of chapter four, there are seven factors that affect the competitiveness of Vietnamese exporting pangasius company as follows:

<i>Business environment:</i> Beta Standardized Coefficient = 0.124; Sig = .018
<i>Physical infrastructure:</i> Beta Standardized Coefficient = 0.307; Sig = .000
<i>Knowledge infrastructure:</i> Beta Standardized Coefficient = 0.149; Sig = .010
<i>Product:</i> Beta Standardized Coefficient = 0.106; Sig = .032
<i>Productivity:</i> Beta Standardized Coefficient = 0.261; Sig = .000
<i>Prices:</i> Beta Standardized Coefficient = 0.184; Sig = .000
<i>Labour supply:</i> Beta Standardized Coefficient = 0.109; Sig = .033

**Question 3:** How is the impact of these factors on the competitiveness of Vietnamese pangasius exporting enterprises to China?

Based on the quantitative analysis, it is shown that all seven factors positively correlate with competitiveness of Vietnam's exporting pangasius companies. The factor that most strongly influenced "Competitiveness" of Vietnamese pangasius exporting enterprises to the China market is the factor "Physical infrastructure" with Beta coefficient = 0.307. Next is the factor "Productivity" with the coefficient Beta = 0.261. Third is the "Prices" factor with Beta coefficient = 0.184. The fourth influencing factor is "Knowledge infrastructure" with Beta

coefficient = 0.149. The next one is "Business environment " with Beta coefficient = 0.124. The factor after that is Labour supply, 0.109. The factor that has the weakest impact on the competitiveness of Vietnamese pangasius exporting enterprises is "Product" with Beta = 0.106.

**Question 4:** Which direction is suitable for Vietnam to improve the competitiveness of pangasius exporting enterprises to the Chinese market?

The answer of this question is provided in the following part of chapter five.

## **5.2 Vietnam's pangasius export target to 2030**

According to Prime Minister's Decision No.339/QD-TTg dated March 11, 2021, Vietnam's market growth plan for the seafood export in general and the pangasius export in the period of 2021-2030 with a view to 2045 is as follows:

### **5.2.1 Overall objective**

Decision No.339/QD-TTg states the overall objectives from 2021-2030 are to develop seafood into a significant national economic sector; attached with industrialization, modernization, sustainable development and proactive adoption. The seafood industry also needs to have a reasonable production structure and form, high productivity, quality and efficiency; has a prestigious brand name, competitiveness and international integration.

Some main target of decision No.339/QD-TTg:

- i) The growth rate of seafood production value reaches 3.0 - 4.0% / year.
- ii) The total output of domestically produced aquatic products reaches 9.8 million tons; of which aquaculture production is 7.0 million tons, and fishing output is 2.8 million tons.
- iii) The value of seafood export turnover reaches 14-16 billion USD.
- iv) To create jobs for over 3.5 million workers, with per capita income of aquatic workers equivalent to the average income of workers nationwide.

### **5.2.2 Pangasius oriented development**

In Decision No.339/QD-TTg, the first objective is to expand pangasius farming in areas affected by the saline intrusion. Government support pangasius enterprise: (i) Apply advanced science and technology, develop pangasius farms in all three salt, brackish, and freshwater areas, and (ii) Expand pangasius farming using industrial models, cutting-edge technology, and ultra-intensive farming techniques result in high productivity and large output.



The second objective is to adopt and enforce policies that promote large-scale pangasius production and export enterprises and groups, provide a distribution network, and offer pangasius goods on domestic and foreign markets.

Finally, organize activity effectively through the supply chain between pangasius processing companies, input sources, and financial organizations, as well as between producers, fishers, and aquaculture. Simultaneously, spending resources to build a highly professional brand and marketing channel for pangasius products.

## **5.3. Recommendations**

### **5.3.1. Recommendations for factor Business Environment**

#### *Optimize ACFTA*

As a direct beneficiary, Vietnam should be able to utilize the full potential of ACFTA to gain a clear edge in competitiveness. China is one of the largest consumer markets for Vietnamese pangasius globally. In recent years, as the COVID 19 cripples many other markets, China has the fastest recovering and contributes an essential part to the export value of pangasius in the international market.

As the first priority, Vietnam should promote relationships with China. As a result of the growing friendship between the two countries, it is easier for both countries to take full advantage of ACFTA's benefits and form long-term sustainable cooperation. Growing access to the Chinese market will also be a grand opportunity to increase the export turnover of Vietnamese pangasius.

Simultaneously, besides zero import/export tariff rate from ACFTA, Vietnam needs to pay more attention to non-tariff challenges. Up to date information is the key solution for both pangasius farmers and business to overcome these challenges. Vietnam needs to continuously gather and prepare more in-depth information about trade arrangements, export-import news, tariff and non-tariff barriers. To succeed, the works above need the close cooperation of all economic sectors (from Government, enterprises to all pangasius farmers).

#### *Overcome COVID 19*

From the beginning of 2020, COVID 19 epidemic has exploded, complicatedly happening in China, the US, and Europe (all are major and key markets of Vietnamese pangasius export).

Following the influence of COVID 19, export value of pangasius dropped heavily throughout the years. For the seriousness of the problem, the authors propose two solutions as follow:

First and foremost, many regulations were built to prevent the spread of COVID 19 and many consumers concerned about pangasius products contaminated with COVID 19. To deal with these problems, pangasius export enterprises need to intensively comply with processing, packing, labeling, traceability and sealing procedures. Strictly following these procedures will help prevent viruses, bacteria and pathogens, significantly increasing consumer reliability. To ensure safety, authors will also highly recommend enterprises doing all these procedures in their factory instead of an intermediary.

Secondly, pangasius business should focus more on frozen pangasius rather than fresh pangasius. COVID 19 slowed down many transactions and increased amount of time to shipping pangasius products, causing many fresh goods to be rotten without crossing border. Comparing frozen pangasius to fresh ones, not only that frozen pangasius can retain the nutritional properties of the fish and preserve them intact, but it also has a more extended expiry date. (sciencevietnam, 2020) Frozen products will also boost sales in the retail segment since consumers tend to buy frozen pangasius and cook at home to limit exposure and exposure to infection risk.

#### *Promulgating new policies*

It is impossible to dispute that government policy substantially impacts the amount of pangasius that Vietnam produces. Therefore, to promote pangasius exports' success in the future, the government must be pragmatic and flexible.

Credit policies for pangasius farmers usually highly impact the amount of pangasius exported. Vietnamese government needs to promulgate more support policies to help farmers and businesses while asking the state bank to aid them in providing optimal assistance. To help pangasius farmers and enterprises, commercial banks should ease the process of lending and broaden the product offerings and expand lending terms.

Moreover, the government should build an entire supporting policies system for newcomers who want to practice in the pangasius industry. Additionally, policies that linkage pangasius farmers, pangasius producers and exporters need to be issued as soon as possible. Close cooperation can help prevent rivalry among domestic consumers to focus on dealing with foreign markets.

### **5.3.2. Recommendations for factor Physical Infrastructure**

#### *Solution for science and technology in aquaculture, including aquaculture facilities and the cultivation, production, and export of aquarium fish, particularly pangasius*

First, all levels of fisheries should continue to actively collaborate and coordinate with agencies and units engaged in scientific research to receive transfer and application of seed production technology, disease prevention and treatment, aquatic veterinary services, and market research support. Besides, fishery departments should strengthen training programs and disseminate mechanisms and policies to support and encourage businesses and individuals to participate in the application of high technology in the field of fisheries in general and pangasius in particular.

Second, the government must do a better job of managing science and technology by creating favourable conditions for organizations and scientists to participate in research and the transfer of science and technology into production and export pangasius. Furthermore, resources for importing, researching, and transferring technology must be mobilized in order to gradually master new processes in the fields of breeding, feeding, veterinary medicine, and disease prevention. Moreover, the State should have policies that encourage and support investment in the development of scientific and technological potentials, as well as mechanisms for training and retraining of scientific and technological and high-tech application human resources in the fishery sector. Businesses or farming households can then proactively produce breeds, quality feed, and bio-products for more efficient pangasius farming. Furthermore, policies or programs that recognize and reward individuals or groups for outstanding achievements in science and technology should be implemented to inspire and motivate industry talent. In addition, policies or programs that recognize and reward individuals or groups for outstanding achievements in science and technology should be implemented to inspire and motivate them to discover more talent in the seafood industry as well as pangasius.

Third, pangasius production and export enterprises must prioritize infrastructure development and comprehensive monitoring of the farming environment in order to facilitate the application of science and technology in production for disease control, environmental protection, and product quality improvement. Businesses must also develop farm production models and join forces to form cooperatives specializing in fisheries in order to build brands and create a link to organize production along the value chain. Furthermore, enterprises can use automatic water environment monitoring and warning technology in ponds, integrate IoT (Internet of Things)

technology in pond monitoring, and consult with virtual assistant applications. Furthermore, they can set up a system of monitoring and warning of surface water environments in concentrated farming areas to check the quality of the water environment and inform farmers as soon as possible. Biogas, bio-products, and biological ponds should also be used to thoroughly treat the environment before it is discharged into surface water or recycled.

#### *Solution for the China-Vietnam transportation as well as logistics process*

Currently, railway lines are almost entirely single lines, with no connecting lines to international seaports to promote goods circulation and service development. As a result, more routes connecting with seaports are required, as is the promotion of goods circulation and the development of logistics services. In particular, the railway industry must improve the operation of inter-country freight trains to China so that freight trains can demonstrate their superiority over other modes of transportation.

Furthermore, infrastructure, wagons, signal information systems, train service, repair, and maintenance facilities must all be developed in a coordinated manner. The government and Vietnamese railway industry should develop policies to establish a double road system and to gasify parts of fishery transport in general, and pangasius transport in particular. In addition, to minimize travel time among lines and increase international connectivity, it is important to suggest the development of a high-speed rail with a 1,435 mm gauge. Not only does the rail infrastructure need to be upgraded, but the wagon quality must also be improved in order to ensure the quality of the goods, as well as investing in station loading and unloading capability and improving management capacity.

Railway transporters must also actively seek customers and improve service quality to meet the needs of customers, rather than ignoring the spirit of service and relying solely on asking customers to follow their transport requirement. In order to attract customers, the railway industry needs to improve the efficiency of the network transport management system, resulting in more convenient conditions for customers.

#### **5.3.3. Recommendations for factor Knowledge Infrastructure**

Although Vietnam has about 145 pangasius businesses exporting pangasius to China in 2021, only 53 firms have had ASC certification, and eight companies have got Global Gap-certified establishments. The authors recommend some solutions for this situation as follows:

Firstly, farm owners or pangasius farming households need to have a management certificate, pangasius workers must have a technical certificate through technical training courses. Therefore, it is essential to increase training and technical training of pangasius farming for farm owners, farming households and workers.

Secondly, about GAP standards, VietGAP is a good agricultural practice code based on four basic criteria: food safety, environmental safety, social safety and product traceability. Therefore, application of VietGAP is a necessary step to bring the fisheries in general and pangasius in particular into the framework, and step by step towards GlobalGAP standards.

On the other hand, in fact, the cost of raw pangasius is often lower than the production cost, so several businesses have cut down some costs such as staff training, involvement of related departments, equipment for farming areas, making it difficult to apply the ASC standard in recent years. In addition, it is even more difficult for individual households to apply and certify the ASC. For that situation, in the short term, companies and farmers need to work together to implement the ASC to reduce costs. Besides, employees participating in the ASC need to be trained, have correct and complete awareness of standards to minimize mistakes when applying. Finally, it can be seen that updating and grasping knowledge is not difficult in today's technological era. The most obvious evidence is that the VASEP now has its own website, which always updates the import and export situation of the seafood industry in general and pangasius in particular. As a result, frequent monitoring of information through websites like the VASEP or similar websites will contribute to or invest in regular and annual reports, which will partly help companies understand market information.

#### **5.3.4. Recommendations for factor Product**

##### *Improve the quality of breeding fish*

The quality of fish of this breed of households has decreased relatively because of the habit of using antibiotics regularly to prevent epidemics. This in the long run will affect the quality of commercial fish and the quality of ponds of the enterprises raising and exporting fish. To improve this, first of all, to ensure the health of the broodstock, right conditions to produce good fingerlings, the broodstock can only spawn twice a year. If you squeeze the fish to lay several times a year, it will result in poor quality fish and the number of fish loss will be increasing.

##### *Technology investment to increase the quality of products*

Combining technology with farming is now a global trend, the benefits it brings are completely worth the effort. As for pangasius production in Vietnam, nowadays, the pangasius business households in Vietnam are mainly small and medium, so they have not invested much in technology. However, with the benefits and efficiency, it can be seen that this investment is completely worth it. Typical examples are found such as Vinh Hoan Company and Nam Viet Company. It is necessary to promote and widely develop the model of "circular economy", an effective model in manufacturing. The feature of this model allows businesses to reuse most of their waste products in the production process. This helps greatly in the process of saving costs as well as increasing income from waste products in the manufacturing process. Especially for pangasius, products from pangasius processing currently account for 60-70% of fish biomass. It will be a great economic benefit for businesses that can apply this reproductive technology to their business because most of the products produced from pangasius products are quality products. High amounts, eg: collagen and gelatin are extracted from fish skin, fish oil and fishmeal are made from fillet by-products. The initial costs spent may not be small, but the benefits and profits brought to the investor will be very worthy and will greatly improve the quality of products as well as the pangasius export market in Vietnam.

#### *Product diversification.*

Product diversification helps increase choices for customers, thereby increasing sales productivity and the level of identity for products from Vietnam. This also helps customers to approach the product from many angles and ways of processing to avoid being bored when using the same product for a long time. In addition to new products that will have to attract customers, it also has to ensure the quality, food safety and environmental protection to meet domestic and international standards, regulations and regulations on quality, food safety, traceability, social responsibility and sustainable development.

Increase the proportion of processed products with high quality and competitiveness for domestic consumption and export; rationally shift product structure towards increasing the proportion of deeply processed products with high added value. Promote the development of models for developing specialty and traditional aquatic products, in a linked chain, in association with technology improvement, quality improvement, food safety, product design improvement, and publishing. marks associated with place names

### **5.3.5. Recommendations for factor Productivity**

According to the analysis of factors affecting Vietnamese fish exporters' competitiveness to the Chinese market, productivity factor strongly affects competitiveness. Productivity is a significant factor in competing in the market today. It shows us the production power, efficiency of the cultivation and processing of fish by Vietnamese enterprises.

To begin with, enterprises need to link pangasius households to focus on organized farming, or businesses need to invest in pangasius production to increase productivity while improving product quality. Export productivity is based on the needs, tastes and quality of processed products. However, the primary productivity of pangasius farming comes from households. The number of fish farming families is quite large but still distributed in many places, so the seedlings' quality is uneven, significantly affecting the pangasius product.

Secondly, processing enterprises need to export other pangasius products or process pangasius products that attract customers and increase product value while increasing competitiveness in the Chinese market. Although pangasius Vietnam exports to China with high nutritional content, mainly frozen products and natural products have been processed but not enough to meet the demand because Vietnam's value-added products are limited to a small number of types, frozen seafood and some fried products, boiled, steamed.

Last but not least, businesses have incentives to attract processing workers, such as raising wages, facilitating new workers to take courses to improve their skills, etc. Currently, it can be evidently seen that many seafood processing enterprises continue to grapple with labor shortages. This directly affects the processing productivity, quality of pangasius products and is an important influence of pangasius products' competition in the Chinese market. Due to the peculiarities of the pangasius processing industry (working environment in frozen factories, standing continuously, etc.) and the shortage of workers, especially high skilled workers, pangasius exporting enterprises have difficulty in ensuring productivity.

### **5.3.6. Recommendations for factor Prices**

The factor "Export pangasius price" significantly affects Vietnamese pangasius exporters' competitiveness to the Chinese market. Price is a significant factor in competing in today's market. However, pangasius exporters need to have a standard price strategy and export price of each type of fish in each specific period.

Firstly, the problem of reducing the cost of farming, processing and creating more new products from Pangasius has been and is being implemented. These are the results of the project "Building a sustainable pangasius supply chain in Vietnam" (SUPA) by the Center for Cleaner Production of Vietnam (VNCPC), Vietnam Association of Seafood Exporters and Producers (VASEP), together with other partners. At the rearing stage, the project has studied, consulted and trained to improve survival rates, reduce feed costs and impact the environment in the nursing and farming stages. Thereby, contributing to cut 7-10% production costs in the stage of breeding pangasius breeds. The project provides technical assistance to 33 farming areas and achieves international sustainable seafood certifications. For the processing factories, the project has supported capacity building and consulting on resource efficiency and cleaner production for more than 70 factories, helping to reduce electricity by 18 - 20% on average, 26 - 30% water, thereby cutting 2 - 5 billion VND production cost for each factory.

Secondly, pangasius's quality directly affects the export price of pangasius. As the rate of pangasius products is good, the price will be high and vice versa. On the other hand, pangasius Vietnam exports mainly frozen products and processed natural products. These products have not brought high prices in the Chinese market, and businesses need to diversify products to bring many choices to customers.

Lastly, by 2020, under the influence of COVID 19, China strictly controls frozen food products. Due to complicated procedures and COVID's test results, it takes 20-30 days or longer to clear goods. This causes congestion of pangasius shipments that directly affects the cost of storing pangasius and increases inspection costs simultaneously. As a result, all expenses have increased from \$2,000 to \$3,000. This makes businesses suffer significant losses in the price of transporting and storing products, and Vietnamese enterprises are under pressure due to the high costs incurred. Under the stressful situation, some pangasius exporters offered to sell at low prices, which caused damage to both the business and the pangasius farmer. With current situation, VASEP has recommended pangasius processing enterprises to calm down, avoid lowering prices, and at the same time, businesses cooperate with importers to capture information, choose to export to other the border gate is not stuck, and at the same time negotiate with partners to adjust the delivery time properly.



### **5.3.7. Recommendations for factor Labour Supply**

The characteristics of the pangasius industry today is that most of the production stages are done by hand, and the working environment is not in good conditions (low and wet environment, workers have to stand a lot). This leads to a shortage of workers in factories. Because the conditions are not good and the income is not high, many people decide to take a break and switch to other jobs. To overcome this, many businesses have some forms of encouraging workers such as raising wages, some businesses that accept to pay nearly 14 million VND / month but still cannot attract manpower. It proves that workers in this industry are not just for the economy but not to continue, they don't want to sacrifice their health to stay in this industry. So the right direction for businesses is to limit manual processes, replaced modern machines, production lines and automation. This will help change the specificity of the industry, helping the working environment become better and safer for the workers. Besides, enhancing remuneration policies, salaries and bonuses for workers, it is possible to support the dormitory for workers who work far away to stay for convenient travel, support transportation on the occasion of holidays and Tet, employees can return to their families, this helps to improve the spiritual life of the workers and will greatly help in the process of working with the company. Strengthen professional training programs for workers to be able to easily operate newly equipped techniques in the future.

### **5.4. Limitations and suggestions for further research**

Since the number of companies exporting pangasius to China is small, the authors needed to change observations to collect information from all seafood exporters in the process of sending surveys to collect data. Furthermore, since the survey has a short period, the findings collected from them may not really be comprehensive or realistic.

What's more, due to the serious situation of the COVID 19 epidemic, which has resulted in many changes, the data for 2020 is still limited and non-specific, so the information in the authors' analysis of factors is not truly objective. Although some information has been updated, it is still not specific and clear.

In the next study, in order to determine the competitiveness of exporting firms, researchers must conduct research over a long period of time and with a wider sample size, as well as using various analytical techniques.

## **5.5 Conclusion**

In summary, the research analyzes the circumstances for Vietnam's pangasius export to the China market during the 2016 - 2020 period and makes recommendations for its sustainable competitiveness. Based on qualitative and quantitative research findings in Chapter 4 and Chapter 5, this study synthesizes the outcomes of evaluating research hypotheses, concluding that all seven hypotheses originally suggested are agreed upon. After that, the author has made a series of factor suggestions to increase the competitiveness of pangasius exporting enterprises in Vietnam targeting the Chinese market, including the following: Business Environment, Physical Infrastructure, Knowledge Infrastructure, Product, Productivity, Price and Labour Supply. Finally, the authors identified the limitations in their research and offered directions for future research.

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## APPENDIX

### SURVEY ABOUT AN ANALYSIS FACTORS AFFECTING THE COMPETITIVENESS OF THE VIETNAMESE PANGASIUUS EXPORTING COMPANIES TO THE CHINA MARKET

#### GENERAL INFORMATION

*Please tick V on your chosen option. All personal information you provide is confidential and only used for research purposes.*

What is your type and size of your business?

Type of business:

- State- owned Enterprise
- Private Enterprise
- Foreign Invested Enterprise
- Others: .....

Size of business:

- Small and Medium Enterprise
- Large Corporate

How many years of experience in your business?

- Less than 3 years
- 3-5 years
- 5-10 years
- More than 10 years

Which office do you work for in the business?

- Research & Development department
- Administration Department
- Accounting Department
- Quality department
- Customer Service department
- Other:.....

What kind of pangasius products do your company export?

- Frozen pangasius.
- Frozen pangasius fillets.
- Pangasius fillets and other fish meat (whether or not minced), fresh, chilled or frozen.
- Other:.....

What are the import markets do your company export to?

- USA
- China
- EU
- Other:.....

How long does your company export pangasius to China?

- Less than 3 years
- 3-5 years
- 5-10 years
- More than 10 years

#### ASSESSMENT QUESTION

*(For those who are working in Vietnamese fishery exporting companies)*

No.	Encode	Description	Evaluates
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			1	2	3	4	5
<b>Business Environment</b>							
1	BE1	Enterprises do not have to pay the export tax for pangasius products to the China market thanks to ACFTA.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	BE2	Pandemic COVID 19 caused congestion at the border because of the strict control of import and export goods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	BE3	The Government of Vietnam proposes many supportive policies for pangasius exporters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	BE4	The exchange rate between VND and RMB has remained stable over the past 5 years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Physical Infrastructure</b>							
5	PI1	Pangasius farming conditions of Vietnamese businesses are all standard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	PI2	Vietnam's natural conditions are very favorable for pangasius farming.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	PI3	There are many modes of transporting goods from Vietnam to China which are suitable for exporting pangasius.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	PI4	Transporting goods becomes easier because China is a neighboring country.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Knowledge Infrastructure</b>							
9	KI1	Vietnamese businesses are always aware of the consumer trend of the Chinese market.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	KI2	Vietnamese businesses have their own regulations in the process of farming and producing pangasius.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	KI3	Your company has applied scientific and technical advances in the farming and production of pangasius.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Product</b>							
12	PR1	Your company undertakes joint production of high-quality three-level pangasius to meet the demand for seed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	PR2	Companies should focus on canned pangasius products at affordable prices to meet the growing demand from the Chinese market.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	PR3	Vietnam develops pangasius farming towards stability in quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	PR4	Investing in processing technology is to create more added-value products in addition to existing fillets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	PR5	Chinese Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary (SPS) measures do not make it difficult for Vietnamese businesses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Productivity</b>							
17	PV1	Harvesting of commercial pangasius tends to maintain while acreage increases.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18	PV2	Pangasius production is much lost due to weather and disease.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	PV3	The trend of automation application in pangasius farming is becoming popular.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	PV4	Most companies have difficulty in applying technology 4.0 to farming pangasius.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Prices</b>							
21	PS1	Pangasius export prices to Chinese market is higher than the domestic products because it meets the requirements of customers for quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	PS2	The price of pangasius imported into the Chinese market in the past 5 years has been more stable than other markets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	PS3	The average monthly export price of pangasius in 2020 was at a very low level compared to the same period last year due to the loss of control over farming costs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Labour Supply</b>							
24	LS1	For the pangasius industry, Vietnam is facing a shortage of skilled workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	LS2	Vietnamese firms offer a high base salary for pangasius industry workers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	LS3	The Vietnamese workforce has had many improvements in technical expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Competitiveness of pangasius exporting company</b>							
27	CP1	Your company is a strong competitor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	CP2	The company's sustainable growth is maintained and guaranteed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	CP3	The company's profits have steadily increased day by day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For each question below, your level of approval for the competitiveness of the Vietnamese pangasius exporting companies is calculated by increasing the scale from 1 to 5:

1. Very disagree
2. Not agree
3. Normal
4. Agree
5. Strongly agree

**Thank you!**

**(This survey was conducted and verified by FPT University)**