
**UNIVERSITY OF AZUAY**

**FACULTY OF LEGAL SCIENCES**

**SCHOOL OF INTERNATIONAL STUDIES**

**Thesis prior to obtaining the degree of Bachelor in International Studies bilingual mention in foreign trade**

# "EVOLUTION AND ANALYSIS OF COMPETITIVE FACTORS OF THE ECUADORIAN SHRIMP SECTOR FROM 2007 TO 2019"

**AUTHOR:**

MIRIAM MARCELA MALDONADO PUCHA

**THESIS DIRECTOR:**

ENG. JUAN CARLOS PAUTA

**CUENCA-ECUADOR**

2022

## DEDICATION

I dedicate this achievement to God for keeping me strong and persevering along the way.

I dedicate it to my parents, Ruis and Celia, for all the efforts they have made for me to get here. They have always watched over me, they have supported me in every step and today this triumph is not only mine, but theirs too.

I dedicate this to my grandmother Luz Orellana, for her charisma, her advice and love, throughout all, she has kept supporting me and filling me with courage to stay firm.

I dedicate it to all my family for being a strong pillar throughout my career, for always believing in me and being proud of what I have achieved so far.

I dedicate this to my fiancé Mauricio Zhagui, my future partner in life, with whom I want to share this and many more successes ahead.

**AKOWLEDGEMET**

I thank God for giving me all the skills to finish this important step in my life.

I thank my parents for keeping me motivated, for giving me all the necessary tools and resources to move forward.

I thank my thesis advisor Juan Carlos Pauta and my professors Ximenita Abril and Toñito Torres, who were the guiding leaders of this project and who have been attentive to every step of the writing process of this work.

I thank my university classmates, who were great friends during this stage, for the shared moments and for the support they were able to give me in the academic environment.

# TABLE OF CONTENTS

## INDEX OF FIGURES

# INDEX OF TABLES

## ABSTRACT

Over time, the world has been evolving, the phenomenon of globalization has driven the interconnection of countries for the transaction and exchange of products and services. However, when several countries are able to produce the same product and offer it to the rest of the world, that is when the game of competitiveness begins.

Competitiveness is based on a set of processes and strategies that are associated with each other to create favorable characteristics to place the industry in a competitive circle with other companies. The objective of these companies is to cover as much ground as possible within the competitive field of negotiations.

For this reason, this research project is based on analyzing the competitive level of Ecuador's shrimp industries with respect to its competitors, through the study of qualitative variables linked to competitiveness as handled by the World Economic Forum and macroeconomic factors presented by the World Bank, in order to draw conclusions and recommendations to be used in the future to keep the country within the competitive thread of shrimp exports in the world.

# CHAPTER 1
# SHRIMP EXPORTS FROM ECUADOR AND ITS COMPETITIVENESS

## SECTION I

### 1. Historical Background

#### 1.1 Ecuador's foreign trade in colonial times

In colonial times, foreign trade of the Real Audiencia de Quito was hindered by the lack of colonial autonomy, that is, being under the dominion of the Spanish Crown, the institutions of political administration, established prohibitions of relationship and interconnection between other kingdoms (Ordoñez, 2012).

Subsequently, in the 19th century, Ecuador produced and marketed quina and the toquilla straw hat, which were the main economic income for the country; however, European markets attributed the export of these products to other countries, due to the lack of knowledge that Ecuadorians had regarding exports and marketing (Ordoñez, 2012).

Later, in colonial times, gold was one of Ecuador's main export products, around 800,000 pesos of gold were sent annually to Spain; however, by the year 1630, the country's gold had begun to be extinguished due to the overexploitation caused the previous years (Ordoñez, 2012).

Also, cocoa became an income-generating product that reached 1 million pesos annually, but suffered declines due to the fall in the international price of cocoa in the 1620s (Ordoñez, 2012). Subsequently, and until the year 1660, shipyard work became the first item of economic income, while gold and cocoa experienced a low level of production (Ordoñez, 2012).

Later, in the year 1660, there was a boom in exports of textile products that contributed more than 1 million pesos annually to the country's economy; however, in the year 1720 these products experienced a negative decline in production (Ordoñez, 2012). Afterwards, between 1773 and 1810 exports registered an income of 700,000

pesos, and later, between the years 1817 and 1820 exports marked an income of 900,000 pesos (Ordoñez, 2012).

### 1.2 Republican period: Ecuador's foreign trade

In 1820, Ecuador's independence was declared after liberation from the oppressive crowns; however, the different economic and political inclinations that Guayaquil and Quito had were an obstacle to the development of foreign trade at that time (Ordoñez, 2012). On the one hand, Guayaquil supported economic liberalism and low tariffs, while Quito demanded the imposition of high tariffs to protect its textile industry, which was weakened by the entry of English and French textiles that overshadowed its national textile industries (Ordoñez, 2012). Despite this, protectionist measures were sought to be implemented, but they did not yield great results, foreign textiles were expanding throughout the country (Ordoñez, 2012).

Later, at the end of the eighteenth century, industrialized countries began to produce bonbons and chocolates in large quantities, requiring the purchase of raw materials such as cocoa from producing countries such as Ecuador (Ordoñez, 2012). To this end, more land was occupied, and employment for its cultivation and production increased, since cocoa was once again at its peak (Ordoñez, 2012).

It is worth mentioning that Ecuador exported raw material for the production of chocolates and imported the final product at a higher price, since it lacked machinery and knowledge for the manufacture of manufactured products (Ordoñez, 2012). During this same period, the toquilla straw hat began to increase its production and sales volumes, and subsequently became one of the main sources of economic income for the country (Ordoñez, 2012).

Later, at the beginning of the XIX century, with the growth of the industrial revolution, countries such as Germany, France and Great Britain, demanded greater coffee consumption, and with this increased coffee production in Ecuador (Ordoñez, 2012). However, coffee production in the country was not very successful due to the instability of the cultivation areas, so this product did not reach a high boom (Ordoñez, 2012). Later, the production of rubber and tagua replaced the toquilla straw hat and had great participation in the country's economy, also, the production and export of bananas grew. (Ordoñez, 2012).

### 1.3 Contemporary period: Ecuador's foreign trade

Ecuador's trade balance is represented by exports and imports. Exports are international transactions where a country generating and producing goods and services sells these goods to other countries, while imports refer to the purchase of goods and services produced from other countries, in order to be consumed by the importing country (ACF International, 2013). Exports include oil products, which are subdivided into crude oil and its derivatives, and non-oil products, which are subdivided into traditional and non-traditional (Ordoñez, 2012).

#### 1.3.1 Ecuadorian oil exports

In 1910, Ecuador began the production and export of oil and black gold, and by 1920, crude oil exports had reached US$50,000 (Ordoñez, 2012). In 1923, the first refinery 'Chimborazo' was built, which produced domestic gasoline and reduced fuel imports from abroad at that time (Ordoñez, 2012). Subsequently, in the following decade, nine oil companies operated in the country, and by 1950, crude oil export volumes were 244,624 tons, then, in 1974, the Gross Domestic Product (GDP) of non-oil products was 16.2% (Ordoñez, 2012).

#### 1.3.2 Ecuadorian non-oil exports

Non-oil exports include traditional and non-traditional products. Traditional exports are concentrated in products such as bananas and plantains, shrimp, cocoa and processed products, tuna and fish, and coffee and processed products. In 2012, shrimp accounted for 9.8% of non-oil exports (Ordoñez, 2012).

Non-traditional exports are grouped into products such as canned fish, natural flowers, vehicles, metal products, and fruit juices and preserves (Ordoñez, 2012).

## SECTION II

### 2. Incursion of shrimp into the Ecuadorian market

In 1968, in the province of El Oro, the seawater dragged post larvae in a state of formation to the salt marshes, and later these became commercial-sized shrimp that were suitable for trade (Cruz, 2016). Later, farmers dedicated extensions of land, pools and collected seeds for the breeding of the crustacean through fundamental development techniques (Cruz, 2016). In the beginning, the shrimp industry produced less than 1,000

pounds of shrimp per hectare; however, this changed in the 1970s when producers occupied more land and had a large amount of post larvae for cultivation (Tagle, 2020).

As time went by, Ecuador's shrimp industry advanced, with 75,000 hectares of shrimp farming throughout the country in the 1980s, and by the end of the 1990s, more than 2,000 shrimp farms and 300 laboratories were created in that century (Tagle, 2020).

In the mid-1980s, shrimp farming companies expanded significantly, and with them also grew the sector related to aquaculture activity in which larval culture laboratories, packers and feed industries for crustacean growth were included (Peña, 2017). The lack of scientific knowledge and the rearing methodology were not obstacles for the production of Ecuadorian shrimp, since in 1998 almost 115,000 Metric Tons (MT) were exported (Piedrahita, 2018).

### 2.1 General information on shrimp

Shrimp is a marine crustacean belonging to the caridea family, is invertebrate, has a hard and transparent exoskeleton, and can measure between 2 and 35 millimeters (Animapedia, 2018). There are more than 2,000 species of shrimp that have an average life span of 1 to 2 years, and inhabit the seabed, coastal lagoons, caves, beaches and freshwater lakes; generally, most of its species are resistant to changes in water temperature, and can survive in conditions of -2.03 and 29.16ºC (Animapedia, 2018). The shrimp is an omnivorous and cannibalistic animal, as it feeds on vegetables, algae, dead tissues, parasites, shrimp and fish remains (BioEncyclopedia, 2021).

This crustacean has a cylindrical body shape composed of head and thorax, its abdomen (cephalothorax) is divided into six sections formed by appendages that serve to propel displacements, they have ten articulated legs of which the first three are used for hunting and feeding (Animapedia, 2018). Its heart is located in the head, its jaw is comprised of fibrous edges and its entire body is compressed by an elongated tail that is used to execute movements in the water (Animapedia, 2018).

Shrimp eyes are bright and greenish which are developed to detect all types of brightness, with the exception of cave shrimp which are blind when inhabiting a completely dark place (Animapedia, 2018).

## 2.2 Climate: an influential factor in the shrimp sector

In the following years, Ecuador has managed to position itself as one of the main shrimps producing and exporting countries in the world. During its growth period, it has been noted that the country's climate has allowed the shrimp to adopt characteristics of great size and quality.

Ecuador is located in northwestern South America, bordered to the north by Colombia, to the south and east by Peru, and to the west by the Pacific Ocean; it is located in the belt of equatorial low pressure in the tropical front oscillation (FIT), where dry and cool continental air masses are generated between the months of May and October, and warm and humid oceanic air masses between the months of November and April (Huttel, 1984). Mass precipitation affects the four regions of the country in different ways, so the climate can vary from one region to another and each has different properties for raising various animals or vegetables (Huttel, 1984).

The climate of the Sierra region is the result of the tropical front crossing twice a year, causing two wet seasons and two dry seasons (Huttel, 1984). The two rainy periods occur between March and June when the tropical front moves north and from October to December, when the tropical front turns south; the rest of the year, dry seasons prevail and are influenced by dry and relatively cool continental air masses (Huttel, 1984).

The climate of the Amazon region is characterized by the flow of hot and humid air masses that produce a very humid mega-thermal temperature (Huttel, 1984). The Amazonian climate is not influenced by the tropical front, so it has uniform rainfall, only the months of June and July are more intense than the others (Huttel, 1984).

The insular region is covered by a variety of thermal and pluviometric climates due to the influence of the Humboldt Current, altitude and wind exposure (Pourrut & Pouyaud, 1995). According to (Ron & Varela, 2020), the lowlands are under the influence of precipitation, which assumes a light dry climate and an average temperature of 23ºC between the months of February and September. The interference of air masses causes rainy periods between the months of November and February and the temperature decreases to 21ºC (Ron & Varela, 2020).

In the coastal region, the climate is strongly affected by intertropical convergence, and is influenced by latitudinal oscillations of the antagonistic marine

currents that generate warm and humid air masses, and together with the warm El Niño current that comes from the northern Gulf of Panama covers the coastal zone between the months of December and May (Huttel, 1984).

Climate is one of the most influential factors in the growth of the crustacean, because shrimp is a poikilothermic animal, that is, it does not have internal mechanisms to regulate its body temperature, and its body reacts to the environmental temperature, so shrimp must be kept in a warm tropical temperature similar to that of its aquatic habitat to survive (A. Rodríguez & García, 2010).

The coastal zone is the most appropriate region in the country for shrimp breeding and growth. As a result, there are currently 210,000 hectares of shrimp farms in the country, of which 60% are located in Guayas, 15% in El Oro, 9% in Manabí and 7% in Santa Elena (Revista Lideres, 2021). The mild climate of the Costa region allows shrimp to be harvested up to three cycles per year, while competing countries such as Thailand harvest twice a year and China once a year (Marriott, 2003).

***Figure 1***

*Shrimp-producing provinces of Ecuador*


Source: Lideres Magazine

https://www.revistalideres.ec/lideres/industria-nacional-camaron-refloto-fuerza.html

## 2.3 Types of shrimp produced in Ecuador

Four types of shrimp are cultivated in Ecuador: Pacific white shrimp, black tiger shrimp, Chinese white shrimp and pink shrimp. The type of shrimp most commonly cultivated in Ecuador is the Pacific white shrimp, Litopenaeus vannamei, which represents 95% of total shrimp production (Marriott, 2003).

### 2.3.1 Pacific white shrimp:

There are two types of Pacific white shrimp: vannamei which is creamy white and stylirostris whose color is white with green or bluish hues. Pacific white shrimp are native to the eastern coast of the Pacific Ocean. This type of shrimp can measure between 9 and 23 centimeters, its color is translucent white and can change color depending on its diet and water turbidity (INEC, 2021). It is also considered one of the most resistant species to changes in water conditions, the temperature in which this crustacean lives is from 22 to 33ºC with a pH of 6 to 9 (INEC, 2021).

***Figure 2***

*Pacific white shrimp*

Source: https://hablemosdepeces.com/camaron-blanco/

### 2.3.2 Black tiger shrimp:

According to (Marriott, 2003), this type of shrimp is named for its black stripes on the carapace and can measure up to 36.3 centimeters. The shrimp is mostly cultivated in Asia, especially in Thailand, although other countries such as India, Bangladesh, Indonesia, Vietnam and Ecuador also offer this product on the world market (Marriott,

2003). The black tiger shrimp is characterized by a sweet and mild flavor, an elastic flesh, ideal for cooking in steamed or sautéed grills (Marriott, 2003).

***Figure 3***

*Black tiger shrimp*

Source: Yong Hian Lim https://es.123rf.com/photo_1987934_crudo-camar%C3%B3n-tigre-negro-aisladas-sobre-fondo-blanco-.html

**2.3.3 Chinese white shrimp:**

Chinese white shrimp is obtained by farming and fishing, it is native to the East China Sea and the west coast of Korea, and its main producing countries are China, Japan and Korea (Marriott, 2003). The Chinese white shrimp comes from low salinities, has a length of 18.3 centimeters, they are kept in cold waters of 16ºC, its meat is white or grayish in color, and has less meat than the Pacific white shrimp whose texture is moist and elastic (Marriott, 2003).

(Meng, 2019) states that in recent years the production of Chinese shrimp has been affected by the high temperatures in China, the country that produces and markets this product in greater quantities. This is due to the fact that shrimp tolerate from 4 to 38ºC, and exceeding this level has resulted in high mortality rates and economic losses for producers, so the F. chinensis culture is expected, whose species are usually more tolerant to cold (Meng, 2019)

***Figure 4***

*Chinese White Shrimp*

Source: PNG EGG https://www.pngegg.com/es/png-boqfa

### 2.3.4 Pink shrimp:

Pink shrimp comes from the North Atlantic, Northeastern and Western Pacific, it is considered one of the most commercial products as it represents 80% of the cold-water shrimp market. This type of shrimp is farmed at depths of 900 to 1400 meters (Marriott, 2003). Its shell turns pink with white shades and its tail is red. It has a very sweet flavor, even sweeter than warm water shrimp (Marriott, 2003).

***Figure 5***

*Pink Shrimp*

Source: Arrecife http://www.arrecife.co/productos-2/camaron-rosado/

## 2.4 Types of shrimp farming

Shrimp farming is carried out through fishing and pool culture. In Ecuador, since the 1990s, 90% of shrimp farming has come from pool culture and 10% from fishing (Marriott, 2003). In Ecuador, the most common types of farming are extensive, semi-extensive and intensive.

### 2.4.1 Extensive farming

In extensive cultivation, shrimp ponds have an extension of 20 to 100 hectares, and a depth of 0.4 to 1 meter, with a planting density of 3 to 5 juveniles per square meter (Marriott, 2003). This type of culture is characterized by lack of capital, lack of infrastructure, specialization and human resources. Because of this, the ponds are constructed with a containment system consisting of a dam with a natural water channel supply, generally made by hand (Marriott, 2003). Given the low cost of this type of culture, crustaceans are exposed to a higher risk of contracting diseases, since there is no adequate control for the prevention of crustacean diseases.

### 2.4.2 Semi-extensive farming

In semi-extensive farming, the ponds have an extension of 5 to 15 hectares, uniform depths and a planting density of 25,000 to 200,000 juveniles per hectare (Marriott, 2003). About 58% of Ecuadorian shrimp farms use this method of culture, because this type of culture is characterized by higher costs, since it allows greater control over the growth of the crustacean, which is why they invest in labor, feed, fuel for pumping water, and production control (Marriott, 2003).

### 2.4.3 Intensive farming

According to (Marriott, 2003), in intensive culture the pools are relatively small in size from 0.01 to 5 hectares with a planting density of up to 200,000 juveniles per hectare. This type of culture is characterized by a high production rate of crustaceans, from 5,000 to 10,000 kilograms per hectare per year; this is because the reduced size of the ponds allows greater control of crustacean production (Marriott, 2003).

Likewise, this type of culture has a greater contribution of operating capital, greater specialization, human resources, food, nutrients, appropriate medication, and care through larval laboratories that prevent the risk of contracting viruses and diseases for the crustacean (Marriott, 2003).

## 2.5 World shrimp market:

The aquaculture industry has experienced ups and downs in its production levels from its beginnings to the present, this is due to several social, political, health and economic factors. A clear example of this is the crisis that Ecuador suffered in 1999 after its shrimp production was threatened by diseases such as white spot.

(Varela, 2011) states that the white spot (White Spot virus) damaged the aquaculture sector and this generated great economic losses for the country with a reduction of 200% to 30% per year in the profit margin. This situation has forced our country to implement technology, machinery, innovation and implements in its logistic chain to avoid the risk of virus and disease contraction that threatens the industrial sector (Varela, 2011).

Subsequently, Ecuadorian shrimp has managed to restructure itself in the world market. According to (Varela, 2011), Asia is the leading shrimp-producing continent with a 59.9% share of exports. This is followed by the Americas with a 32.1% share, Europe with 5.6%, Africa with 1.8% and Oceania with 0.6%. (Varela, 2011) states that Ecuador is the country with the largest shrimp exports in Latin America with a 25.2% share of the world market.

### 2.5.1 Harmonized System

The Harmonized System (HS) is a specific multi-purpose numeric code designed by the World Customs Organization (WCO). The WCO is an intergovernmental body made up of 165 countries and created for the purpose of dealing with customs matters, improving the customs system and preventing illicit activities concerning international trade (World Customs Organization (WCO), 2021).

The HS is a specific numeric code designated to different goods with the purpose of classifying and recognizing their obligations and rights in fiscal and logistical matters, at the time of international exchange (Harmonized System Convention (HS), 2021). The numeral coding is designated for WCO member countries, and facilitates the recognition of merchandise and avoids confusion in the names of each product (Harmonized System Convention (HS), 2021).

The HS is made up of sections, chapters and subchapters. Within the field of sections, there are three classifications: Kingdom of Nature, Industrial Sector and

Economic Sector, of which account for a total of 21 divisions, written in Roman numerals (I- XXI), made up of commodities and processed products (Guardiola, 2017).

The chapters are part of the sections, and are grouped among goods that are related to each other. There are 97 chapters that are subdivided into 21 sections, the chapters are the first two numbers shown in the numerical coding (Guardiola, 2017).

Subchapters appear in certain chapters that require more identification logic in the goods. Chapters are subdivided into headings, they can range from number 01 to 99, and they are identified in the third and fourth numbers of the numerical code (Guardiola, 2017). The next two numbers (fifth and sixth) of the code are the subheadings, which serve to identify the goods more specifically (Guardiola, 2017).

### 2.5.2 Harmonized System for shrimp

Within Section I Live animals and products of the animal kingdom, in Chapter 03 identified as fish and crustaceans, mollusks and other aquatic invertebrates (Aduanet, 2021). Heading 0306 groups several types of crustaceans in different states (frozen, cooked, dried, in shell, smoked, unsmoked, etc.). Also, 0306 groups all crustaceans produced and exported by Ecuador, such as: shrimp, lobster, crabs, and crayfish (Aduanet, 2021).

Within subheading 030611, we find lobsters, according to data published by Trade Map, an official page that presents data of exporting and importing countries in all headings and subheadings, lobster registers the following FOB values in thousands of dollars and MT exported during the period 2007- 2019:

***Table 1***

*Ecuadorian lobster exports 2007-2019*

| YEAR | TM (weight) | FOB (thou. USD) |
|---|---|---|
| 2007 | 28 | 412 |
| 2008 | 15 | 339 |
| 2009 | 27 | 409 |
| 2010 | 3 | 14 |

| | | |
|---|---|---|
| 2011 | 29 | 336 |
| 2012 | 34 | 629 |
| 2013 | 61 | 574 |
| 2014 | 41 | 563 |
| 2015 | 66 | 1.127 |
| 2016 | 139 | 1.579 |
| 2017 | 127 | 1.419 |
| 2018 | 121 | 1.445 |
| 2019 | 194 | 3.012 |

Source: Trade Map

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=3%7c218%7c%7c%7c%7c030611%7c%7c%7c6%7c1%7c1%7c2%7c2%7c1%7c2%7c2%7c1%7c1

Prepared by: Miriam Maldonado

Subheading 030614 represents crabs, of which the following FOB values are recorded in thousands of dollars and MT exported:

***Table 2***

*Ecuadorian crab exports 2007-2019.*

| YEAR | TM (net weight) | FOB (thou. USD) |
|---|---|---|
| 2007 | - | - |
| 2008 | - | - |
| 2009 | - | - |
| 2010 | - | - |

| | | |
|---|---|---|
| 2011 | - | - |
| 2012 | - | - |
| 2013 | 2 | 9 |
| 2014 | 1 | 3 |
| 2015 | 5 | 20 |
| 2016 | 27 | 75 |
| 2017 | 29 | 109 |
| 2018 | 5 | 26 |
| 2019 | 14 | 78 |

Source: Trade Map

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=3%7c218%7c%7c%7c%7c030614%7c%7c%7c6%7c1%7c1%7c2%7c2%7c1%7c2%7c1%7c1%7c1

Prepared by: Miriam Maldonado

Subheading 030634 belongs to langoustines, a decapod crustacean similar to lobster, which does not have a large participation in the export market. According to Trade Map, these were the exported values in thousands of dollars and MT, only in 2016 and 2018:

***Table 3***

*Ecuadorian crayfish exports*

| **YEAR** | **TM (net weight)** | **FOB (thou. USD)** |
|---|---|---|
| 2016 | 1.3 | 5.1 |
| 2018 | 1.0 | 24.3 |

Source: BCE

Prepared by: Miriam Maldonado

Subheading 030617 represents shrimp and is subdivided into whole shrimp, tails without shell, tails with shell not cooked in water or steam, tails with shell cooked in

water or steam, river shrimp and others. According to data extracted from Trade Map, these were the FOB values in millions of dollars and MT exported of shrimp in the period 2012- 2018. It is worth mentioning that the official Trade Map website does not show data for the years 2007- 2011.

***Table 4***

*Ecuadorian shrimp exports*

| YEAR | TM (net weight) | FOB (thou. USD) |
|---|---|---|
| 2013 | 148.658 | 1.223.394 |
| 2014 | 229.073 | 1.941.021 |
| 2015 | 284.988 | 1.894.670 |
| 2016 | 324.340 | 2.254.581 |
| 2017 | 384.805 | 2.671.265 |
| 2018 | 464.272 | 2.922.812 |
| 2019 | 614.854 | 3.675.300 |

Source: Trade Map

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=3%7c218%7c%7c%7c%7c030617%7c%7c%7c6%7c1%7c1%7c2%7c2%7c1%7c2%7c2%7c1%7c1

Prepared by: Miriam Maldonado

As we can notice, shrimp is the main income generating product of heading 0306 corresponding to crustaceans. Lobster is in a state of growth, however, it does not show great participation in the market until 2018, as well as crab. And for their part, langoustines have been exported for two years, but in small quantities, therefore, their participation is not so significant in the market. In view of this, this research project will study the general data extracted from heading 0306, which is mostly represented by shrimp.

### 2.5.3 Free Trade Agreements

Free Trade Agreement (FTA) is a trade agreement without a defined term that links two or more countries in an economic integration related to the reduction of non-tariff barriers to trade, intellectual property, investment in new markets, financial services, competition policies, electronic commerce, trade defense mechanisms, and dispute settlement (MEF, 2021).

The advantages of signing FTA with other countries are: they contribute to improving the competitiveness of companies (availability of raw materials and machinery or lower costs), increased flow of foreign investment, higher productivity and increased employment, integration of the country into the world economy, and the level of country risk, among others (MEF, 2021).

**FTA: United States-Ecuador**

In 1990, U.S. President George Bush proposed the opening of a free trade area with the American continent (Jacome, 2021). But it was not until 2003, when the Trade Representative, Robert Zoellick, sent a letter to the countries of Bolivia, Colombia, Ecuador and Peru proposing to initiate a negotiation agreement through the signing of the Free Trade Agreement (Jacome, 2021).

This agreement meant for Ecuador the opportunity to strengthen alliances between Ecuador and the United States through the entry of Ecuadorian products to the North American country (Jacome, 2021). The proposal to begin negotiations between the United States and the Andean Region through the Andean Trade Preference and Drug Eradication Act (ATPDEA) agreement was aimed at freeing tariffs on thousands of products exported by the four countries, which meant economic compensation for the fight against the illegal sale of drugs (Jacome, 2021).

(Jacome, 2021) argues that, at that time, Ecuador had a high trade dependence on the United States, since its market share was 40%, which represented a positive increase in the Ecuadorian trade balance, followed by the European Union and the Andean Community of Nations. The agreement established meant the elimination of tariffs on certain Ecuadorian products in the basket (Jacome, 2021).

From 2000 to 2004, the entry of products such as shrimp, bananas, oil, flowers, prepared tuna, fresh fish, wood, pineapples, mangoes, and sanitary products represented 90% of total exports to the United States, of which four products stand out: oil, bananas,

shrimp and roses, which account for around 70% of exports to the United States (Jacome, 2021). However, it is important to mention that the increase in exports to the U.S. market was not due to an increase in productivity, but to the elimination of tariffs.

Despite this, between those years, Ecuador had a very low level of competitiveness, since it had the opportunity to export up to 6,000 tariff items, but of these it did not manage to cover 20% (Jacome, 2021). This is due to two important aspects; the first has to do with insufficient State policies to support the insertion and development of the productive sectors, and the second is related to the countless protectionist barriers and anti-dumping measures, barriers that were only aimed at benefiting the United States (Jacome, 2021).

However, by 2006, the Washington delegation terminated the FTA of the Ecuador-US negotiations through the Andean Treaty; this was due to the defense of the private oil transnationals after the resolution given by the Ecuadorian president at that time, Alfredo Palacios (Hidalgo, 2006). The resolution was based on the application of the hydrocarbon reforms, demanding the participation of the State in the revenues produced by crude oil, and declaring the contract with Occidental Petroleum (OXY) expired and the reestablishment of the axis in favor of Ecuador (Hidalgo, 2006).

When the Washington delegation heard about the modifications in oil policies, they decided to break with the treaty that links Ecuador with the United States (Hidalgo, 2006). On the one hand, critics charged that the Ecuador-US treaty was an agreement from which a capitalist minority was benefiting, and that the revocation of the treaty by the Americans showed that such agreements were only created to guarantee the growth of the American economy, while national interests were of little importance (Hidalgo, 2006). On the other hand, the State Department qualified the Palacios procedure as an act of nullity, given that, after the support of the populist movement, the president proceeded to break ties with the country's main investor (Hidalgo, 2006).

Subsequently, in 2013, Ecuador resigned from the ATPDEA after accusing the United States of using this relationship as a means of blackmail to optimize geopolitical issues that went against Ecuadorian sovereignty (Hidalgo, 2006). The Ecuadorian State has expressed its dissatisfaction, after the North American country has issued pressures in terms of bilateral relations that Ecuador maintained with other countries judged to be adversaries of the United States, threatening to remove the ATPDEA if Ecuador did not

proceed as they requested (Secretaría General de Comunicación de la Presidencia, 2021). Faced with this, Ecuador decided to renounce the aforementioned law, since it considered that the country was not willing to take decisions interposed by another nation.

Although Ecuador does not have a signed FTA with the United States, since 2015, Ecuador has been part of the Generalized System of Preferences (GSP). The objective of the GSP provided by the United States to developing countries is to contribute to the growth of their economies through trade (Quilumba, 2020). That is, the GSP established by the United States determines preferential import treatment for multiple products that are imported from the countries benefiting under the system (USTR, 2021).

The GSP is not the only system under which Ecuadorian imports are treated in the United States, but they are also treated under the Most Favored Nation (MFN) tariff, which grants low-rate tariffs to WTO member countries (El Universo, 2018). Between 2014 and 2016, imports from the United States were governed under GSP and MFN, of which, in terms of non-oil imports, 11% entered the United States under GSP, and 89% under MFN (Ministerio de Comercio Exterior, 2016).

**European Union - Ecuador**

In 2003, the European Union set the objective of signing trade alliances with Andean countries, however, it was not until 2013 when the signing of an FTA with Peru and Colombia was achieved, and later, at the end of 2016, trade alliances were established between Ecuador and the European Union (Saénz, 2018).

Several years ago, Ecuador sought to sign an FTA with the European Union because the participation of the Ecuadorian non-oil sector was weakened, especially shrimp and bananas, since African and Central American countries had better tariff rates due to their trade relations and FTAs with the European Union bloc (Saénz, 2018).

But the situation changed with the signing of the FTA with the EU, because 85% of Ecuadorian exports, including shrimp, benefit from the System of Tariff Preferences called GSP when entering the merchandise to the European Union (Saénz, 2018). The GSP is the elimination or reduction of tariffs on certain products, granted by member countries of the European Union to developing countries to contribute to the

fortification and growth of their productive sectors and industrialization (SICE, 2021). While GSP Plus is an enhanced GSP system through which, developed countries grant tariff preferences to imports of products originating from developing countries (Toapanta, 2015).

The GSP Plus contains 6,600 tariff subheadings, of which 6370 enter the European market with a 0% tariff, and the rest with partial preferences (Toapanta, 2015). After the signing of the agreement, in 2014, crustacean export revenues grew significantly to US$796.091 million, growing by 21.35% over the previous year (Toapanta, 2015). Prior to the signing of the GSP Plus agreement, Ecuador paid 12% duty on shrimp, then the tariff payment dropped to 3.6%, which allowed it to position itself as one of the most competitive sectors in the European market (Toapanta, 2015).

## SECTION III

### 3. Shrimp export cycles.

#### 3.1 Shrimp boom

According to (Romero, 2014), the shrimp industry in Ecuador had great relevance in the world market, and the highest percentage of participation was represented by commercial partners from North American countries. Because of this, entrepreneurs extended agricultural lands and mangrove areas to double the cultivation of these marine species (Romero, 2014). Subsequently, and with the extension of aquaculture activity, an increase in employment and the generation of foreign currency for the benefit of the country followed.

Before 1955, shrimp production represented less than 1,000 metric tons, by 1956 this figure doubled, and by 1958 it rose to 3,000 metric tons of production (Santana, 2015). Subsequently, by the 1960s it increased 3.5 times reaching a production of 9,000 metric tons in the year 1969 (Santana, 2015). Following the success represented by such production, aquaculture activity was extended in coastal provinces such as Manabí, Esmeraldas and Guayas (Santana, 2015).

According to (McPadden, 1985), between 1954 and 1974 the fleet increased to 266 vessels representing a total of 8,700 metric tons. This is due to the increase in production hectares that emerged in the 1970s, and it was precisely between 1979 and 1984 that Ecuador experienced a drastic growth in shrimp production (McPadden,

1985). Among these years, the year 1983 stands out, whose annual production is recorded as the highest with a total of 36.6 thousand metric tons evaluated at 183 million dollars being this value almost three times higher than in the year 1979 (McPadden, 1985).

In addition, (Santana, 2015) estimates that between the years 1980 and 1981 there was an increase of 40,000 jobs dedicated to aquaculture activity. Subsequently, between the years 1983 and 1984, 25,000 and 45,000 people were hired to fill positions in the farm, packing plants and refrigerators, and around 90,000 and 120,000 people were dedicated to larval harvesting (Santana, 2015). The 1980s brought remarkable positive changes in the Ecuadorian shrimp industry, since before 1980, there were less than 20 packing houses in the country, but by 1985 more than 70 packing houses were implemented (Santana, 2015).

In 1976, shrimp exports were worth US$25 million, but by 1983 this value had increased to US$175 million (Santana, 2015). This marked decade allowed shrimp to become the second largest foreign exchange earner for the country (Santana, 2015). It is worth noting that the successful rise of the shrimp industry goes hand in hand with other industries related to this activity such as food and crustacean growth industries, medication and laboratory chemicals, equipment and machinery suppliers.

In 1998, a production of 154,000 metric tons was recorded, a value that positioned Ecuador as the second largest shrimp producer with a 20.2% share of the world market (Santana, 2015). Its predecessor and first producer of the crustacean was Thailand, which produced around 212,146 metric tons, and Ecuador was followed by India, which was the third largest shrimp exporter with a 9.2% share and a production of 70,715 metric tons (Santana, 2015).

It is important to mention that the shrimp boom of the decade brought with it the support and financing of local governments and international financial organizations, including the World Bank (WB), International Monetary Fund (IMF), Inter-American Development Bank (IDB), which granted substantial loans to Ecuador through the International Finance Corporation (IFC) (Romero, 2014). In addition, the increase in exports was consolidated through the privatization of goods and services and the free market (Romero, 2014).

This remarkable growth was due to the expansion of land and increase in shrimp farming, especially there was a high volume of Pacific white shrimp production (Bernabé, 2016). Subsequently, in 2000 after the contamination of the white spot virus, shrimp production was dramatically reduced by 30%; however, for the following years, Ecuador has achieved a significant recovery of shrimp production (Bernabé, 2016). That is, prior to the contraction of the virus, there were 1200 farms operating aquaculture activity, after the recovery from the disease, a total of 3000 farms increased (Bernabé, 2016).

It is worth mentioning that the recovery of the shrimp market is not due to an increase in land or resources, but to a new way of working and farming methodology on the part of producers, since a new production system based on the cultivation of 8 to 15 larvae per meter was implemented (Revista Lideres, 2021). In addition to this, in 2014, there was a 25% deficit of shrimp, due to the low production of the crustacean in Asia due to the contraction of the early death syndrome. This situation allowed the price of shrimp to double from US$2 to US$4 per pound (Revista Lideres, 2021).

### 3.2 Shrimp crisis

The appearance of shrimp pests and diseases are the main cause of the shrimp crisis in Ecuador. Between 1988 and 1992, the shrimp sector was affected by the appearance of gull syndrome, a disease caused by a genus of bacteria belonging to the gamma subdivision of proteobacteria called Vibrio spp (Vega, 2019). These bacteria can originate from heavy metals, and accumulate in the digestive tract of the crustacean in the form of white pellets and cause decreased appetite and high death rates of the shrimp (Vega, 2019).

Later, in 1993, the Ecuadorian crustacean was threatened by Taura syndrome (TSV), a viral disease caused by Taura virus infection, which arises in the rearing phase between 14 and 40 days, when the shrimp is usually in its juvenile stage and weighs between 0.05 and <5 g (OIE, 2019). TSV affects the general exoskeleton, gills, appendages, foregut and hindgut, connective tissues, and antennal gland (OIE, 2019). Transmission of Taura virus is contracted through contaminated water or cannibalism (consumption of an infected shrimp) and the mortality rate ranges from 40 to 90% of the contaminated population (OIE, 2019).

According to (Marcillo, 2003), at the end of 1998, a new deadly disease emerged for shrimp, which according to studies conducted in May 1999 was white spot syndrome (WSS). The white spot virus has the shape of a stick, presents several white spots on the exoskeleton and attacks shrimp tissues causing mortality (Marcillo, 2003).

This syndrome originated in the Asian continent in 1992. Later, the virus reached Panama and Honduras through the importation of frozen Asian shrimp (Marcillo, 2003). Later, it is presumed that it reached Ecuador through the importation of larvae from Panama, a situation that caused the virus to be contracted in 85% of the shrimp samples studied in 2000 (Marcillo, 2003).

The disease spread throughout the entire coastal zone of the country, causing unsustainable economic damage due to a significant reduction in exports. That is, exports decreased from 20 million pounds to 5 million pounds per month, shrimp hectares decreased from 180,000 to 50,000, which meant a 72.23% reduction in production, and the number of exporters decreased from 135 to 40 and 2 of them went into total crisis (Romero, 2014). The monetary value of shrimp farms went from 6,000-12,000 dollars to 1200- 2,500 per hectare, and the credit loans that were granted in the previous decade, were suspended (Romero, 2014). According to (Notarianni, 2006), exports in 1999 were reduced by 17% compared to the previous year and at the end of 2001 they were down 60% compared to 1998.

In 2000, with the impact of this strong sanitary crisis, around 90,000 people lost their jobs that were directly related to shrimp farming, 70% of the larvae laboratories were forced to close and 40% of shrimp ponds suspended their activities (Marcillo, 2003).

Added to this, between 1997 and 1998, the country faced a strong climatic crisis due to the influence of the El Niño phenomenon, which is characterized by intense rains, landslides, floods, droughts and forest fires that last between 12 and 18 months (EIRD, 2016). The damage caused by the climate phenomenon triggered negative effects on the country's productive sector, including the shrimp sector. Also, GDP growth experienced negative stagnation, increased fiscal deficit and inflation, and exports decreased due to low production (EIRD, 2016).

It is worth noting that Ecuador sought to rehabilitate the shrimp sector through underground farming practices, however, the country was going through a severe

economic and financial crisis and therefore lacked sufficient budget to invest in biosecurity measures and implementation of improvements in shrimp farming (Romero, 2014). During the shrimp boom, neoliberal reforms were implemented linked to the granting of credit loans and low interest rates that gave way to the free market.

However, the banks, supported by the established reforms, made loans to their own companies and thus created ghost companies (Romero, 2014). Subsequently, the rise in interest rates was justified by banks as a way to attract foreign investment, but this situation caused economic instability for producers who invested in their businesses through bank loans (Romero, 2014).

After the financial crisis faced by Ecuador, the government of Jamil Mahuad decided to launch bank bailout policies, which gave way to the national holiday, an episode that prevented the population from withdrawing their cash from the bank, since these had been declared bankrupt (Plan V, 2020). The situation of Ecuadorians worsened when the Ecuadorian currency was devalued and their wealth was reduced by 50%, adding the collapse of nine banks out of the 39 existing in the country harmed almost one million people who had their money seized in these entities (Plan V, 2020).

After the loss of money, thousands of Ecuadorians decided to migrate abroad, and others took their own lives due to the unsustainable crisis they were facing. The national crisis is an influential fact in the shrimp crisis, since, after the contraction of the virus, producers did not have enough economic resources to raise the shrimp industry again. During these years, it remained stagnant, giving way to other shrimp producers such as China, Brazil and Vietnam (Marriott, 2003).

### 3.4 Competitive impact of shrimp exports

Let us remember that the aquaculture industry in Ecuador started unexpectedly, when the producers, after observing how the larvae that reached the salt pans adopted considerable sizes for commercialization, decided to create businesses based on shrimp farming and production. At the beginning, only less than 1,000 pounds per hectare were produced, but the figure changed in the 1970s when it was decided to occupy more land and thus increase larvae cultivation.

According to (Machado, 2013), later, in the 1980s, shrimp production increased by 600% compared to what it produced at the beginning. This is due to the adaptation of infrastructure, extension of cultivation areas, investment in machinery and the

contribution of the tropical climate of the coastal region, which allows shrimp to reach a large size and, with a balanced diet, to have an exquisite flavor, rich in protein, vitamins, sodium, potassium and Omega 3 (Machado, 2013).

However, as previously mentioned, the shrimp industry had to experience a great fall after its boom, which came from the contraction of diseases in the crustacean; such as gull syndrome, Taura syndrome and white spot, adding the financial crisis suffered by Ecuador that hinders the early recovery of the shrimp sector due to the lack of budget for investment and production of the industry.

The decline of the Ecuadorian aquaculture sector has allowed other countries to incorporate their shrimp supply to the international market. Among them, Thailand improved its underground farming practices and increased biosecurity measures to prevent the contraction of viruses. Brazil and Vietnam joined the world shrimp market, producing mostly white shrimp, Argentina increased its production significantly, and after the recovery of Chinese shrimp, the European Economic Community began to buy large percentages of this shrimp, overshadowing American shrimp (Marcillo, 2003).

In 2001, countries such as India, China, Vietnam, Thailand, and Mexico, of which India, China, and Vietnam were not competitors for Ecuador, increased their shrimp exports, surpassing Ecuador's level (Marriott, 2003). These countries have a large share of exports to the U.S. market, which is Ecuador's main trading partner (Marriott, 2003).

Below are the figures for shrimp exports in kilos to the U.S. market between 2001 and 2002:

***Table 5***

*Shrimp exports in kilos to the United States*

| **Country** | **2001** | **2002** |
|---|---|---|
| Thailand | 136.078.393 | 115.104.532 |
| Vietnam | 33.100.726 | 44.686.319 |
| India | 32.871.736 | 44.244.750 |
| México | 30.007.172 | 24.297.105 |

| | | |
|---|---|---|
| China | 28.017.263 | 49.507.496 |
| Ecuador | 26.759.586 | 29.714.818 |

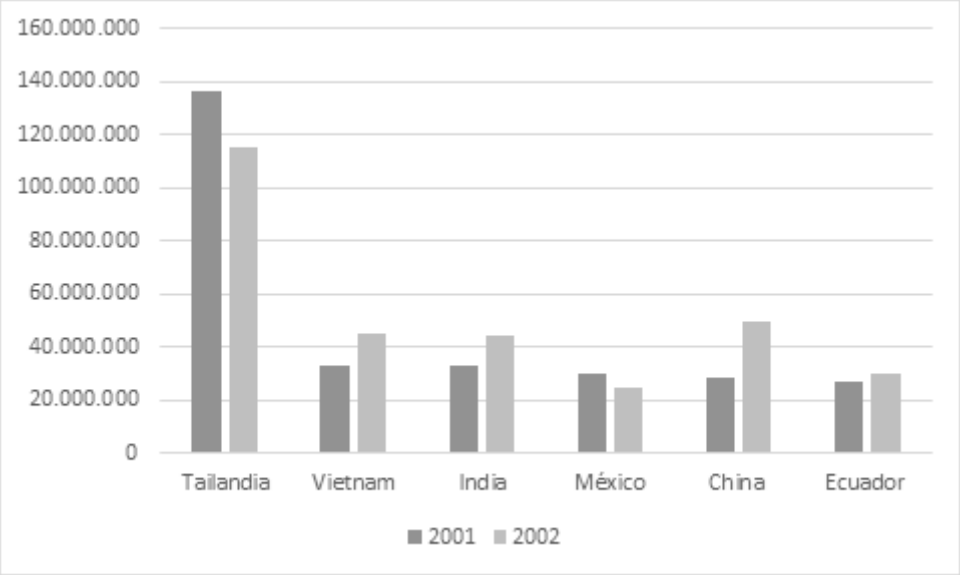
Source: National Marine Fisheries Service (USA)

https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/Apuntes/ae29.pdf

Prepared by: Miriam Maldonado

***Figure 6***

*Shrimp exports to the United States in kilos*




Source: National Marine Fisheries Service (USA)

https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/Apuntes/ae29.pdf

Prepared by: Miriam Maldonado

The increase in exports from the aforementioned countries was due to the increase in shrimp hectares. In the case of China, in 2001 it had 222,000 hectares for shrimp farming, an increase of 6.9% compared to 2000 (Marriott, 2003). In 2000, Vietnam had 77,000 hectares dedicated to shrimp farming, but in 2001 these increased to 202,000 hectares, which meant an increase of 61.88% of the crustacean producing areas (Marriott, 2003).

In 2001, Thailand became the world's leading shrimp exporter, due to the country's commercial capacity to re-export Asian shrimp to European and American countries (Marriott, 2003). However, in 2002, the shrimp industry fell by 40% due to unfavorable weather conditions that caused the contraction of diseases in the product (Marriott, 2003).

Ecuador could not be left behind, it had to find ways to rehabilitate the shrimp sector and seek strategies to avoid a second wave of virus and disease spread in crustaceans. Ecuador sought to re-incentivize shrimp production, starting with heavy investments in civil works such as: walls, pumping stations, pools, canals; in machinery such as: tractors, backhoes and boats; in equipment such as: aerators and pumps; and in balanced feed to ensure shrimp growth. However, for Ecuador this meant a challenge, given that, due to the financial crisis, in the year 1999, the country was experiencing inflation of 60%, and this percentage increased in the year 2000 with an annual inflation of 90% (Guerrero, 2017). This figured a high level of prices that hinder the purchase of inputs and supplies for the production of the productive sectors; among them, the shrimp industry.

Now, another important factor should also be taken into account such as the distance that competing Asian countries have with main partners such as the European Union, in relation to Ecuador. As the distance is longer, they also increase their prices in terms of transportation, product treatment, transfer and dispatch. In 2001, the inflation rate dropped significantly to 22%, and in 2002 it decreased to 9.4% (Banco Central del Ecuador, 2001).

This significant decrease in the inflation rate was due to the dollarization process faced by Ecuador, which represented greater financial stability for the country, given the increase in foreign investment, and added to this, remittances from migrants and the rise in oil prices motivated the country's economic upturn, and thus, the reactivation of the productive sectors (Central Bank of Ecuador, 2001).

Another positive aspect for Ecuador that arose as an opportunity to reposition itself in the market was the sanitary crisis faced by Thailand in 2002. Due to unfavorable climatic conditions in the country, the transmission of diseases and the poor reaction to antibiotics by Thai crustaceans, 40% of sales were lost from one year to the next (Marriott, 2003).

In 2003, in Ecuador, the National Center for Aquaculture and Marine Research (CENAIM) of the Escuela Superior Politécnica del Litoral (ESPOL) proposed the development of a technology for planting shrimp in greenhouses to maintain the temperature of the water in pools between 29 and 32ºC, which prevents the survival and influence of the virus in the cultures (Marriott, 2003). This technological innovation was used by a large number of producers who were focused on reviving the shrimp industry.

Subsequently, according to data extracted from (Trade Map, 2021a), in 2007, Ecuador ranked seventh as an exporter of shrimp with an FOB value of USD 601,040, preceded by Canada, Vietnam, Thailand, Indonesia and India. Later, in 2013, Ecuador climbed to fourth place with an FOB value of USD 1,794,992, preceded by India, Canada and Vietnam (Trade Map, 2021a). Then, in 2018, Ecuador already occupied the second position as world shrimp producer with the FOB value of 3,246,149 and India occupied the first place in shrimp exports (Trade Map, 2021a).

According to (Duran et al., 2017), Ecuador's positioning as the second largest shrimp producer in the world in 2016 made the shrimp sector the second largest contributor to the country's economy. In large part, this was due to greater investment in resources, supplies and technification in the production chain since 2014, which favored the increase in world exports (Duran et al., 2017). Likewise, 39 crustacean exporting companies, 1,315 producers, and around 210,000 hectares for cultivation were established in Ecuador (Duran et al., 2017).

Between 2013 and 2017, the shrimp industry contributed 1.14% to the Gross National Domestic Product (GDP), of which 64% came from laboratories and crustacean breeding establishments, which supplied 1.13% of employment rates dedicated to larval culture and companies related to its production (V. Reyes, 2019).

***Table 6***

*FOB value exported by Ecuador between 2007, 2013 and 2018*

| YEAR | VALUE FOB EXPORTS |
|---|---|
| 2007 | 601.040 |
| 2013 | 1.794.992 |

| | |
|---|---|
| 2018 | 3.246.149 |

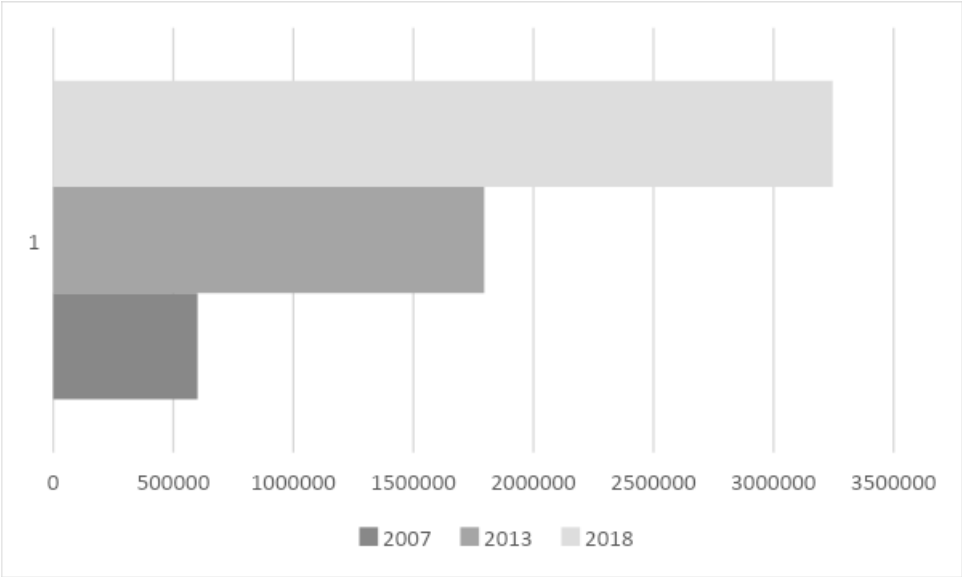
Source: Trade Map

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=3%7c218%7c%7c%7c%7c0306%7c%7c%7c4%7c1%7c1%7c2%7c2%7c1%7c2%7c1%7c1%7c1

Prepared by: Miriam Maldonado

***Figure 7***

*FOB value exported by Ecuador between the years 2007, 2013 and 2018:*




Source: Trade Map

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=3%7c218%7c%7c%7c%7c0306%7c%7c%7c4%7c1%7c1%7c2%7c2%7c1%7c2%7c1%7c1%7c1

Prepared by: Miriam Maldonado

***Table 7***

*Percentage participation of shrimp among non-oil products*

| YEAR | % of participation |
|---|---|
| 2007 | 10.7% |

| | |
|---|---|
| 2008 | 9.8% |
| 2009 | 9.6% |
| 2010 | 10.7% |
| 2011 | 15.18% |
| 2012 | 12.6% |
| 2013 | 16.6% |
| 2014 | 20.7% |
| 2015 | 19.5% |
| 2016 | 22.8% |
| 2017 | 24.9% |
| 2018 | 25.3% |
| 2019 | 28.5% |

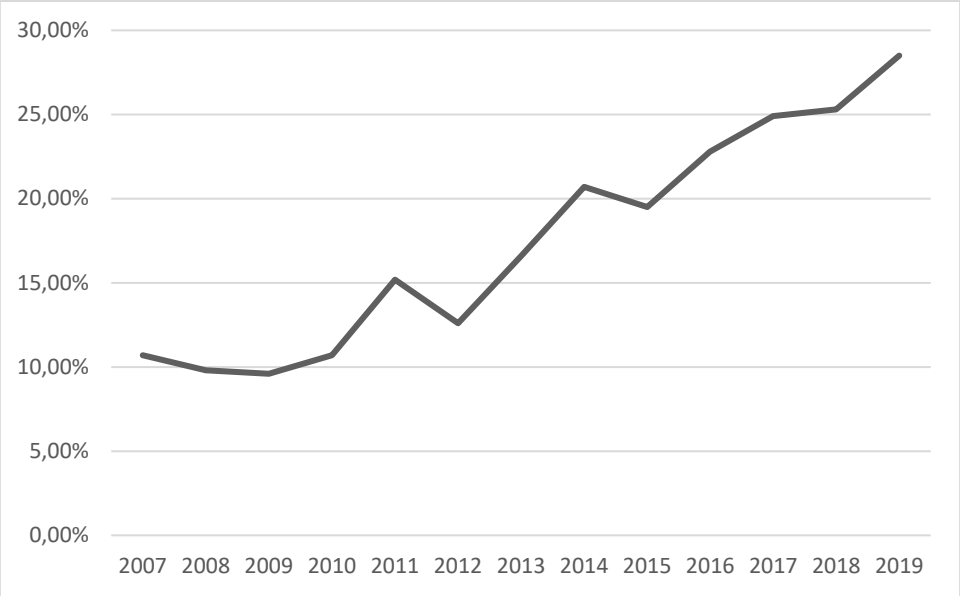
Source: BCE

Trade Balance of Ecuador

Prepared by: Miriam Maldonado

***Figure 8***

*Percentage participation of shrimp in non-oil products in the period 2007- 2019*




Source: BCE

Trade Balance of Ecuador

Prepared by: Miriam Maldonado

Regarding the percentage share of non-oil products, in 2007 shrimp recorded a contribution of 10.7%, for the following years there was a constant growth, and in 2013 it reached a share of 16.6%, the next years continued to rise, so that in 2018 a contribution of 25.3% was appreciated (BCE, 2021b). This shows a significant growth of around 15 points in a decade.

### 3.5 Ecuador's trade balance

The trade balance records the difference between exports and imports of goods made by a country in a given period (Santander, 2021). A trade balance surplus indicates that the country has had a greater number of exports than imports, thus, more income than expenditure (Santander, 2021). Conversely, if purchases abroad exceed sales abroad, it is a trade deficit (Santander, 2021). On the other hand, if the result of the trade balance is zero, it is a balance (Santander, 2021).

Ecuador's trade balance includes exports and imports. Exports are subdivided into oil products based on the production of oil and its derivatives, and non-oil products are subdivided into traditional products (bananas, shrimp, cocoa, coffee, tuna and fish) and non-traditional products (natural flowers, canned fish, vehicles, fruit juices and preserves, and metal manufacturing) (Ordoñez, 2012). Imports are based on raw

materials, fuels and lubricants, consumer goods, and capital goods, among others (Ordoñez, 2012).

The trade balance is projected annually through the Central Bank of Ecuador (BCE). The BCE's mission is to promote economic growth through proper financial management to maintain currency stability and control inflation (ECB, 2021a). It also manages the payment system, seeks to generate confidence among economic agents about the monetary value, has mechanisms for immediate action based on credit, monetary and financial policies, and manages public sector resources, destined for investment in the different productive and economic sectors (ECB, 2021a).

Below are data extracted from the Central Bank of Ecuador, of Ecuador's trade balance between the years 2007 and 2018:

***Table 8***

*Trade Balance of Ecuador in FOB Values in thousands of dollars between the years 2007- 2019:*

| | **2007** | **2008** | **2009** | **2010** |
|---|---|---|---|---|
| Total Exports | 14,321 | 18,510 | 13,762 | 17,489 |
| Oil Exports | 8,328 | 11,672 | 6,964 | 9,673 |
| Non Oil Exports | 5,992 | 6,837 | 6,797 | 7,816 |
| Total Imports | 12,907 | 17,600 | 14,094 | 19,468 |
| **Total Trade Balance** | 1,414 | 909 | -332 | -1,978 |

| | **2011** | **2012** | **2013** |
|---|---|---|---|
| Total Exports | 22,322 | 23,898 | 24,750 |
| Oil Exports | 12,944 | 13,791 | 14,107 |
| Non Oil Exports | 9,377 | 10,106 | 10,643 |

| | | | |
|---|---|---|---|
| Total Imports | 23,009 | 24,041 | 25,825 |
| **Total Trade Balance** | -687 | -142 | -1,075 |

| | **2014** | **2015** | **2016** |
|---|---|---|---|
| Total Exports | 25,724 | 18,330 | 16,797 |
| Oil Exports | 13,275 | 6,660 | 5,459 |
| Non Oil Exports | 12,448 | 11,670 | 11,338 |
| Total Imports | 26,447 | 20,460 | 15,550 |
| **Total Trade Balance** | -723 | -2,129 | 1,247 |

| | **2017** | **2018** | **2019** |
|---|---|---|---|
| Total Exports | 19,122 | 21,605 | 22,328 |
| Oil Exports | 6,913 | 8,801 | 8,679 |
| Non Oil Exports | 12,208 | 12,804 | 13,649 |
| Total Imports | 19,033 | 22,120 | 21,474 |
| **Total Trade Balance** | 89 | -514 | 854 |

Source: BCE

Trade Balance of Ecuador

https://contenido.bce.fin.ec/documentos/Estadisticas/SectorExterno/BalanzaPagos/balanzaComercial/ebc200712.pdf

Prepared by: Miriam Maldonado

As we can observe in the table above, in terms of exports, between the years 2007 to 2014, exports for oil and non-oil products have experienced an increase of

around 9 million. However, since 2015, a significant recession of 7 million is observed. However, between 2015 and 2019, exports grew by around 4 million.

In terms of imports, from 2007 to 2014, a growth of around 14 million is analyzed. Subsequently, for the year 2019, imports decrease by 5 million. Since the value of imports is higher than exports, in certain years there are deficits in the total trade balance.

### 3.5.1 Gross Domestic Product (GDP)

Gross Domestic Product (GDP) corresponds to the value of total wealth generated among goods and services of a country generally within a period of time (quarterly or annually) (Sanchez et al., 2019). GDP is a quantitative monetary indicator that shows the contraction or expansion of the economy according to the level of production and sales.

There are two types of GDP, nominal and real. Nominal GDP reflects the output of final goods and services produced in a country in a defined period of time (Economists, 2019). While real GDP shows the value of final production at constant prices, thus, real GDP analyzes the prices of a year and compares the production of a given country at different times, without taking into account price changes over time (Economists, 2019).

The measurement of GDP is the result of the sum of the final values of consumption, investment, public spending, and exports minus imports. The analysis of the total value of GDP allows a State to implement economic policies aimed at improving its productivity and reducing public spending in order to regulate the economy in the short and medium term, if the economy is in a state of recession (Segura & Segura, 2017).

In Ecuador, certain sectors have greater weight and participation in the GDP, among them oil stands out, and traditional non-oil products that are contributing axes to the development of the economy. Ecuador has managed to lay its foundations as an oil producer, recognized in South America, after having reached a 4% share in total exports (Villegas, 2014). It is the world's leading banana exporter, and recognized as a producer of shrimp, natural flowers and cocoa in the world (Villegas, 2014).

The GDP growth between 2007 and 2018 is presented below:

***Table 9***

*Nominal GDP of Ecuador between the years 2007 and 2018:*

| YEAR | Millons of USD | Nominal GDP |
|---|---|---|
| 2007 | 51.008 | 2.2% |
| 2008 | 61.763 | 6.4% |
| 2009 | 62.520 | 0.6% |
| 2010 | 69.555 | 3.5% |
| 2011 | 79.277 | 7.9% |
| 2012 | 87.925 | 5.6% |
| 2013 | 95.130 | 4.9% |
| 2014 | 102.292 | 4.0% |
| 2015 | 100.177 | 0.2% |
| 2016 | 97.802 | -1.5% |
| 2017 | 100.599 | 1.42% |
| 2018 | 107.562 | 1.40% |
| 2019 | 17.921 | 0.6% |

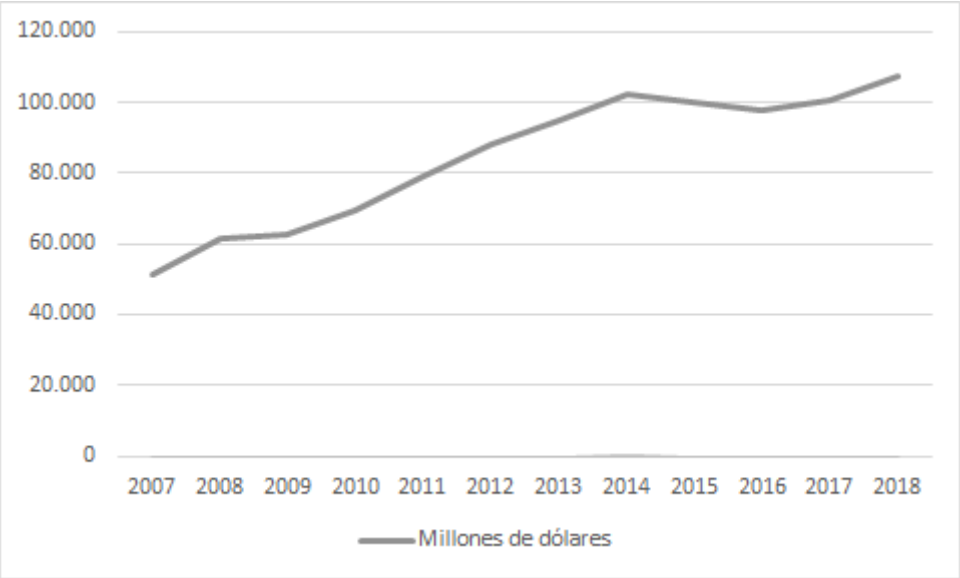
Source: ECB

Press Releases

Prepared by: Miriam Maldonado

***Figure 9***

*Nominal GDP Growth between 2007- 2018*




Source: ECB

Prepared by: Miriam Maldonado

As we can see in the table above, the country's GDP has experienced increases and decreases between 2007 and 2019. The year 2008, 2011 and 2013 are the years that have experienced the highest growth, while the year 2016 contracts the country's economy with a percentage of -1.5%, and in the year 2016 a negative value of -1.5% is observed.

**Shrimp GDP**

According to the National Finance Corporation (2017), between the year 2013 and 2016, the following values coming from the aquaculture sector, and influential in the GDP, are recorded:

***Table 10***

*Percentage participation of shrimp in Ecuador's GDP between the years 2007- 2019.*

| YAER | GDP Participation |
|---|---|
| 2007 | 0.50% |
| 2008 | 0.55% |
| 2009 | 0.51% |

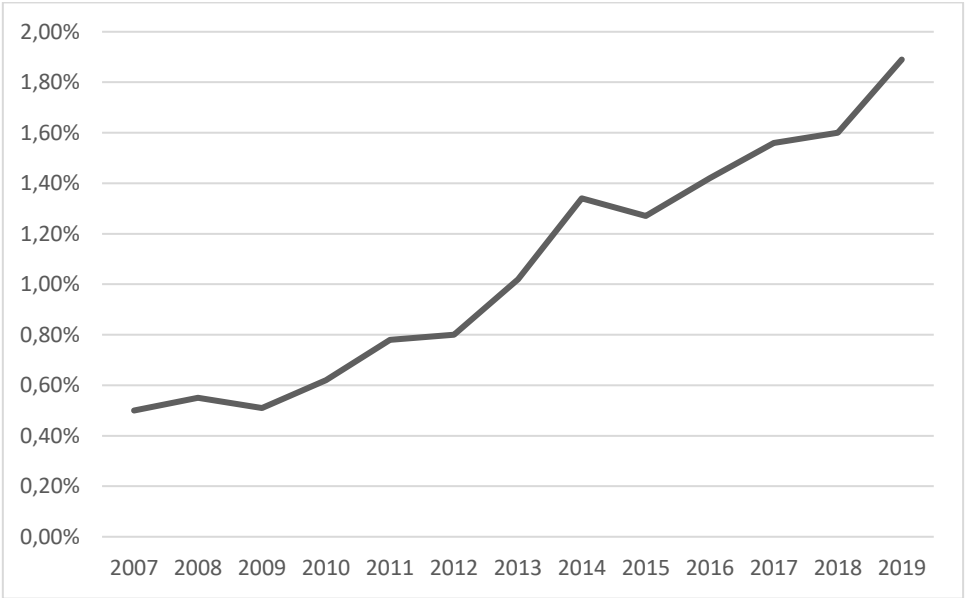
| | |
|---|---|
| 2010 | 0.62% |
| 2011 | 0.78% |
| 2012 | 0.80% |
| 2013 | 1.02% |
| 2014 | 1.34% |
| 2015 | 1.27% |
| 2016 | 1.42% |
| 2017 | 1.56% |
| 2018 | 1.60% |
| 2019 | 1.89% |

Source: ECB

Prepared by: Miriam Maldonado

***Figure 10***

*Percentage participation of shrimp in Ecuador's GDP (2007-2019).*




Source: Central Bank of Ecuador

According to the projected table, it can be observed that the participation of the shrimp sector in the GDP has experienced a notorious growth in recent years. Between 2013 and 2014, the sector underwent a considerable increase and for the following years these values have been growing. It can be observed that in 2019, the sector's share reaches 1.89%, the highest in comparison with the other years.

### 3.5.2 Inflation

Inflation is an economic phenomenon, determined by the generalized increase in the prices of goods and services that usually takes place over a prolonged period of time and has a negative influence on all sectors of the economy (Erraez, 2005). Inflation measures the percentage variation of the consumer price index (CPI), which measures the changes and alterations in the average prices of goods and services, and thus analyzes the level of impact on consumers' income due to price increases (Erraez, 2005).

Inflation tends to lower the standard of living by reducing the purchasing power of the economy (El Economista, 2021). In other words, the higher the inflation rate, the lower the amount of goods that can be purchased with a nominal income or a defined amount of money.

Below are the inflation percentages that Ecuador has experienced between 2007 and 2019:

***Table 11***

*Annual Inflation in Ecuador between 2007 and 2019:*

| YEAR | % INFLATION |
|---|---|
| 2007 | 3.32% |
| 2008 | 8.83% |
| 2009 | 4.31% |
| 2010 | 3.33% |

| | |
|---|---|
| 2011 | 3.33% |
| 2012 | 4.16% |
| 2013 | 2.70% |
| 2014 | 3.67% |
| 2015 | 3.38% |
| 2016 | 1.12% |
| 2017 | -0.20% |
| 2018 | 0.27% |
| 2019 | 0.07% |

Source: ECB

https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Notas/Inflacion/inf200712.pdf

Prepared by: Miriam Maldonado

Inflation has experienced constant movements in this period, the year that stands out the most with a high percentage of inflation is 2008, followed by 2009, then 2012. And 2016, 2017, and 2018 are the years with the highest inflation recession.

### 3.5.3 Investment in the Ecuadorian shrimp sector

**Animal feed industry**

In 2018, the U.S. firm Cargill, with a foreign investment of US$65 million, inaugurated a plant dedicated to the marketing and sale of balanced feed for shrimp. Cargill is projected to produce 165,000 tons of feed, a figure that represents 25% of the 600,000 tons of shrimp produced annually (S. Reyes, 2017). The feed plant has a high technological potential that guarantees to provide producers with quality feed that ensures the healthy growth of the crustacean. Also, this plant has a training center where knowledge of nutrition and it's related to aquaculture activity is taught (S. Reyes, 2017).

For its part, Ecuador has given powers to the food company such as: exemption from the payment of income tax, import of machinery free of tariffs, the entry of foreign

trained personnel and subsidies on electricity (S. Reyes, 2017). That is to say; it is an investment that brings with it profitable products for crustacean farming, transmission of foreign knowledge for the improvement of the sector, implementation of technological and innovative machinery, as well as the generation of jobs.

**Shrimp Post larvae Laboratory**

Hendrix Genetics, Nutreco and Ecuacultivos, have partnered to invest in a quality Pacific white shrimp postlarvae laboratory industry based on genetics, advanced breeding technology and nutritional solutions (CNA, 2019). To this end, companies will seek to invest in innovative production machinery and import services of personnel trained in genetics, nutritional technology, world-class production with the objective of creating strategic alliances and increasing the competitiveness of the Ecuadorian shrimp sector vis-à-vis the world (CNA, 2019). Likewise, through nutritional and genetic knowledge, the company has projected to enter the Ecuadorian shrimp as an animal resistant to diseases, free of antibiotics and with better growth (CNA, 2019).

## SECTION IV

### 4. Competitiveness concepts

#### 4.1 Competitiveness

In a globalized world, where social needs are constantly emerging, countries, enterprises and companies are committed to seek strategies to stay within the international market and deliver superior value to their buyers compared to other suppliers. Competition involves a series of efforts and is directly linked to the adoption of comparative, competitive and absolute advantages that contribute to the encompassing of demand, and positioning as the most efficient and satisfactory offer.

Professor Michael Porter, a great thinker in the world of management and competitiveness, considers that competitiveness is the capacity to increase the productive processes of a sector to increase its participation in world industry (Suñol, 2006). Porter alludes to the human factor as a key axis of the competitiveness of the sectors, that is to say; the human being through capacity, strategies and techniques has the power to increase the levels of productivity, which is a determining factor of the level of competitiveness of a sector, generator of profits, salaries, and other benefits attributable to the owners (Suñol, 2006).

According to the author John M. Ivancevich, competitiveness is deeply linked to quality, which is the value created to satisfy implicit consumer needs and offer improved options (Labarca, 2007). Ivancevich mentions that when a sector sets itself the objective of being competitive, it looks for improvement techniques in the creation of its products, with respect to those of its competitors (Labarca, 2007). Also, the author refers to another factor developing competitiveness as national competitiveness, he mentions that a nation is competitive when it has the capacity to produce goods and services overcoming the obstacles and conditions of the free and fair market (Labarca, 2007).

On the other hand, Berumen, argues that competitiveness is divided into two determining variables: prices and costs, and product quality (Ruiz, 2014). In terms of prices and costs, a sector that offers lower prices than its competitors and at the same time its costs are low, is said to be a competitive sector compared to the others (Ruiz, 2014). In terms of product quality, it is directly linked to innovation, implementation of equipment and machinery, training and specialization of its workers (Ruiz, 2014).

According to the concepts analyzed above, we can define competitiveness as a set of processes, strategies and skills used by a sector to position itself in the world market as one of the preferred options for the customer. Thus, through product or service quality, low costs and prices, and increased productivity, a sector can design offers that adapt to the needs and requirements of buyers.

To determine the degree of competitiveness of a sector, it is important to analyze the competitive factors and their conditioning variables in order to visualize a concrete panorama of the current situation of the shrimp sector, and thus outline strategies that contribute to increasing the industry's competitiveness in the international market. Taking into account the competitive position of the sector, it would be possible to identify the problems and disadvantages that threaten the sector's participation, and to design strategies aimed at addressing the comparative and competitive advantages to better enter the world market.

Porter makes a competitive analysis of certain factors that accompany competition:

### 4.2 Competition and strategy

Competition is in constant movement and changes that seek to improve and adapt to customer needs. Thus, companies are constantly searching for strategies to enter the market, gain competitive advantages and adopt distinctive skills that allow them to gain diversification in the face of other competitive parts (Porter, 2009).

To apply competitiveness strategies, companies usually use tools such as Porter's diamond and the five forces, which allow analyzing possible techniques that contribute to the improvement of the administrative, logistic and operational management of the industry to obtain competitive advantages in favor of the sector and strengthen its participation in the world market (Porter, 2009).

### 4.3 Porter's Diamond

For the analysis of the degree of competitiveness of some industries in relation to others. By means of the diamond, the variables that influence the development of the sector can be made visible and, through evaluation, generate competitive advantage. Porter's Diamond is defined by five conditioning factors such as: factor conditions, demand conditions, related and support industries, company strategy, structure and

rivalry and governmental events, which Porter considers to be the generators of competitive advantage (Culqui & Suárez, 2019).

Factor conditions: These are all those tangible and intangible resources that a country possesses to become competitive against others, the tangible ones are usually: climate, location, natural wealth, and labor, while the intangible ones are the capabilities, knowledge, skills, and human efforts, which together are optimal for the creation of a product (Culqui & Suárez, 2019).

Demand conditions: It studies the conditioning factors established by the demand such as: satisfaction, market size, and consumer demands (Culqui & Suárez, 2019). When the customer demands a product with high quality standards, sectors are forced to improve their resources such as technology, machinery and equipment to deliver a product that meets the customer's expectations and thus be the one selected before the competition (Culqui & Suárez, 2019).

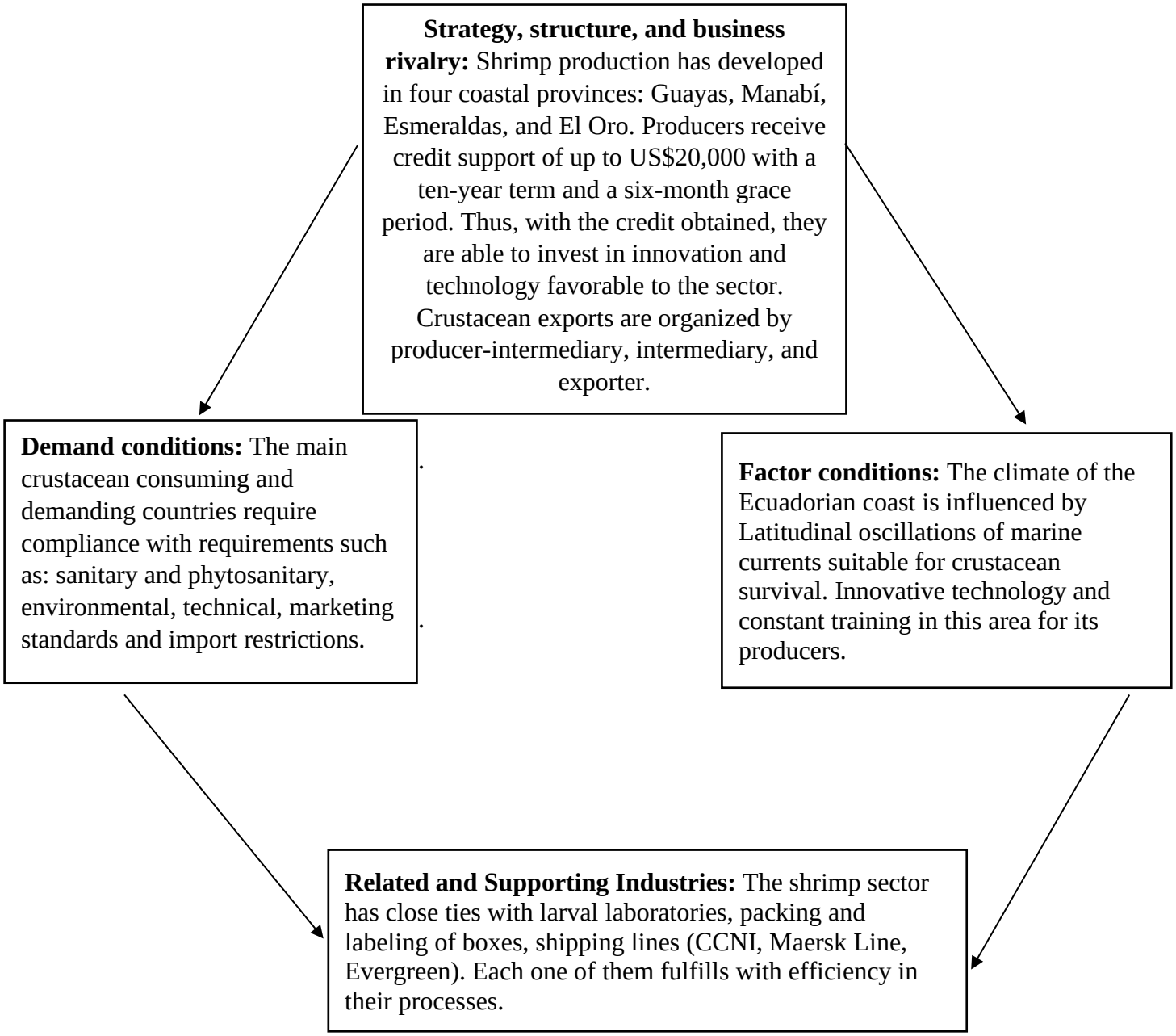
Related and support industries: Porter mentions that when several sectors are located in the same area, these generate a high level of competitiveness, since they are offering the same product associated with the same axes of innovation and productivity (Culqui & Suárez, 2019). For this, the role of the supplier should be embedded in delivering methodology and quality in its resources so that its customers can deliver products to improve within the same range (Culqui & Suarez, 2019).

Company strategy, structure and rivalry: This refers to the state of the sector, its organization, structure, administration and control, in order to make decisions, manage its policies and exercise in the production and efficiency of its goods and services offered (Culqui & Suárez, 2019).

Figure 11 below describes the diamond relating to Ecuador's shrimp sector:

***Figure 11***

*Porter's Diamond of the Ecuadorian shrimp sector*




Prepared by: Miriam Maldonado

In his book Competitive Strategy Techniques for Analyzing Industries and Competitors, Porter describes five forces that compete with each other to obtain the largest share within the industry.

**4.4 Porter's five forces:**

Porter's five forces support a strategic and systematic position that allows analyzing the level of feasibility of an economic sector, and whose purpose is to examine the value of the market, its future projection and business rivals working in that

sector (Then et al., 2014). In such a way that the threat of new entrants, substitute products, the power of suppliers, the power of customers, and competitive rivalry are influencing axes of profitability, and should be worked in an evaluative way to take into account the weaknesses that a sector may have in order to develop strategies, ideas, and business solutions that allow it to remain within the competitive core.

The following is a description of each of them:

Threat of new entrants: When a certain sector has a high level of value, it is attractive to new competitors seeking to obtain the same or higher level of profits than the sectors that are already established in the market. (Porter, 2015), recommends that, in order to prevent the entry of new competitors, entry barriers must be implemented, which turn out to be obstacles that new competitors must overcome. It is worth mentioning that, as long as there are numerous entry barriers, it will be more difficult for competitors to enter the market, whereas, if there are few barriers, there will be a greater number of competitors (Porter, 2015).

Substitute products: They are a form of rivalry, since they can be substituted by the consumer when their variables such as price, quality, design, among others, are more acceptable to the customer (Porter, 2015). Substitute products have a great influence on the markets they serve, for two reasons: first, they impose a price ceiling on the industry's products (Porter, 2015). In other words, since there is a variety of products with which one can be replaced by another, the sectors do not have a great opportunity to increase their prices, since, upon noticing this difference, the consumer could start buying the products that are cheaper (Porter, 2015).

Secondly, substitute products force the sectors previously established in the market to have greater differentiation in the creation of their products by having a more complex product creation process, it would be more difficult for them to imitate these processes to the other sectors (Porter, 2015).

The consumer: Porter analyzes the consumer to design the strategy based on three important axes: differentiation, cost leadership and focus on niches or segments (Porter, 2015). Regarding differentiation, (Porter, 2015), mentions that underserved segments should be analyzed according to their tastes and preferences to create a product with new properties that allow it to stand out from the competition. Also, (Porter, 2015) emphasizes cost leadership as when an industry offers a product with

several attributes and features that make it expensive, but to place it within a price that the customer is willing to pay, some determinants of the high price should be overridden.

It is important for an industry to analyze the position of its competitive front, its strategies, movements before situations, decision making, capabilities, implementation of improvements, its weaknesses, threats, among others (Porter, 2015). In that way, by knowing its competitors in depth, the sector can implement improved strategies and techniques compared to the competition, which are inclined to the consumer's preference. To do so, it is important to know the consumer, and four aspects should be taken into account: purchasing needs according to the sector's capacity, potential growth, structural position (business power), and cost of service (Porter, 2015). With this, the industry can divide the different segments and types of consumers that exist in order to be able to adapt a product and service to the corresponding one (Porter, 2015).

Suppliers: They are usually part of the value created by the industry, and therefore there must be an adequate management of purchasing policies that allow compliance of the parties to the transactions (Porter, 2015). It is important for a sector to select suppliers that meet its needs in the creation of products and analyze their prices in order to choose the most cost-effective one (Porter, 2015). However, it should be taken into account that, when demanding low prices from the supplier, the level of quality of the inputs that are relative to the prices should be analyzed (Porter, 2015). That is, when companies prefer to buy low-priced materials to reduce costs and increase profits, it usually happens that the product does not obtain an efficient result and therefore does not receive a high degree of acceptance by the consumer (Porter, 2015).

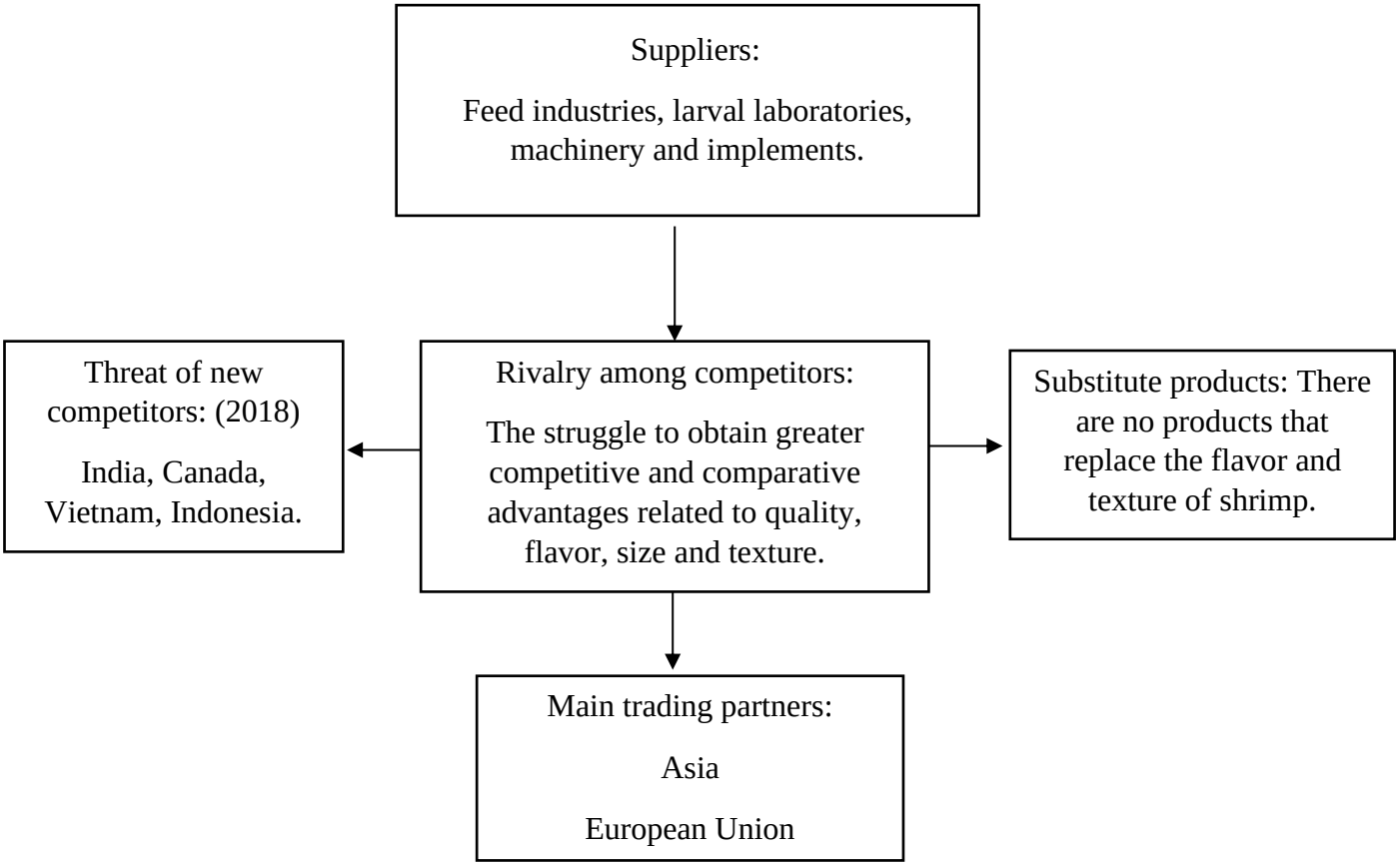
Rivalry among competitors: Within industrial competition, rivalry among companies is directly related to prices, advertising, introduction of new products, and improved services (Porter, 2015). In order to stand out within the market, industrial sectors often constantly push competitive techniques or strategies to offer improved options to demand compared to the other sectors (Porter, 2015). Likewise, other sectors often introduce new methods to counteract the technique used by their competitors, and thus a chain of strategic moves by countries and their sectors to become the consumer's preferred option constantly emerges (Porter, 2015).

Additionally, when a country has a competitive advantage and it is in a superior position to compete and production and investment costs are lower than those of its competitors, the price of the final product is also lower compared to the price offered by other countries, since their costs are usually higher (Porter, 2015).

Below is an example of Porter's five forces related to the Ecuadorian shrimp sector:

***Figure 12***

*Porter's Forces for the Ecuadorian shrimp industry:*




Prepared by: Miriam Maldonado

**4.5 Competitiveness of locations**

The geographic location of countries could influence competitive advantage, given that the conditioning factors for the development of a product could be easy to achieve in one country and more complex for another (Porter, 2009). Thus, when competing from different locations, companies seek to aggregate economic development policies that allow them to keep up with their competition (Porter, 2009). Also, the improvement in the production chain could cross borders, where countries

outsource and extract advanced technologies and high technical performance to achieve high levels of productivity, adding that globalization has taught us that it is no longer so important where a product is being manufactured but how it is being made (Porter, 2009).

A strategic procedure to increase productivity is consolidated in the value chain, when the company decides to improve its logistics chain in product development, packaging, design and quality, infrastructure, among others (Porter, 2009). Technological innovation in the 21st century is a strong axis of diversification that brings improvements in the value chain and, together with the strategy, allows offering the market a variety of products and quality at low costs (Porter, 2009). And in the end, the fact that a company offers the same product, but the production of that product has meant lower costs than its competitors, is what positions that company as competitive (Porter, 2009).

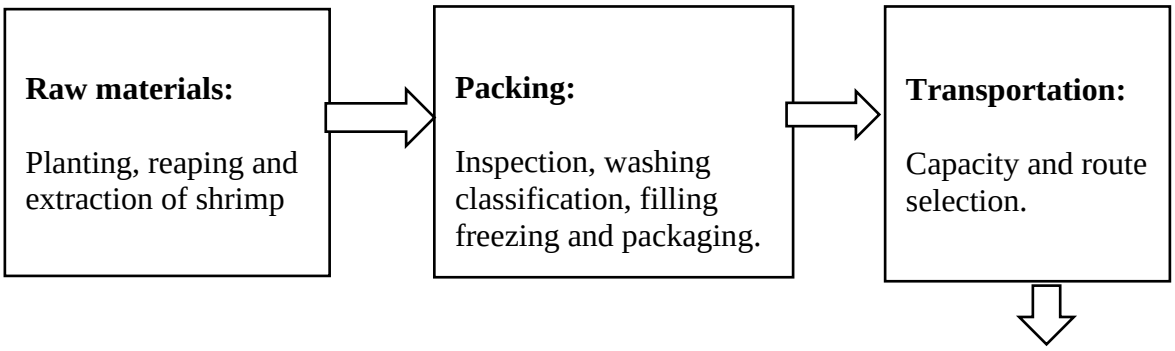
### 4.6 The value chain

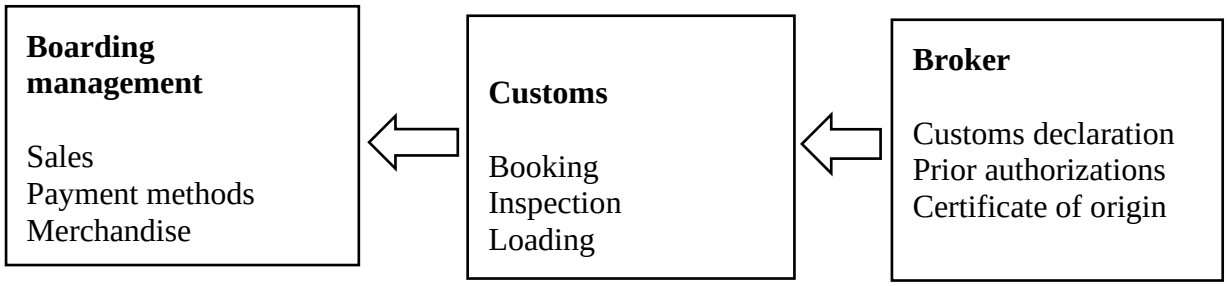
It is a process and organization where different activities that create value for customers are determined. It is an appropriate way to know the costs in the creation of products through each step, as well as to increase improvements in the techno-economic efficiency of certain industrial sectors (Quintero & Sanchez, 2006). The value chain provides a coherent vision of the level and positioning of the sectors within the competitive framework, and in turn allows value to be added in order to scale in the face of the thread of the most competitive sectors.

The following is an example of a value chain in Ecuadorian shrimp production:

***Figure 13***

*Shrimp production value chain*






Source: Paúl Fabre
https://repositorio.pucese.edu.ec/bitstream/123456789/146/1/FABRE%20GONZALEZ%20PAUL.pdf

Prepared by: Miriam Maldonado

The process of the value chain in the Ecuadorian shrimp sector begins with the larvae planting, the first step that the producer performs is to place the larvae in small pools for their maturation process, later, these are taken to larger pools where they adopt more considerable sizes for commercialization (Fabre, 2014). Then, when the crustacean adopts that size, harvesting is carried out, usually at night, since, at that time, the weather is usually cool and thus, the crustacean does not lose its properties at the time of transferring it from the cold chamber pools to the inspection and freezing area (Fabre, 2014).

In the inspection area, the state of the crustacean is analyzed and the packaging and labeling process is approved. Once the product has been approved by the sanitary inspection processes, it proceeds to packaging and labeling where information is issued to the consumer about the product and its good sanitary conditions are guaranteed (Fabre, 2014).

Subsequently, the routing process is carried out. For the international mobilization of the product, refrigerated containers are chosen to keep the shrimp in good condition (Fabre, 2014). Afterwards, the customs processes are handled and the documents required by customs are: the commercial invoice, the previous documentation and the customs declaration (Fabre, 2014).

Once the exporter has complied with all the documents required by customs, he proceeds to shipment. Shipment is the action of taking the goods from the dock to the port where the product will be moved to its final destination (Fabre, 2014).

Then, when the product has arrived at its destination, it is delivered to the broker, who is in charge of receiving the product and the nationalization and commercialization documents (Fabre, 2014). By this time, the importer and exporter should have agreed on the payment terms. In general, the payment methods depend on the conditions imposed by the importer, who will look for options that guarantee the lowest commercial risk; among the best known payment methods are: prepayment, down payment, open account, and letters of credit (Fabre, 2014).

Pre-payment is when the importer pays in advance for the merchandise, before it arrives at the port. The entry payment refers to a fraction of money paid by the importer as a guarantee basis to the exporter, these can be in open account and letters of credit (Fabre, 2014). Regarding open account, this occurs when the importer receives the merchandise and agrees with the exporter to pay for it at a defined time in the future (Fabre, 2014). In turn, letters of credit are those when the importing bank guarantees the exporter that payment will be made as soon as the product complies with the conditions agreed in the letter of credit (Fabre, 2014).

### 4.7 Competitive and comparative advantages

To make a product competitive, a country must analyze the entire production process to be followed, carry out an adequate control of resources, train in specific areas, strengthen its weak points, increase productivity through the implementation of machinery or technology and adapt relevant characteristics to the product (quality, flavor, size) that will allow the product to be relevant to the competition.

In the publication Science and Society, presented by (Suñol, 2006), the author affirms that the design and elaboration of elaborate and sectorial policies by the government are the main axes to achieve competitiveness capacity. On the other hand, technological and research policies allow strengthening knowledge in technology and with it the implementation of modern machinery, credit policies allow entrepreneurs to obtain capital allocated to the investment of resources, education policies allow increasing trained professionals, and the policy of distributive equity contributes to the growth of the local market (Suñol, 2006).

### 4.8 Absolute advantages

For Adam Smith, absolute advantages allow exchanges of goods and services between countries. This is because if a country can produce a good at low costs and has greater capacity and specialization, it could sell it to another country that does not have these characteristics to create the product (Melera, 2011). On the other hand, the buyer country can also become a seller if it produces another good for which it is better qualified and has sufficient resources. Thus, if countries were to specialize in the fields in which they usually develop best, production in the world would rise, and with this, all countries would gain and benefit from each other (Melera, 2011).

### 4.9 Competitive strategies

The growing supply of products in such a globalized and structured market requires competitive companies to implement a plan of strategies aimed at improving their internal environment and then modify and adapt to the external sector.

In Ecuador, the shrimp sector has undergone several changes over the years. Due to the sanitary crisis caused by the white spot virus that the industry faced in the 1990s, the sector was forced to consider competitive strategies that consisted of implementing quality and sanitary management policies, logistics, environmental policies, rectifications in farming and feeding systems, improved infrastructure and biosafety (Moncada et al., 2020). The implementation of these factors has allowed Ecuadorian shrimp to excel in the international market and maintain its position as one of the best shrimps compared to its competitors.

(Moncada et al., 2020) state that, in 2018, the National Chamber of Aquaculture promoted the Sustainable Shrimp Partnership (SSP) certification where the health of antibiotic and chemical-free shrimp was demonstrated, qualities that differentiate Ecuadorian shrimp from other international offers and allow for greater international costumers.

## SECTION V

# 5. Shrimp competitiveness

## 5.1 Current state of shrimp competitiveness in Ecuador

The Ecuadorian shrimp sector has become the second largest contributor to the country's economic growth. It should be remembered that aquaculture activity began in 1968, when the producers did not know anything about the subject and used rudimentary techniques using improvised pools. However, in the following years, the sector implemented improvements in the production process, innovated machinery, extended the hectares of land for greater larvae cultivation and invested in inputs.

The extension of hectares dedicated to larval farming has been growing progressively, thus, in 1987, Ecuador had 117,000 hectares, by 1995, these were extended to 178,000 hectares, then in 2016 there were already 213,000 hectares, later, in 2018, the country already had 215,421 hectares for production (Saltos, 2020).

It can be mentioned that the success and growth of the aquaculture sector in Ecuador is largely due to its significant increase in productivity. As mentioned by Porter, the level of competitiveness of a sector is measured through its productive capacity. However, we must take into account that along with productivity there are other factors such as quality, taste, costs, price and sales potential.

Other relevant factors in the development of the sector are the mild climate of the Ecuadorian coasts, ideal for the survival of crustaceans. Also, this achievement is attributed to greater attention by private companies in the entry of cutting-edge technology and innovation, as well as implements that provide greater attention to crustaceans in the face of the threat of viruses and diseases that crustaceans are prone to contract.

That is why, thanks to the powers that have increased the shrimp sector, in 2019, the export of crustaceans reached a record of production and significant sales. In that year, around 1291 million pounds representing 3375 million dollars were sold, which meant a 27% increase in production compared to the previous year (El Comercio, 2020).

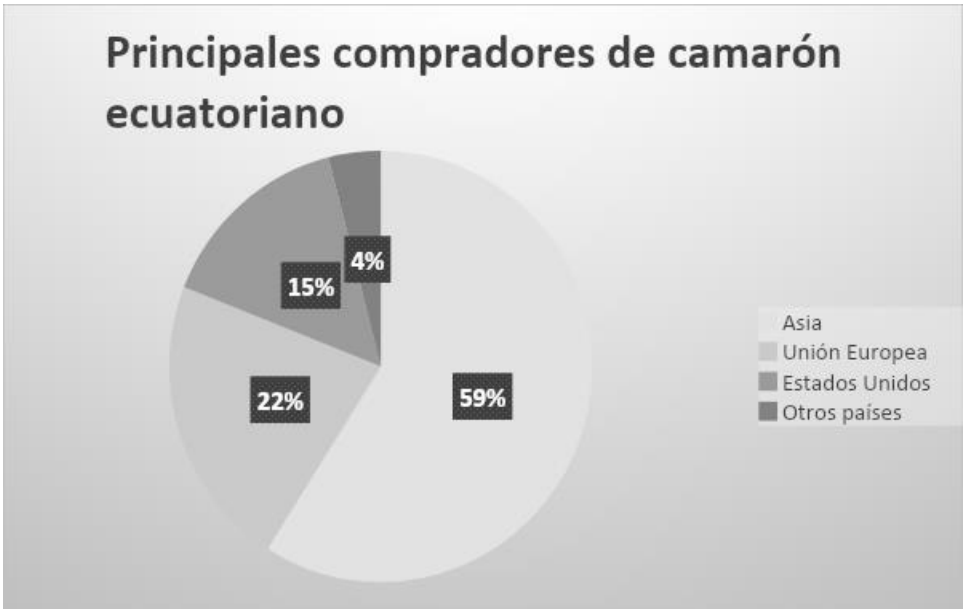
In the same period, the shrimp sector provided 48,624 jobs, of which 20% represented Agriculture, Livestock, Forestry and Fishing, and 10% the manufacture of

food products, and together accounted for 3% of total employment in the country (CFN, 2020).

Also, sales were distributed to 56 different countries, of which the main buying countries were Asian, representing 59% of participation, followed by the European Union with 22%, the United States with 15%, and other countries with 4% (Saltos, 2020).

***Figure 14***

*Main buyers of Ecuadorian shrimp*




Source: Jorge Saltos file:///C:/Users/HP/Desktop/Saltos%202020.pdf

Prepared by: Miriam Maldonado

Between January and May 2019, the main shrimp importing countries were: China with a share of 42%, Vietnam with 22%, United States with 13%, Spain with 5%, France represents 4%, and the other countries have a share of 14% (El Comercio, 2019).

## 5.2 Shrimp competitiveness variables in Ecuador.

The growth and strengthening of the Ecuadorian shrimp sector in recent years is due to a series of factors involving the farming, production and marketing of the crustacean. Among them, the following could be considered:

### 5.2.1 Geographical location.

The Ecuadorian coasts have a tropical and fairly uniform climate, perfect conditions for crustacean survival. Most of the companies dedicated to shrimp production are concentrated in the province of Guayas, while the others are scattered in the provinces of Manabí, Esmeraldas and El Oro (Chavéz & Herrera, 2000). It should be noted that climate is one of the conditioning factors with the greatest potential for the supply of this product, since shrimp is a poikilothermic marine animal, and its body temperature reacts to the environmental temperature, and it can survive up to 29.16ºC (Animapedia, 2018).

### 5.2.2 Production costs

The general costs of shrimp production are divided into: input materials, labor, and indirect operating costs.

Within the materials-inputs are concentrated in feed, chemicals, and seeds. It is worth mentioning that, in 2017, Skretting and Cargill companies executed an investment plan of around US$115 million to increase their productivity levels, in line with the increase in crustacean exports experienced by the country in that period (El Comercio, 2017).

Regarding labor, this refers to the physical-human effort in the creation of the product through their skills and knowledge. Constantly, producers receive talks and training by technicians from the Undersecretariat of Aquaculture with the objective of providing preventive information about viruses and diseases that attack crustaceans. (Ministerio de Agricultura y Ganadería, 2021b).

With respect to indirect operating costs, these are distributed into indirect labor costs, basic services, fuel, tools, salaries, and maintenance costs. The country's shrimp sector invested between 500 and 1000 million for electrification and equipment that would contribute to aeration processes, automatic feeding, fuel-powered machinery, and pumping (El Telégrafo, 2018). This investment plan, undoubtedly, means the significant growth of productivity, so currently, 2000 hectares are working based on the mentioned electricity project, and another 4500 are on the way (El Telégrafo, 2018).

#### *5.2.3 Technology and innovation:*

The experience gained by Ecuador in the 1990s, when Ecuadorian shrimp suffered the contraction of various viruses that brought great economic losses, was a scenario

that allowed the country to increase innovation, technology and machinery to prevent future diseases and have greater control over shrimp growth.

For this reason, the National Fisheries Institute carries out periodic inspections of crustaceans in the Aquaculture Products Testing Laboratory, a laboratory in South America that has the IQ REAL TM AHPND/EMS Toxin 1 kit, an innovative technology that has detection mechanisms for Early Mortality Syndrome, which is used to prevent the spread of this virus (Ministry of Agriculture and Livestock, 2021a).

Ecuadorian producers prefer to invest in innovation to reduce costs in the production chain. (Publicayo, 2021) reports that in Ecuador the idea of integrating a hydrophone has emerged, whose software is computerized to notify feeding times, if previously food was served to the crustacean up to three times a day, the device will notify the producer of the next feeding time that can be from 100 to 200 times in determined quantities. Ecuadorian producers continue to incorporate innovative technology to reduce risks and costs in the production phase.

With respect to the water monitoring system, the cultivation systems mostly used in Ecuador are extensive and semi-extensive and their water quality control tool is through the conversion of nitrogen waste into bacterial protein biomass that allows constant suspension and low turbidity in the wastewater (Figueroa, 2021). Additionally, an external source of carbon is used, which allows viable management to maintain water quality and guarantee safety and protection in crustacean farming (Figueroa, 2021).

## SECTION VI

### 6. Competition Index

The World Economic Forum (WEF) is an international organization that emerged with the objective of fostering public-private cooperation in the world to bring companies, political, economic and business leaders to global and industrial agendas (Government of Mexico, 2021). Thus, every year, the most influential heads of state, businessmen and personalities in the world meet to analyze and study future trends and strategies in the field of economy, society and politics (Duke, 2012).

Within the WEF, the factors that contribute to the rise of productivity in the economic sectors of the countries are analyzed, thereby examining the Global Competitiveness

Index, which measures the macro and microeconomic indicators of a sector to examine its level of competition with respect to others (SNCI, 2021).

Within the years 2009 and 2019, Ecuador ranked between 100 and 70 among all countries, and ranked between ranks 12 and 18 in the Latin American region (Fedexpor, 2020).

# CHAPTER 2
# ANALYSIS OF INFORMATION ON THE SHRIMP SECTOR IN ECUADOR

## SECTION I

### 7.1 Identification and characterization of the main competitive factors of Ecuador's shrimp sector.

For the analysis of the general variables related to shrimp competitiveness, both qualitative and quantitative data were considered. For the qualitative data, variables such as the quality of port infrastructure, quality of the education system, extent of market dominance and capacity to innovate were considered. These variables are indicators that correspond to the pillars of the World Economic Forum (WEF) and, for our study, were considered as: infrastructure, education and training, efficiency of the goods market, and innovation, respectively.

Annually, the WEF issues a Global Competitiveness Index (GCI) report, which measures the level of competitiveness that a country has to develop economic opportunities for its citizens, which contribute to productivity and social progress (SNCI, 2021). The competitiveness report is a project carried out by the organization, based on research through executive opinion surveys to all participating countries in the world to measure their level of competitiveness by means of different variables to which the sequential value of ranking is assigned (ESPAE, 2020).

Given that the analysis of these factors is important to show the development and growth of a sector, it is important to study the situation of Ecuador compared to its main competitors based on the competitiveness reports issued by the WEF.

The competitiveness report is based on analyzing 12 individual pillars, which are subdivided into indicators that respond to the measure or ranking in an ascending way, that is, the first places are occupied by the countries that have a better position compared to others, methodology that is replicated in each of the variables, and the last positions are occupied by the least qualified countries. This ranking is the one considered for the analysis of the indicators from which the position of Ecuador was compared with the other countries in the shrimp sector, the objective was to contrast the differences between them and thus determine the degree of competitiveness that Ecuador had between 2007 and 2019.

With respect to quantitative variables, these were taken from the annual publications of the World Bank, from which the shrimp sector variables such as: GDP per capita, GDP ppa (current prices), inflation, metric tons exported, FOB USD exported, GDP over total exports, total exports, oil exports, and non-oil exports of each and every one of the countries studied were retrieved.

It is considered important to analyze the macroeconomic factors of the countries because by examining the economic behavior of the countries, their production level, the general behavior of prices, total income, productive resources and the goods and services offered, a comparative analysis was made regarding the economic position of the competing countries, thus achieving the proposed objective of interpreting their competitive capacity, based on the economic indexes.

## 7.2. Obtaining data corresponding to the shrimp sector in the proposed years.

### 7.2.1 Obtaining qualitative data

For the analysis of the qualitative variables, the competitiveness indicators issued by the Global Competitiveness Index (GCI) report conducted by the World Economic Forum (WEF) were used. The WEF is a partial, private, non-profit international organization founded to promote public debates concerning global issues with the participation of countries and entrepreneurs worldwide (The World Order, 2020). Global debates have been varying their topics of discussion over time, since, if 5 years ago they were talking about the economy, in recent times climate change and technology have gained ground, and the forum has even become a stage for the resolution of international disputes (The World Order, 2020).

Each year, the WEF issues a report called Global Competitiveness, which generally studies 140 countries in order to analyze general variables that are part of global competitiveness, and thereby establish the level of competitiveness of each country with respect to each pillar. The report works with the imposition of grades called ranking in an ascending way, being the lower value the one that places the countries in the best position.

The pillars considered by the WEF are:

1. Institutions

2. Infrastructure

3. Macroeconomic Environment

4. Health and Primary Education

5. Education and Training

6. Goods Market Efficiency

7. Labor Market Efficiency

8. Financial Market Development

9. Technological Readiness

10. Market Size

11. Business Sophistication

12. Innovation

Each pillar is measured by means of its productive indicators that fit within each category. For the analysis of the general variables against the level of competitiveness, the following indicators were selected:

***Table 12***

*Global Competitiveness Indicators*

| No. of pillar | Pillar | Indicator |
|---|---|---|
| 2 | Infrastructure | Quality of the port infrastructure |
| 5 | Education and training | Quality of education system |
| 6 | Efficiency of the goods market | Extent of market dominance |
| 12 | Innovation | Capacity to innovate |

Source: WEF

Prepared by: Miriam Maldonado

The justification for the selection made corresponds to the fact that each of them become factors that add value to the competitive sector, which are described as follows:

The quality of the port infrastructure, this factor adds value in competitiveness, because a well-developed port infrastructure allows to effectively connect the routes by

which the products of the local market are moved to the international market(s) (World Economic Forum (WEF), 2008). Maritime networks are also part of economic growth, this consideration is attributed to the effective and safe mobility of goods that are moved for commercialization.

The efficiency of a port system demands a series of transformations that are mainly based on technological changes in transportation systems, in order to increase international trade. Within the competitive field, the port industry has to undergo updating, incorporation of equipment and technology, specialized terminals for different types of merchandise, dock cranes, computer databases, and other elements that allow adapting to the new market demand (Doerr & Sanchez, 2006).

It is important to manage an efficient port system, since this is the means by which goods leave and enter a country, and its inefficiency could cause a series of economic and material losses. The port system indicator is part of the research, since, when talking about foreign trade, the port system plays an important role in the transport system and the logistics platform within the transport chain as well as in the value chain (UPC, 2004).

On the other hand, the quality of the education system is another crucial factor for the national economy, because, at the level of competitiveness, it acquires importance because countries must have suitable human resources that are capable of adapting to a changing social and economic environment (World Economic Forum (WEF), 2008). This indicator measures the educational capacity of the population to identify the updating of their skills and abilities over time (World Economic Forum (WEF), 2008). The quality of the education system is a complementary factor that within the global market allows producers to develop skills and capabilities that allow them to generate innovation that meets customer expectations.

Education is considered an important factor in the competitive sector because, as time evolves, new areas related to shrimp production emerge that require research and scientific experiments. For this reason, the production sector must be prepared to develop in terms of development and growth, disease prevention, quality and flavor, among others. On the contrary, if the country lacks the necessary knowledge for the production of crustaceans, it loses its level of competitiveness compared to other countries.

Another important factor considered in competitiveness is the extent of market dominance, which is characterized by the ability to sustain an appropriate combination of international supply and demand within the world market, and the capacity of a sector to produce the goods demanded by the customer (World Economic Forum (WEF), 2008).

The extension of market dominance often places the supplier under demanding conditions such as consumer orientation and sophistication, so the sector is forced to create competitive advantages through innovative and efficient ideas that allow it to stay within the competitive thread of the world market (World Economic Forum (WEF), 2008).

However, within this factor, there are often government conditions that hinder competitiveness, such as distorting taxes, restrictions, discriminatory regulations and direct investment (FDI) (World Economic Forum (WEF), 2008). The extent of market dominance is part of the study, given that it is fundamental to analyze the commercial status of countries in the market, and their capacity to sustain supply and demand in economic terms.

It is also important to add the capacity to innovate as a necessary factor in competitiveness, because, as economies approach the frontiers of knowledge, it gives the possibility of integrating external technologies (World Economic Forum (WEF), 2008). Innovation in this sense, is a complementary axis for the other indicators, infrastructure, education, and market efficiency, and this is due to the fact that each of the factors go hand in hand with technological growth, since as time evolves, economic sectors must improve their productivity by incorporating existing technologies and adapting new systems that contribute to better development in the different areas of production (World Economic Forum (WEF), 2008).

Within the innovation capacity factor, quality scientific research, research conducted by universities, industries and intellectual property protection are considered, which are key contributors to competitive advantage reflected in innovative products (World Economic Forum (WEF), 2008).

The pillars not considered in this study have an individual justification and correspond to:

The indicators of the variable called Institutions, makes mention of governments, who are responsible for designing operational regulations within the legal, political and judicial framework for the creation of wealth, which lead to the reduction of corruption, lack of transparency, fraud and mismanagement, so that, with this, ethical and honest practices by companies arise, and thus achieve the confidence of investors and consumers (World Economic Forum (WEF), 2008).

This pillar has been set aside because the research is not based on a legal and juridical analysis related to competitiveness, since the institutions in charge of creating norms in response to corruption and its derivatives are not the protagonists of productivity, since they do not participate directly in creating, designing and transporting a good to the consumer. Nor is it based on governments or companies, but rather focuses on the productive sector.

The indicators of the factor called Macroeconomics, alludes to the country's economic issues such as inflation, and mentions that companies cannot make decisions when the price increase has skyrocketed. Nor can governments provide an efficient service if they have to cancel debts and interest from previous periods (World Economic Forum (WEF), 2008). This variable has not been included in the qualitative study; rather, it has been included as part of the quantitative analysis, where the percentages and price increases of the countries at the level of the period studied are expressed quantitatively, so as to project the dynamics that emerged chronologically.

Alo, the variables of the factor, Health and Primary Education are not included because this indicator refers to health as an important factor in production, since a worker with health problems could lead to delays in the company's productivity, and adding to this, the lack of primary education can be an obstacle for the adaptation of advanced production techniques (World Economic Forum (WEF), 2008).

This pillar has not been considered as relevant within the study, since the fifth pillar, education and training, alludes to the training of the worker in operating techniques and includes safety, which projects to avoid risks and threats to the employee's health. Similarly, education tells us about the levels of study reached by the population, and with this we can visualize the capacity that workers could have to manipulate new productivity and development techniques.

Another factor not considered refers to the indicators of the labor market efficiency factor, since this refers to the incentives that companies provide to workers to ensure better performance in their various jobs (World Economic Forum (WEF), 2008). The term 'incentive' is directly related to bonuses, salary increases, and prizes that employees receive for giving all their talent to the work area, and as a benefit, producers receive a better productive performance from them (World Economic Forum (WEF), 2008).

However, these aspects are secondary within productivity, since they are directed more to the human resources area, and although it could be indirectly related to productivity, it is not a leading factor, and its absence could mean the paralysis of the labor system and production. In fact, the factors that could be more linked to the efficiency of the product within the market could be education, innovation and transportation.

The indicators of the Financial Market Development factor are also excluded, because within this variable the importance of the banking sector is exposed, which makes economic loans available to companies for investment in their productive axes (World Economic Forum (WEF), 2008). This pillar has not been considered in the research, because the analysis is not based on the financial systems and direct investments in the sectors, but rather on the capacity of a productive sector to reach high levels of sales at a global level and thus maintain investment in optimal resources dedicated to productive development.

The indicators of the Technological Readiness variable refer to the capacity of companies to manage existing technologies that contribute to the access of advanced plans and products (World Economic Forum (WEF), 2008). Instead, the Innovation pillar has been taken as a factor that encompasses resources related to the increase of competitive advantage, and among them is the technological development and implementation of new systems that allow the creation of new products, or in turn, add value to the existing product. In addition, the education variable also covers the level of citizens' ability to handle technological and information systems.

Similarly, the Market Size variable and its indicators refer to the way in which the size of the market directly affects productivity, and according to the size of the market, companies can take advantage of economies of scale, given that they can produce a

greater quantity at a lower production cost (World Economic Forum (WEF), 2008). In its place, quantitative data (metric ton and FOB in crustacean exports) were used to describe the size of the market in relation to the product and the competing countries. The quantitative analysis of the level of sales of crustaceans is done in a more specific and direct way, as opposed to the market size variable, which includes all the products in a country's market.

Finally, the indicators of the Business Sophistication variable refer to the operational quality, networks and business strategies, when companies have passed the development stage, and the means of productivity have been exhausted, they need to make use of the variability on quantity and quality to create unique and sophisticated products (World Economic Forum (WEF), 2008). The study of this variable has been discarded, since the Innovation pillar considered includes, factors related to variability and strategy designs to create an innovative product, as a strategy to extend the market.

The qualitative analysis will be analyzed between 2007 and 2018. It is important to mention that the WEF has not published data for the year 2007- 2008, so probable data were obtained by means of the linear regression method. According to (Amat, 2016), linear regression allows generating a linear model that considering the predictor or independent values are able to reveal the dependent values.

On the other hand, the WEF in the competitiveness report, since 2018, has made certain modifications in the methodology, so, certain data that were exposed in previous years are no longer collected; these changes do not greatly affect the comparative results of the two editions (WEF, 2018) However, within this qualitative research it is necessary to analyze the data of the years 2007- 2018, since they have an established order and a single methodology in terms of the twelve pillars, while, from the year 2019, a section for future research arises, since, the information of the twelve pillars has been replaced and updated.

These seven countries have been chosen, since, within the study period (2007-2019), through the Trade Map page, in the level of exports in Metric Tons and FOB, they are the countries that have experienced high levels of shrimp exports worldwide. Below are the FOB values of shrimp exports from Ecuador and the countries studied for the period 2007, 2011, 2015 and 2019:

***Table 13***

*Shrimp export in FOB in the years 2007, 2011, 2015, 2019.*

| Country | 2007 | 2011 | 2015 | 2019 |
|---|---|---|---|---|
| Argentina | 292.727 | 528.620 | 780.234 | 2.107.349 |
| Canadá | 1.590.564 | 1.917.240 | 2.432.513 | 3.090.863 |
| China | 368.070 | 1.383.052 | 1.713.508 | 1.029.957 |
| Ecuador | 601.040 | 1.176.453 | 2.287.403 | 3.901.559 |
| India | 894.319 | 1.658.664 | 3.194.185 | 4.676.921 |
| Indonesia | 992.860 | 1.161.657 | 1.355.905 | 1.428.656 |
| Tailandia | 1.295.644 | 1.785.876 | 778.753 | 991.033 |
| Vietnam | 1.440.226 | 1.745.999 | 1.805.824 | 2.107.349 |

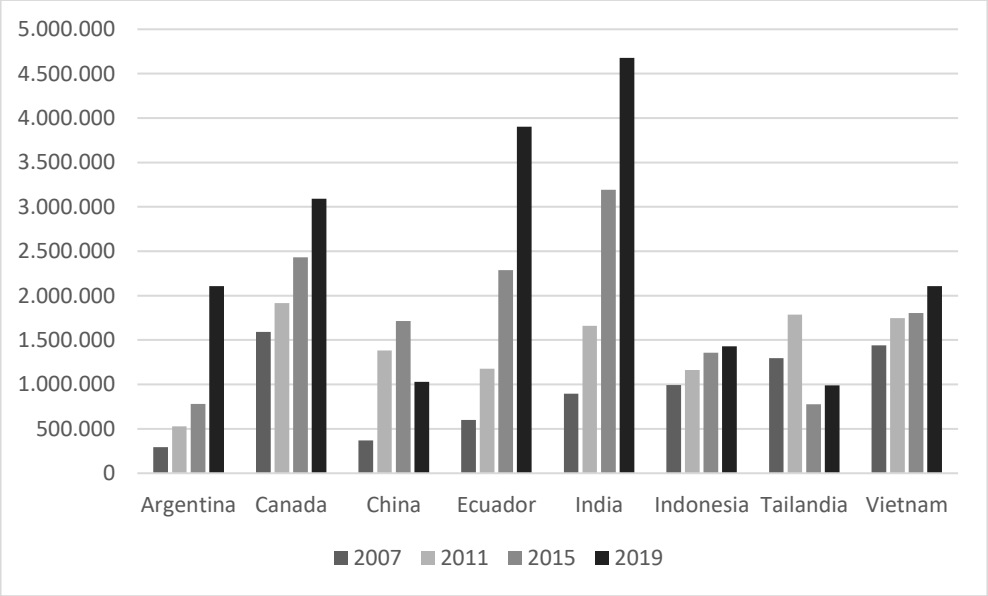
Source: Trade Map

https://www.trademap.org/Country_SelProduct_TS.aspx?nvpm=3%7c%7c%7c%7c%7c0306%7c%7c%7c4%7c1%7c1%7c2%7c2%7c1%7c2%7c1%7c1%7c1

Prepared by: Miriam Maldonado

***Figure 15***

*Shrimp exports in FOB in the years 2007, 2011, 2015, 2015, 2019*




Source: Trade Map

Prepared by: Miriam Maldonado

In 2007, Canada became the main shrimp exporting country, followed by Vietnam and Thailand with exports of 1,590,560, 1,440,226 and 1,295,644 million dollars, respectively (Trade Map, 2021a). In 2011, Canada remains in first place, followed by Thailand and Vietnam, with a value of 1,917,240, 1,785,876 and 1,745,999 million dollars, respectively (Trade Map, 2021a). In the same year, there was a notable growth of Argentina, China, Ecuador, India and Indonesia, compared to 2007, compared to other exporting countries such as the Netherlands (482,878) and Denmark (399,325), Greenland (135,220), which do not have an interesting growth dynamic (Trade Map, 2021a).

Subsequently, in 2015, India is positioned in the first place as an exporter of crustacean, followed by Canada and Ecuador, whose values were 3,194,185, 2,432,513, 2,287,403 million dollars, respectively (Trade Map, 2021a). Later, in 2019, India remains the pioneer shrimp exporter in the world, and followed by Ecuador, and Canada representing values of 4,676,921, 3,901,559, 3,090,863 million dollars, respectively (Trade Map, 2021a).

However, the other countries do not go unnoticed, since, as can be seen in the graph, within the period 2007- 2019, it can be observed that Argentina, China, Indonesia, Vietnam, have experienced accelerated growth with respect to the level of sales of crustaceans. In the case of Thailand, this country registers high export values, except for the years 2014, 2015 and 2019, where there was a decrease in sales. However, its values are still high compared to the other countries (Netherlands, Denmark, Greenland), which also export shrimp, but do not have a surprising level of sales, which is why they are discarded within the competitive thread.

Within the analysis of general factors, the following countries will be studied:

1. Argentina

2. China

3. Ecuador

4. India

5. Indonesia

6. Thailand

7. Vietnam

Canada is not included in the analysis, although it is a country that has a large share of the world shrimp market, it is important to consider that this country is mainly a trader, since it does not produce large quantities of crustaceans, but buys from other countries and re-sells them to certain key markets. According to (BID-FOMIN, 2021), Canada buys the raw material from sea animals and then converts them into canned, preserved or packaged products with an added value, and exports them to the market.

In 2019, China became the main trading partner for Ecuadorian shrimp, accounting for 42% of shrimp production, compared to 7 years ago when it only accounted for 2% of local production (El Comercio, 2019). However, according to (Qiufen et al., 2021), in 1978, China had 1,300 ha dedicated to shrimp production, and in 2011 this amount increased to 300,000, thus, the figure increased by more than 6,900 times. Therefore, it could be analyzed that China is a producer and marketer of crustaceans.

It is important to consider that the research is aimed directly at producing countries, so Canada it is not considered a direct competitor in terms of production, since it does not have sufficient resources to be considered a producer, so it does not compete with other countries. Also, it is prudent to discard Canada in the study of competitiveness factors, since it is not logical to compare the resources or tools of a country that does not produce the product being studied with others that do, given that, although this has sufficient resources, does not know the processes of the production chain of the product compared to the countries considered producers.

Regarding the graphs of qualitative and quantitative data, these have been managed through the R system. The R system comprises a programming language, composed of the plot function, which is the most basic function in the creation of different types of graphs, such as line graphs, scatter, density, bar graphs, histograms, box plots, among others (Gráficos En R, 2021).

### 7.2.2 Obtaining quantitative data

In this section it is pertinent to point out that the quantitative variables include sectoral and economic development issues, such as trade balance, GDP per capita, GDP PPP (current prices), inflation, total exports, tons of shrimp exported, FOB shrimp exports, which include numerical data supported by the World Bank's website, an accessible site that covers macroeconomic factors in the most complete way.

The World Bank is made up of 189 member countries, has 130 offices worldwide and works with five institutions, which are in charge of seeking sustainable solutions for the reduction of poverty and inequalities, especially in developing countries (World Bank, 2021). The World Bank's database has been compiled through officially recognized international sources. The data is constantly updated and reveals accuracy in terms of global development (World Bank, 2021).

On the other hand, specific quantitative data related to shrimp exports in metric tons and FOB have been collected from the official Trade Map page. Trade Map provides data on exporters, world demand for alternative and competitive markets, as well as a series of importing and exporting companies. Trade Map provides information for 220 countries with 5300 Harmonized System products, the data presented are usually monthly, quarterly and annual (Trade Map, 2021b).

It is necessary to analyze these quantitative data, since shrimp is a product with high demand in the national and world market, which makes the country a mass producer.

## SECTION II

### 8. Analysis of the variables corresponding to the product

The general variables are divided into qualitative and quantitative variables:

### QUALITATIVE VARIABLES

### 8.1 QUALITY OF PORT INFRASTRUCTURE

The quality of a country's port infrastructure is a very important factor in matters of sectoral and economic development, and even more so when seeking to expand and promote foreign trade. Port infrastructure is a very broad term, encompassing the structure of physical maritime transport channels, technological standards in the logistics system both in national coverage and port service, basic services and energy inputs that drive the operation of ports (Rozas & Sanchez, 2004). Therefore, investment

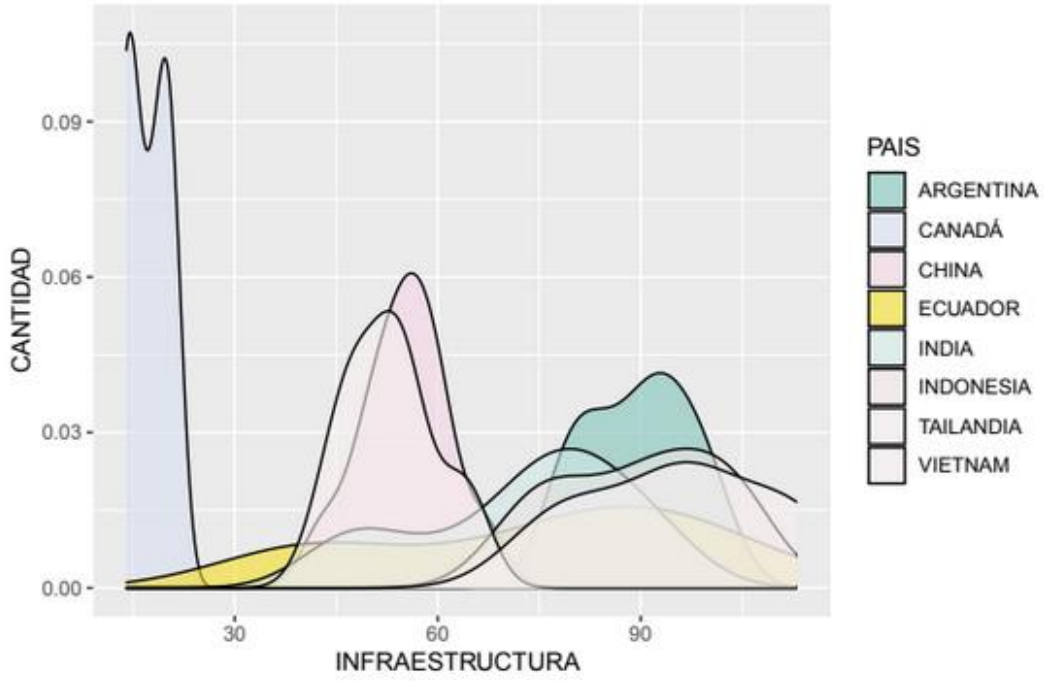
in the infrastructure field allows improving the transaction of goods and inputs markets and the articulation of trade flows within the geographic-economic zone (Rozas & Sanchez, 2004).

Now, if we analyze from the opposite side, if a country lacks an efficient port system, the competitive market would have a great disadvantage in terms of commercialization, because the absence of supporting factors in the maritime network, such as means of transportation, energy and technology prevent extending the local market to the international market.

The following is a graphic analysis of the rankings of Ecuador and other competing countries in terms of infrastructure for the period 2007-2018:

***Figure 16***

*Port Infrastructure Quality Density between the years 2007-2018*




Source: WEF

Prepared by: Miriam Maldonado

Within the study period, in the field of port infrastructure, the following rankings are recognized: Argentina (79-101), China (43-67), Ecuador (40-109), India (47-93), Indonesia (72-104), Thailand (43-65), Vietnam (76-113). Within this dynamic it can be seen that Argentina, Ecuador, Vietnam and Indonesia are below China and Thailand.

However, it is important to rescue that Ecuador between the years 2008-2009 ranked 109th, for the following years, the country has been ascending, because between the years 2013- 2014 it is located in the 69th position, and in the years 2017- 2018 it is located in the 44th position of the ranking, surpassing China and India that were located in the 49th and 47th position, respectively. In other words, within the period a notorious improvement is observed in the field of port infrastructure in Ecuador.

Ecuador has the following ports: Puerto Bolivar, Port of Guayaquil, Port of Manta, Port of Balao, Port of San Lorenzo, and the Port of Posorja, all of which face the Pacific Ocean (Osorio, 2021). Each port in the country is specialized in shipping and receiving certain products, the Port of Guayaquil, which is in charge of transiting containerized cargo; Puerto Bolivar exports bananas and cocoa; the Port of Manta is destined to be a fishing and coffee port; Balao transports petroleum; San Lorenzo is in charge of timber and the Port of Posorja is destined to be the main deep water port (Osorio, 2021).

One of the problems faced by the port of Guayaquil in recent years was the lack of draft, since it was estimated that around 95 kilometers had an unfavorable depth for the transit of maritime vessels; this situation forced ships to wait for the tide to rise to about 2 meters or to reduce their cargo, which as a result made maritime transit impossible (Chaparria et al., 2003). However, for the next few years, the port of Guayaquil has begun operations to deepen its channels, allowing access to ships with a draft of up to 13 meters, thus increasing cargo capacity and making the process of entry and exit more agile, as it avoids waiting in Guayaquil due to the tide (MundoMaritimo, 2020).

For its part, the Port of Posorja managed to become the port with the largest dredging in the country, since it is 16 meters deep, 175 meters wide, and 21 nautical miles long (DP World, 2018). This new project allowed the arrival of deeper draft ships that previously could not transit in Ecuadorian ports due to lack of capacity, manages to increase the Ecuadorian economy, and improves the country's competitiveness.

Adding to this, in 2018, Ecuadorian ports underwent a drastic transformation that was focused on the improvement of the logistics system, reduction of process times, incorporation of complementary system, and a greater depth draft for the entry of vessels with a high level of cargo capacity (García, 2018). In the process of port modernization, the country has signed a negotiation agreement with multinationals of

Dubai, Chilean and Turkish origin for the improvement of the system, for a total amount of 2.2 billion dollars over a period of 40 and 50 years (Garcia, 2018).

In comparison with Vietnam, between the years 2008- 2009, the country was ranked 112th, then, between the years 2012- 2013, it is positioned 113th, and for the years 2017- 2018 it is ranked 82nd in the ranking. Unlike Ecuador, the country has had a slow growth and it was not until 2014 when a notorious rise was observed in the field of infrastructure.

In 2012, one of the challenges facing Vietnamese ports was the narrow logistics zone and the lack of synchronization of road transport in connecting the ports with the national traffic system (Tuan, 2012). The chairman of the Vietnam Freight Forwarders Association, Do Xuan Quang, states that Vietnam's problem lies in the fact that there is no connection between ports and the logistics system of storage, cargo and transport, due to this, the potentiality of ports cannot be optimized (Tuan, 2012).

On the contrary, Argentina, between the years 2007- 2008 is positioned in the 95th place, then, in the years 2012- 2013 it occupied the 101st place, and later, in the years 2017- 2018 it was positioned in the 82nd place. In comparison with Ecuador, Argentina had a decrease in its port system from the year 2007 to 2013, but, from that year a dynamic ascent is observed, however, this does not surpass Ecuador, which had a drastic ascent with respect to the same years.

In the case of Argentina, its ports are managed by specialization, therefore, each port is designed to move different types of goods, depending on the origin, destination and product, with the Port of Buenos Aires being the largest of all and mobilizes 35% of total international trade cargo (OAS, 2021). There are eight ports with specialized export facilities, however, the Port of Rosario, Bahía Blanca and Buenos Aires concentrate the majority of exports (OAS, 2021).

One of the problems faced by the Argentine port system is the lack of deep water ports for the resistance for the entry or exit of deep sea vessels called 'super tanks', so the country must make extra expenses for maintenance of the channels, and for this reason in recent years has been analyzed to build a deep water port in the Bay of Samborondon (OAS, 2021).

On the other hand, Indonesia, in the years 2007-2008 is established in the 90th position, then, in the years 2012- 2013 it is located in the 104th position, and in the years 2017- 2018, it occupies the 72nd position in the ranking. Although there is a decrease between 2007 and 2013, by 2018 there is a significant increase in this variable. However, this increase does not manage to surpass the growth experienced by Ecuador between these years.

Indonesia's port system faced a great challenge in high logistics costs, delays in the transit of goods, and low levels of efficiency within Southeast Asia, which prevents the country from increasing its level of competitiveness (López et al., 2016). Also, Indonesia invests only 7% of its GDP in infrastructure, being a low value compared to countries such as China (Lopez et al., 2016).

Indonesia's logistics problems impede connectivity between islands, leading to increased logistics costs for businesses and the consumer (World Bank, 2015). Tanjung Priok Port has made investments in equipment and management systems at international terminals. However, still the system is inefficient, as it takes 6 days for a container in port to be unloaded, a process that includes economic losses and extensive waiting times (World Bank, 2015). It is worth mentioning that, in the last 10 years, Indonesia has increased its investments in strategies aimed at improving maritime infrastructure, given the country's potential for internal and external trade (López et al., 2016).

Now, regarding the countries that are in higher positions. In the case of Thailand, it is observed that between the years 2007- 2008, the country ranked 53rd, then, between the years 2012- 2013 it ranked 56th, and, subsequently, in the year 2017- 2018, it was established in the 63rd position. In comparison with Ecuador, in the first years of the period it is observed that Thailand is above Ecuador, however, in recent years, Ecuador surpasses Thailand with a difference of 19 positions.

Thailand has approximately 122 ports for international trade. The Port of Bangkok and Laem Chabang Port handle most of the container cargo. Meanwhile, Bangkok Port has adequate facilities that properly handle dredging system and hydrographic survey (Celaya et al., 2015).

The types of dredging used in Thailand are: Bucket Dredger, Clam Shell Dredger, Backhoe Dredger, Trailing, and Suction Dredging, which is the most modern in Southeast Asia, these ports possess a depth of between 8.5 and 10.72 meters, the

suitable for berthing (Celaya et al., 2015). In addition, the hydrographic survey has high inspection equipment that allows to know the depth of the docks, the structure of the depth of the channels, dredging materials, among others (Celaya et al., 2015).

For its part, China, between the years 2007- 2008 occupied the 56th place, in the years 2012- 2013 it was positioned in 59th place, and for the years 2017- 2018, it takes the 49th place in the ranking. It can be seen that China is positioned above Ecuador for several years, but at the end of the period, Ecuador surpasses China with 5 positions difference.

China, the Asian giant, is characterized by its accelerated growth rate, as the country attaches great importance to competitiveness factors. That is why, it is one of the main investors in infrastructure, for several years, the country has invested up to 12% of its annual GDP in infrastructure works, which has made seven of its ports the most important in the world (Legiscomex, 2016).

The increase in infrastructure works accompanies the growth in container volume, which means an increase in China's imports and exports to the world. China's port system has had a drastic growth in recent years, thus, the Port of Shanghai, between 2000 and 2010 shows a growth of 200% (Celaya et al., 2015). (Celaya et al., 2015) states that in this year the port managed to transit 29,069 million containers, surpassing the port of Singapore and becoming the main port mobilizing goods in the world. Subsequently, in 2013, the figures rose to 33 million (Celaya et al., 2015).

At the end of the analysis of the variable called quality of the port system, it is considered that Ecuador is competitive within this field, given that it has experienced an intense development within the period 2007- 2018. It is impressive how from 2015 until the end of the period, it came to surpass China, the Asian giant with a powerful global economy. In addition, the country's exports increased, due to the increased level of deep water dredging that allows the access of ships with greater capacity, and the incorporation of modern technology in the logistics and distribution area.

This was possible thanks to the investment and the signing of negotiations with 3 multinationals that guarantee the improvement of the system for the next 20 years. Therefore, it is recommended that the country continue with these construction projects that have benefited the productive and commercial sector, and for the same reason the current of competitiveness against other countries has been fortified.

## 8.2 QUALITY OF THE EDUCATION SYSTEM

The capacity of the education system is a very important factor in contributing to a country's development. Globalization has driven societies to extend their knowledge in order to take advantage of the new advances that science and technology can offer. It is a fact that development goes hand in hand with education, and it is to this field that we owe the transformations, innovations, inventions and advances that society incorporates into the world on a daily basis.

The economic and social development of a country is largely due to the educational progress that society can access. In the competitive world of business, the level of a country's capacity to offer a good and an input that compares favorably with its competitors is also a factor. In terms of production, there are cases in which countries have perfect natural conditions to produce a good, indeed, they may even stand out in the market for having these privileges, but not only natural factors are usually of great importance in production, but also the level of training of producers to shape the good and deliver quality to their partners.

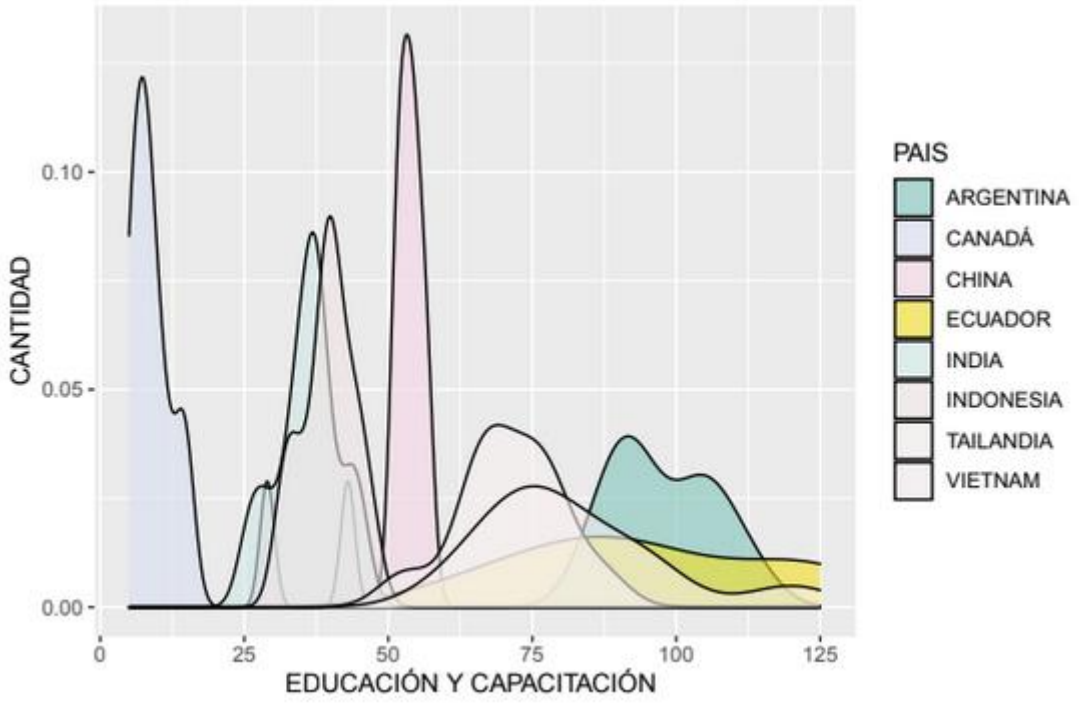
When a country is privileged in its natural conditions but its educational system related to the activity is weakened, the product will have lost the value it could have if it were added to the professional treatment of the product. In the business world this happens, countries with high levels of training tend to buy from the country that produces the good in order to improve it and then market it, thus obtaining higher profits than the producing country and standing out in the market as the main supplier of the product.

For this reason, the field of education should not be left aside when a country seeks to grow competitively at a global level. Specifically, in the shrimp sector, in the year 2000 when the white spot virus affected a large part of shrimp production due to lack of knowledge, it was not until 2006 when it was completely stabilized. This situation resulted in large economic losses for the sector and a loss of competitiveness in the market. Since 2007, the sector has strengthened, but much of this is due to the training that producers receive periodically. However, there is still work to be done to fortify this field, which adds competitiveness to all productive sectors in the world market.

The following is a graphic presentation of the positions and rankings of the countries under study in the field of education and training:

***Figure 17***

*Density of the quality of the education system between the years 2007- 2019.*




Source: WEF

Prepared by: Miriam Maldonado

Within the field of the education system, the following rankings are shown: Argentina (85-113), China (29-57), Ecuador (62-125), India (25-45), Indonesia (32-47), Thailand (53-87), Vietnam (61-120). It can be seen that the countries that rank below are Ecuador, Vietnam, Argentina, while those that rank higher are Canada, China and India.

Despite the fact that Ecuador is in a lower position than the other countries studied, it can be seen that from 2007 to 2018, Ecuador presents an interesting dynamic of growth, since it has been evolving and thus moving up positions in the ranking, which shows that there has been an improvement in this field. Especially in the year 2013- 2014, when a ranking of 62 is appreciated, being the lowest value in all periods.

According to data extracted from the (Ministry of Education, 2021) the country ranks among the countries with the highest growth in recent years, and this is due to several factors, which have been part of the growth, among them, the closing of obstacles for access to education, that is, the elimination of the voluntary contribution of

25 dollars, the improvement of school meals, and the delivery of books and school uniforms. Also, this growth is due to the increase in investment in this field, the (Ministry of Education, 2021) states that in the last 6 years the amount of investment in education has tripled, so that, in 2014, the investment exceeded 3 billion dollars.

Another factor that is part of this growth is the training of more than 500,000 teachers through the Sí Profe program, as a way to support the delivery of quality education to students (Ministry of Education, 2021). In addition, the country has ensured the creation of learning standards and updating of the curriculum, so that the study material is constantly updated and efforts are made to strengthen the quality of education (Ministry of Education, 2021).

On the other hand, Vietnam's education has presented a dynamic of rise and fall within the period. In the years 2007- 2008, Vietnam ranked 82, then, between the years 2012-2013 it rises to 72nd place, and, then between the years 2017- 2018, it drops to 71st place. In comparison with Ecuador, between the years 2015- 2016, Ecuador surpasses Vietnam in the ranking, however, at the end of the period Vietnam obtains a higher rating than Ecuador.

According to (Schleicher, 2015), in 2010, the country decided to invest 21% of its GDP in education. The changes in Vietnamese education were reflected in 2012, when the country entered the Program for International Student Assessment (PISA) tests, and obtained the 17th place within the 61 participating countries, surpassing the United States (Schleicher, 2015).

According to a report issued by (Luque, 2014), the reasons why Vietnam has surprised everyone with this rise was due to the fact that the education system is centralized both in the decisions made about teachers and the level of evaluation to students to ensure quality education. Also, extracurricular activities contribute to this, Vietnam employs up to 17 hours of teaching with extracurricular learning activities (Luque, 2014). Adding to this, 91% of students state that their parents exert great pressure on them to improve in their quality of learning (Luque, 2014).

Although Vietnam has achieved growth in its education system, it is still facing challenges. While 96% of children between 6 and 11 years of age attend primary education, secondary education has a lower attendance rate, while higher education is characterized by high costs (Humanium, 2021). It is estimated to cost around US$ 960

per year, and the salary earned by poor families is US$ 240 per year, which makes it difficult for them to attend university (Humanium, 2021).

For its part, Argentina, between 2007-2008 is positioned in 93rd place, then, in 2012-2013 it was in 89th place, and then, in 2017-2018, it drops to 102nd place.

In the case of Argentina, the country has a literacy rate of 99%, where 90.06% are women and 98.94% are men (Datosmacro, 2021). Argentina is one of the Latin American countries with a high level of schooling, but also one of those that has grown the least in the last fifteen years compared to other countries in the region such as Chile or Peru (Fernandéz, 2020). If we take into account years ago, in 1974, 8 out of 10 Argentines had not completed school, while in 2018 it was analyzed that 4 out of 10 Argentines had incomplete primary school (Fernandéz, 2020).

One of the problems faced by the country is that when young people finish high school, they get stuck in studying at university for reasons of economic capital or skills. (Fernandéz, 2020) mentions that, if we compare, in the year 1974, 1 in 10 adults had studied higher education, and in the year 2018, 4 in 10. Faced with this situation, Argentina has created a program called Progresar to allow a greater number of adults to study at the higher level, however, in the country a high level of enrollment was determined, but low percentages of graduations, which resulted in a setback to the Argentine education (Fernandéz, 2020).

Now, with respect to the countries that are above the others are India, China and Thailand.

Taking into account the Indian education system, it can be seen that in the years 2007- 2008, India was ranked 36th, then in the years 2013- 2014 it was ranked 33rd, and by the end of the period it was ranked 25th. As can be seen, India has experienced a remarkable growth dynamic during the period 2007-2018.

India's education system is mostly concentrated in the public, while only 5% is private, most of the scientific research advances have come from some public institutions (REDEM, 2021a). Also, Indian education is considered to be one of the factors contributing to the country's economic growth.

India's higher education seeks to become an emerging leader globally, for this, the country has implemented satellite infrastructure, modern e-governance services,

distance education, telemedicine that are supported by universities and prestigious hospitals in India (Sanseau, 2015). Over the last few years, training scholarships for foreign students have increased substantially (Sanseau, 2015).

However, the country remains faced with several challenges regarding education of its native citizens, as about 25% of students are illiterate, only 15% attend secondary education, and 7% have obtained a postgraduate degree (REDEM, 2021a).

On the other hand, Thailand between the years 2007- 2008 was ranked 71st, later, in the years 2013- 2014 it was ranked 78th, at the end of the period it was ranked 65th. Compared to Ecuador, Thailand is in a higher position at the end of the period, only, in the years 2015- 2016, Ecuador surpassed Thailand with 3 positions of difference.

Therefore, Thailand's education indicators have experienced significant growth in recent years. Starting in 2005, the Thai government decided to invest approximately 22% of its national budget in the field of education (REDEM, 2021b). In the same year, Thailand ranked as the top Asian country with the highest literacy levels (REDEM, 2021b).

According to UNICEF, primary education has 100% coverage of the population, while the literacy rate among males and females aged 15-24 is 97% (Bohorquez, 2015). In addition, Thailand has become an exporter of higher education service. In the process of internationalization of Thai education, it has adapted to international practices and standards directly linked to market demand (Ramirez, 2014). Adding that, the country has implemented improvements in its technological field and has incorporated the English language within transnational programs (Ramirez, 2014).

At the conclusion of the analysis of the variable called quality of the education system, it is determined that Ecuador can become competitive in the field of education, if it continues with the rise it has revealed after 2013, where it managed to overtake Argentina, a country that was above Ecuador in previous years. However, until the end of the period, Ecuador remains below the countries, so it is recommended that the country fortifies investment in the field of education, especially in the third level, because the problem that Ecuador sustains is the lack of budget to support the creation of public universities and the generation of salaries for teachers. It is considerable that the strengthening in this area will allow forging a greater number of professionals in the

country that will adopt modern skills and abilities that will be used in the productive field.

## 8.3 EXTENSION OF THE MARKET DOMAIN

Traditionally, economists have had concerns about market power: the ability of a seller to set a price above its marginal cost of production and marketing (or, in the case of buyers, the ability of a firm to set a price below its marginal cost when purchasing a product) (Córdoba & Moreno, 2017).

An unregulated monopoly that maximizes profits in a single market has the greatest market power and causes the greatest negative impact on consumers (Resico, 2010). Competitive firms where there is no dominance cause the greatest positive impact on consumers (Resico, 2010). In considering the impact of dominance, economists have long argued that ways must be found to compare the prices that might exist at these two extremes (Resico, 2010).

If there is no finding of not much market power for a dominant firm, then there really is not much consumer harm, regardless of the size of that firm (Martin, 2017). Many economists argued in that case that the size of the firm did not matter, furthermore, in numerous court cases due to economies of scale (where costs fall as the firm gets larger), larger firms can make consumers better off (Martin, 2017).

Market dominance is a measure of the quality of a brand, service or product relative to current competition. In defining market dominance, one must see to what extent an item, brand or company controls the ranking of an item in a given geographic area (Stripping Marketing, 2021). To find out the market dominance in a specific type of product, good or service is the market demand (Stripping Marketing, 2021). It is the rate of the aggregate business sector served by a company or brand, an organization, item or service that has a consolidated share of the overall industry that exceeds 50% is considered to have market power and market dominance (Stripping Marketing, 2021). There are four types of market dominance strategies, which an organization will consider to recognize whether they are a market leader, market follower, market niche, or market challenger (Stripping Marketing, 2021).

When markets for goods and services function efficiently, each factor of production is allocated to its most productive use (Quiroa, 2020). This means that firms produce the goods and services most desired by the market and customers, selling at the lowest

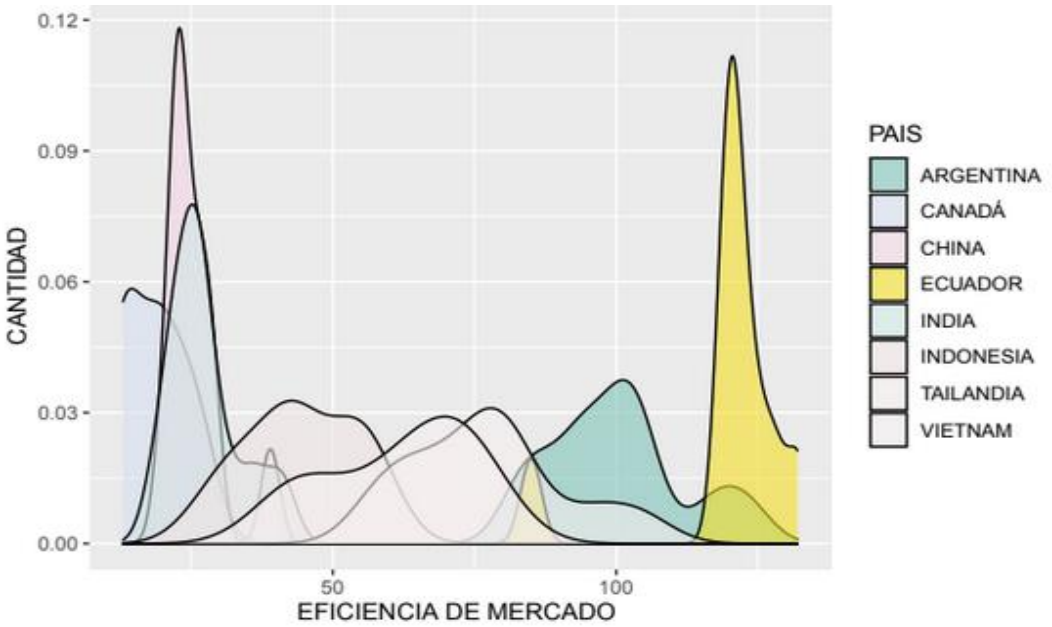
possible price (Quiroa, 2020). The efficiency of product markets can be reduced by lack of competition and distortionary tax policies and regulations (Quiroa, 2020).

Industries where competition is more intense are those where they are more efficient and produce more innovation, thus improving productivity. Policies that improve competition allow the market to select the best firms, creating incentives for firms to reduce costs and for new and more efficient firms to enter the competitive market.

The dynamics of market dominance extension in the countries studied are presented graphically below:

***Figure 18***

*Density of the extension of market dominance between the years 2007*




Source: WEF

Prepared by: Miriam Maldonado

Within the field of market dominance system, the following rankings are shown: Argentina (84-123), China (20- 39) Ecuador (119- 132), India (19- 41), Indonesia (28-57), Thailand (59-104), Vietnam (41-78). It can be seen that Ecuador, Argentina, Thailand are below the other countries, while Canada and China are in a higher position.

Ecuador does not show a notable growth movement during the 10-year period, nor is there a significant rise in any year; instead, the positions are maintained. In 2008, Ecuador experienced dynamic growth, profits grew by US$325 million compared to 2007, and profitability was 25% at the end of the year (ECLAC, 2010). However, in 2009, the country suffered a loss of liquidity due to the withdrawal of approximately US$750 million by the banks' economic partners, an effect caused by the crisis the country was facing (ECLAC, 2010). In addition, economic growth this year was affected by lower oil prices, reduced domestic demand, and low income from remittances (ECLAC, 2010).

After dollarization, the country faced positive changes such as a reduction in inflation, lower unemployment rates, human development and reduced inequalities (World Trade Organization, 2021a). However, the country's economic income is strongly linked to oil, there is no diversification in exports, but the economy is highly dependent on oil, while the percentage of participation of traditional products is lower, and the limited incorporation of competitiveness due to the depreciation of the dollar (World Trade Organization, 2021a).

Ecuador is also considered to have a high degree of dependence on oil; it is estimated that oil revenues are between 14 and 20% of GDP, and between 20 and 30% of public revenues (World Trade Organization, 2021a). The problem lies in the fact that wealth is distributed in few hands, institutionalism and centrality are used, corruption increases and the environment is damaged (Acosta, 2009). In addition to this, a country is formed with a weakened internal market due to inequalities in the economic income of society, reduced sectoral linkages in agriculture and industry for export, inefficient controls of the financial system (Acosta, 2009).

Additionally, the problem that Ecuador sustains is the deceleration in GDP growth, since, in 2012, 2013 and 2014, a value of 5.2%, 4.5%, and 4%, respectively, was observed (ECLAC, 2014). This was due to the low level of investments, and private consumption, and the weak dynamism of public consumption; however, in these years, the increase in exports managed to reduce this phenomenon (ECLAC, 2014).

In addition, the Ecuadorian economy has been affected by the increase in internal and external debt. In 2014, public debt had an increase of 27.7% in relation to GDP, an indebtedness of 11.2% in domestic debt, and 16.5% of external debt (ECLAC, 2014).

This severe increase is attributed to the placement of long-term bonds for a value of 2000 million, international reserves reached 6,689 million, so that, China is the creditor of the debt of 30% of its total debt (ECLAC, 2014). Despite this, exports have risen by 7.5% over the previous year, especially in shrimp, cocoa and crude oil, which figured a rise of 57.5%, 43.5%, 2.9%, respectively (ECLAC, 2014).

Subsequently, in 2018, the Ecuadorian economy has an increase of 1.0%, a low value with respect to 2017, where a rise of 2.4% was figured (ECLAC, 2018). The revelation of these values was due to the contraction of oil production of -3.1%. In addition, public debt figured 49,069 million which responds to 44.8% of GDP, a lower value compared to 2017 which was 44.6% (ECLAC, 2018). In addition, during this year, the sectors with the greatest dynamism were the aquaculture industry where shrimp stands out with a real annual growth of 10.2%, water and electricity supply (7.2%), food accommodation (6.5%), while the industries with reduced participation were fishing, oil and mining, and oil refining (ECLAC, 2018).

Despite the fact that, during the 10-year period, changes have emerged in the economy, and a greater participation of non-traditional products in the market is observed, it is important for the economy to regain strength, so that, through investment in productive sectors, diversification of markets at the world level is achieved to thereby cover greater global demand.

In addition, the government administration has the opportunity to consolidate the changes that the country needs to return to a path of growth and prosperity (World Bank, 2022). The first challenge will be to get the support of the population, the private sector and political actors to work together to overcome the immediate effects of the crisis and lay the foundations for an inclusive and sustainable recovery (World Bank, 2022). In addition, Ecuador needs to make its public policies more efficient to protect the economic and financial system from the global market, as well as to improve access to economic opportunities.

Now, taking into account Argentina, whose country, in comparison to Ecuador, has not had a considered growth during the period. Since 2010, the Argentine economy experienced a deficit until 2015 of 4,313 million (Gallo, 2017). This recession is due to a reduction in exports, given by the low dynamics of the world economy, the drastic fall

in raw material prices, the trade deficit of energy products and the external restriction of commercial and financial factors (Gallo, 2017).

In addition to this, the Argentina's economy has been affected by the outflow of resources from the country to foreign countries, thus, between 2004 and 2015, net interest payments and remission of profits of 120,175 million dollars were recorded (Gallo, 2017). The problem stems from the economic crisis suffered by Argentina, therefore, multinational companies decide to extract the money produced within the country abroad, for this reason, in the year 2010, the balance of payments figured negative values within the country's economy (Gallo, 2017).

Another factor that has affected the country's economy is the devaluation of the currency, since, in 2013, the exchange rate of the dollar was 5.5 Argentine pesos and in 2017 it was 16.6 pesos (Mincomercio, 2022). Given the devaluation of the currency and the low levels of economic growth, inflation occurred, which in 2016 and 2017, and 2018 was 41% and 24.8%, and 47.6%, respectively (Mincomercio, 2022). Likewise, in recent years exports have been significantly reduced, due to the fact that in 2011 they were 83 billion dollars, and subsequently, in 2017 they were reduced to 58.3 billion, in the field of imports, these were reduced by 13.7% (Mincomercio, 2022).

Despite the current macroeconomic challenges, there are important figures of investment by the United States in almost all productive sectors in Argentina (Kulfas et al., 2002). The figures have risen over time, in the eighties this was 12 billion but in the following years this increased to 47,307.2 billion, money that has been invested 52% in the purchase of companies, while 6.5 billion was used in privatizations, physical investments and capital formation (Kulfas et al., 2002). These investments could be a contributing axis for the improvement of Argentina's economy, which would serve as an investor in the productive sector, accumulating competitiveness by expanding its resources and tools.

As for Thailand, despite occupying a higher position than Ecuador and Argentina, in terms of market dominance, the country still shows declines and rises within the period. Thirty years ago, Thailand managed to fortify its economy based on exports; however, since 2000, economic growth has slowed due to slowdowns in investments and obstacles in productive infrastructure (World Trade Organization, 2011). Although in 2008 and 2009 the country's GDP decreased, in 2010, it managed to stabilize, reaching

7.8% of GDP, increasing 3.74 dollars to 4.73 dollars per inhabitant of the country (World Trade Organization, 2011). Also, this same year, exports and imports increased by 135%, making it the sixteenth largest exporter in the world (World Trade Organization, 2011).

Despite the fact that in 2010, the country's economy had a positive balance of 6.5 billion dollars, it is important to mention that the problems faced by the Thai market are the reduction of foreign direct investment, restrictions on foreign ownership, especially in services and agriculture (World Trade Organization, 2011). Also, the Thai market has high tariffs for some products such as wine, and non-tariff barriers (technical and phytosanitary requirements), and irregular customs practices of changing processing (ICEX, 2011).

China is above the other countries, so it is important to know the economic market structure of this country. The Asian giant, China, has high positions in the field of market dominance, this is due to the fact that China is the second world power, with a high annual economic growth. The growth of the Chinese economy is due to the large size of its market of approximately 1.4 billion people, and a government policy linked to the support of companies (Mirroux & Casanova, 2020). This is due to the fact that since 2000, China introduced a series of policies in order to support international investments, with the creation of the China Development Bank and the China Export-Import Bank, which were intended to contribute to the internationalization of companies (Mirroux & Casanova, 2020).

China has shown significant growth in the goods and services market, so much so that in 2006 it became the third largest exporter in the world (M. Rodríguez, 2008). China's economic income to GDP is highly related to foreign trade, since its contribution is greater than 37% (Ling, 2020). The accelerated growth of the country is due to the diversification of its products with the support of foreign capital and involvement of the economy in its production lines (M. Rodriguez, 2008). In addition, through Foreign Direct Investment, China has managed to consolidate connections and income to various markets, especially in developed countries, in order to consolidate investments in new sectors that the country plans to establish (M. Rodriguez, 2008).

China is characterized by its enormous population and economic size, which allows for an abundance of labor force and diversity of regional economic factors (M.

Rodriguez, 2008). In addition, the country has strong institutions, a stable financial system, favorable conditions for opening new businesses, developed infrastructure, foreign trade policies, a high level of education system, among others (M. Rodriguez, 2008). It is also worth noting that China's gross savings have been increasing in recent years, since in 2000 it was 0.43391 trillion dollars; however, by 2008 it had increased to 2.4 trillion dollars (Ling, 2020).

In summary, it is considered that Ecuador is not competitive in the field of market dominance, due to the fact that during the period 2007-2018, the country has presented a lower score than the countries compared in the study, and there is no noticeable increase over time. Ecuador's problem lies in the political and economic instability within the goods market. That is, Ecuador lacks efficient regulatory policies within the market, and is instead hampered by fiscal barriers that impede the fluidity of a product in the competitive field of the world market. It is recommended that Ecuador analyze its current economic and financial situation in order to outline feasible ways to ensure the development of a product in the goods market in terms of supply and demand. Like China, Ecuador could rely on feasible programs and plans to sustain the economy and thus ensure the productivity axis in the industries, and employment of the population.

## 8.4 INNOVATION CAPACITY

Within the field of competitiveness, innovation is one of the most influential factors in business productivity, since it allows the exploration of new sectors and diversification, which refers to the search for new products to offer in the market. Innovation derives a series of factors such as the capacity to innovate, the quality of scientific research institutions, spending on Research and Development, the research contribution of universities, public procurement, advice from engineers, patent registration and intellectual property (Gomez, 2017).

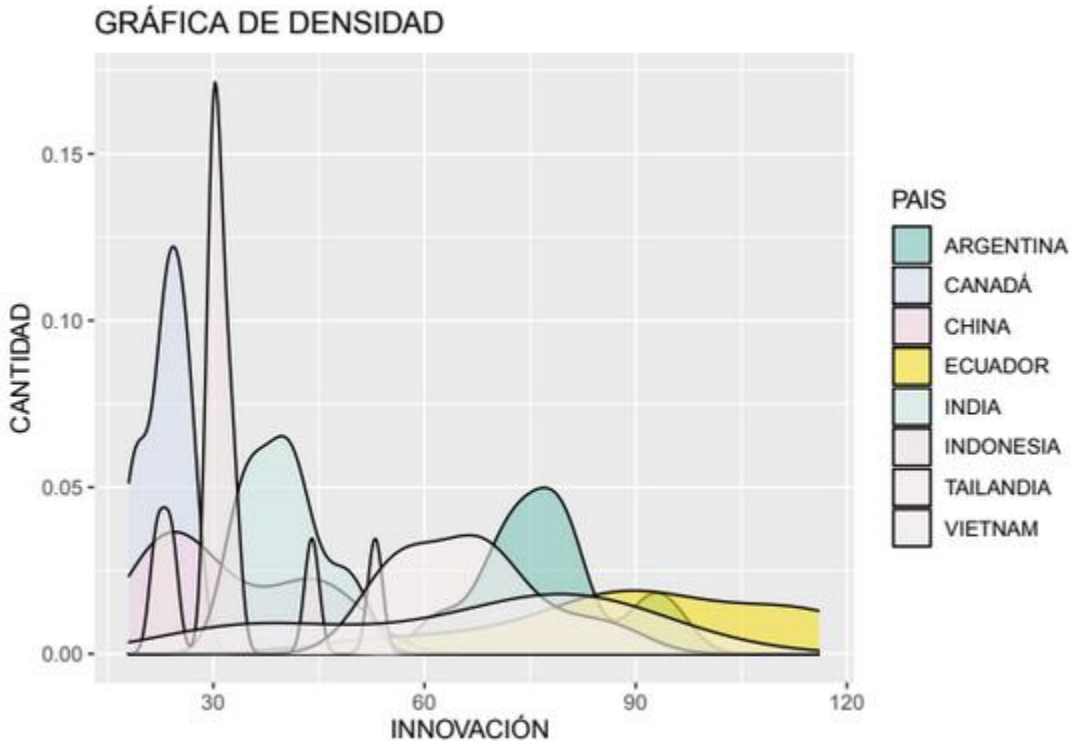
Innovation is a dynamic axis that allows the interaction of various actors that together create connectivity, creativity and diversity in the process of the creation of the product or its additional features (Gomez, 2017). One of the qualities that innovation possesses is the possibility of discovering economic sectors and reducing risks in vulnerability, causing accelerated growth of the economy. The innovation factor plays the role of complementarity with the other factors, since, it encourages the

implementation of elements that together create new and unique ideas that contribute to the consumer's comfort (Goméz, 2017).

Below, the dynamics of Innovation in the countries studied are presented graphically:

***Figure 19***

*Density of innovation capacity between the years 2007- 2019.*




Source: WEF

The innovation ranking shows that Ecuador (53-116), Argentina (62-99) and Vietnam (32-95) are below the countries studied, while China (21-49) and India (33-50) are in higher positions than the other countries. It is important to analyze the reasons for determining these positions within the determinant.

In the case of Ecuador, it is analyzed that the country has experienced rises and falls in the innovation ranking. It is worth mentioning that, in recent years, the country has faced a rise with respect to the first years of the period; however, there is still a long way to go, since it is the country with the lowest ranking compared to other competitors. According to the National Survey of Science, Technology and Innovation Activities (ACTI), Senescyt & INEC, in 2015, it is recorded that 1206 companies, which is 37%

of companies, and 26% of medium-sized companies invested in resources aimed at innovation, while small companies have less motivation to resort to the implementation of innovative elements (EKOS, 2018).

Despite this, the country still faces several obstacles in the implementation of innovation. Specifically, in the agricultural sector, Ecuador lacks technological tools such as crop and soil condition monitoring, crop location systems and information platforms about farms, given this absence there is not a high level of efficiency in the distribution and control of the system (EKOS, 2018).

On the other hand, Argentina, also occupies lower positions in the field of innovation compared to the other countries. However, a notorious change is observed since 2007, since it occupies the 91st place in the ranking, then in 2011 it appears in the 73rd place, and by 2018 it is located in the 72nd place.

Most of the growth of companies in Argentina is due to the ability to increase competitiveness. However, they are weak in the area of innovation, lacking in production and expansion of scientific and technological knowledge (Belmar, 2021). The problem faced by Argentina is that approximately 40% of companies do not invest in Research and Development (R&D), the purchase of equipment and machinery are low, and 24% of companies lack an engineer, this challenge limits the fortification of Argentina's competitive field, especially in the markets that the country exports (Stumpo & Rivas, 2013).

According to (Inter-American Business Bank, 2015), in 2009, the Inter-American Development Bank (IDB) approved a loan of 750 million for the General Technology Investment Program. Argentina's objective is to boost the program which is based on increasing entrepreneurial capacities for innovation, generated by technological and scientific knowledge (Inter-American Business Bank, 2015).

(Inter-American Business Bank, 2015) states that, starting in 2015, Argentina boosted the General Program for Technological Investment IV with a loan made to the IDB for US$150 million. The loan was intended to finance technological development projects, internal development and research units, intellectual property and technical assistance. In addition, it was invested in the implementation of technological services for different groups of companies (Inter-American Business Bank, 2015).

Regarding Vietnam, the Asian country has undergone major growth transformations, mainly in the agricultural sector, which is due to its transition from a Soviet centralized economy to expanding internationally (Lemus, 2019). However, the current economic model based on the export of low value-added products is not sufficient to achieve significant growth in the coming years (Lemus, 2019). Vietnam ranks lower compared to the other countries, and this is because, despite economic reforms, the country has a weakening in the field of science and technology.

Despite the fact that innovation policies have focused on research, development and knowledge production, most of these institutes have been fragile, the utilization of current technology by industries is low, because workers lack knowledge in handling new machinery, investment in research and development in higher education is limited (Lemus, 2019).

Now, in a brief analysis, the country that far superior than all the others countries is China. China occupies high positions within the Innovation ranking, and this is due to the fact that the Asian giant's economy has implemented an ambitious public policy plan to build an innovation-based economy. The objective of expanding China's technological field lies in the expansion of different programs such as the Medium and Long Term National Plan for Science and Technology Development (2006-2020), which are based on the incorporation of modern technology machinery and equipment (Blanco, 2021). In addition, the 12th Five-Year Plan (2016-2020) has set out to invest 2.5% of expenditure in R&D, with the objective that innovation will account for 60% growth in the economy (Blanco, 2021).

In recent years, China has increased investment in development and research, as 0.72% of GDP expenditure was invested in 1991, and in 2017 this value increased to 2.13% (Lleytons, 2021). China has made R&D investments of up to $279 billion, it is the country that has required the most patents with 1.3 million in 2016, and its exports in technology are 25% (White, 2021).

In addition, over time, China has managed to build technological megaprojects such as the C919 commercial aircraft, the implementation of the magnetic levitation train, the creation of the Tianhe-3 computer, and the construction of the longest bridge in the world (White, 2021). In addition, the Asian country has managed to become the ninth country with the highest business sophistication, as most of investment is allocated to

commercial industries, however, they also nurture higher education, as between the years 2008 and 2017, 7.5% of R&D was invested in universities and academies (Lleytons, 2021).

On other hand, India is a country that has the largest number of qualified professionals in the technological field, and the third in having reserves of technological manpower, and due to this it has become one of the five countries with the greatest attraction of foreign investment (El País, 2005). (El País, 2005) argues that the Indian system is based on research plans in the academic field, support from institutions, high quality levels, market diversification and labor support specialized.

In the recent years, the country has sought ways to intensify the technological field and innovation, since the government declared between 2010 and 2020 the decade of innovation and it implemented the National Innovation Council and the Innovation Policy based on the sophistication of companies and society (BCN, 2015). The technological incorporation plan is based on the implementation of technological workshops, scientific research congresses, laboratories and modernized infrastructure for the participation of public and private actors, the country planned to invest 3% of its GDP in the mentioned activities (BCN, 2015).

India pays much attention to the technological field, since Foreign Direct Investment (FDI) is mainly used in the chemical, electrical, electronic, food and financial systems, adding that it receives support from transnational companies in research systems Indians (R. A. Cruz, 2005). Specifically, in the agricultural sector, the Indian government has analyzed the need to incorporate artificial technology and monitoring of agricultural crops, in such a way as to reduce the risks of infection and contamination of the soil and the product (Aggarwal, 2021).

In concluding with the topic of innovation capacity, it is summarized that Ecuador, at present, is not competitive in terms of technology, science and other elements of innovation. However, there has been a notable increase in the last years of the period analyzed, so it is understood that the country has implemented equipment and machinery for the economic sectors. Therefore, it is recommended that Ecuador continue with investment projects for the incorporation of equipment that contribute to

the development of the creation of a product that seeks to add value over the competition.

## SECTION III

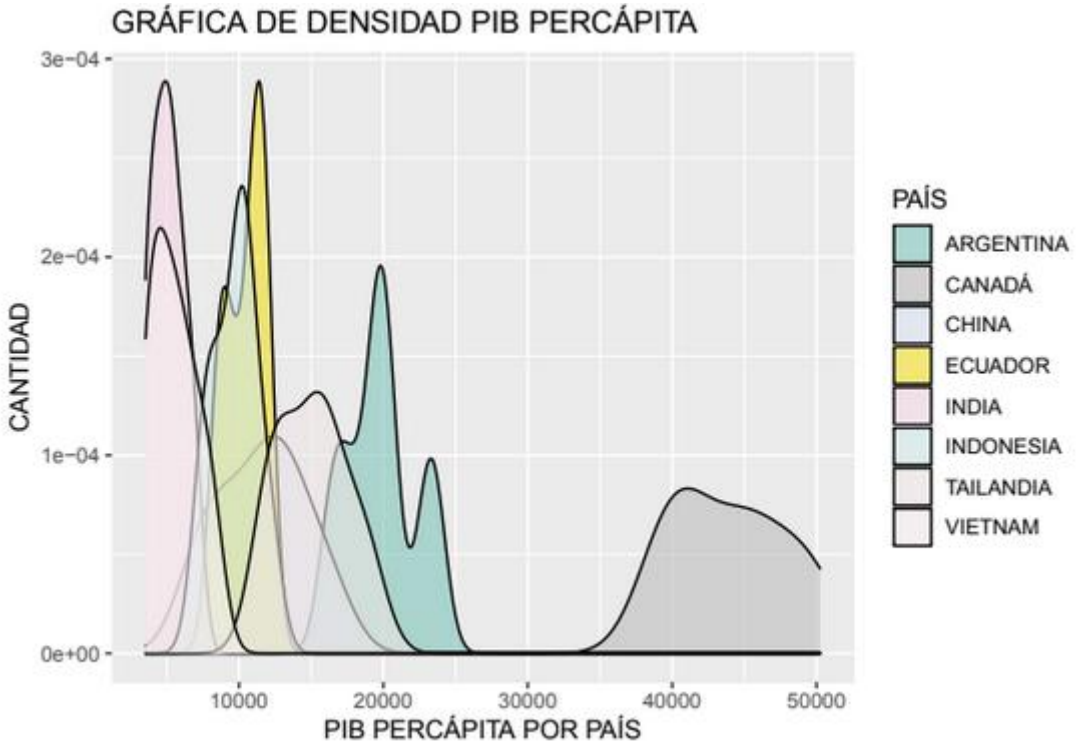
## 9. QUANTITATIVE VARIABLES

Now, within the quantitative variables, a comparative analysis between Ecuador and other countries shows an interesting dynamic within the graph:

### 9.1 GDP per capita

***Figure 20***

*GDP per capita in thousands of dollars (2007-2019)*




Source: World Bank

Prepared by: Miriam Maldonado

Regarding the GDP per capita, Ecuador for the year 2007 has registered a total of USD 8,294 thousand, being a considerable value, since for the year 2010 this has increased its value reaching USD 9,090 thousand, while in the year 2019 it shows a significant growth, since it figures USD 11,851 thousand. Unlike Vietnam, a country

that represented a value of USD 3,522 thousand for the year 2007; and ten years later, it increased its figures reaching USD 8,381 thousand.

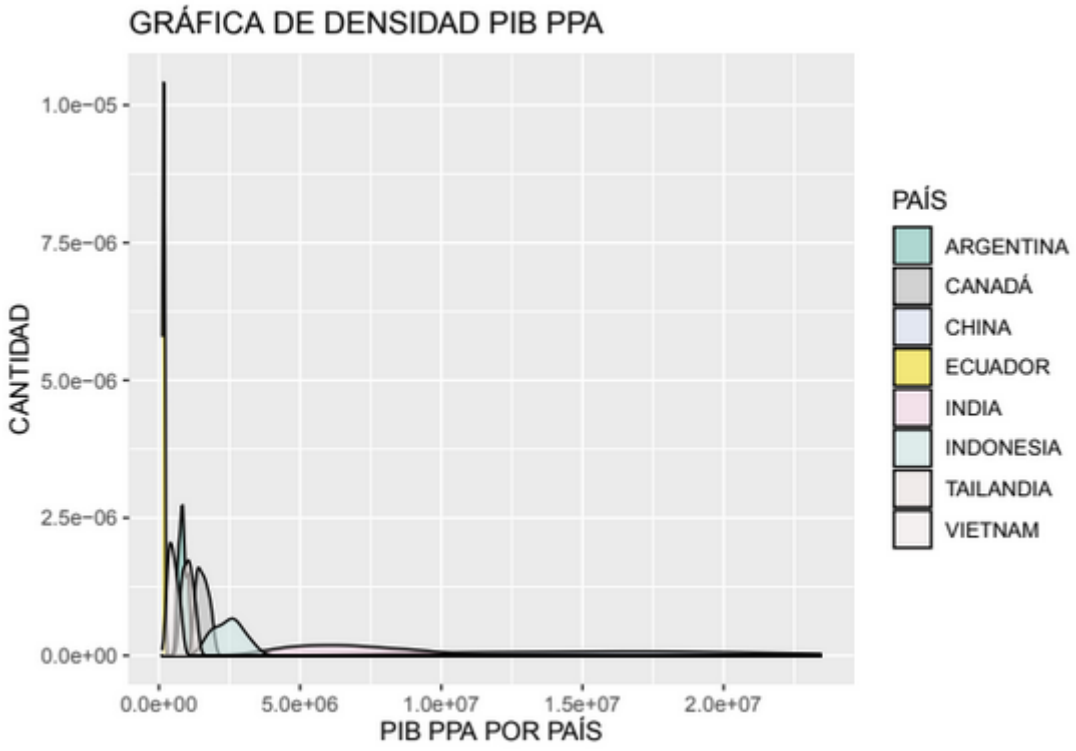
Followed by Vietnam, is India that reports a value of USD 3,525 in the year 2007; subsequently, a growth is visualized, since in the year 2019 a value of USD 6,997 thousand was recorded. Despite the fact that India reports a higher value than Vietnam in the year 2007, subsequently, in the year 2019 it is observed that Vietnam increases approximately 5000 thousand dollars, while India only increased 3000 thousand dollars.

The highest value for this field is Argentina with an income of up to USD 23,597 thousand dollars, followed by Thailand with a figure of up to 19,233 thousand dollars. These countries have been increasing their values as time progresses. Ecuador is with a not very strong value, which forces it to look for improvement strategies regarding the national economy.

### 9.2 GDP ppa (current prices)

***Figure 21***

*GDP ppa (current prices) (2007-2019)*



Source: World Bank

Prepared by: Miriam Maldonado

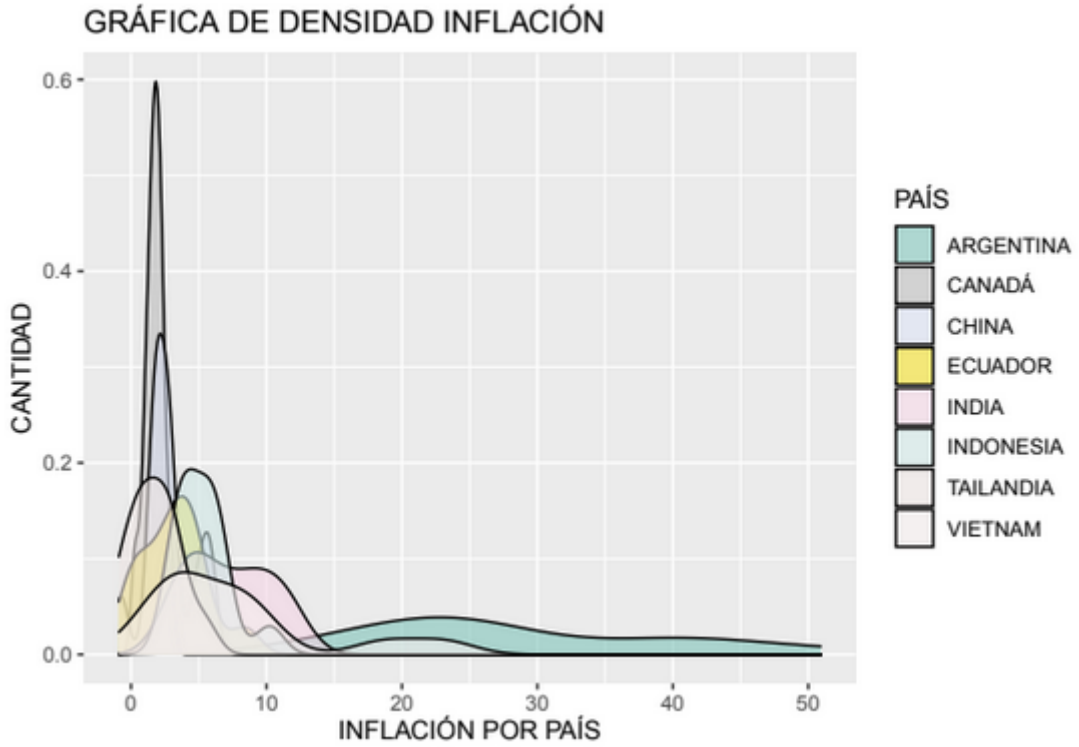
In this section, the interpretation is made taking into account the GDP PPP which corresponds to the Gross Domestic Product in Purchasing Power Parity of a country, under this statement it can be alluded that Ecuador in 2007 has been established with a value of USD 118 thousand dollars compared to China that in the same year has generated a total of USD 8,974 million being a very considerable amount compared to Ecuador.

However, the amount exposed in relation to the Ecuadorian GDP PPP does not stand out compared to the eight countries under study, being the one that generated the least amount in 2008. And not only in this year it has remained with a low value, since until 2019 it has still remained under all the countries studied, and China has remained the leader with USD 21,739 million for 2018; followed by India that does not reach it, but compared to the others it was with higher productivity with USD 21,739 million dollars.

### 9.3 Inflation

***Figure 22***

*Inflation (2007- 2019)*



Source: World Bank

Prepared by: Miriam Maldonado

This indicator interprets inflation, which tends to analyze the increase in the prices of goods and services of the countries, in this context when the price increases the consumption of goods and services decreases, resulting in lower economic productivity, in the case of Ecuador, in the year 2008 the highest inflation value was recorded with respect to other periods, since a percentage of 840,009% of inflation was recorded.

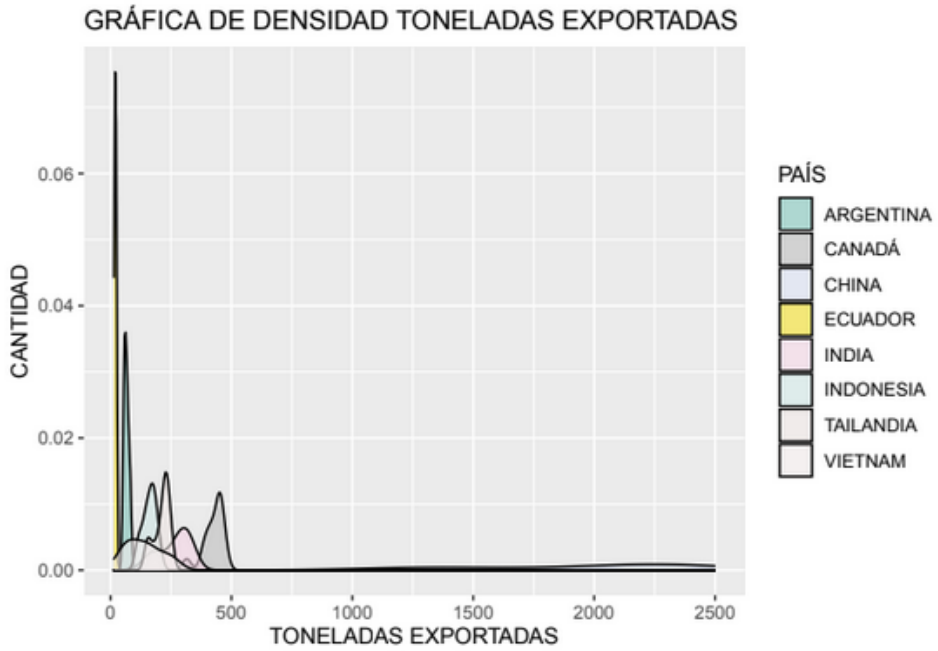
However, for the following years a decrease is registered, since for the year 2019 it closed with an inflation of 26.601% compared to other countries that belong to the region such as Argentina that ended the year 2019 with 5092.150%, being one of the countries with a high inflation rate, which is considered detrimental to the country's productivity.

However, in the same year, China has been established with 289.923% of inflation. Among these countries it can be significantly evidenced that Argentina is the only country that has closed with a high percentage, which decreases the purchasing power of Argentinean income and financial assets, thus reducing the consumption of goods and services. And this activity directly affects companies and, above all, the population.

### 9.4 Metric tons exported of shrimp

***Figure 23***

*Metric tons of shrimp exported (2007- 2019)*




Source: World Bank

Prepared by: Miriam Maldonado

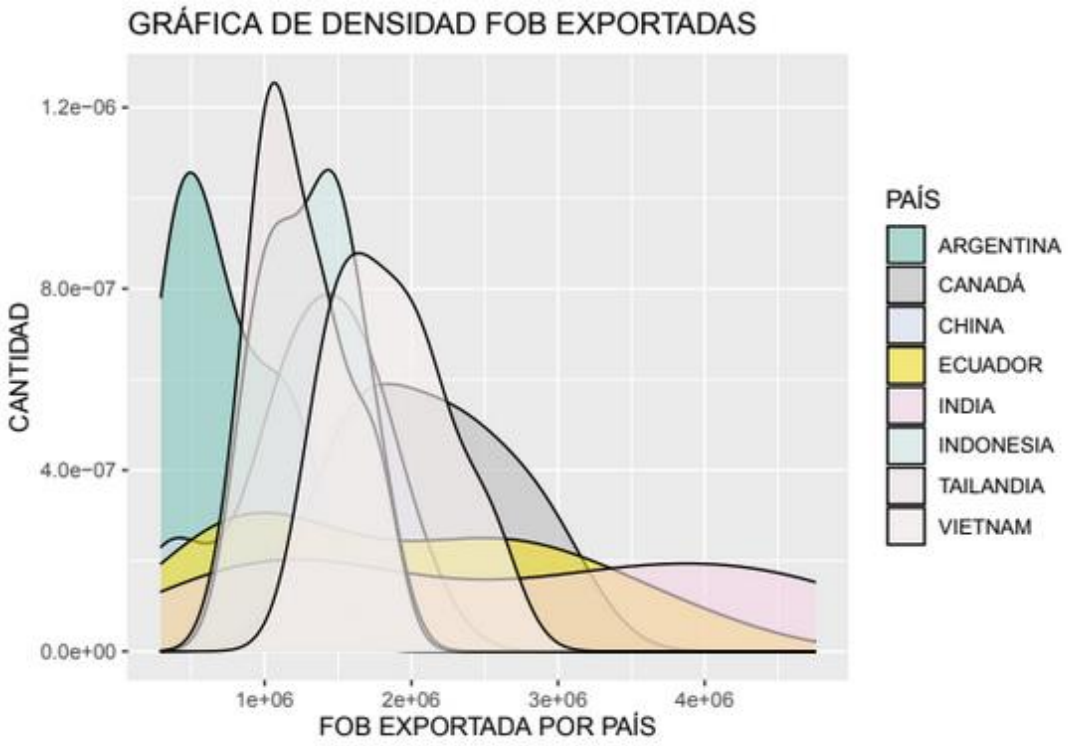
For the analysis of this indicator, the data established by the World Bank is used again, where the data is interpreted from 2007 to 2019, and it is possible to interpret that Ecuador has had a great participation in terms of shrimp exports in Metric Tons (MT), for 2007 it has generated a total of 125 MT, consequently, in 2008 it has exported a total of 130, surpassing the previous year. This increase has been evidenced every year, until the end of 2019 where the year closes with 645 MT. In comparison with India the quantities are not very distant, since, for 2007 the MT of shrimp exported were 139 MT, and for 2018 it was 596 MT. However, for 2014 India surpassed Ecuador by more than 200 MT, reaching 357 MT.

On the other hand, the country that had the lowest participation in terms of MT of shrimp exports for 2014 was Thailand, which only reached 86 MT. In contrast to 2007, which achieved a total of 204 MT.

### 9.5 FOB USD shrimp exports

***Figure 24***

*FOB USD export of shrimp*




Source: World Bank

Prepared by: Miriam Maldonado

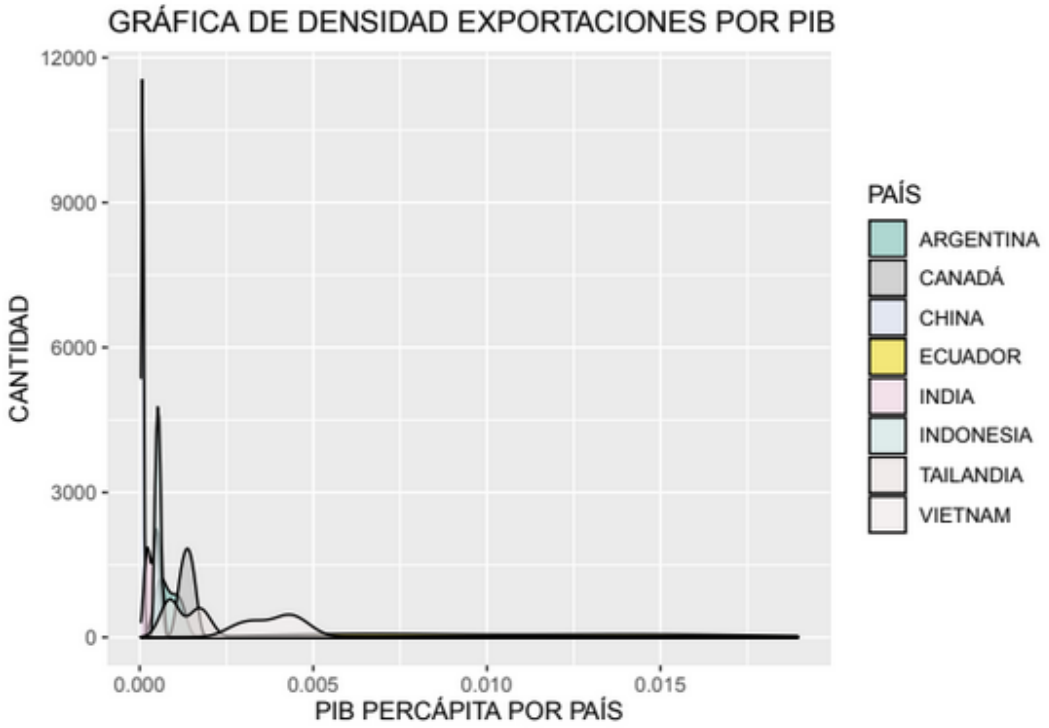
Regarding the FOB of shrimp exports in Ecuador, it can be seen that between 2007 and 2019, which are the periods under study, they have been USD 601 and USD 3,901 million respectively, which has generated a considerable increase in 10 years. Throughout this period, Ecuador has not experienced a decrease, on the contrary, it has been increasing. However, India precedes it with a value of USD 4,676 million in the last year of the studied period.

In the case of Argentina who is within the region, for this period of time that goes from 2007 to 2019 has not surpassed Ecuador, since it has been established with a total of USD 292 and USD 1,079 million respectively. However, for the year 2010 both countries had a drop reaching USD 474 for Argentina and USD 850 for Ecuador, unlike Thailand which in that same year surpassed with USD 1,725 million.

**9.6 GDP over total exports as a percentage unit**

***Figure 25***

*GDP over total exports as a percentage unit (2007-2019)*




Source: World Bank

Prepared by: Miriam Maldonado

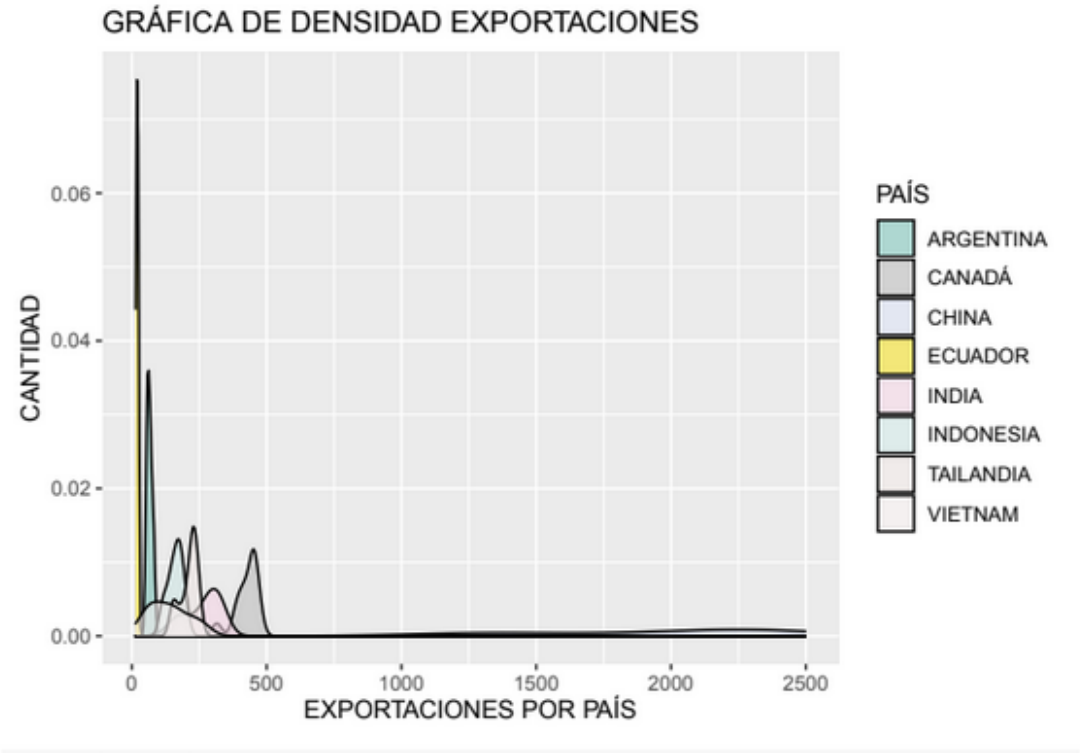
This indicator shows the relationship between total shrimp exports and the GDP of the eight countries studied, in order to determine the level of importance and participation of the product in the country's economy. In this field, it was found that Ecuador had a total of 0.51% in 2007, a percentage that has been increasing over the years, such as in 2012 when it reached 0.80% and at the end of 2019 it had a total of 1.90%, surpassing the remaining 7 countries, including China, which in 2010 had a total of 0.01%, being the lowest. Consequently, China has also been surpassed by Indonesia and India, both with 0.05%.

Similarly, in relation to the neighboring country of Argentina a total of 0.04% in 2007 and 0.10% for 2019, percentages that have been surpassed by Ecuador.

### 9.7 Total exports

***Figure 26***

*Total Exports (2007-2019)*




Source: World Bank

Prepared by: Miriam Maldonado

In terms of dollar value, Ecuador's total exports in 2008 were low, since Ecuador had a total of USD 13 million compared to Argentina, which had USD 55 million. However, the country that has obtained the highest amount was China with USD 1,220 million.

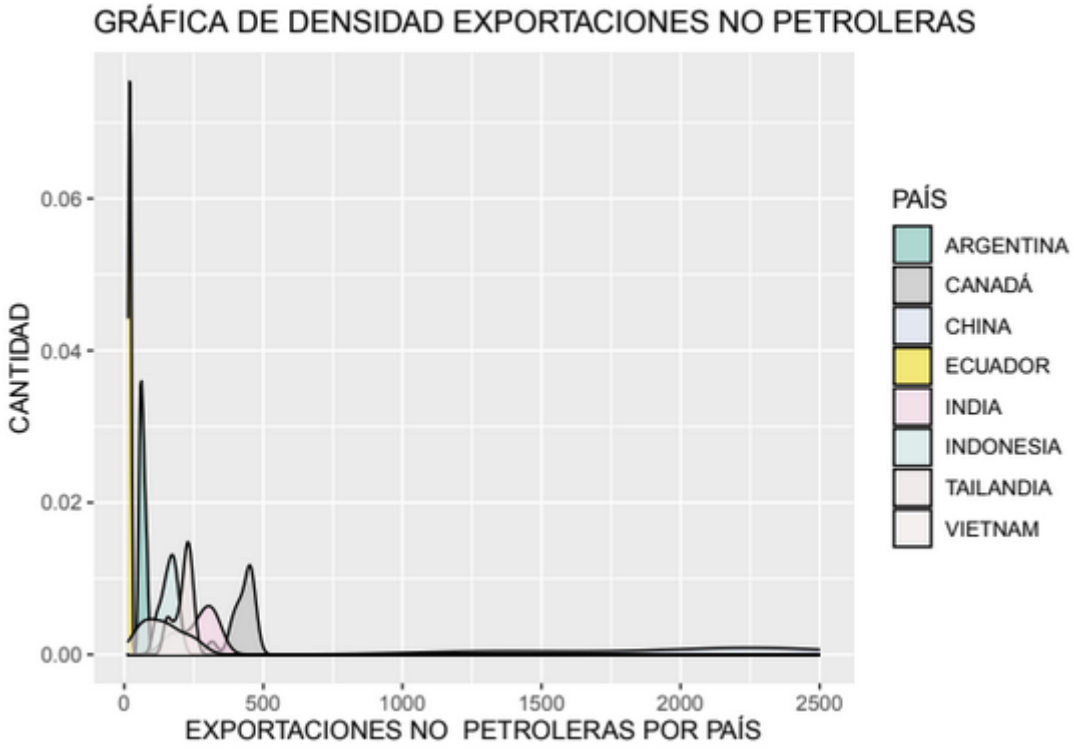
On the other hand, Ecuador is set for 2019 with a total of USD 22 million, compared to Argentina which surpassed it with a total of USD 61 million. In addition, in this year the country that has generated the largest number of exports has been China surpassing the 7 countries under study with USD 2,498 million dollars, followed by India which does not reach China, but it does surpass the Latin American countries with a total of USD 323 million.

In 2011 and 2013 Ecuador had a drop in total exports, given that it reached a total of USD 22 million, being the country with the lowest amount, even Argentina surpassed it with USD 82 million and Vietnam with USD 96.

### 9.8 Non-oil exports

***Figure 27***

*Non-oil exports (2007-2019)*




For the interpretation of this indicator, the years 2008 and 2019 were taken into account, where Ecuador has generated a total of non-oil exports of USD 13 million, being the country with a very low value compared to Argentina, which had a total of USD 55 million and Vietnam which had a total of USD 48 million. Both countries were surpassed by the Asian country China, which had USD 1,220 million, making it the most productive country.

These values with the passing of time (11 years) have been increasing, without changing the order of the positions where the eight countries have been positioned, therefore, China for 2019 remained the leader with total non-oil exports with USD

2,498, followed by India with USD 323, for their part Ecuador and Argentina maintained a total of USD 22 and USD 65, respectively.

## SECTION IV

### 10. Determination of the findings.

The findings involve issues of sectoral and economic development, where qualitative and quantitative variables that are associated with the competitiveness of a country intervenes, therefore, the variables regarding the level of competitiveness have been considered to the quality of port infrastructure, quality of the education system, extent of market dominance and innovation capacity. In the quantitative field, the trade balance, GDP per capita, GDP PPP (current prices), inflation, tons of shrimp exported and total oil and non-oil exports were considered.

In this sense, it has been defined that if a country lacks specific infrastructure services, the productive sectors would be at a great disadvantage in terms of competitiveness, since the absence of productivity support factors such as means of transportation, knowledge and technology are obstacles to extending the local market to the international market. The country that has the greatest advantage in the four variables is China, whose economy is larger than the other countries.

In the field of education, Ecuador is undergoing various changes for the conception of an effective educational model, as is Argentina, which is facing problems with young people who are stagnating in their university studies. Although Ecuador has managed to improve its educational level, there is still much to be done, since most young people in Ecuador suffer the concern of limited places in higher education. It is important to maintain professional citizens capable of facing the productive endeavors of the different sectors of the country.

Regarding the market dominance variable, it is analyzed that China is in a favorable position, given that its emerging economies are able to establish themselves in a point of equilibrium between cost and price, supply and demand in the world market. Meanwhile, Ecuador, Argentina and Thailand occupy inferior positions with respect to the other countries, since these countries have been affected by the economic crisis faced by the countries in recent years, given the lack of diversification in exports, centralization and dependence on a single market item, inflation and currency

devaluation, lack of foreign direct investment and implementation of tariff barriers within the market.

In terms of innovation, it has been shown that technology is an important factor in competitiveness, since it allows the development of crustaceans to be maintained with quality standards. China led among the eight countries studied as the country with the greatest technological development. India is one of the largest shrimp exporters and remains one of the main producers of crustaceans. It cannot be denied that its capacity for innovation has been a contributing factor in improving the quality of crustaceans, allowing it to deliver a value-added product to its trading partners. As for Ecuador, the country has recorded an upward trend throughout the period; however, several changes still need to be made and investments need to be made to implement innovative technology to strengthen the shrimp production sector.

Now, regarding the results of the quantitative variables, it has been found that the GDP per capita for Argentina is one of the strongest and representative points in terms of this indicator at the level of the 7 countries analyzed, surpassing them with a great value (USD 39.55 per year), while Vietnam and India occupy the lowest positions, followed by Ecuador; however, a representative growth of this quantitative value in recent years is analyzed.

With respect to the Gross Domestic Product in Purchasing Power Parity (GDP PPP), it is evident that China leads with a great value in GDP PPP, followed by India. Regarding inflation, the only country that exceeds with 50.9% is Argentina and in the case of Ecuador it remains stable with 1.94%.

Regarding shrimp exports in FOB terms and Metric Tons, it is analyzed that, in last years, India and Ecuador lead the figures, it can be seen that Ecuador, in the first years, of the period, occupied seventh place, but, as of the year 2014, this reached to second place. While a decrease in Thailand from 2013 is analyzed, what is interesting about this dynamic is that, in the first years, Thailand led the top positions as an exporter of shrimp in the world, but at the end of the period, it is located in the last place compared to the other countries.

Finally, in terms of non-oil exports, the order of the countries positioned are China, and India, countries with the highest participation in this quantitative variable. Although

Ecuador does not lead among the eight countries in this variable, there has been notable growth during the period.

# CHAPTER 3
# PROPOSAL OF A COMPETITIVE MODEL FOR THE SHRIMP SECTOR

## SECTION I

### 11. Competitiveness variables of Ecuador's shrimp sector.

Among the qualitative variables that give Ecuador an advantage over the other countries analyzed is port infrastructure, given that the country has six ports facing the Pacific Ocean and each port in the country specializes in shipping and receiving certain products. Guayaquil is one of the main ports with a depth of 34 feet and 400 feet wide. In addition, it has favorable weather conditions for the transit of ships 365 days a year. Although, this does not mean that it surpasses the leading country which is Chima, a significant growth is observed during the analyzed period.

On the other hand, after several fluctuations with the national GDP, it has been shown that there is a greater weight in education, since there are better levels of learning and investment in public education, allowing public spending on education to be of high interest due to the importance of sustaining the levels of social investment in countries with low-income population and economic inequalities.

With respect to innovation, although Ecuador has lower positions compared to China and India, specifically in the shrimp sector in Ecuador laboratories have been implemented for the protection and strengthening of shrimp. These laboratories also work with genetic improvement programs that consist of making the crustacean more resistant to the spread of diseases and increasing quality. These actions allow the country to increase its competitiveness for export to different countries.

As for quantitative variables, inflation is one of the points that Ecuador maintains stable at 1.94%, unlike the other countries under study, allowing it to generate greater purchasing power of income and financial assets, thus increasing the consumption of goods and services.

Similarly, the relationship that exists between Ecuador's total shrimp exports was found with an accessible percentage, unlike the other countries, those percentages have been increasing over the years and this increases the country's competitiveness. Currently, Ecuador remains in second place as a producer of crustaceans for five years,

which encourages us to continue with the policies of improvement and quality, to reach the first place, and thus to avoid the way to other producing countries worldwide.

## SECTION II

### 12. Relationship of the competitiveness variables of Ecuador's shrimp sector for the international market

Although Ecuador has drastically improved the infrastructure of its port system, it is important to recognize that in order to continue this improvement, more work must be done. A clear example is China, which has fortified investment funds in infrastructure to maintain a modern and quality port system. Also, the use of modern technology, brevity in logistics and distribution processes, which places it in a higher position than the other countries studied.

Likewise, one of the great disadvantages Ecuador has been training and innovation, since it has maintained an unequal and differentiated development, compared to China, who have trained personnel capable of managing technological systems and modern machinery to increase efficiency in the product, in addition to being the creators of technology.

In the field of education, again China has a large number of students and higher levels of education systems in the world. The main flaws of the educational system lie in the scarce investment in higher education, although it is true that every year a large number of Ecuadorian students are left out of the university system due to the limited quota attributed to each institution. Undoubtedly, the lack of preparation and educational training in the country brings with it consequences such as the lack of knowledge of the productive area of a sector that causes disadvantage within the thread of competitiveness in the world market.

On the other hand, it is analyzed that Ecuador is the country that benefits the least in the field of market dominance compared to other countries. For this reason, the country must work on its economic terms, which is directly related to the country's productivity capacity. For this, it is necessary that the country uses all its resources and optimizes tools to obtain competitive advantage, which adapts to needs and allows it to be the preferred option for the consumer.

## SECTION III

### 13. CONCLUSIONS

The research project is based on a comparative analysis of the Ecuadorian shrimp industry and other competing countries, main shrimp producers in the world from 2007 to 2019, in terms of comparative and competitive advantages obtained by the countries throughout the period studied, so that, through the quantitative and qualitative study, it is possible to identify the factors and variables that serve as strategies in international trade to increase their level of productivity and sales. The following has been found in the study:

- Historically, the Ecuadorian shrimp industry began in the 1960s with the production of less than one thousand pounds of shrimp per hectare; however, later, in 1998, it was able to export almost 115,000 metric tons.

- Ecuador's advantage in shrimp production, which can be seen in its quality and size, is due to its strategic geographic location, since shrimp is a poikilothermic animal; that is, it does not have internal mechanisms to regulate its temperature, so it must be kept at a warm tropical temperature similar to that of its habitat, which is why the coast is the most appropriate region for shrimp farming. In addition, Ecuador's climate allows the crustacean to be harvested up to three times a year.

Beginning in 1999, Ecuador experienced the white spot crisis and the Taura syndrome, a virus that usually spreads among crustaceans and causes mortality, resulting in losses of up to 300% of shrimp production.

- The crustacean health crisis of 2000 brought with it the incorporation of machinery, equipment and control systems to prevent the contraction of diseases in the shrimp sector.

- After 2000, the shrimp industry managed to stabilize, thanks to loans requested from banking institutions by producers for reinvestment in the industry.

- In 2007, Ecuador managed to reach the seventh position in shrimp exports worldwide, in 2013, it occupied the fourth position and later, in 2018, it was positioned in second place preceded by India.

-Within the period 2007- 2019, the main competitors of the shrimp industry are: Argentina, Canada, China, India, Indonesia, Thailand and Vietnam. Canada has been ruled out as a trading country and not a producer of crustaceans.
Within the period studied, there has been an accelerated growth of each country, with the exception of Thailand, which has been decreasing its level of sales in recent years.

- Canada is not a large-scale producer country, but a crustacean trading country, so it lacks internal productivity and the resources to compete as a producer; however, as a marketer it has reached the top positions in shrimp exports in recent years.

- Given that Ecuador has rival countries with a high level of competitiveness, the study sought to analyze qualitative variables that are issued by the World Economic Forum to make a comparison between countries, of the 12 pillars set out by the organization, four competitive indicators have been taken that have a high relationship with the productive system of the countries, these are: quality of port infrastructure, quality of the education system, extension of the marking domain, and the quality of innovation.

- Regarding the quality of port infrastructure, it has been found that Ecuador has the following ports: Puerto Bolivar, Puerto de Guayaquil, Puerto de Manta, Puerto de Balao, Puerto de San Lorenzo, and Puerto de Posorja, all of which face the Pacific Ocean. Each port in the country specializes in shipping and receiving certain products.

- The countries that have a high ranking in port quality are China, Thailand and India. However, over the last few years, the country has made high economic investments in the improvement of ports, thus achieving a higher level of draft for the entry of ships with greater cargo capacity. Between 2016 and 2017, Ecuador came to surpass China and India in terms of port quality.

- In the field of education, Ecuador has notoriously improved, since, from 2007 to 2018, a constant evolution is demonstrated. However, Canada, China and India are above the country with a higher ranking than Ecuador, this is because these countries invest high percentages of their GDP in education. The problem faced by Ecuador is the lack of resources for the creation of universities, so that most young people stagnate their education until high school, the same problem suffers Argentina.

- The market dominance of the shrimp sector was considerably affected by the economic crisis, so many of the companies have faced difficulties that they have not yet been able to overcome. Within the period studied, Ecuador has a lower position with respect to the other countries, nor does it show notable increases in any year. It is above Canada and China, large economies with economic capital reserved to face future crises and support the productive sector, a problem that Ecuador has, since external indebtedness does not allow it to maintain economic reserves for states of emergency.

- Regarding the field of innovation quality, Ecuador occupies lower positions in the field of innovation with respect to the other competing countries; although, from the year 2010, a rise in the ranking is observed, after 2017 a notable decline is analyzed. In the sense of innovation, in recent years Ecuador has renewed technological tools and new machinery. However, there is still much to be done, unlike China, country that has technological and scientific capabilities and resources to incorporate in the industry.

- China is the country that is at a higher level with respect to the variables of infrastructure, education, market dominance and innovation.

- Regarding quantitative factors, in terms of GDP per capita, Argentina has a high value compared to the other countries. India and Vietnam have lower values, followed by Ecuador; however, there has been growth during the period. However, there is still a long way to go since the value from 2007 to 2019 has not grown significantly.

- In terms of inflation, the country with the highest percentage is Argentina and throughout the period this is growing, since the year 2019 closed with a surprising value within the period, which can be detrimental to the support and production of industries. On the other hand, the other countries have experienced inflation recessions as time progresses, including Ecuador, which in recent years its value has been low. On Ecuador's part, it is beneficial that the country has not experienced inflation so that the productive sectors related to the economy are not affected.

- Regarding the tons and FOB produced in shrimp, it can be seen that in the first years of the study period, Vietnam and Thailand obtain the first positions as shrimp producers in the world. However, by 2014, the positions are succeeded by India, Ecuador and Vietnam, and at the end of the period, India, Ecuador are the pioneers. This shows that Ecuador and India have been moving up the rankings and are still the main producers in the world.

- In terms of shrimp participation in the countries' GDP, it can be concluded that in recent years the participation of Ecuadorian shrimp has been increasing and taking on a more significant role in the economy, so it is important for Ecuador to maintain its position as an exporter of shrimp, since this item contributes significantly to the country's economy.

- In terms of total exports, high values are observed for China, followed by India, considering that they are giant economies, compared to Ecuador and Argentina, which have the lowest values in terms of total exports. This means that these countries have export diversification and do not focus on institutionalizing a single item.

- Similarly, the countries with high values in non-oil products are China and India, while Ecuador and Vietnam have lower values. The basic reason is centered on the size of the economies; however, Ecuador, being a smaller economy, has shown remarkable growth in recent years in non-oil exports, where shrimp stands out after bananas.

## 14. RECOMMENDATIONS

- It is recommended that the government and public administration of Ecuador continue with the investment plans put in place with respect to the adaptation and improvement of the country's ports. In order to continue increasing advantages in capacity, ease of entry and exit of goods, agility in the physical distribution processes and shortening costs and time in the mobility processes. Such as the example of China, whose ports are enhanced by extensive and specialized infrastructure and modern and systematized technology. In this way, shrimp exports will be able to stay within the competitive thread, since they have efficient transit capacity to be delivered to customers.

- It is important that the government pay special attention to the field of education, and analyze an extended investment plan to be used in infrastructure and salaries for university teachers. In this way, by promoting access to education and training for all people, specifically in the shrimp sector, it will be possible to obtain a better performance in the processes and implications related to the growth of crustaceans and the prevention of diseases and pests. Furthermore, in accordance with this, knowledge must be maintained as a fundamental part of obtaining jobs, adapted to the activities that are developed there.

- Ecuador must outline economic policies and means of employment generation that will allow the country to face the crises caused by over-indebtedness that threatens to raise prices without increasing salaries. It is important that the Ecuadorian government, like countries such as China, design economic policies based on the injection of money in the weakened sectors in order to lift the economic sector exhausted due to the country's crisis.

- The country and its industries should encourage the importation of machinery and systems that contribute to the technological development applied to the country's production areas, and play the role of creating added value, tripling productivity, lowering costs, and increasing the economy in general. It is also necessary the involvement and knowledge of the personnel in the technological processes, in order to make their production line efficient and effective. It is also important to study the feasibility of using equipment according to the product offered so that it can effectively fulfill its function in the market.

- Finally, it is recommended that society promote and encourage the consumption of Ecuadorian shrimp in order to support the sector's economy, which will contribute to strengthening competitiveness through investment in resources related to the industry. In this way, the export figures will position Ecuador as the world's leading crustacean exporter. In addition, the country's economy will experience growth, since shrimp is the second largest source of income in the field of non-petroleum products.

## 15. BIBLIOGRAPHY.


ACF International. (2013). Exporting and importing in business. Acción Contra El Hambre. https://www.accioncontraelhambre.org/sites/default/files/documents/u.d.9_exportacion_importacion.pdf

Acosta, A. (2009). Ecuador: a country handcuffed in the face of the crisis? Ildis, 1-18. https://www.flacsoandes.edu.ec/web/imagesFTP/1245949623.Policy_Paper_Ecuador_Acosta.pdf

Aduanet. (2021). SECTION:I LIVE ANIMALS AND PRODUCTS OF THE ANIMAL KINGDOM. http://www.aduanet.gob.pe/servlet/EAIScroll?Partida=0307992000&Desc=.

Aggarwal, R. (2021). India: Technology can solve many of the challenges in agriculture. https://www.agribusinessglobal.com/es/agtech/india-la-tecnologia-puede-resolver-muchos-de-desafios-agricolas/

Amat, J. (2016). Introduction to Multiple Linear Regression. https://www.cienciadedatos.net/documentos/25_regresion_lineal_multiple.html

Animapedia. (2018). Shrimp. https://animapedia.org/animales-acuaticos/camaron/

Central Bank of Ecuador. (2001). Chapter III: The Ecuadorian economy in the year 2001. https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/Memoria/2001/cap03.PDF.

Inter-American Business Bank. (2015). Argentina to increase investment in research, development and technological innovation with IDB support. https://www.iadb.org/es/noticias/comunicados-de-prensa/2015-06-26/argentina-mejorara-la-productividad-de-las-empresas%2C11186.html

World Bank. (2015). The story of two ports in Indonesia. World Bank. https://www.bancomundial.org/es/news/feature/2015/05/26/the-tale-of-two-ports-in-indonesia

World Bank. (2021). WHO WE ARE. https://databank.bancomundial.org/home.aspx

World Bank. (2022). The World Bank in Ecuador. https://www.bancomundial.org/es/country/ecuador/overview#1

BCE. (2021a). CENTRAL BANK OF ECUADOR IN THE DOLLARIZATION REGIME. 24. https://doi.org/10.1038/sj.bdj.2010.1088

BCE. (2021b). Evolución de la Balanza Comercial. http://contenido.bce.fin.ec/documentos/Estadisticas/SectorExterno/BalanzaPagos/balanzaComercial/ebc201312.pdf

BCN. (2015). The innovation policy that would make India a commercial power. https://www.bcn.cl/observatorio/asiapacifico/noticias/politica-innovacion-decada-india-2010-2020

Belmar, C. (2021). Competitiveness support program. In Calidad & Gestion - Consultoría para Empresas. https://www.argentina.gob.ar/sites/default/files/programa_de_apoyo_a_la_innovacion_y_la_competitividad.pdf

Bernabe, L. (2016). Shrimp sector: Evolution and short-term projection. Fcshopina, 87(0), 1-7. http://www.test.revistas.espol.edu.ec/index.php/fenopina/article/view/100/107

BID- FOMIN. (2021). Market Study - Canada Fish and Seafood. https://boletines.exportemos.pe/recursos/boletin/28626.PDF.

BioEncyclopedia. (2021). Shrimp. https://www.bioenciclopedia.com/camaron/

Blanco, A. (2021). China as an innovative leader, between success and doubts. https://www.realinstitutoelcano.org/analisis/china-como-lider-innovador-entre-el-exito-y-las-dudas/

Bohorquez, A. (2015). Education systems of the world: Thailand. https://www.compartirpalabramaestra.org/articulos-informativos/sistemas-educativos-del-mundo-tailandia

Celaya, R., Licona, A., & Reyes, M. (2015). Ports in Northeast and Southeast Asia: China, Japan, South Korea, Philippines, Indonesia, Malaysia, Thailand and Socialist Republic of Vietnam.

CEPAL. (2010). Economic Survey of Latin America and the Caribbean-Ecuador 2009-2010. https://repositorio.cepal.org/bitstream/handle/11362/1070/22/Ecuador_es.pdf.

CEPAL. (2014). Preliminary Overview of the Economies of Latin America and the Caribbean ▪ Ecuador. 3. https://repositorio.cepal.org/bitstream/handle/11362/37344/8/Ecuador_es.pdf

CEPAL. (2018). Preliminary Balance Sheet of the Economies of Latin America and the Caribbean ▪ Ecuador. https://repositorio.cepal.org/bitstream/handle/11362/44326/124/BPE2018_Ecuador_es.pdf

CFN. (2020). Ficha Sectorial: Camarón. 1(1), 24. https://www.cfn.fin.ec/wp-content/uploads/2017/10/FS-Octubre-2017.pdf

Chaparria, V., López, R., & Aznar, J. (2003). EVALUATION OF THE MAIN PORTS OF SOUTH AMERICA Institutional, technical and economic analysis. 778. http://www.iirsa.org/admin_iirsa_web/uploads/documents/mad_eppas.pdf

Chavez, L., & Herrera, G. (2000). "ANÁLISIS ESTADÍSTICO DE LA PRODUCCIÓN. 1-7." https://core.ac.uk/download/pdf/12393293.pdf.

CNA. (2019). New investment in the shrimp sector. https://www.cna-ecuador.com/nueva-inversion-para-el-sector-camaronero/.

Harmonized System (HS) Convention. (2021). United Nations. https://tfig.unece.org/SP/contents/HS-convention.htm

Cordoba, M., & Moreno, F. (2017). The importance of a good pricing strategy as a market penetration tool. Tendencias, 18(2). https://doi.org/10.22267/rtend.171802.73

Cruz, J. (2016). ANALYSIS OF THE BEHAVIOR OF THE ECUADORIAN SHRIMP EXPORT SECTOR AND ITS IMPACT ON EMPLOYMENT, PERIOD 2010 - 2014. 4(4). http://repositorio.ucsg.edu.ec/bitstream/3317/5462/1/T-UCSG-PRE-ECO-CECO-89.pdf

Culqui, J., & Suárez, D. (2019). Aplicación Del Diamante De Porter Competitive Advantage of Diferent Industries According To the Application of Porter ' S Diamond.

Tambara Electronic Journal, 50, 693-703. file:///C:/Users/HP/Downloads/Culqui & Suarez.pdf.

Datosmacro. (2021). Argentina - Literacy rate. https://datosmacro.expansion.com/demografia/tasa-alfabetizacion/argentina

Stripping marketing. (2021). Market position strategies: how to position yourself in the face of competition. https://desnudandoelmarketing.com/estrategias-competitivas-de-posicion-como-posicionarse-ante-la-competencia/

Doerr, O., & Sanchéz, R. (2006). Productivity indicators for the port industry: application in Latin America and the Caribbean. https://www.oas.org/cip/docs/areas_tecnicas/6_exelencia_gestion_port/3_ind_de_produc.pdf

DP World. (2018). Start of dredging of new access channel made official. https://www.dpworldposorja.com.ec/wp-content/uploads/2018/07/Boletin-OficializaoDragadoposorja.pdf

Duke, K. (2012). World Economic Forum and World Social Forum: The challenge of sitting down to reinvent the world. Reality: Journal of Social Sciences and Humanities, 133. https://doi.org/10.5377/realidad.v0i133.3158

Duran, F., Muñoz, M., & González, M. (2017). Analysis of the Ecuadorian shrimp sector and its competitive and comparative advantages to face a competitive international market. International Congress II of Science and Technology, 1(1), 1-8. http://investigacion.utmachala.edu.ec/proceedings/index.php/utmach/article/download/221/192

Economists. (2019). Difference between nominal and real GDP. https://economistas.es/diferencia-pib-nominal-real/.

EIRD. (2016). El Niño Phenomenon in Ecuador. United Nations, Economic and Social Council Economic Commission for Latin America ECLAC, 1-58. https://www.eird.org/estrategias/pdf/spa/doc12863/doc12863-10.pdf

EKOS. (2018). Analysis: how Ecuador is doing when we talk about innovation. https://www.ekosnegocios.com/articulo/analisis-como-esta-ecuador-cuando-hablamos-de-innovacion.

El Comercio. (2017). New investments in Ecuador's shrimp sector. https://www.elcomercio.com/actualidad/negocios/inversiones-sectorcamaronero-ecuador-negocios-exportaciones.html

El Comercio. (2019). China concentrates 42% of shrimp sales in 2019. https://www.elcomercio.com/actualidad/negocios/china-ventas-camaron-exportaciones-cna.html

El Comercio. (2020). Shrimp reached record figure in 2019 in Ecuador. https://www.elcomercio.com/actualidad/negocios/camaron-record-ecuador-exportacion-economia.html

El Economista. (2021). Inflation. https://www.eleconomista.es/diccionario-de-economia/inflacion

The World Order. (2020). What is the World Economic Forum, or Davos Forum? https://elordenmundial.com/que-es-el-foro-economico-mundial/

El Pais. (2005). The technological boost places India as one of the five most attractive countries to invest in. https://elpais.com/tecnologia/2005/11/29/actualidad/1133256483_850215.html

El Telegrafo. (2018). Electrification project will increase shrimp production by 30%. https://www.eltelegrafo.com.ec/noticias/economia/1/proyecto-electrificacion-produccion-camaron

El Universo. (2018). Increased entry of products to the United States as Most Favored Nation. https://www.eluniverso.com/noticias/2018/05/13/nota/6756681/mayor-ingreso-como-nacion-mas-favorecida/

Erráez, J. P. (2005). The inflationary process in Ecuador: an analysis of its determinants with Arima and Vector autoregressive models. Cuestiones Económicas, 22(3), 1-50. https://www.bce.fin.ec/cuestiones_economicas/images/PDFS/2005/No3/Vol.21-1-2005JuanPabloERRAEZ.pdf

ESPAE. (2020). No Title. https://www.espae.edu.ec/nuestros-eventos/reporte-de-competitividad-global-2020/

Fabre, P. (2014). DESIGN OF A LOGISTIC CHAIN FOR THE SHRIMPING COMPANY LOS ANGELES AS A PLAN FOR COMPETITIVE IMPROVEMENT AND THE EXPORT OF ITS PRODUCT FROM THE PORT OF GUAYAQUIL TO THE PORT OF MIAMI [PONTIFICIA UNIVERSIDAD CATÓLICA DEL ECUADOR SEDE ESMERALDAS]. file:///C:/Users/HP/Downloads/FABRE GONZALEZ PAUL.pdf.

Fedexpor. (2020). Ecuador, one of the least competitive countries in Latin America. https://www.fedexpor.com/ecuador-menos-competitivo-en-2019/

Fernandéz, M. (2020). Argentina has one of the best schooling rates in the region, but it is not growing at the rate of other countries. https://www.infobae.com/educacion/2020/03/10/argentina-tiene-una-de-las-mejores-tasas-de-escolaridad-de-la-region-pero-no-crece-al-ritmo-de-otros-paises/

Figueroa, J. (2021). Wastewater treatment of intensive Pacific white shrimp ( Penaeus (Litopenaeus) vannamei ) (Boone, 1931) culture using the MaB-floc system, the green Biofloc. 113. http://www.cenaim.espol.edu.ec/sites/cenaim.espol.edu.ec/files/T_3.pdf

Gallo, M. (2017). The Argentine economy during the period 2004-2017: expansionary cycle, external restriction and return of financial valorization. 1-38. https://www.minhacienda.gob.ar/secretarias/politica-economica/programacion-macroeconomica/

García, A. (2018). Port infrastructure in Ecuador. Universidad & Empresa, 19(32), 87-106. https://www.icex.es/icex/GetDocumento?dDocName=DOC2018794499&urlNoAcceso=/icex/es/registro/iniciar-sesion/index.html?urlDestino=https://www.icex.e. https://www.icex.es/icex/GetDocumento?l dDocName=DOC2018794499&urlNoAcceso=/icex/en/registro/iniciar-sesion/index.html?urlDestino=https://www.icex.es:443/icex/es/navegacion-principal/todos-nuestros-servicios/informacion-de-mercados/estudios-de-mercados-y-ot

Government of Mexico. (2021). what is the World Economic Forum? https://www.gob.mx/se/articulos/que-es-el-foro-economico-mundial

Gomez, D. (2017). Innovation as a factor of competitiveness in Latin America. https://es.weforum.org/agenda/2017/03/la-innovacion-como-factor-de-competitividad-en-latinoamerica/

Graphics in R. (2021). https://r-coder.com/graficos-r/

Guardiola, A. (2017). The Harmonized System and Tariff Classification.

Guerrero, S. (2017). Determinants of inflation in Ecuador 2000-2016. 1-70. http://bibliotecadigital.econ.uba.ar/download/tpos/1502-0530_GuerreroManjarresSJ.pdf

Hidalgo, F. (2006). why did the United States abort the FTA with Ecuador? https://rebelion.org/por-que-estados-unidos-aborto-el-tlc-con-ecuador/.

Humanium. (2021). Children of Vietnam. https://www.humanium.org/es/vietnam/.

Huttel, C. (1984). Formaciones Vegetales Naturales. 1974, 40. https://horizon.documentation.ird.fr/exl-doc/pleins_textes/divers16-09/010022383.pdf

ICEX. (2011). Thailand seeks its future. https://www.icex.es/icex/es/Navegacion-zona-contacto/revista-el-exportador/mundo/4469049.html

INEC. (2021). AQUACULTURE FACT SHEET. https://aplicaciones2.ecuadorencifras.gob.ec/SIN/co_acuicultura.php?id=04210.01.01

Jacome, H. (2021). More than a Free Trade Agreement. https://biblio.flacsoandes.edu.ec/libros/digital/48429.pdf

Kulfas, M., Porta, F., & Ramos, A. (2002). nversión extranjera y empresas transnacionales en la economía argentina estudios y perspectivas ECLAC Office in Buenos Aires. http://repositorio.cepal.org/bitstream/handle/11362/4874/S027508_es.pdf?sequence=1

Labarca, N. (2007). Theoretical considerations of business competitiveness. Omnia, 13(2), 28. https://www.redalyc.org/pdf/737/73713208.pdf

Legiscomex.com. (2012). Market intelligence-Canada logistics profile. https://www.legiscomex.com/BancoMedios/Documentos PDF/Canada-port-montreal.pdf.

Legiscomex. (2016). Market Intelligence-China logistics profile. Engineering, Construction and Architectural Management, 25(1), 1-9.

https://www.legiscomex.com/BancoMedios/Documentos PDF/ficha-logistica-china-2016-completo.pdf.

Lemus, D. (2019). Vietnam: public policies in science, technology and innovation. https://www.redalyc.org/journal/586/58663250002/html/

Ling, F. (2020). Analisis De La Economia China Y Su Evolucion. https://repositorio.upct.es/xmlui/bitstream/handle/10317/8820/tfg-fan-ana.pdf?sequence=1&isAllowed=y

Lleytons. (2021). China: a global innovation leader. https://www.lleytons.com/conocimiento/china-lider-en-innovacion-a-nivel-global/

López, M., Montenegro, Y., & Pardo, C. (2016). MARITIME TRANSPORT IN INDONESIA: A CHALLENGE FACING THE COUNTRY OVER LACK OF INFRASTRUCTURE INVESTMENT Indonesia: A geostrategic point for international trade (Vol. 4, Issue 1). https://repositorio.unbosque.edu.co/bitstream/handle/20.500.12495/3071/López_Medina_Mariantonia_2019.pdf?sequence=1&isAllowed=y

Luque, J. (2014). The big surprise: Vietnam. https://blogs.iadb.org/educacion/es/la-gran-sorpresa-vietnam/

Machado, D. (2013). The hidden history of shrimp. Plan V. https://www.planv.com.ec/investigacion/investigacion/la-historia-oculta-del-camaron#:~:text=Shrimp

Marcillo, F. (2003). White spot crisis and its current recovery. DSpace Repository, 4. https://www.dspace.espol.edu.ec/bitstream/123456789/8972/3/AnalisisWSSV2003.pdf

Marriott, F. (2003). Analysis of the shrimp sector. Apunte de Economia, 29, 1-60. https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/Apuntes/ae29.pdf

Martin, R. (2017). Pricing Strategy in an increasingly competitive marketplace. https://www.escueladenegociosydireccion.com/revista/business/marketing-ventas/estrategias-de-precios-en-un-mercado-competitivo/

McPadden, C. (1985). Brief study of the Shrimp Industry in Ecuador. Boletín Científico y Técnico, 1(85), 1-68.

https://aquadocs.org/bitstream/handle/1834/3221/Brevestudyofthe shrimpindustryinEcuador.pdf?sequence=1&isAllowed=y.

MEF. (2021). TRADE AGREEMENTS. https://www.mef.gob.pe/es/?option=com_content&language=es-ES&Itemid=101051&lang=es-ES&view=article&id=474

Melera, F. (2011). Universidad Nacional de Cuyo Rectorado. https://bdigital.uncu.edu.ar/objetos_digitales/4805/tesinamelera.pdf.

Meng, X. (2019). Evaluation of heritability of growth, cold tolerance in Chinese white shrimp. August.

https://www.globalseafood.org/advocate/evaluacion-de-la-heredabilidad-del-crecimiento-tolerancia-al-frio-en-camarones-blancos-chinos/?savePDF=4302f6f1f06ca8e89e39b7d3d32a324d&article=evaluacion-de-la-heredabilidad-del-crecimiento-tolerancia-al-frio-en-cam

Mincomercio. (2022). Argentina Profile. 1-12. https://www.mincit.gov.co/getattachment/dd9b205b-4fdc-4e18-9f5f-5b85b859cd7e/Argentina.aspx

Ministry of Agriculture and Livestock. (2021a). Ecuador reinforces measures to avoid disease affecting shrimp. https://www.agricultura.gob.ec/ecuador-refuerza-medidas-para-evitar-enfermedad-que-afecta-al-camaron/

Ministry of Agriculture and Livestock. (2021b). Shrimp producers receive talks on pathogens. https://www.agricultura.gob.ec/productores-camaroneros-reciben-charlas-sobre-patogenos/

Ministry of Foreign Trade. (2016). U.S. GSP: relevance for Ecuador. https://www.produccion.gob.ec/wp-content/uploads/2019/06/Informe-SGP-con-Estados-Unidos-20-oct-final.pdf

Ministry of Education. (2021). Ecuador improved its education system in the last 7 years. https://educacion.gob.ec/ecuador-mejoro-su-sistema-educativo-en-los-ultimos-7-anos/

Mirroux, A., & Casanova, L. (2020). It depends: Are Chinese companies global? https://www.esglobal.org/depende-son-las-empresas-chinas-globales/

Moncada, G., Ramírez, X., & González, L. (2020). Competitive strategies of Ecuadorian shrimp exporting companies. Success cases. INNOVA Research Journal, 5(1), 125-142. https://doi.org/10.33890/innova.v5.n1.2020.1115

MundoMaritimo. (2020). Port of Guayaquil, Ecuador: Dredging works in the access channel allow the entry of vessels with a maximum draft of 13 meters. MundoMaritimo. https://www.mundomaritimo.cl/noticias/puerto-de-guayaquil-ecuador-obras-de-dragado-en-el-canal-de-acceso-permiten-el-ingreso-de-buques-con-calado-maximo-de-13-metros

Notarianni, E. (2006). Ecuador after the White Spot. 20-21.

OAS. (2021). Export and supply corridors or basic infrastructure corridors. https://www.oas.org/dsd/publications/Unit/oea18s/ch08.htm

OIE. (2019). Taura syndrome virus infection. Manual of Diagnostic Tests for Aquatic Animals. https://www.oie.int/es/que-hacemos/normas/codigos-y-manuales/acceso-en-linea-al-manual-acuatico/?id=169&L=1&htmfile=chapitre_taura_syndrome.htm

Ordoñez, D. (2012). EL COMERCIO EXTERIOR DEL ECUADOR: ANALISIS DEL INTERCAMBIO DE BIENES DESDE LA COLONIA HASTA LA ACTUALIDAD. Eumed. https://www.eumed.net/cursecon/ecolat/ec/2012/ddoi.html

World Customs Organization (WCO). (2021). https://www.aduana.gob.ec/organizacion-mundial-de-aduana-oma/

Osorio, L. L. (2021). BULLETIN No. 193 THE PORTS OF ECUADOR AND FOREIGN TRADE. Colegio de Economistas de Pichincha. https://colegiodeeconomistas.org.ec/boletin-no-193-los-puertos-del-ecuador-y-el-comercio-exterior/

Peña, L. (2017). FACULTY OF ECONOMICS Ecuador's Shrimp Sector and Sectoral Policies https://horizon.documentation.ird.fr/exl-doc/pleins_textes/divers16-09/010022383.pdf

Piedrahita, Y. (2018). The shrimp farming industry in Ecuador, part 1. Global Seafood Alliance. https://www.globalseafood.org/advocate/la-industria-de-cultivo-de-camaron-en-ecuador-parte-1/

Plan V. (2020). The bailout of the century. https://www.planv.com.ec/historias/sociedad/el-salvataje-del-siglo#:~:text=This is a story about the government of Jamil Mahuad.&text=There were no banks%2C his money to get to his house.

Porter, M. (2009). Being Competitive (DEUSTO). https://books.google.com.pe/books?id=CIgKoErmS_MC&printsec=frontcover&hl=es#v=onepage&q&f=false

Porter, M. (2015). Competitive Strategy. https://books.google.com.ec/books/about/Estrategia_Competitiva.html?id=_n0dDAAAQBAJ&printsec=frontcover&source=kp_read_button&hl=es&redir_esc=y#v=onepage&q&f=false

Pourrut, P., & Pouyaud, B. (1995). Water in Ecuador: Climate, precipitation, runoff. In Estudios de Geografía. https://horizon.documentation.ird.fr/exl-doc/pleins_textes/pleins_textes_7/divers2/010014823.pdf

Publicayo. (2021). Hydrophone. https://www.publicayo.com/tag/hidrofono/

Qiufen, D., PengZhidong, Song, Z., & Yong, Y. (2021). Review of the shrimp feed industry in China. https://aquafeed.co/entrada/rese-a-de-la-industria-de-alimentos-para-camarones-en-china-20433/.

Quilumba, A. (2020). Generalized System of Preference (GSP) between the United States and Ecuador. https://comunidad.todocomercioexterior.com.ec/profiles/blogs/sistema-generalizado-de-preferencia-sgp-entre-estados-unidos-y

Quintero, J., & Sànchez, J. (2006). La cadena de valor : Una herramienta del pensamiento estratégico The Value Chain : A Strategic Thought Tool. Telos, 8(3), 377-389. http://www.redalyc.org/articulo.oa?id=99318788001%0ACómo

Quiroa, M. (2020). Market for goods and services. Economipedia. https://economipedia.com/definiciones/mercado-de-bienes-y-servicios.html

Ramirez, P. H. (2014). The internationalization of higher education in Thailand : progress and unfinished business. 40-52. https://rimac.cinvestav.mx/Portals/rimac/Libros

RIMAC/geohistoryofinternationalization/Geo-strategy The internationalization of higher education in Thailand 40-52.pdf?ver=2019-11-14-120133-177.

REDEM. (2021a). India. https://www.redem.org/asia/india/

REDEM. (2021b). Thailand. https://www.redem.org/asia/tailandia/

Resico, M. (2010). Introduction to the Social Market Economy. https://www.kas.de/c/document_library/get_file?uuid=22412104-f255-886e-178f-8b32bf5bce06&groupId=252038

Lideres Magazine. (2021). The national shrimp industry refloated with strength. Lideres Magazine. https://www.revistalideres.ec/lideres/industria-nacional-camaron-refloto-fuerza.html

Reyes, S. (2017). New investment in shrimp sector. Revista Lideres. https://www.revistalideres.ec/lideres/nueva-inversion-sector-camaronero-ecuador.html

Reyes, V. (2019). "ANALYSIS OF THE SHRIMP SECTOR AND ITS PARTICIPATION IN ECUADOR'S ECONOMIC GROWTH, PERIOD 2013-2017" [UNIVERSITY OF GUAYAQUIL]. http://repositorio.ug.edu.ec/bitstream/redug/41222/1/T-REYES COQUE VERONICA ANABEL.pdf.

Rodríguez, A., & García, A. (2010). Effect of temperature on the growth and survival of Southern River Shrimp (Samastacus spinifrons, Phillipi 1992) in its juvenile stage. AquaTIC: Electronic Journal of Aquaculture, 32, 7-21. http://www.revistaaquatic.com/aquatic/pdf/32_02.pdf. http://www.revistaaquatic.com/aquatic/pdf/32_02.pdf.

Rodríguez, M. (2008). China. External sector support policies. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-952X2008000100003

Romero, N. (2014). Neoliberalism and shrimp industry in Ecuador. Letras Verdes, Latin American Journal of Socio-environmental Studies. https://doi.org/10.17141/letrasverdes.15.2014.1257

Ron, S., & Varela, A. (2020). Geography and Climate of Ecuador. https://bioweb.bio/faunaweb/amphibiaweb/GeografiaClima/.

Rozas, P., & Sánchez, R. (2004). Infrastructure Development and Economic Growth. In Cepal, SERIE Recursos naturales e infraestructura.

Ruiz, L. (2014). COMPETITIVENESS STRATEGIES OF MICRO, SMALL AND MEDIUM WINE ENTERPRISES IN THE WINE ROUTE OF THE GUADALUPE VALLEY, BAJA CALIFORNIA, MEXICO. https://www.eumed.net/tesis-doctorales/2014/lmr/marco-teorico.htm

Saenz, P. (2018). PRELIMINARY EFFECTS OF THE FREE TRADE AGREEMENT BETWEEN ECUADOR AND THE EUROPEAN UNION. Bibliographic Review of Dental Amalgam, Its Use and Safety as a Restorative Material in the Oral Cavity of Children under 12 Years of Age, 0, 1-61. http://repositorio.usfq.edu.ec/bitstream/23000/7654/1/140187.pdf

Saltos, J. (2020). The shrimp sector and its incidence in the economic growth of the province of Guayas during the period 2013-2018. In Universidad politecnica salesiana. file:///C:/Users/HP/Downloads/Saltos 2020.pdf.

Sanchez, A., Vayas, T., Mayorga, F., & Freire, C. (2019). Evolution of the gross domestic product - GDP, in Ecuador. Observatorio Económico y Social de Tungurahua, 1(1), 1-4. https://fca.uta.edu.ec/v4.0/images/OBSERVATORIO/dipticos/Diptico_N60.pdf

Sanseau, M. (2015). Education in India. https://geirprecsur.wordpress.com/2015/06/16/educacion-en-la-india/

Santana, N. (2015). Factores de Auge, Crisis y Recuperación Del Sector Camaronero Ecuatoriano En El Periodo 1994-2004. http://repositorio.ug.edu.ec/bitstream/redug/7158/1/PROYECTO FINAL DE TESIS NARCISA SANTANA NAVARRO.pdf.

Santander. (2021). What is the trade balance? https://www.bancosantander.es/glosario/balanza-comercial

Schleicher, A. (2015). How Vietnam did to dramatically improve the quality of its education. https://www.bbc.com/mundo/noticias/2015/06/150617_cultura_vietnam_exito_sistema_educativo_bd

General Secretariat of Communication of the Presidency. (2021). In defense of its sovereignty, Ecuador unilaterally and irrevocably renounces the ATPDEA. https://www.comunicacion.gob.ec/en-defensa-de-su-soberania-ecuador-renuncia-de-manera-unilateral-e-irrevocable-a-las-atpdea/

Segura, C., & Segura, A. (2017). Las Recaudaciones Tributarias Y El Crecimiento. Revista Empresarial, ICE-FEE-UCSG, 11(1390). file:///C:/Users/HP/Downloads/Segura Segura Segura.pdf.

SICE. (2021). Generalized System of Preferences (GSP). http://www.sice.oas.org/tpd/gsp/gsp_schemes_s.asp

SNCI. (2021). Global Competitiveness Index -ICG (Índice de Competitividad Global -ICG). http://www.colombiacompetitiva.gov.co/snci/indicadores-internacionales/indice-competitividad-global

Stumpo, G., & Rivas, D. (2013). La industria argentina frente a los nuevos desafíos y oportunidades del siglo XXI. ECLAC, 402. https://repositorio.cepal.org/bitstream/handle/11362/35466/S2013348_es.pdf

Suñol, S. (2006). Theoretical aspects of competitiveness. Ciencia y Sociedad, 31(2), 178-198.

Tagle, E. (2020, August). History of shrimp in Ecuador, innovation and development. The Inca Trail. https://incatrailfoods.com/news/historia-del-camaron-en-ecuador-innovacion-y-desarrollo/

Then, L., Pimentel, S., Olivero, P., Soto, A., Luna, A., Cruz, G., Peguero, M., Jáquez, C., & Lluberes, J. (2014). Analysis of Porter's competitive forces in the real estate development sector in greater Santo Domingo. Science and Society, 39(3), 441-476. https://doi.org/10.22206/cys.2014.v39i3.pp441-476

Toapanta, A. (2015). "ALTERNATIVES FOR THE BEST USE OF THE TARIFF PREFERENCES GRANTED BY THE GENERAL SYSTEM OF PREFERENCES (SGP PLUS)" (Vol. 151). https://doi.org/10.1145/3132847.3132886

Trade Map. (2021a). List of exporters for the selected product Product: 0306 Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in ...

https://www.trademap.org/Country_SelProduct_TS.aspx?nvpm=3%7C%7C%7C%7C%7C0306%7C%7C%7C4%7C1%7C1%7C2%7C2%7C1%7C2%7C1%7C1%7C1

Trade Map. (2021b). No Title. https://www.trademap.org/Country_SelProduct_TS.aspx?nvpm=3%7C%7C%7C%7C%7C0306%7C%7C%7C4%7C1%7C1%7C2%7C2%7C1%7C2%7C1%7C1%7C1

Tuan, T. (2012, June 26). Vietnam boosts port system towards sustainable maritime economy. https://vovworld.vn/es-ES/economia/vietnam-fomenta-el-sistema-portuario-hacia-una-economia-maritima-sostenible-92391.vov

UPC, D. of nautical science and engineering. (2004). Technological Future of Maritime Vehicle Terminals. 8-49. https://www.tdx.cat/bitstream/handle/10803/7001/02Jmmc02de12.pdf?sequence=2&isAllowed=y

USTR. (2021). GENERALIZED SYSTEM OF PREFERENCES. https://ustr.gov/archive/assets/Trade_Development/Preference_Programs/GSP/GSP_Program_Summary_(available_in_multiple_languages)/asset_upload_file925_14706.pdf.

Varela, M. (2011). Shrimp processing for export. In Centro de Investigaciones Económicas de la Pequeña y Mediana Empresa. https://www.flacso.edu.ec/portal/pnTemp/PageMaster/v1h0ohbg78sb6mncmkkr5w3mwji4ep.pdf

Vega, J. (2019). MAIN PROPHYLACTIC AND THERAPEUTIC MEASURES USED FOR DISEASE PREVENTION IN WHITE SHRIMP LITOPENAEUS VANNAMEI CULTURES. In Universidad Técnica de Machala. http://repositorio.utmachala.edu.ec/handle/48000/15166

Villegas, M. (2014). EXPORT OF TUNA AS A TRADITIONAL PRODUCT OF ECUADOR AND ITS POSITIONING IN THE EUROPEAN UNION PERIOD 2009 - 2013. [UNIVERSITY OF GUAYAQUIL]. file:///C:/Users/HP/Downloads/Villegas 2014.pdf.

WEF. (2018). The Global Competitiveness Index 4 . 0 Methodology and Technical Notes. 631-647. https://www3.weforum.org/docs/GCR2018/04Backmatter/3. Appendix C.pdf.

World Economic Forum (WEF). (2008). The Global Competitiveness Report 2008-2009. In Forum American Bar Association. http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2008-09.pdf

World Trade Organization. (2011). Thailand. https://www.wto.org/spanish/tratop_s/tpr_s/s255_sum_s.pdf

World Trade Organization. (2021a). Ecuador. 6. https://www.wto.org/spanish/tratop_s/tpr_s/s254_sum_s.pdf

## 16. ANNEXES

### Shrimp exporting countries in the world in FOB value

| Exporters | Value exported in 2007 | Value exported in 2008 | Value exported in 2009 | Value exported in 2010 | Value exported in 2011 | Value exported in 2012 |
|---|---|---|---|---|---|---|
| Argentina | 292.727 | 383.513 | 323.604 | 474.323 | 528.620 | 495.872 |
| Australia | 437.416 | 462.972 | 384.900 | 441.081 | 528.297 | 487.740 |
| Bangladesh | 612.631 | 459.337 | 318.453 | 437.983 | 498.161 | 262.996 |
| Belgium | 406.977 | 432.917 | 333.264 | 370.838 | 470.296 | 359.177 |
| Canada | 1.590.564 | 1.565.724 | 1.372.750 | 1.617.955 | 1.917.240 | 1.948.267 |
| China | 368.070 | 379.105 | 1.039.500 | 1.156.150 | 1.383.052 | 1.465.553 |
| Denmark | 468.634 | 523.473 | 383.187 | 393.195 | 399.325 | 427.522 |
| Ecuador | 601.040 | 715.652 | 666.008 | 850.686 | 1.176.453 | 1.279.766 |
| United States | 581.556 | 603.520 | 554.127 | 667.336 | 846.285 | 901.837 |
| India | 894.319 | 775.989 | 795.809 | 1.058.559 | 1.658.664 | 1.791.279 |
| Indonesia | 992.860 | 1.070.921 | 845.223 | 939.852 | 1.161.657 | 1.206.544 |
| Malaysia | 334.319 | 361.484 | 299.055 | 426.635 | 481.721 | 390.969 |
| Mexico | 412.987 | 408.966 | 426.690 | 295.829 | 405.222 | 245.039 |
| Nigeria | 46.310 | 70.180 | 336.606 | 323.805 | 82.509 | 329.852 |
| Netherlands | 363.757 | 393.736 | 408.274 | 397.565 | 482.862 | 580.795 |
| United Kingdom | 520.292 | 448.972 | 381.493 | 393.909 | 442.306 | 377.395 |
| Russia | 16.064 | 16.016 | 187.339 | 228.928 | 271.500 | 296.746 |
| Thailand | 1.295.644 | 1.353.685 | 1.400.477 | 1.725.136 | 1.785.876 | 1.534.669 |
| Vietnam | 1.440.226 | 1.407.074 | 1.397.365 | 1.608.770 | 1.745.999 | 1.592.933 |

| Value exported in 2013 | Value exported in 2014 | Value exported in 2015 | Value exported in 2016 | Value exported in 2017 | Value exported in 2018 | Value exported in 2019 |
|---|---|---|---|---|---|---|
| 635.731 | 776.869 | 780.234 | 1.018.342 | 1.222.180 | 1.328.140 | 1.079.696 |
| 565.569 | 709.239 | 641.014 | 635.157 | 622.232 | 643.718 | 623.761 |
| 457.463 | 559.192 | 393.970 | 541.993 | 544.466 | 460.773 | 438.614 |
| 391.217 | 413.415 | 332.489 | 362.925 | 431.303 | 344.160 | 290.990 |
| 2.057.433 | 2.296.614 | 2.432.513 | 2.404.358 | 2.788.380 | 2.791.990 | 3.090.863 |
| 1.752.079 | 2.043.898 | 1.713.508 | 1.683.367 | 1.495.374 | 1.266.261 | 1.029.957 |
| 469.239 | 475.554 | 417.054 | 454.865 | 491.654 | 518.768 | 492.509 |
| 1.794.992 | 2.520.243 | 2.287.403 | 2.587.434 | 3.047.028 | 3.246.149 | 3.901.559 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 956.747 | 1.138.533 | 1.141.925 | 1.118.206 | 1.015.623 | 1.081.620 | 941.301 |
| 2.976.797 | 3.834.859 | 3.194.185 | 3.594.925 | 4.751.589 | 4.491.743 | 4.676.921 |
| 1.481.284 | 1.815.230 | 1.355.905 | 1.464.399 | 1.689.721 | 1.574.130 | 1.428.656 |
| 353.032 | 418.278 | 257.404 | 212.052 | 234.331 | 261.993 | 317.123 |
| 396.934 | 419.239 | 434.094 | 419.429 | 573.058 | 497.893 | 529.470 |
| 180.042 | 89.830 | 65.870 | 63.527 | 45.760 | 42.718 | 31.686 |
| 562.526 | 621.759 | 453.476 | 506.905 | 517.783 | 597.524 | 582.367 |
| 400.609 | 441.934 | 356.187 | 411.180 | 437.266 | 454.475 | 424.618 |
| 349.227 | 548.821 | 532.914 | 665.086 | 948.832 | 1.185.418 | 1.582.383 |
| 1.020.414 | 966.598 | 778.753 | 1.080.134 | 1.157.367 | 1.055.338 | 991.033 |
| 2.052.907 | 2.553.754 | 1.805.824 | 1.918.834 | 2.450.280 | 2.122.949 | 2.107.349 |

## The main shrimp exporting countries in FOB values

| Exporters | Value exported in 2007 | Value exported in 2008 | Value exported in 2009 | Value exported in 2010 | Value exported in 2011 | Value exported in 2012 |
|---|---|---|---|---|---|---|
| Argentina | 292.727 | 383.513 | 323.604 | 474.323 | 528.620 | 495.872 |
| Canada | 1.590.564 | 1.565.724 | 1.372.750 | 1.617.955 | 1.917.240 | 1.948.267 |
| China | 368.070 | 379.105 | 1.039.500 | 1.156.150 | 1.383.052 | 1.465.553 |
| Ecuador | 601.040 | 715.652 | 666.008 | 850.686 | 1.176.453 | 1.279.766 |
| India | 894.319 | 775.989 | 795.809 | 1.058.559 | 1.658.664 | 1.791.279 |
| Indonesia | 992.860 | 1.070.921 | 845.223 | 939.852 | 1.161.657 | 1.206.544 |
| Thailand | 1.295.644 | 1.353.685 | 1.400.477 | 1.725.136 | 1.785.876 | 1.534.669 |
| Vietnam | 1.440.226 | 1.407.074 | 1.397.365 | 1.608.770 | 1.745.999 | 1.592.933 |

| Value exported in 2013 | Value exported in 2014 | Value exported in 2015 | Value exported in 2016 | Value exported in 2017 | Value exported in 2018 | Value exported in 2019 |
|---|---|---|---|---|---|---|
| 635.731 | 776.869 | 780.234 | 1.018.342 | 1.222.180 | 1.328.140 | 1.079.696 |
| 2.057.433 | 2.296.614 | 2.432.513 | 2.404.358 | 2.788.380 | 2.791.990 | 3.090.863 |
| 1.752.079 | 2.043.898 | 1.713.508 | 1.683.367 | 1.495.374 | 1.266.261 | 1.029.957 |
| 1.794.992 | 2.520.243 | 2.287.403 | 2.587.434 | 3.047.028 | 3.246.149 | 3.901.559 |
| 2.976.797 | 3.834.859 | 3.194.185 | 3.594.925 | 4.751.589 | 4.491.743 | 4.676.921 |
| 1.481.284 | 1.815.230 | 1.355.905 | 1.464.399 | 1.689.721 | 1.574.130 | 1.428.656 |
| 1.020.414 | 966.598 | 778.753 | 1.080.134 | 1.157.367 | 1.055.338 | 991.033 |
| 2.052.907 | 2.553.754 | 1.805.824 | 1.918.834 | 2.450.280 | 2.122.949 | 2.107.349 |

**Qualitative Variables**

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| | | QUALITY OF PORT INFRASTRUCTURE | QUALITY OF THE EDUCATION SYSTEM | EXTENSION OF MARKET DOMINANCE | CAPACITY FOR INNOVATION |
| **PERIOD** | **COUNTRY** | **RANKING** | **RANKING** | **RANKING** | **RANKING** |
| 2007-2008 n: 140 | ARGENTINA | 96 | 93 | 92 | 81 |
| | CHINA | 56 | 51 | 26 | 31 |
| | ECUADOR | 83 | 95 | 119 | 92 |
| | INDIA | 73 | 36 | 27 | 40 |
| | INDONESIA | 90 | 40 | 44 | 33 |
| | THAILAND | 53 | 71 | 77 | 66 |
| | VIETNAM | 95 | 82 | 62 | 66 |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| | | QUALITY OF PORTUARY INFRASTRUCTURE | QUALITY OF THE EDUCATION SYSTEM | EXTENT OF MARKET DOMINANCE | INNOVATION CAPACITY |
| **PERIOD** | **COUNTRY** | **RANKING** | **RANKING** | **RANKING** | **RANKING** |
| 2008-2009 n:134 | ARGENTINA | 92 | 105 | 84 | 79 |
| | CHINA | 54 | 55 | 39 | 25 |
| | ECUADOR | 117 | 125 | 123 | 116 |
| | INDIA | 93 | 37 | 19 | 35 |
| | INDONESIA | 104 | 39 | 28 | 53 |
| | THAILAND | 48 | 53 | 60 | 64 |
| | VIETNAM | 112 | 120 | 44 | 41 |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| | | QUALITY OF PORTUARY INFRASTRUCTURE | QUALITY OF THE EDUCATION SYSTEM | EXTENT OF MARKET DOMINANCE | INNOVATION CAPACITY |
| **PERIODO** | **COUNTRY** | **RANKING** | **RANKING** | **RANKING** | **RANKING** |
| 2009-2010 n: 133 | ARGENTINA | 85 | 94 | 85 | 69 |
| | CHINA | 61 | 52 | 26 | 22 |
| | ECUADOR | 96 | 122 | 119 | 114 |
| | INDIA | 90 | 37 | 22 | 35 |
| | INDONESIA | 95 | 44 | 34 | 44 |
| | THAILAND | 47 | 67 | 59 | 59 |
| | VIETNAM | 99 | 85 | 41 | 33 |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| **PERIODO** | **COUNTRY** | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| 2010- 2011 n:139 | ARGENTINA | 88 | 90 | 104 | 62 |
| | CHINA | 67 | 53 | 23 | 21 |
| | ECUADOR | 92 | 122 | 132 | 114 |
| | INDIA | 83 | 39 | 26 | 33 |
| | INDONESIA | 96 | 40 | 42 | 30 |
| | THAILAND | 43 | 66 | 69 | 56 |
| | VIETNAM | 97 | 61 | 48 | 32 |

| INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|
| **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |

| | | | EDUCATION SYSTEM | | |
|---|---|---|---|---|---|
| **PERIOD** | **COUNTRY** | **RANKING** | **RANKING** | **RANKING** | **RANKING** |
| 2011-2012 n: 142 | ARGENTINA | 94 | 86 | 103 | 99 |
| | CHINA | 56 | 54 | 20 | 23 |
| | ECUADOR | 91 | 105 | 128 | 87 |
| | INDIA | 82 | 38 | 23 | 35 |
| | INDONESIA | 103 | 44 | 53 | 30 |
| | TAILANDIA | 47 | 77 | 83 | 56 |
| | VIETNAM | 111 | 69 | 57 | 58 |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| **PERIOD** | **COUTRY** | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| 2012- 2013 n: 144 | ARGENTINA | 101 | 89 | 101 | 95 |
| | CHINA | 59 | 57 | 23 | 23 |
| | ECUADOR | 88 | 93 | 125 | 82 |
| | INDIA | 80 | 34 | 27 | 42 |
| | INDONESIA | 104 | 47 | 57 | 30 |
| | THAILAND | 56 | 78 | 79 | 79 |
| | VIETNAM | 113 | 72 | 73 | 78 |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| | | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| **PERIODO** | **COUNTRY** | **RANKING** | **RANKING** | **RANKING** | **RANKING** |
| | ARGENTINA | 99 | 104 | 123 | 91 |

| | | | | | |
|---|---|---|---|---|---|
| | CHINA | 59 | 54 | 23 | 30 |
| 2013-2014 | ECUADOR | 69 | 62 | 85 | 53 |
| n:148 | INDIA | 70 | 33 | 26 | 41 |
| | INDONESIA | 89 | 36 | 54 | 24 |
| | THAILAND | 56 | 78 | 76 | 87 |
| | VIETNAM | 98 | 95 | 74 | 86 |
| | | | | | |

| | | **INFRASTRUCTURE** | **EDUCATION AND TRAINING** | **EFICIENCY OF THE GOODS MARKET** | **INNOVATION** |
|---|---|---|---|---|---|
| **PERIOD** | **COUNTRY** | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| | ARGENTINA | 91 | 113 | 117 | 80 |
| | CHINA | 53 | 52 | 29 | 40 |
| 2014- 2015 | ECUADOR | 71 | 81 | 121 | 91 |
| n:144 | INDIA | 76 | 45 | 36 | 48 |
| | INDONESIA | 77 | 32 | 43 | 22 |
| | THAILAND | 54 | 87 | 67 | 70 |
| | VIETNAM | 88 | 94 | 69 | 95 |

| | | **INFRASTRUCTURE** | **EDUCATION AND TRAINING** | **EFICIENCY OF THE GOODS MARKET** | **INNOVATION** |
|---|---|---|---|---|---|
| **PERIOD** | **COUNTRY** | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| | ARGENTINA | 81 | 108 | 96 | 74 |
| | CHINA | 50 | 56 | 28 | 49 |
| 2015- 2016 | ECUADOR | 40 | 71 | 121 | 69 |
| n: 140 | INDIA | 60 | 43 | 41 | 50 |
| | INDONESIA | 82 | 41 | 56 | 30 |
| | TAILANDIA | 52 | 74 | 81 | 54 |

| | | | | | |
|---|---|---|---|---|---|
| | VIETNAM | 76 | 78 | 64 | 81 |
| | | | | | |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| **PERIOD** | **COUNTRY** | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| 2016- 2017<br>n: 138 | ARGENTINA | 79 | 93 | 94 | 74 |
| | CHINA | 43 | 43 | 23 | 30 |
| | ECUADOR | 40 | 81 | 121 | 88 |
| | INDIA | 48 | 29 | 31 | 39 |
| | INDONESIA | 75 | 39 | 43 | 32 |
| | THAILAND | 65 | 67 | 104 | 70 |
| | VIETNAM | 77 | 76 | 71 | 79 |

| | | INFRASTRUCTURE | EDUCATION AND TRAINING | EFICIENCY OF THE GOODS MARKET | INNOVATION |
|---|---|---|---|---|---|
| **PERIOD** | **COUTRY** | **QUALITY OF PORTUARY INFRASTRUCTURE** | **QUALITY OF THE EDUCATION SYSTEM** | **EXTENT OF MARKET DOMINANCE** | **CAPACITY TO INNOVATE** |
| 2017-2018<br>n: 137 | ARGENTINA | 80 | 102 | 103 | 71 |
| | CHINA | 49 | 29 | 22 | 44 |
| | ECUADOR | 44 | 88 | 120 | 104 |
| | INDIA | 47 | 25 | 23 | 42 |
| | INDONESIA | 72 | 33 | 34 | 31 |
| | THAILAND | 63 | 65 | 95 | 69 |
| | VIETNAM | 82 | 71 | 78 | 79 |

Source: World Economic Forum

Prepared by: Miriam Maldonado

**Variable Quantity**

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ CAMARON |
|---|---|---|---|---|---|---|
| 2007 | ARGENTINA | $16.570,01 | $657.569.211.584,86 | $657.569,212 | 1493,992% | 45.545 |
| | CHINA | $6.810,60 | $8.975.592.720.883,64 | $8.975.592,721 | 481,676% | 103.926 |
| | ECUADOR | $8.294,64 | $118.584.813.696,74 | $118.584,814 | 227,618% | 125.214 |
| | INDIA | $3.525,31 | $4.171.185.449.753,47 | $4.171.185,450 | 637,288% | 139.526 |
| | INDONESIA | $7.229,54 | $1.679.958.456.542,15 | $1.679.958,457 | 640,656% | 145.328 |
| | TAILANDIA | $11.869,67 | $785.559.554.134,53 | $785.559,554 | 224,154% | 204.707 |
| | VIETNAM | $3.522,94 | $300.927.940.785,90 | $300.927,941 | 834,444% | 222.134 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_CAMARON_EXP_ NON_OIL |
|---|---|---|---|---|---|
| $292,73 | 0,045% | $55,780 | $55.778.284,00 | $55,778 | 524,805% |
| $368,07 | 0,004% | $1.220,060 | $1.220.057.129,69 | $1.220,057 | 30,168% |
| $601,04 | 0,507% | $13,800 | $13.792.935,64 | $13,793 | 4357,593% |
| $894,32 | 0,021% | $145,898 | $145.898.024,00 | $145,898 | 612,975% |
| $992,86 | 0,059% | $114,101 | $114.091.646,96 | $114,092 | 870,230% |
| $1.295,64 | 0,165% | $153,571 | $153.569.966,83 | $153,570 | 843,683% |
| $1.440,23 | 0,479% | $48,561 | $48.552.855,40 | $48,553 | 2966,305% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATIÓN | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2008 | ARGENTINA | $17.404,07 | $697.557.858.459,69 | $697.557,858 | 2317,116% | 43.391 |
| | CHINA | $7.574,22 | $10.033.234.295.495,50 | $10.033.234,295 | 592,525% | 86.923 |
| | ECUADOR | $8.845,55 | $128.576.671.514,50 | $128.576,672 | 840,009% | 130.325 |
| | INDIA | $3.650,94 | $4.383.576.794.711,13 | $4.383.576,795 | 834,926% | 125.897 |
| | INDONESIA | $7.710,67 | $1.815.628.705.517,81 | $1.815.628,706 | 1022,666% | 149.544 |
| | THAILAND | $12.244,82 | $814.659.803.934,08 | $814.659,804 | 546,848% | 206.452 |
| | VIETNAM | $3.758,55 | $324.150.645.725,93 | $324.150,646 | 2311,544% | 207.953 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP_EXP_ NON_OIL |
|---|---|---|---|---|---|
| $383,51 | 0,055% | $70,019 | $70.017.232,84 | $70,017 | 547,741% |
| $379,11 | 0,004% | $1.430,693 | $1.430.690.097,06 | $1.430,690 | 26,498% |
| $715,65 | 0,557% | $18,818 | $18.807.757,05 | $18,808 | 3805,090% |

| | | | | | |
|---|---|---|---|---|---|
| $775,99 | 0,018% | $181,861 | $181.860.862,54 | $181,861 | 426,694% |
| $1.070,92 | 0,059% | $137,020 | $137.008.005,26 | $137,008 | 781,648% |
| $1.353,69 | 0,166% | $177,667 | $177.665.655,56 | $177,666 | 761,928% |
| $1.407,07 | 0,434% | $62,685 | $62.674.773,15 | $62,675 | 2245,040% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2009 | ARGENTINA | $16.334,74 | $661.275.816.702,50 | $661.275,817 | 1537,764% | 52.114 |
| | CHINA | $8.307,85 | $11.059.907.750.616,40 | $11.059.907,751 | -72,816% | 189.054 |
| | ECUADOR | $8.818,68 | $130.290.804.563,05 | $130.290,805 | 515,996% | 136.442 |
| | INDIA | $3.912,42 | $4.764.254.227.921,92 | $4.764.254,228 | 1088,235% | 139.570 |
| | INDONESIA | $8.021,75 | $1.914.153.967.345,50 | $1.914.153,967 | 438,641% | 124.837 |
| | TAILANDIA | $12.191,41 | $815.201.282.465,63 | $815.201,282 | -84,571% | 225.550 |
| | VIETNAM | $3.952,73 | $344.252.518.691,61 | $344.252,519 | 671,698% | 202.947 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP EXP_ NON_OIL |
|---|---|---|---|---|---|
| $323,60 | 0,049% | $55,672 | $55.669.652,64 | $55,670 | 581,293% |
| $1.039,50 | 0,009% | $1.201,647 | $1.201.644.644,27 | $1.201,645 | 86,506% |
| $666,01 | 0,511% | $13,863 | $13.856.765,87 | $13,857 | 4806,374% |
| $795,81 | 0,017% | $176,765 | $176.765.033,88 | $176,765 | 450,207% |
| $845,22 | 0,044% | $116,510 | $116.502.171,74 | $116,502 | 725,500% |
| $1.400,48 | 0,172% | $152,497 | $152.496.164,63 | $152,496 | 918,369% |
| $1.397,37 | 0,406% | $57,096 | $57.090.079,41 | $57,090 | 2447,649% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2010 | ARGENTINA | $18.061,93 | $736.718.360.687,75 | $736.718,361 | 2091,512% | 64.861 |
| | CHINA | $9.253,77 | $12.378.807.960.428,50 | $12.378.807,960 | 317,532% | 199.586 |
| | ECUADOR | $9.090,31 | $136.455.680.459,36 | $136.455,680 | 355,437% | 151.372 |
| | INDIA | $4.236,74 | $5.229.333.741.119,76 | $5.229.333,741 | 1198,938% | 169.405 |
| | INDONESIA | $8.505,75 | $2.056.981.019.927,07 | $2.056.981,020 | 513,420% | 123.284 |
| | TAILANDIA | $13.195,37 | $886.663.383.108,20 | $886.663,383 | 324,758% | 248.799 |
| | VIETNAM | $4.213,30 | $370.633.744.438,35 | $370.633,744 | 920,746% | 258.441 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP_EXP _NON_OIL |
|---|---|---|---|---|---|
| $474,32 | 0,064% | $68,174 | $68.171.863,47 | $68,172 | 695,775% |
| $1.156,15 | 0,009% | $1.577,764 | $1.577.762.155,19 | $1.577,762 | 73,278% |
| $850,69 | 0,623% | $17,490 | $17.480.970,06 | $17,481 | 4866,355% |
| $1.058,56 | 0,020% | $220,408 | $220.408.476,56 | $220,408 | 480,271% |
| $939,85 | 0,046% | $157,779 | $157.768.700,13 | $157,769 | 595,715% |
| $1.725,14 | 0,195% | $195,312 | $195.310.682,58 | $195,311 | 883,278% |
| $1.608,77 | 0,434% | $72,237 | $72.231.641,50 | $72,232 | 2227,237% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2011 | ARGENTINA | $19.322,23 | $797.263.881.242,04 | $797.263,881 | 2370,347% | 79.634 |
| | CHINA | $10.292,94 | $13.844.365.195.917,50 | $13.844.365,196 | 555,389% | 215.601 |
| | ECUADOR | $9.857,52 | $150.266.909.235,13 | $150.266,909 | 447,453% | 187.179 |
| | INDIA | $4.493,67 | $5.618.380.734.786,90 | $5.618.380,735 | 885,836% | h249.171 |
| | INDONESIA | $9.095,74 | $2.229.511.719.014,97 | $2.229.511,719 | 535,604% | 131.644 |
| | TAILANDIA | $13.519,13 | $912.789.677.004,35 | $912.789,677 | 380,879% | 209.738 |
| | VIETNAM | $4.523,25 | $401.987.730.083,88 | $401.987,730 | 1867,773% | 280.486 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP_EXP _NON_OIL |
|---|---|---|---|---|---|
| $528,62 | 0,066% | $82,981 | $82.978.908,78 | $82,979 | 637,053% |
| $1.383,05 | 0,010% | $1.898,388 | $1.898.386.494,32 | $1.898,386 | 72,854% |
| $1.176,45 | 0,783% | $22,343 | $22.330.724,03 | $22,331 | 5268,316% |
| $1.658,66 | 0,030% | $301,483 | $301.483.234,50 | $301,483 | 550,168% |
| $1.161,66 | 0,052% | $203,497 | $203.482.790,32 | $203,483 | 570,887% |
| $1.785,88 | 0,196% | $228,824 | $228.822.594,15 | $228,823 | 780,463% |
| $1.746,00 | 0,434% | $96,906 | $96.898.432,50 | $96,898 | 1801,886% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2012 | ARGENTINA | $19.641,35 | $819.697.901.873,04 | $819.697,902 | 2231,488% | 80.672 |
| | CHINA | $11.168,70 | $15.124.538.193.948,20 | $15.124.538,194 | 261,952% | 189.479 |
| | ECUADOR | $10.311,40 | $159.559.695.566,13 | $159.559,696 | 510,172% | 208.928 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | INDIA | $4.861,16 | $6.153.155.415.797,75 | $6.153.155,416 | 931,244% | 282.306 |
| | INDONESIA | $9.713,90 | $2.413.435.225.696,69 | $2.413.435,226 | 427,949% | 137.778 |
| | TAILANDIA | $14.870,98 | $1.008.787.036.643,55 | $1.008.787,037 | 301,489% | 191.608 |
| | VIETNAM | $5.042,48 | $452.824.522.357,48 | $452.824,522 | 909,470% | 255.897 |

| FOB_ SHRIMP | EXP_GDP_ | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP_EXP_ NON OIL |
|---|---|---|---|---|---|
| $495,87 | 0,060% | $79,982 | $79.979.768,78 | $79,980 | 619,997% |
| $1.465,55 | 0,010% | $2.048,782 | $2.048.779.973,98 | $2.048,780 | 71,533% |
| $1.279,77 | 0,802% | $23,852 | $23.839.305,77 | $23,839 | 5368,302% |
| $1.791,28 | 0,029% | $289,565 | $289.564.768,99 | $289,565 | 618,611% |
| $1.206,54 | 0,050% | $190,032 | $190.019.545,59 | $190,020 | 634,958% |
| $1.534,67 | 0,152% | $229,545 | $229.542.850,80 | $229,543 | 668,576% |
| $1.592,93 | 0,352% | $114,529 | $114.520.773,05 | $114,521 | 1390,956% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2013 | ARGENTINA | $20.131,68 | $849.616.000.404,32 | $849.616,000 | 2394,879% | 93.702 |
| | CHINA | $11.872,50 | $16.185.063.329.894,80 | $16.185.063,330 | 262,105% | 195.153 |
| | ECUADOR | $11.153,69 | $175.196.209.316,48 | $175.196,209 | 272,177% | 222.828 |
| | INDIA | $5.057,23 | $6.477.517.561.942,86 | $6.477.517,562 | 1106,367% | 278.596 |
| | INDONESIA | $10.067,47 | $2.535.041.372.928,96 | $2.535.041,373 | 641,251% | 145.662 |
| | THAILAND | $15.407,67 | $1.049.947.947.719,55 | $1.049.947,948 | 218,488% | 103.639 |
| | VIETNAM | $5.358,95 | $486.338.303.051,95 | $486.338,303 | 659,267% | 329.790 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON OIL | EXP_SHRIMP_EXP _NON_OIL |
|---|---|---|---|---|---|
| $635,73 | 0,075% | $75,963 | $75.961.244,23 | $75,961 | 836,915% |
| $1.752,08 | 0,011% | $2.209,007 | $2.209.005.843,79 | $2.209,006 | 79,315% |
| $1.794,99 | 1,025% | $24,958 | $24.944.232,24 | $24,944 | 7196,020% |
| $2.976,80 | 0,046% | $336,611 | $336.611.388,99 | $336,611 | 884,342% |
| $1.481,28 | 0,058% | $182,552 | $182.541.549,29 | $182,542 | 811,478% |
| $1.020,41 | 0,097% | $228,527 | $228.526.276,47 | $228,526 | 446,519% |
| $2.052,91 | 0,422% | $132,033 | $132.025.478,64 | $132,025 | 1554,932% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2014 | ARGENTINA | $19.683,77 | $839.896.688.260,09 | $839.896,688 | 4028,297% | 109.815 |
| | CHINA | $12.480,34 | $17.121.277.216.284,50 | $17.121.277,216 | 192,164% | 194.109 |
| | ECUADOR | $11.713,18 | $186.846.614.273,66 | $186.846,614 | 358,922% | 296.951 |
| | INDIA | $5.233,88 | $6.781.021.982.581,72 | $6.781.021,983 | 664,950% | 357.781 |
| | INDONESIA | $10.278,18 | $2.622.251.600.815,57 | $2.622.251,601 | 639,492% | 160.939 |
| | TAILANDIA | $15.480,21 | $1.059.446.245.268,47 | $1.059.446,245 | 189,514% | 86.729 |
| | VIETNAM | $5.745,21 | $526.914.892.839,94 | $526.914,893 | 408,455% | 290.579 |

| FOB_ SHRIMP | EXP_GDP_ % | TOT_EXP | NON OIL | TOT_EXP_ NON OIL | EXP_SHRIMP_ EXP_NON_OIL |
|---|---|---|---|---|---|
| $776,87 | 0,092% | $68,404 | $68.402.727,37 | $68,403 | 1135,728% |
| $2.043,90 | 0,012% | $2.342,293 | $2.342.292.205,30 | $2.342,292 | 87,261% |
| $2.520,24 | 1,349% | $25,724 | $25.711.415,98 | $25,711 | 9802,039% |
| $3.834,86 | 0,057% | $317,545 | $317.544.641,44 | $317,545 | 1207,660% |
| $1.815,23 | 0,069% | $176,036 | $176.026.922,79 | $176,027 | 1031,223% |
| $966,60 | 0,091% | $227,573 | $227.572.343,03 | $227,572 | 424,743% |
| $2.553,75 | 0,485% | $150,217 | $150.209.914,77 | $150,210 | 1700,123% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2015 | ARGENTINA | $20.105,20 | $867.176.759.338,26 | $867.176,759 | 2657,999% | 122.986 |
| | CHINA | $12.897,50 | $17.796.747.505.545,60 | $17.796.747,506 | 143,702% | 176.779 |
| | ECUADOR | $11.060,29 | $179.309.604.311,67 | $179.309,604 | 396,664% | 341.988 |
| | INDIA | $5.464,86 | $7.159.798.324.012,18 | $7.159.798,324 | 490,697% | 383.057 |
| | INDONESIA | $10.247,21 | $2.647.706.548.803,03 | $2.647.706,549 | 636,312% | 152.554 |
| | THAILAND | $15.822,37 | $1.087.226.612.256,61 | $1.087.226,612 | -90,042% | 88.455 |
| | VIETNAM | $6.102,64 | $565.574.577.528,97 | $565.574,578 | 63,120% | 205.476 |

| FOB_ SHRIMP | EXP_GDP_ PORC | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP_ EXP_NON_OIL |
|---|---|---|---|---|---|
| $780,23 | 0,090% | $56,752 | $56.751.737,39 | $56,752 | 1374,820% |
| $1.713,51 | 0,010% | $2.281,856 | $2.281.854.376,36 | $2.281,854 | 75,093% |
| $2.287,40 | 1,276% | $18,331 | $18.324.252,77 | $18,324 | 12482,926% |

| | | | | | |
|---|---|---|---|---|---|
| $3.194,19 | 0,045% | $263,889 | $263.889.005,00 | $263,889 | 1210,427% |
| $1.355,91 | 0,051% | $150,282 | $150.275.801,02 | $150,276 | 902,278% |
| $778,75 | 0,072% | $211,178 | $211.178.410,58 | $211,178 | 368,765% |
| $1.805,82 | 0,319% | $162,017 | $162.012.918,22 | $162,013 | 1114,617% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATION | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2016 | ARGENTINA | $20.307,87 | $885.227.528.869,05 | $885.227,529 | 4111,937% | 161.696 |
| | CHINA | $13.483,38 | $18.712.096.136.720,30 | $18.712.096,137 | 200,000% | 171.216 |
| | ECUADOR | $11.034,27 | $181.967.413.007,43 | $181.967,413 | 172,826% | 370.985 |
| | INDIA | $5.839,86 | $7.735.001.687.457,93 | $7.735.001,687 | 494,821% | 427.475 |
| | INDONESIA | $10.494,47 | $2.744.896.640.112,26 | $2.744.896,640 | 352,580% | 164.308 |
| | THAILAND | $16.616,20 | $1.146.040.786.539,43 | $1.146.040,787 | 18,814% | 128.667 |
| | VIETNAM | $6.572,98 | $615.496.353.815,73 | $615.496,354 | 266,824% | 233.751 |

| FOB_ SHRIMP | EXP_GDP_ % | TOTAL_EXP | NON OIL | TOTAL_EXP_ NON_OIL | EXP_SHRIMP_ EXP_NON_OIL |
|---|---|---|---|---|---|
| $1.018,34 | 0,115% | $57,733 | $57.732.623,12 | $57,733 | 1763,894% |
| $1.683,37 | 0,009% | $2.118,981 | $2.118.979.638,51 | $2.118,980 | 79,442% |
| $2.587,43 | 1,422% | $16,798 | $16.792.613,06 | $16,793 | 15408,168% |
| $3.594,93 | 0,046% | $260,964 | $260.963.959,00 | $260,964 | 1377,556% |
| $1.464,40 | 0,053% | $144,494 | $144.489.009,28 | $144,489 | 1013,502% |
| $1.080,13 | 0,094% | $213,559 | $213.558.450,94 | $213,558 | 505,779% |
| $1.918,83 | 0,312% | $176,581 | $176.578.208,68 | $176,578 | 1086,677% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATIÓN | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2017 | ARGENTINA | $23.597,12 | $1.039.330.591.568,54 | $1.039.330,592 | 2600,637% | 184.621 |
| | CHINA | $14.243,53 | $19.887.033.884.256,70 | $19.887.033,884 | 159,313% | 161.088 |
| | ECUADOR | $11.617,91 | $195.010.792.573,63 | $195.010,793 | 41,733% | 438.224 |
| | INDIA | $6.182,92 | $8.276.934.253.114,33 | $8.276.934,253 | 332,817% | 557.657 |
| | INDONESIA | $10.935,63 | $2.894.125.530.220,37 | $2.894.125,530 | 380,879% | 169.197 |
| | TAILANDIA | $17.422,95 | $1.205.839.343.826,68 | $1.205.839,344 | 66,563% | 134.371 |
| | VIETNAM | $7.155,44 | $676.909.526.449,60 | $676.909,526 | 352,025% | 281.257 |

| FOB_ SHRIMP | EXP_GDP_ PORC | TOT_EXP | NON OIL | TOT_EXP_ NON_OIL | EXP_SHRIMP_ EXP_NON_OIL |
|---|---|---|---|---|---|
| $1.222,18 | 0,118% | $58,134 | $58.132.970,19 | $58,133 | 2102,387% |
| $1.495,37 | 0,008% | $2.271,796 | $2.271.794.319,63 | $2.271,794 | 65,823% |
| $3.047,03 | 1,562% | $19,092 | $19.086.162,18 | $19,086 | 15964,592% |
| $4.751,59 | 0,057% | $295,862 | $295.862.157,00 | $295,862 | 1606,014% |
| $1.689,72 | 0,058% | $168,811 | $168.805.399,36 | $168,805 | 1000,988% |
| $1.157,37 | 0,096% | $235,871 | $235.870.674,24 | $235,871 | 490,679% |
| $2.450,28 | 0,362% | $215,119 | $215.115.498,42 | $215,115 | 1139,053% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATIÓN | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2018 | ARGENTINA | $23.293,40 | $1.036.428.172.096,80 | $1.036.428,172 | 4001,216% | 187.323 |
| | CHINA | $15.497,36 | $21.739.076.706.358,40 | $21.739.076,706 | 207,479% | 140.194 |
| | ECUADOR | $11.839,34 | $202.267.590.160,50 | $202.267,590 | -22,410% | 506.328 |
| | INDIA | $6.675,36 | $9.029.375.940.711,86 | $9.029.375,941 | 394,506% | 596.314 |
| | INDONESIA | $11.644,76 | $3.116.958.911.116,03 | $3.116.958,911 | 319,834% | 172.899 |
| | TAILANDIA | $18.530,21 | $1.286.523.956.730,17 | $1.286.523,957 | 106,389% | 121.169 |
| | VIETNAM | $7.768,08 | $742.208.673.971,92 | $742.208,674 | 353,962% | 207.813 |

| FOB_ SHRIMP | EXP_GDP_ % | TOTAL_EXP | NON OIL | TOTAL_EXP_ NON OIL | EXP_SHRIMP EXP_NON_OIL |
|---|---|---|---|---|---|
| $1.328,14 | 0,128% | $61,782 | $61.780.018,86 | $61,780 | 2149,789% |
| $1.266,26 | 0,006% | $2.494,230 | $2.494.228.924,58 | $2.494,229 | 50,768% |
| $3.246,15 | 1,605% | $21,628 | $21.620.124,59 | $21,620 | 15014,479% |
| $4.491,74 | 0,050% | $323,998 | $323.997.680,00 | $323,998 | 1386,350% |
| $1.574,13 | 0,051% | $180,215 | $180.209.915,53 | $180,210 | 873,498% |
| $1.055,34 | 0,082% | $249,921 | $249.920.496,81 | $249,920 | 422,269% |
| $2.122,95 | 0,286% | $243,699 | $243.696.551,33 | $243,697 | 871,144% |

| YEAR | COUNTRY | GDP PER CAPITA | GDP PPA | GDP_PPA | INFLATIÓN | TONS_ SHRIMP |
|---|---|---|---|---|---|---|
| 2019 | ARGENTINA | $ 22.999,28 | $ 1.033.557.797.795,68 | $ 1.033.557,80 | 5092,150% | 167.118 |
| | CHINA | $ 16.653,34 | $ 23.443.654.490.268,20 | $ 23.443.654,49 | 289,923% | 117.294 |
| | ECUADOR | $ 11.851,47 | $ 205.903.294.944,80 | $ 205.903,29 | 26,601% | 645.385 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | INDIA | $ 6.997,86 | $ 9.562.005.607.605,22 | $ 9.562.005,61 | 372,328% | 645.009 |
| | INDONESIA | $ 12.311,50 | $ 3.331.807.553.957,09 | $ 3.331.807,55 | 303,059% | 169.65 |
| | TAILANDIA | $ 19.233,87 | $ 1.339.169.089.346,26 | $ 1.339.169,09 | 70,673% | 116.782 |
| | VIETNAM | $ 8.381,24 | $ 808.472.012.424,41 | $ 808.472,01 | 279,582% | 248.658 |

| **FOB_ SHRIMP** | **EXP_GDP_ %** | **TOTAL_EXP** | **NON OIL** | **TOTAL_EXP_ NON_OIL** | **EXP_SHRIMP _EXP_NON_OIL** |
|---|---|---|---|---|---|
| $ 1.079,70 | 0,104% | $ 65,12 | $ 65.113.843,63 | $ 65,114 | 1658,167% |
| $ 1.029,96 | 0,004% | $ 2.498,570 | $ 2.498.569.504,22 | $ 2.498,570 | 41,222% |
| $ 3.901,56 | 1,895% | $ 22,329 | $ 22.321.647,84 | $ 22,322 | 17478,813% |
| $ 4.676,92 | 0,049% | $ 323,251 | $ 323.250.726,00 | $ 323,251 | 1446,840% |
| $ 1.428,66 | 0,043% | $ 167,683 | $ 167.681.269,37 | $ 167,681 | 852,007% |
| $ 991,03 | 0,074% | $ 245,380 | $ 245.379.802,88 | $ 245,380 | 403,877% |
| $ 2.107,35 | 0,261% | $ 264,610 | $ 264.608.430,42 | $ 264,608 | 796,403% |

Source: World Bank

Prepared by: Miriam Maldonado