CASE STUDY

Import processes and total cost of goods in companies importing agricultural machinery to southern Peru–2023

Michael Chambi-Vilca,[†] Iván Ebenezer Condori-Hito,[*‡] & Cristian Rafael Mamani-Ordoñez[¶]

[†]Universidad Peruana Unión, Juliaca, Perú; ORCID: https://orcid.org/0009-0002-1856-9900
[‡]Universidad Peruana Unión, Juliaca, Perú; ORCID: https://orcid.org/0009-0001-7833-2959
[¶]Universidad Peruana Unión, Juliaca, Perú; ORCID: https://orcid.org/0000-0002-7142-8405
[*]Correspondence to email: ebenezer201612407@gmail.com

Abstract

The study investigates how the import processes are related and influence the costs of the merchandise, in importing companies of agricultural machinery in southern Peru, because for a company dedicated to imports it is vital to have a deep knowledge of what entails an import, in order to achieve the reduction of its costs and thus present competitive prices within the market. It had the quantitative approach because data collection and analysis was used. Where the research questions were answered in addition to testing the established hypotheses. Analyzed through the reliability analysis of the instrument, the Normality test, Spearman's Rho and Determination Coefficient, of the SPSS statistical program. The sample was made up of 44 participants belonging to 6 companies, determined by discretionary sampling or by trial where the population is known. The results showed that there is a significant relationship between import processes and costs. This relationship is direct; in addition, the relationship was very high positive ($\rho = 0.96$). And the independent variable has an influence ($R2$) of 0.922. before the dependent variable. Determining that it is important to take these factors into account when calculating the import costs of a product. For future research, it is recommended to relate free trade agreements, protectionism, and foreign exchange as factors that have an impact on import costs.

Keywords: processes, costs, import, import, companies, correlation

1. Introduction

Importing is the lawful entry of goods into a destination country, where the prevailing commercial nature is beneficial to both nations. Also, importation gives companies access to machinery that expands their production capacity, product categories in the market and offers consumers more choices. Similarly, according to Guncay et al. (2020), imports are important for a developing country as they increase the productivity and growth of firms and make possible the purchase of quality goods that are not produced domestically due to limited technological possibilities.

In the national context, according to the CIEN report, the annual value of imports in 2022 will be the highest in the last 20 years, reaching US$60,073.6 million, an increase of 18.1% over 2021, being a variable of constant growth. The data responds mainly to the increase in import prices of fuels, fertilizers and inputs in industry and food (Valdiviezo, 2023). Meanwhile, according to the newspaper El Comercio (2021), in the agricultural sector there was an increase in the import of tractors and/or agricultural machinery of about 40% compared to 2020. Therefore, it is important to study and analyze the costs associated with imports and exports (Rodríguez, 2016).

Therefore, all companies wishing to import and export products must consider in the investment: the costs of related operations (transportation, insurance, among others) (Falcón et al., 2018). Because if an import process is not efficient, it can generate significant economic losses for the company (Zurita, 2021). In turn, import processes are delimited by technical aspects, such as foreign trade, logistics and customs that ensure a thorough import of the goods, in addition to complying with all legal aspects (Crespo, 2012).

According to the National Competitiveness Council of the Dominican Republic (2011), a poor import process influences competitiveness and productivity, marketing and integration, and the price of food and other goods. It is then highlighted that, it is imperative that references are given to the implementation of good practice manuals in the case of storage and standard operating procedures for the quality management system within the institution (Fernandez, 2021). Another aspect to take into account is the import insurance that prevents some events such as theft, losses and damages that represent the value as a preventive measure before the event occurs (Guachichullca, 2022). That is why as an importer it is important to know all the steps and requirements requested from the approval entities, so as not to face additional costs or penalties (Molinares, 2021).

For their part, import costs include the purchase price, import duties and other taxes that cannot be recovered from the tax authorities, with the exception of financial expenses because they are unrelated to the real value of the imported product (Gavelán, 1999), an exclusion corroborated by Roque and Inga (2019) since financial expenses are not included because they are irrelevant to the real value of the goods. According to Alban (2020), costs are determined by the payments made, consumptions, and applications related respectively to a specific period of time, associated with the functions of production, administration, financing and distribution. Therefore, the import costs considered are those that were contracted by the importer as part of the logistical, tax and administrative process established in this activity within the framework of foreign trade (Campos and Becerra, 2018).

For a company dedicated to imports, it is vital to have an adequate knowledge of what an import entails, in order to reduce its costs and thus obtain competitive prices in the market. This will allow you to avoid some situations such as delays in the import processes, which generate unnecessary cost overruns. Also, the problems encountered at the time imports is the required quality of the product, it is considered a basic element of the import (Mcneil and Felgate, 2014). In addition, the lack of confidence in domestic suppliers can generate import problems, and depends largely on the supplier's ability to control quality and processes, so international suppliers are resorted to (Jaud et al., 2009). Then, if imports of goods are not properly managed, excess imports can lead to market dependence and can affect the cost of the final product, which can be detrimental to the economy. Therefore, demonstrating the relationship of these processes on import costs is essential in order to provide a clear focus to any individual on the importance of this issue for the development of companies.

1.1 State of the art

There is research related to the variables in question, therefore, the following research was compiled. The study by Anaya C. et al., (2012) contributes to the literature on the factors that affect the import process, and the result shows that border management, business environment and port infrastructure, transportation and communications are the areas that hinder the import process.

About Irannezhad et al. (2017), present an agent-based method in order to be able to estimate the efficiency of a Port Community System, aiming to achieve the cooperation of sharing vehicles and creating routes to deliver shipments to various importers in order to reduce the total logistics costs. The results indicated an increase in the efficiency of the entire logistics process. Similarly, Garcia and Irigoin (2021), conclude that proper supplier selection procedures and marketing channels increase the efficiency of the import process. Therefore, the importance of import processes and their problems is evident.

In relation to the second variable, Sampén (2020), analyzed import costs and evidenced the inadequate management of import costs, and one of his results was that only 23% had a high level of

knowledge to improve their costs and obtain greater benefits.

Therefore, import processes are necessary for the development of the country's economy. However, the number of studies on the costs of this process and the search for optimization possibilities is still small given the relationship between the agents included, which indicates a lack in this subject (Figuerédo, 2020). After reviewing the background, we sought to establish how much they are related and the degree of influence between the import processes with all the costs involved in the import.

2.   Methodology

2.1   Methodological design

The study has a quantitative approach since the information collected was analyzed and the research hypothesis has been tested (Vega et al., 2014). The type of study is causal since it seeks to explain the effect occurred (Hernández et al., 2017). It is observational because it is conducted without deliberately manipulating the variables (Hernández-Sampieri and Mendoza, 2018). It is also prospective, since the information is recorded as the phenomenon or events programmed to be observed occur (Müggenburg and Perez, 2007). The information is cross-sectional because data were collected at a single moment, in a single time (Lai et al., 2008). Within the framework of this quantitative research, we also sought to complement the analysis with a qualitative perspective to gain a deeper understanding and enrich the quantitative findings (Creswell, 2014). The method used was the documentary analysis of the imports made of a product from an importing company.

2.2   Sample design

The sample is composed of 44 people, belonging to 6 private importers of agricultural machinery located in southern Peru, which is an important sector that contributes to the economy and food security.

For the determination of the sample, the probabilistic or intentional calculation can be used (Arroyo 2020). Discretionary or judgmental sampling was used, where the population is known (Requena 2014). For the selection of the sample, the exclusion criterion was used, where collaborators not belonging to any position of the documentary process were excluded from the sample, in addition to the determination of costs, referring to the import, such as the areas of customer service, human resources,production, marketing and sales.

2.3   Data collection techniques

The quantitative data collection technique was the survey and the instrument used was the questionnaire, validated by experts and applied to a sample of 44 participants. The questionnaire is a coherent and articulated set of questions to obtain the necessary information to carry out the research in which it is required (Grande and Abascal, 2014). The instrument for the import process variable was compiled from the research of Falcón et al. (2018), while the import costs variable was obtained from the study of Salazar (2019).

The qualitative collection technique was documentary analysis, this type of analysis involves the identification of themes, patterns, trends and emerging perspectives present in the documents examined. Coding and categorization techniques are used to organize and analyze the qualitative data extracted from the documents (Bowen, 2009).

The internal consistency of the instrument is determined using Cronbach's alpha reliability coefficient (Tuapanta et al., 2017). Cronbach's alpha coefficient is a widely used measure to assess the internal consistency of a questionnaire (Cronbach, 1951). This measure describes the rating scales of reliability levels.(Table 2).

The value obtained from Table 3, Cronbach's alpha ($\alpha=0.66$), according to Table 2, indicates that the instrument has a good to very good level of reliability.

Table 1. Data collection instrument used in the research Variable

Variable	Dimension	Indicators	Ítems
Import processes	Control Documentary	Management	1 – 7
		Processing and receiving	8 – 10
	Technology	Digital systems	11 – 15
		Follow up	16 – 20
Import costs	Acquisition costs	Cost of goods	21
		Freight	22
		Insurance	23
	Costs associated with the purchase	Customs broker	24
		Warehouse	25
		Freight forwarder	26
		Transportation and unloading	27
	Customs costs	Tariff items	28
		Surcharges	29
		Tariff preferences	30
		Subsidies	31

Source: Import processes (Falcón et al., 2018) and import costs (Salazar, 2019).

Table 2. Reliability of the instrument

Índex	Reliability level	Cronbach's Alpha value
1	Excellent	0.9 – 1
2	Very good	0.7 -0.8
3	Good	0.5-0.6
4	Regular	0.3-0.5
5	Deficient	0-0.3

Source: Tuapanta et al., 2017

2.4   Statistical techniques for quantitative information processing

The data obtained from the surveys was collected by means of a questionnaire, evaluated in Microsoft Excel, and then entered into the SPSS program, where the Normality test, Spearman's Rho and the Coefficient of Determination (R2) were used.

2.4.1   Normality test

This statistical test is used to evaluate whether a sample of data follows a normal distribution, one of the most common being the Shapiro–Wilk test, which is one of the most common tests used to evaluate the normality of data (Shapiro & Wilk, 1965).

a. Hypothesis Statement
   Ho: The data have a normal distribution
   Ha: The data do not have a normal distribution
b. Significance level
   Alfa 0.05
c. Decision rule
   If p<0,05, Ho is rejected and Ha is accepted.
   If p>= 0,05, Ho is accepted.

2.4.2   Correlation test

Correlation test is a statistical technique used to assess the relationship between two quantitative variables (Pallant, 2016).

a. Statement of Hypothesis

Table 3. Reliability statistics

Alpha of Cron-bach	N of elements
0.663	44

Source: Own elaboration

Ho: $\rho = 0$ (No correlation)
Ha: $\rho \neq 0$ (Yes correlation)
b. Significance level
   Alfa 0.05
c. Decision rule
   If p<0,05, the Ho is rejected and the Ha is accepted
   If p>= 0,05, the Ho is accepted
d. Correlation Parameters

2.5   Statistical techniques for qualitative data processing

2.5.1   Documentary analysis

For this research, documentary analysis involves the systematic collection of data from existing documents and their analysis in search of answers to the research (Kothari, 2004). For this purpose, the Single Customs Declarations provided by the entity were reviewed.

a. Documents
   The documents to be analyzed are the DUAS, obtained through the platform Consultation by Importer/Exporter. These belong to the years 2018 to 2020.
b. Population
   The entity analyzed is Innovatekp located in the city of Juliaca, with the main economic activity called "Wholesale of machinery, equipment and agricultural materials".

3.   Results

3.1   Quantitative results

3.1.1   Normality test

As the sample size is not greater than 50, the test used is Shapiro-Wilk. Table 4 shows that $p = 0 < 0.05$, therefore, Ha is accepted, i.e., the data do not have a normal distribution, so a nonparametric statistic (Spearman's Rho) is applied.

Table 4. Shapiro–Wilk Normality Tests

	Statistics	gl	P
Processes	0.94	44	0.02
Costs	0.95	44	0.04

Source: Own elaboration

3.1.2   Correlation of variables

a. Overall objective
   According to Table 5, there is a correlation between the processes and import costs. It has a direct correlation ($\rho = 0.96$), implying that the greater the knowledge of import processes, the better the import costs.

Table 5. Spearman correlation of processes and import costs

	r	p (sig.)	N
Procesos-Costos	0.96	0	44

Source: Own elaboration

b. Specific Objective 1

According to Table 6, there is a significant correlation between processes and acquisition costs. It has a direct correlation (ρ = 0.824), implying that the more knowledge in import processes the better the acquisition costs are realized.

Table 6. Spearman correlation of processes and acquisition costs

	r	p (sig.)	N
Processes-Costs	0.824	0	44

Source: Own elaboration

c. Specific Objective 2

According to Table 7, there is a significant correlation between the processes and costs related to purchasing. It has a direct correlation (ρ = 0.758), implying that the greater the knowledge of import processes, the better the costs associated with the purchase.

Table 7. Spearman correlation of processes and costs related to purchasing

	r	p (sig.)	N
Processes-Costs	0.758	0	44

Source: Own elaboration

d. Specific Objective 3

According to Table 8, there is a significant correlation between processes and customs costs. It has a direct correlation (ρ= 0.892), the greater the knowledge of import processes, the better the customs costs.

e. Specific Objective 4

According to Table 9, the independent variable import processes explain 0.92 % (R^2) of the significance of the dependent variable import cost.

3.2   Qualitative results

3.2.1   Data of the goods - brush cutters

The examination of import data of an importing company between the years 2018 to 2020, from the Single Customs Declarations of the Innovatekp entity, specific data protected by the sense of privacy. Patterns and trends in import costs were identified.

a. Seasonal analysis

According to Graph 1 and Table 10, imports occur in the period of April of each year, and with the amounts of 600, 650 and 600 corresponding to the year 2018, 2019 and 2020 respectively. It is identified that the import pattern is in the month of April, which responds to an adequate management planning and document preparation, in addition to performing the follow–up in order to avoid unnecessary delays, allowing the goods to reach the warehouses in the same period.

b. Fluctuation Analysis

From the analysis of fluctuations in costs, it can be seen in Table 11, in the 2019 period, imports increased by 50 additional units with respect to the previous and subsequent year. However, the total acquisition, related and customs costs decreased by 23.48% with respect to 2018. Which

Table 8. Spearman's correlation of customs processes and costs

	r	p (sig.)	N
Processes-Costs	0.892	0	44

Source: Own elaboration

Table 9. Coefficient of determination

Model	R2
1	0.922

Source: Own elaboration

Figure 1. Trend in imports

Suurce: Own elaboration

indicates that the factors that impacted changes proved beneficial, these can be price negotiation (in acquisition cost), logistic efficiency (linked costs) and favorable tariff and trade items (customs costs). However, according to Graph 1, in 2020 there is an increase of $ 11,090.77 dollars (29.37%) in total costs with respect to 2019, there was a significant increase of $ 4200.00 dollars in the value of the merchandise Brush cutter, with $ 502.84 dollars in Transportation and $ 1,698.93 in customs duties.

Therefore, it is interpreted that, even using the correct import procedures, external factors such as raw material, fuel, exchange rate, etc., have an impact. This implies that it is necessary to understand the external influences on costs and adjust the approach accordingly.

4. Discussion

The study sought to determine the correlation and influence between the process variable and import costs, and the results show that they maintain a direct, very high and relevantly influential relationship, which confirms the affirmative hypothesis.

From the analysis of the results of this study, it can be stated that the importance, impact and relationship of import management for the reduction of total import costs is highlighted. This statement is in agreement with the research of author Souza et al. (2015), called "Transportation modal choice in coolant importation through total costs minimization: a case study". This aimed to select the mode of transport that is able to minimize total costs, where it is stated that it is possible to save up to 73% in the international transport of refrigerant by changing the transport mode used by the company. Therefore, it is interpreted that the management of the transport mode affects the total import costs.

Table 10. Data collected from importer 206007*** – INNOVATEKP E.I.R.L.**

Importation	DUA	Date	Acquisition cost	Insurance	Tariff tax	Freight	Total cost	Physical quan–tity	Unit value
DEFINITIVA	134340	03/04/2018	$ 9,200.00	$ 92,00	$ 1,791.30	$ 659.69	$ 11,742.00	200	$ 58.71
DEFINITIVA	134340	03/04/2018	$ 16,600.00	$ 166.00	$ 3,232.14	$ 1,190.00	$ 21,188.45	400	$ 52.97
DEFINITIVA	160000	22/04/2019	$ 15,500.00	$ 255.00	$ 2,983.25	$ 879.43	$ 19,617.68	500	$ 39.24
DEFINITIVA	160000	22/04/2019	$ 3,900.00	$ 39.00	$ 750.62	$ 221.28	$ 4,910.90	100	$ 49.11
DEFINITIVA	160000	22/04/2019	$ 1,700.00	$ 17.00	$ 327.20	$ 96.45	$ 2,140.00	50	$ 42.81
DEFINITIVA	130779	17/04/2020	$ 30,000.00	$ 300.00	$ 5,760.00	$ 1,700.00	$ 37,760.00	600	$ 62.93

Source: Own elaboration

Table 11. Fluctuations in annual costs

Annual im–portation	Physical quantity	DUA	Date	Total cost	year on year fluctuation	Variation %
2018	$ 600.00	134340	3/04/2018	$ 32,931.44		
2019	$ 650.00	160000	22/04/2019	$ 26,669.23	-6262.206	-23.48
2020	$ 600.00	130779	17/04/2020	$ 37,760.00	11090.766	29.37

Source: Own elaboration

Likewise, Falcón, et al. (2018), research called "Factors that hinder the import process of metal-working companies in the province of Lima,2018". Which aimed to establish how the factors hinder the import process, and as results were had that documentary control, technology, and import costs eloquently hinder metalworking companies in the province of Lima. It is found that this is consistent with the dimensions studied in this document. Since it is agreed that these factors are challenges that influence the import processes.

It is necessary to point out that the results of this research are not applicable to other sectors of importing goods, due to the different regulations and processes necessary to carry them out. In addition, similarity with the procedures required in foreign countries was not sought. Therefore, for future research it is recommended to relate the benefits and barriers in the country's imports in the various sectors, as well as international policies such as the free trade agreement and protectionism with import costs, which may have an effect on the economy of the companies. Also, it is important to investigate the foreign exchange rate and its impact on import costs, because it transmits the exchange rate fluctuations from the foreign value to the domestic value for the domestic consumer.

5.   Conclusions

First, it is important to keep in mind that the relationship between import processes and costs may vary depending on the specific context and circumstances of each import. By analyzing import processes, it is also possible to identify areas for improvement in terms of regulatory compliance, which can reduce the risk of delays, fines and penalties.

In the present investigation, of agricultural products, it is recognized that an efficient management of the import processes is directly related to the result of the total costs of the goods; this is reflected in the coefficient of determination that explains a high percentage of the variations of the total costs through the behavior of the import processes.

In turn, import processes may have several associated costs, such as acquisition costs, shipping costs, insurance, additional costs, compliance with regulations and requirements of each country. However, in spite of demonstrating that there is a significant and very high positive relationship between the research variables, other factors that affect the determination of import costs are also present. From the documentary analysis, it was observed that there are other factors such as fluctuations in exchange rates, foreign trade policies, world economic conditions and fortuitous events such as the coronavirus

pandemic.

Therefore, taking into account the relevant internal and external aspects, a well-managed and efficient import will be carried out, which will help to reduce costs by understanding the risks involved in this economic activity, thus avoiding economic damage to any individual or company engaged in imports.

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