INTERNAL FACTORS THAT DETERMINE THE SUCCESS OF PERUVIAN EXPORTS OF GINGER TO THE UNITED STATES IN THE PERIOD 2006 – 2020

Romina Andrea Arana-Nicanor
Faculty of Business Sciences, Continental University, Av. San Carlos 1980, Huancayo, Peru, 71468725@continental.edu.pe

Victor Hugo Llacuachaqui-Tovar
Faculty of Business Science, Continental University, Av. San Carlos 1980, Huancayo, Peru, 73944128@continental.edu.pe

Wagner Enoc Vicente-Ramos
Faculty of Business Science, Continental University, Av. San Carlos 1980, Huancayo, Peru, wvicente@continental.edu.pe (corresponding author)

Keywords: internal factors, ginger export, exported quantity, exports

Abstract: This study analyzed the internal determining factors in ginger exports to the United States, being a controversial issue at the international level, due to the demand for exports of multiple products; to describe the internal factors that influence the success of ginger exports and making known the relationship with each of these, concerning the exported quantity, whether the result is favorable or not. The focus of this study is quantitative; it was based on the multiple linear regression model applied to our sample, which is the United States. Numerical data of ginger exports, export price, production volume, Investment in technology and innovation in trade, and exported value of Trademap during the period 2006 - 2020 were obtained. Through the econometric model, it was obtain that there is a direct relationship significant between the export price and the exported quantity (p < 0.05), that is; the greater the quantity of ginger exported, the lower the export price, and the higher the production volume, the greater the quantity of ginger exported (p < 0.05), the greater the investment in technology and innovation in trade, the greater the quantity exported (p < 0.05). These results provide accurate information for medium and large exporting companies of agricultural products, farmers, producers; the results show the key factors that lead to the success of Peruvian ginger exports.

1 Introduction

In recent years, trade interactions between countries in recent years, trade interactions between countries have been increasing and strengthening, thus achieving a significant increase in exports and imports. These merchandise exchange activities generated a high level of competition between the parties, whether it affects them positively or negatively, that will depend on the resources and competitive advantages they possess to take advantage of them.

International trade is currently an attractive topic in research, studies, and reports; since its contribution to economic and social development has been of great advantage, this process involves a series of factors that induce and interfere in the final result. Current leaders make the decisions of companies that want to internationalize based on different internal and external scenarios [1]. Likewise, [2] developed an investigation about the determining factors of export success, in which they explain the great importance of export activity from economic and business perspectives.

Ginger exports at the international level show that China, the Netherlands, Peru, and India are the major exporting countries for 2020. Likewise, the growth of ginger exports was due to national production and distribution and factors such as the domestic price, world prices, exchange rates, and inflation rates for the world market. Likewise, [3] indicates that the most relevant factors such as price, volume, and quantity are the primary and most relevant factors when exporting to the destination country. It was also determined that the factors influence the international demand when exporting to different global markets.

In the case of Peru, exports have benefited, making it grow economically and positioning it as one of the most important suppliers of agricultural products worldwide. The main factors that have influenced the improvement in export performance have been the increase in world demand for food, trade openness, the expansion of agricultural areas destined for export, and comparative advantages in food production [4]. A clear example with Peru are agrarian export companies, climate as factor inside volume of production, variance of the price according season, or the exchange rate, the different prices for needs of each country, the current technological development inside production processes of these companies, and other factors intervene in internationalization.

Regarding the export of ginger, it has become more valued by foreign countries, with Peru being the leading
exporter of ginger, becoming the main supplier to the United States, this being the market with the highest demand for this product. Likewise, it has been made known that the United States is one of the countries that value Peruvian ginger more than other countries; this is due to its organoleptic characteristics, for which they are willing to pay a very high price [24]. Despite all this, the demand in the US market is still very high and must be satisfied at the lowest possible price; It should be noted that China continues to be its leading supplier since they have very competitive prices, with a global market position of 50% and sales of over 800 million [5].

The main objective of this study is to reveal and find the relationship of the internal factors that have been determining factors in Peruvian ginger exports to the United States in the period 2006 to 2020.

2 Literary reviews

2.1 Internal factors

According to [6], internal factors are those agents that can generate a positive or negative impact; they are generally factors that can be exercised with a high degree of control; it is also essential to identify which are these factors to strengthen them and to contribute good performance and eliminate or reduce those that negatively affect it. The dimensions referred to the internal export factors that are applied in every organization are financial resources, human resources, technological resources, internal systems, and internal relationships. All of these together work to reach the objective. [7] considers that internal or external factors determine not only the possibility of access to new markets but also the quantities, values, export prices, and also explains that strategies, competencies, and even demand depend a lot on the characteristics of internal factors.

2.2 Exported value

It is the most significant characteristic of all exports; it expresses the exported product or services in monetary values, it is also the magnitude used to measure the goods, products or services, compared to the quantity, you can refer to the amount in which the price is calculated or money costs in the market. According to [8], exporting activity is desirable for most companies and producers since the exported value is compared in price and profit margins with those who sell in the national market. Furthermore, if a product can be sold in a foreign market, this favors to the exporting country, these operations benefits the economy; in the other words, even when you have to consider costs, you earn more than you invest in exportations, and the profit is greater when an optimal sale price is placed, the profitability of the exporting companies depends on it, taking into account that the objective is that the profits are always above those projected. [8] also indicates that the exported value in real examples, countries that export agricultural products such as Mexico that exported in 2008 obtained a price that on average was paid for these products at rural prices in the national territory. On the other, an implicit price of the exports of their agricultural products was estimated, concluding that the value exported to that country generated significant profits for those companies that export agricultural products.

2.3 Exported quantity

The quantity exported is another essential factor for all countries when making an export, since based on the quantity, the monetary value will be higher or lower, this factor is associated with the volume of production in the exporting country expressed in tons.

On the other hand, foreign countries that export non-traditional products analyze more the quantity and quality of the products they harvest. According to [9], indicate that the quantity exported is the growth of exports in quantity since each country produces more and more variety in each category of its products that it offers. For an individual country, the production of each type of its products is more excellent so that the most significant economies export greater value and volume. Likewise, [10] mentions that the amount exported is significantly more critical for developing countries since agriculture generates income for its inhabitants. This reflects a flow positively for the population since their jobs will be remunerated. In this way, the population can cover their basic needs and gradually use their disposable income in another variety of products. That is why countries are betting on investing more in agricultural products.

2.4 Export price

It is the monetary value requested from the importer in exchange for a product that will be exported. Therefore, certain factors that involve producing and taking the product as far as the customer requires must be considered when determining the export price. The importance of designating a price is based on determining the profitability and sustainability of the company. Likewise, the export price is the sale price that allows recovering the costs plus the profit that includes a return related to the business effort made and the risk based on the committed capital. To determine the export price, the costs of production are first identified; These costs are those that are generated in the process of transforming raw materials to finished products, and these are classified into, direct labor, indirect costs manufacturing, these are the main factors to be able to identify the export price. Also, the export costs are direct and indirect, to determine the management costs such as administrative, marketing, this includes all the expenses that must be faced from when the product is in storage and originates from market research and studies, sales promotion, advertising, among others. Likewise, financial costs determine the profit margin of the exporting company; This will depend on the commercial objectives that have been proposed, it is essential to specify that this
margin must be related to the prices of the destination market. Several researchers agree that the export price can be the easiest and fastest way to increase the competitiveness of companies. Likewise, indicates that export prices face environmental factors that negatively influence when export is on the way.

2.5 Volume of production

According to [15], The production volume is the productive capacity obtained from a raw material, it quantifies the amount of goods and services that a certain productive unit has, this quantity has units of measurement according to the products, expressed in kilograms, liters, tons, through which we can determine and count the exact quantities, as well as measure and determine the total production capacity, it is also one of the significant indicators in imports and exports, since to determine the price and export quantity, it is necessary to know the volume of this, finally you can also define the maximum and minimum quantity to be exported according to demand. The production volume reflects how profitable a particular product is. On the other hand, the volume of production is a determining factor in exports, because thanks to the volume it is known how much can be exported from time to time and based on this, we can make international quotes and negotiations. Likewise, ignorance or poor application of technology and innovation in production processes causes low performance [16].

2.6 Investment in technology and innovation in commerce

According to [17], investment in technology and innovation is defined, as the remodeling and expansion of the quality of products and services, whether it is an investment in new software or specialized systems. Also, innovation in infrastructure is that tools and machinery that favor and streamline some processes that are developed within the trade to achieve greater competitiveness at the national level and at the international level. Likewise, when talking about investment in technology and innovation, it refers to the technological modification of a product or service and the manufacturing and production processes. Nowadays, technological development has advanced considerably, and it is one of the main most essential factors for the market since not only a country considers technology and innovation, but also in companies and commercialization since this is a tool that facilitates and it simplifies processes, and on many occasions, it is the key factor in closing negotiations. Likewise, if a country has advanced in its technological development, it also means that companies, processes, and exchanges have developed positively and have been updated over time, therefore, the results are satisfactory in terms of competitiveness, demand, and profitability [18].

2.7 Ginger export

According to [19], exports are defined as the commercialization of products produced in a country destined for different markets (countries), also called merchandise exchange, an increase in commercial activity has been achieved at an international level, exports have not only benefit one country economically, but it positions a country to compete with others, positions companies, products and generates international relations, since through exports it can interact with more than two countries, exports mainly drive the agricultural sector, since artisan producers.

On the other hand, there are many benefits that exports bring, contributing not only to the economy of a country, but also allowing to execute economies of scale that optimize the resources of companies, reducing costs, diversifying and covering foreign markets, generating improvements in the quality standards of the products and broadens the possibilities of generating solid relationships with international partners.

3 Methodology

3.1 Population and sample

An investigation was carried out that has a quantitative approach because it is based on numerical measurement, and it is of the applied type because it was developed based on the existing theory. The level of investigation is correctional in order to determine the relationship between the success of Peruvian exports to the United States for the period 2006 - 2020.

The population was made up of the annual exports of ginger produced in the Peruvian territory for the period 2006-2020. A sample of the total population was estimated, since, when analyzing annual time series, the sample becomes more precise and significant.

3.2 Data collection instrument

Data were obtained from Trademap on the annual exports of Peruvian ginger destined for the United States, from the United Nations Organization for Food and Agriculture, we obtained data on the annual production of ginger from the Ministry of Economy and Finance data was obtained from the amount of annual investment in technology and innovation and Fresh Fruit (commercial intelligence and data from the agro-export sector) obtained the export prices of Peruvian ginger.

Based on the initial information, an analysis was carried out on the internal factors that are determinant in Peruvian ginger exports, six were chosen, whose information was considered reliable for the years 2006 - 2020. The control variable investment in technology and innovation was used to adjust the results.

3.2.1 Study variables

The use of internal factors and the definition of the variables were based on the Trademap (2020).
3.2.2 Econometric model

The Multiple Linear Regression Model that incorporates the dependent variable and the explanatory variables is expressed as follows (1).

\[ Y = \beta_0 + \beta_1 (EP) + \beta_2 (PV) + \beta_3 (TI) + \beta_4 (EV) + u \]  

(1)

QE = Peruvian ginger export (tons).
EP = Export price
PV = Production volume.
TI = Technology investment and innovation in commerce.
EV = Exported value (control variable)
\( \beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 = \text{Coefficient of the linear regression model.} \)
\( u = \text{Term that represents the error.} \)

Seasonality test (Dickey Fuller), normality test (Shapiro-Wilk), self-correlation test or error independence (Durbin Watson), heteroscedasticity test (Breusch-Pagan and Koenker), ANOVA test and goodness of fit tests (R squared).

3.2.3 Hypothesis

H1: There is a direct relationship between the export price and Peruvian ginger exports.

H2: There is a direct relationship between the volume of production and exports of Peruvian ginger.

H3: There is a direct relationship between investment in technology and innovation in Peruvian ginger trade and exports.

H4: There is a direct relationship between the exported value and Peruvian ginger exports.

4 Results

4.1 Descriptive results

In table 2, it is shown that the standard deviation of the exported quantity presents the value of 13953 compared to the export price variable, which presents a standard deviation of 0.8485, showing that the exported quantity variable has greater relevance as opposed to the price of export, this is because the export price varies according to the quantity that is exported. Likewise, Peru is one of the first 3 countries that export large quantities of ginger to the United States, since the export price that Peru manages is flexible compared to other countries, competition is another factor that influences the price from exportation.

[20] noted in their study that the price of ginger in Nigeria decreased by 24%, was because the unit price of ginger in Nigeria was higher. higher than the world price, countries like India, Ethiopia, and Peru are some of the countries that won the market in terms of quantity; however, they all lost in terms of price. The average of the volume of production presents the value of 9900 compared to the variable technology and innovation in commerce that presents an average of 1609, showing that the variable volume of production has greater relevance in contrast to the variable technology and innovation in commerce This is because Peru can be able to produce ginger all year round supplying the foreign market, although Peru invests very little in technology and innovation in trade, this does not impede for the production volume to be high, greater each year. The median of the exported value presents the value of 5707 compared to the variable quantity exported, which has a median of 3431, with the exported value being more relevant compared to the quantity exported, this is since the greater the quantity of export, the greater the exported value. Therefore, the variables exported quantity, production volume, and exported value, present data with greater relevance for an optimal export of ginger to the United States, the variables such as export price, technology, and innovation in trade, present low data, which for future studies it is recommended to further evaluate these three variables and reinforce them.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Half</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>QE</td>
<td>1112</td>
<td>3431</td>
<td>13953</td>
<td>6.000</td>
<td>49657</td>
</tr>
<tr>
<td>EP</td>
<td>1711</td>
<td>2.060</td>
<td>0.8485</td>
<td>0.2600</td>
<td>3.240</td>
</tr>
<tr>
<td>PV</td>
<td>9900</td>
<td>3800</td>
<td>10187</td>
<td>165.0</td>
<td>27170</td>
</tr>
<tr>
<td>TI</td>
<td>1609</td>
<td>600.0</td>
<td>2286</td>
<td>80.00</td>
<td>7936</td>
</tr>
<tr>
<td>EV</td>
<td>10295</td>
<td>5707</td>
<td>11398</td>
<td>3.000</td>
<td>41904</td>
</tr>
</tbody>
</table>

4.2 Correlation coefficient

Table 3 shows the correlation between the variables to measure the strength of the association. In the following results, it is obtained that there is a positive correlation of the exported quantity concerning the export price (0.6376), taking into account that the closer the value is to 1, the higher its association, also in terms of volume of production (0.8653), investment of technology and...
innovation (0.9454), and exported value (0.9927). This indicates that the export price is a function of the exported quantity, the more quantity, or the higher the demand for ginger, the lower the price, while there is greater production of ginger in the Peruvian territory, the quantity available to be exported will be. On the other hand, if new investment projects in technology and innovation are managed in the commercial area, it will facilitate the development of production processes, logistics and export processes, therefore it will be possible to export in greater quantities with ease. Being the exported value as a control variable, and the investment variable in technology and innovation those that have the highest positive correlation [21].

<table>
<thead>
<tr>
<th>Variable</th>
<th>QE</th>
<th>EP</th>
<th>PV</th>
<th>TI</th>
<th>EV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>300.225</td>
<td>307.074</td>
<td>0.9777</td>
<td>0.3513</td>
<td></td>
</tr>
<tr>
<td>QE</td>
<td>-1320.20</td>
<td>298.040</td>
<td>-4.430</td>
<td>0.0013 ***</td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>0.119796</td>
<td>0.0480607</td>
<td>-2.493</td>
<td>0.0318 **</td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>1.40909</td>
<td>0.187814</td>
<td>7.503</td>
<td>0.0000206 ***</td>
<td></td>
</tr>
<tr>
<td>EV</td>
<td>0.916619</td>
<td>0.0365905</td>
<td>25.05</td>
<td>0.00000000235 ***</td>
<td></td>
</tr>
<tr>
<td>R-cuadrado</td>
<td>0.998813</td>
<td>0.6669</td>
<td>0.8495</td>
<td>0.9373</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.309209</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Correlation coefficient (at a significance level of 5%)

4.3 Relationship between the export price and the export quantity of ginger

The results of the ordinary least squares model indicate that if there is a significant direct relationship at a level of 1% to determine the relationship between the export price and the exported quantity of ginger (p < 0.05); The coefficient for the export price variable has a value of -1320.20, which indicates that there is a negative inverse correlation, this is because the higher the quantity of ginger exported, the lower the export price. [20] they obtained as a result in their study that the world ginger market grew at a rate of 10% per year in the period 2008 - 2012 that was in In terms of quantity, the price of ginger also grew by 12% annually, but in the period 2011 - 2012 the world price of ginger fell by 29%, which caused the price of ginger in that period to decrease worldwide, countries such as Lithuania, India, Nigeria, Ethiopia, and Peru are some of the countries in which their results were favorable, in the market terms of quantity. Likewise, this variation is due to the different socio-economic, political, and cultural factors used by each country.

4.4 Relationship between the production volume and the exported quantity of ginger

There is a significant direct relationship at a 5% level between the volume of production and the quantity exported (p < 0.05). This result indicates that the higher the production volume, the greater the quantity of ginger exported to the destination country. This is because Peru can produce ginger throughout the year, in any season of the year, which benefits the export of ginger, since, with the existing demand, it can supply the foreign market without any problem. Likewise, the optimal production of ginger in Peru is due to the geographical location in which it is produced since Peru has fertile soils and good water resources to keep up with the high demand for ginger, as [22] in their study, emphasizes the importance of these geographical factors, water resources for excellent production, and to become an agricultural power and productive.

4.5 Relationship between investment in technology and innovation in trade and the quantity of ginger exported

Based on the results obtained from the econometric model, it was determined that there is a significant direct relationship at a level of 1% between investment in technology and innovation in commerce and the quantity of ginger exported (p < 0.05); The coefficient for the variable investment in technology and innovation in commerce presents a result of 1.40909, this result indicates that the greater investment in technology and innovation in commerce, the greater the quantity exported, since by investing more in technologies, machinery, and...
technological equipment within the logistics processes, facilitates the export of Peruvian ginger to the foreign market [23], obtained as a result in their study, that the evolution of technology has provided further expansion of production networks, generating new opportunities for access to new markets. Likewise, it has generated new attractive commercial strategies, a clear example is; how production networks, generating new opportunities for the export of Peruvian ginger to foreign countries, becomes possible; However, although the study of international trade has advanced optimally, there are still certain limitations regarding trade and its effects on income for the technological cycle of products and the technical capabilities of the producer. The [24] in his study “Prospecting the information technology (IT) market” in Peru, pointed out that Peru is one of the countries in South America with the highest investment in technology since it allocates 2.57% of GDP. This means that due to the considerable percentage it allocates to investment in technology, it facilitates business, logistical, and systematic processes, among others, which favors and simplifies results.

5 Conclusion

According to the econometric model that was carried out, the relationship between internal factors and the export of ginger to the United States was evidenced. All the internal factors presented in this study are positively related to the exported amount of ginger, according to what is obtained in the model, an optimal and significant relationship is maintained in this study. Therefore, and based on the aforementioned, it is determined that in order to be successful in Peruvian ginger exports to the United States, it is important to consider internal factors such as; ginger export, export price, production volume, Investment in technology and innovation in commercial and exported value, since each of them has a direct and significant relationship with the exported quantity; For example, the determination of the export price is calculated based on the quantity or demand for ginger, since the higher the quantity, the lower the export price. It is also considered that the volume of production depends on geographical, territorial and climatic factors, since the greater the production of ginger there is in the year, the quantities to be exported will be greater, likewise and being one of the most attractive variables in this study, investment in technology and innovation in trade, facilitates production processes, negotiations with other countries, also simplifies and saves time, therefore the relationship with the exported quantity is positive, as well as favorably influencing the increase in exports of Peruvian ginger, although in this study there is a direct relationship between internal factors and the export of ginger, it is recommended that for future studies other additional attractive factors that are significant and relevant be considered, and thus be able to reinforce new studies. On the other hand, it is recommended that this study be considered for agro-export companies that wish to export this type of product to international markets since in this study the main variables were mentioned to be able to carry out an export with optimal results.

References

INTERNAL FACTORS THAT DETERMINE THE SUCCESS OF PERUVIAN EXPORTS OF GINGER TO THE UNITED STATES IN THE PERIOD 2006 – 2020
Romina Andrea Arana-Nicanor; Victor Hugo Llacuachaqui-Tovar; Wagner Enoc Vicente-Ramos


Review process
Single-blind peer review process.