

EFFECT OF IMPORT TAXES OF RAW MATERIALS, COVI19 AND INTERNAL MARKETING IN THE ECONOMY OF INDUSTRIES OF BAJA CALIFORNIA, STATE, MEXICO

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ABSTRACT

The industrial activities have diverse characteristics that can modify the forms to fabricate the products to will be send to the customers. Some of these relevant aspects are the cost of the import taxes of raw materials that was made a negative effect in the economy of industrial plants installed in the Baja California State, which is located in the northwest of the Mexican Republic. This important factor, in the industrial companies of this region of Mexico, generated economic losses to some industrial companies of this zone of Mexico, which not had an optimal management of the human, economical and materials resources, and had put people out of work, by closing. This occurred in the Baja California State, which was reflected in an investigation made from at beginning of 2019 to the end of the 2020, where was presented other important aspect as the Covid9 pandemic. The Covid 19 was other factor, in addition of the what was already happening before the occurrence of this pandemic, respect to one a relevant aspect, as was the cost of the import taxes, which affected to some industrial plants installed in the Baja California State. These industrial plants affected by the import taxes and the Covid19 pandemic, had to close and lay off workers, mainly from the manufacturing areas, due to the pandemic situation and the complaints about the high cost of the tax due to the need to import raw materials for the manufacture of their products, this aspect has been mentioned for several years before. For this reason, an investigation in the period of time mentioned above, with the strict health regulations in ten industries of the Baja California State, to found a solution of this problematic situation, where was obtained an immediate solution, being the applying of the internal marketing in the ten industries that survive to the high cost of the import taxes and the Covid19 pandemic, for the application of this strategic method as was the internal marketing techniques. This originated an increase of the productivity and quality levels in the ten industrial companies, where was made this scientific study. This investigation was made in two industries located in Ensenada, four industries in Mexicali and four industries in Tijuana.

Keywords Industry, import taxes, Covid19, internal marketing, manufacturing areas.

1. INTRODUCTION

The industry installed in the Baja California State, which includes the cities of Ensenada, Mexicali and Tijuana as a industrial cities, has generated a great diversity of jobs for the people of this state, since they began to installed, being of great importance in the economy of the families of this region of the Mexican Republic. This zone of Mexico, is considered a border zone with the California State of USA, where is an important region of commercial activities in the world. Mexico is a country that have some commercial trades with some countries of the world, being the most important the Free Commercial Trade (FCT) (FCT, 1992) with the United States of America (USA) and Canada, where the majorly of the industrial plants installed in the Baja California State, was from the USA country. Also,

industries of USA, which are installed in this region, are from other countries as Canada, China, England, France, Germany, Italy, Japan, Korea, Netherlands and Spain; which generates a lot of employments to people who live in this region of the Mexican Republic (Tecma, 2020). With all countries mentioned, Mexico has commercial trades, and some industries as the principal company, have branch industrial plants in this region of the Mexican Republic (CRS, 2020). In these types of industrial plants, can occur a diverse problematic situation, which can decrease the productivity and quality levels, being the principal causes, the inexperienced workers in the manufacturing areas, and also the attitude and awarenesses that originates low effort of workers of the industrial processes, and with this causes low operative yielding (Vargas, 2003). One relevant factor that supports to increase the attitude and awarenesses aspects was the application of the internal marketing to convince the persons that work in the manufacturing areas of the ten industries evaluated, obtained an increase in the productivity and quality indices, and avoiding that these industrial companies closed in the period where was made this scientific study. As mentioned in the report of 2021 of the Baja California INMAQ (Industria Maquiladora), are 960 industries (where in Tijuana are 609, in Mexicali 241, in Ensenada 85, and in Tecate city 25 (INMAQ, 2021).

Type of industries in the Baja California State

In this region of the Baja California State are a lot of types of industries installed in the three cities mentioned above, generates a great quantity of activities, being of the aerospace, agricultural, biomedical, cardboard, electronic, food and beverage, metallic, plastics, textile and wood operations (INMAQ, 2021). Each type of industry uses diverse raw materials to fabricate its products to be sending to the customers, and have different type of production flow, where in sometimes some raw materials are damaged and need obtain more raw materials and the cost of the industries increase, specially to replace this raw material damage and to the high cost of the import taxes of the raw materials provided from the countries mentioned above. In table 1 is showed the type of industries mentioned and the principal raw materials, industrial processes and products manufactured in the industry of the Baja California State (FCT, 1992).

Table 1 Type of industries by country installed in the border between Mexico and USA

Industry	Type of industry	Type of raw materials	Type of process	Type of product
Countries				
Canada	Electronic and Plastics	Electronic devices, electronic boards, cardboard, plastics	Linear, T, U and G flow processes, and manufacturing cells	Cellular phones, Computers, Tablets, Televisions
China	Electronic and Plastics	Electronic devices, electronic boards, cardboard, plastics	Linear, T, U and G flow processes, and manufacturing cells	Cellular phones, Computers, Tablets, Televisions
England	Aerospace and wood	Electronic devices, electronic boards, cardboard, plastics, wood	Linear, T and U flow processes	Parts of aircrafts and furniture to homes and offices
France	Electronic and Biomedical	Biomedical and Electronic devices, electronic boards, cardboard, plastic	Linear, T, U and G flow processes, and manufacturing cells	Cellular phones, Computers, Oxymeters, Surgical materials, Pacemakers, Prosthesis, Tablets, Televisions
Germany	Electronic and Biomedical	Biomedical and Electronic devices, electronic boards, cardboard, plastic	Linear, T and U flow processes, and manufacturing cells	Cellular phones, Computers, Oxymeters, Surgical materials, Pacemakers, Prosthesis, Tablets, Televisions
Italy	Textile and Food and Beverage	Clothes, Plastics	Linear, T and U flow processes, and manufacturing cells	Uniforms, casual and elegant clothes
Japan	Electronic	Electronic devices, electronic boards,	Linear, T, U and G flow processes, and	Cellular phones, Computers,

		plastics	manufacturing cells	Tablets, Televisions
Korea	Electronic	Electronic devices, electronic boards, plastics	Linear, T, U and G flow processes, and manufacturing cells	Cellular phones, Computers, Tablets, Televisions
Netherlands	Textile	Clothes, Plastics	Linear, T and U flow processes, and manufacturing cells	Uniforms, casual and elegant clothes
Spain	Agricultural	Seeds and sowing grains	Linear, T and U	Cropped Food cropped
USA	Aerospace, Agricultural, Biomedical, Electronic and Plastics	Electronic devices, electronic boards, cardboard, plastics, Seed and sowing grains,	Linear, T, U and G flow processes, and manufacturing cells	Cellular phones, Computers, Food cropped, Peacemakers, Prosthesis, Surgical materials, Tablets, Televisions

Table 1 shows the diverse type of industries, raw of materials used in the manufactured areas of the ten industries evaluated, type of processes and products manufactured, showing the diversity of specialized industrial operations and the necessity of specialized people to make the industrial activities.

Import taxes to raw materials

The import taxes that are used in the Baja California State to industrial companies located in this state, is The Tariff of the Law of General Import and Export Taxes -TLGIE or called tariff (representing in Spanish as the TIGIE-Tarifa de la Ley de los Impuestos Generales de Importacion y Exportacion o llamado Arancel), being regulated by Mexico. The TLGIE is based on the Harmonized Commodity Designation and Coding System (HSDS) (CRS, 2020), whose objective is to classify the merchandise subject to international trade, according to its nature, degree of elaboration. This import taxes are 16% of the cost of the raw material and if any foreign industry wants sale raw materials provided from his country to other industry located in the Mexico country to manufacture his products, the industry that buy the raw materials, debit pay the 8% of the cost of the raw materials. The topic of the taxes of the raw materials is very important, because people as directive and managers of the industrial companies are concerned by the great quantity to spend about this relevant aspect. In figure 1 is illustrated the impact of the import taxes in this region of our country. (Vargas, 2003)

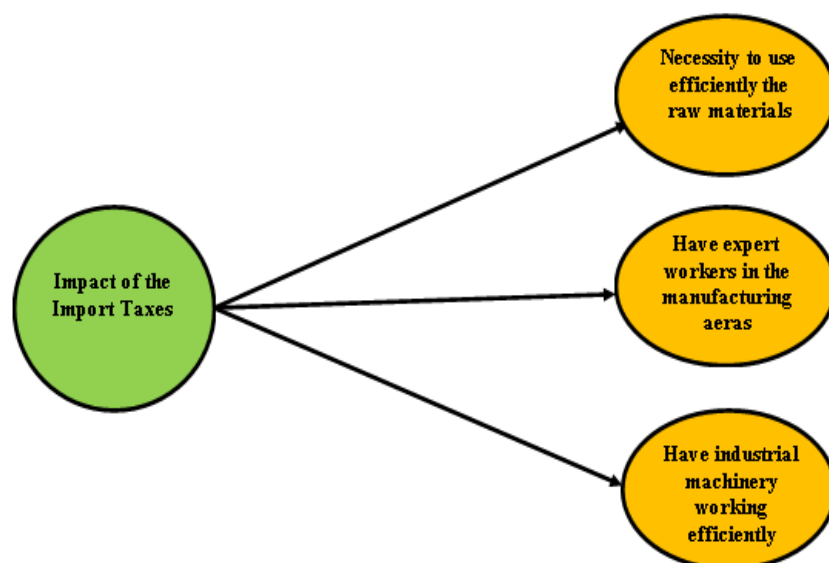


Figure 1 Representation of the impact of import taxes in the industrial operations in the ten industries evaluated

Figure 1 shows the three principal aspects that have effect from the application of the import taxes to industrial companies established in the Baja California State. This represents the situation in each industry evaluated, expressing the three relevant aspects next (FCT, 1992):

a) Necessity to use efficiently the raw materials. This aspect is important to utilize efficiently the raw materials and approach at the maximum. If the raw material is used as a wrong form, can reduce the quantity of the materials used and can't reach the final quantity of the products manufactured to the customers.

b) Have expert workers in the manufacture areas. This relevant factor is necessary to avoid errors and with the generation of the defective products. Only that debit pays more to have expert people, and will reward in optimal activities and with this, efficient manufactured products.

c) Have industrial machinery working efficiently. This aspect is interesting to obtain the maximum operative yielding of the industrial machinery and have the quantity of fabricated products with the high quality.

The three relevant aspects mentioned above, were important in the increase of the productivity and quality levels, which were increased at the end of the first month (in January of 2019), in the activities of this investigation.

The Covid19 pandemic

This pandemic has negative effect in all regions of the world; (Benita, 2021), being a factor that generated the close of some industrial plants in the Baja California State, some of which was problematic situations in their industrial processes, with a lot error of the workers of the manufacturing areas and with this originating a great quantity of defective products (Mohammad et al, 2020). This causing the waste of materials used in the industrial processes. The Covid 19 pandemic, during in the Mexican Republic from March of 2019 to June of 2021, closing the period of this investigation from January of 2019 to December of 2021. Figure 2 shows the negative effects caused by the occurrence of the Covid19 pandemic in the ten industrial plants where were made the investigation.

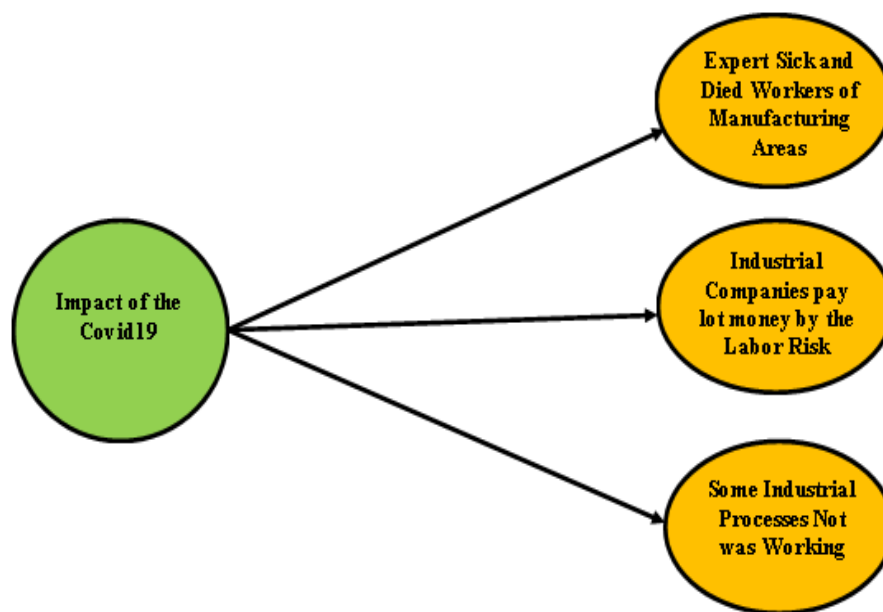


Figure 2 Negative effects of the Covid19 pandemic occurrence in the ten industries evaluated

The last figure shows the three principal effects of the Covid 19 pandemic, which are explained next:

a) Expert Sick and Died Workers of Manufacturing Areas. In this Covid19 pandemic, a lot people that was working in the industrial processes were sick and some sick persons of this health symptom died. These workers were expert in his operative activities and this caused that some industrial operations were made by inexperienced people, causing a lot quantity of errors and for this reason great quantity of defective products manufactured. This originated that materials used in the manufacturing areas were waste and not complete the fabricated products, being a cause of loss of customers of some industries evaluated before made this scientific study.

b) Industrial companies pay a lot money by the labor risk. For the occurrence of the Covid19 pandemic, the industries in this region, paid a lot money at the beginning of the pandemic, because Mexican health authorities believe that the industrial processes worsened the health of industrial workers, affecting with major grade the Covid19 pandemic.

c) Some Industrial Process Not Work. The lack of expert and sick workers generated that some industrial processes not work by some periods during this investigation, and with this the goals of the productivity and quality levels not was reaching. This provokes problematic situations in the ten industries evaluated by the lack of expert or inexperienced people, causing executives and managers with health problems due to nerves.

Internal marketing in industrial plants

To control the problematic situations in the ten industries evaluated, was used the method of the internal marketing to convince the few workers that remained in the ten companies evaluated, to carry out their activities with great effort, dedication and attitude, and sometimes they operated up to two industrial machines, causing great fatigue (Grande, 2014; Figueroa, 2020). This was done because many workers in the ten industrial companies where this scientific study was carried out were discouraged and tired and did not want to work (Al-Borie, 2012; Tortosa et al, 2014). Figure 3 shows how an internal marketing process in each industry evaluated, the way in which a person from the operational area elaborated his activities and supplied his operational successor with the by-product with an efficient quality and quantity (Tang et al, 2020; Ruizalba et al, 2014). In the next paragraphs are explained the actions as vendor and customer as operative workers (Vera et al 2018):

Level 1 (red color). Represents an ineffective and unpleasant situation, being represented for both cases as the vendor and customer of industrial operative actions between workers of manufacturing areas.

Level 2 (orange color). Indicates an effective and unpleasant situation, illustrated both cases as the vendor and customer of industrial operative actions between workers of manufacturing areas.

Level 3 (yellow color). Shows an ineffective and pleasant situation, being the real situations both cases as the vendor and customer of industrial operative actions between workers of manufacturing areas.

Level 4 (green color). Illustrates an effective and pleasant situation, being the best event, which can consider a success of both cases as the vendor and customer of industrial operative actions between workers of manufacturing areas.

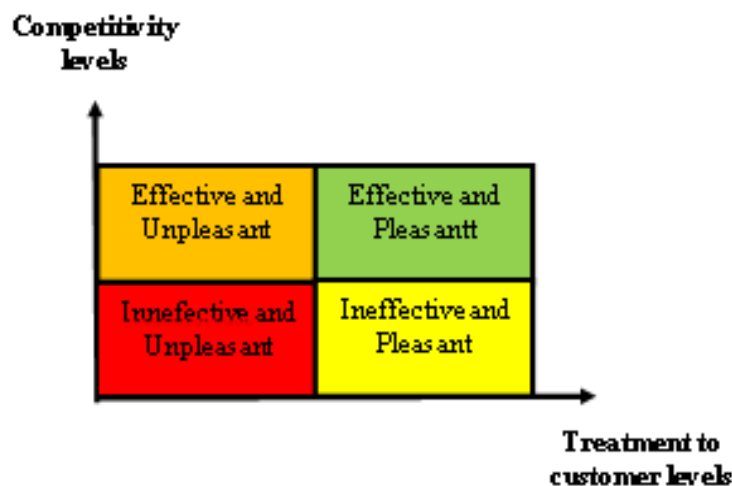


Figure 3. Analysis of actions of vendor and customer as operative works in industrial process of the industries evaluated

2. METHODOLOGY

This investigation was relevant because for the great cost of the import taxes of the raw materials used in the industries installed in the Baja California State, and the occurrence of the Covid19 pandemic; generated some problematic situations for the sick and died experts' workers, causing the necessity of use inexperienced or lack of workers in some industrial operations causing a decrease in the productivity and quality indices. For this reason, was made this scientific study, expressing next the activities elaborated:

- Realization a correlation analysis of the cost of import taxes and productivity and quality levels.
- Elaboration of a correlation analysis of the presence of Covid19 and productivity and quality levels.
- Realization of a correlation analysis of the application of the internal marketing in and its impact in the productivity and quality levels.

3. RESULTS

The high cost of the import taxes and the presence of the Covid19 pandemic, influenced in the economy of the industrial plants located in this region of our country. For avoid this problematic situation, is necessary apply efficient strategies in the industrial processes, reflecting in the results that is presented in the next sections.

Correlation analysis of import taxes and productivity and quality levels

This was made to evaluate the relationship of the cost of the import taxes to the industrial companies of this region of the Mexican Republic and the generation of the productivity and quality levels in the different periods of the analysis of the begin of 2019 to the end of 2020. The information is represented in tables 2 and 3.

Table 2 Correlation analysis of the cost of import taxes and the productivity and quality indices in the ten industries evaluated before the investigation

Parameters Industries	Type of industry	Productivity Level, %	Quality Level, %
Ensenada I1	Electronic	56	86
Ensenada I2	Food and Beverage	58	89
Mexicali I1	Aerospace	62	84
Mexicali I2	Agricultural	68	84
Mexicali I3	Metallic	65	88
Mexicali I4	Textile	66	86
Tijuana I1	Biomedical	60	86
Tijuana I2	Electronic	55	88
Tijuana I3	Plastics	67	83
Tijuana I4	Cardboard	68	85

Table 3 Correlation analysis of the cost of import taxes and the productivity and quality indices in the ten industries evaluated after the investigation

Parameters Industries	Type of industry	Productivity Level, %	Quality Level, %
Ensenada I1	Electronic	88	86
Ensenada I2	Food and Beverage	84	88
Mexicali I1	Aerospace	89	85
Mexicali I2	Agricultural	91	87
Mexicali I3	Metallic	83	88
Mexicali I4	Textile	84	89
Tijuana I1	Biomedical	82	85
Tijuana I2	Electronic	88	86
Tijuana I3	Plastics	85	87
Tijuana I4	Cardboard	86	88

The tables 2 and 3 show the type of product of each industry evaluated and percentages of productivity and quality levels, observing an increase between the relationship the parameters considering the periods before and after made this scientific study. The increase was around of 20% at average in the ten industries evaluated. The productivity and quality levels were correlated with the spent of each industry evaluated that are in the next numerical data in the 2019, referring the same spent in the five last years and in 2020 and 2021:

Ensenada I1: 560, 000 dlls.

Ensenada I2: 770, 000 dlls.

Mexicali I1: 1,260, 000 dlls.

Mexicali I2: 1,660, 000 dlls.

Mexicali I3: 1,890, 000 dlls.

Mexicali I4: 1,750, 000 dlls.

Tijuana I1: 2,230, 000 dlls.

Tijuana I2: 2,580, 000 dlls.

Tijuana I3: 2,910, 000 dlls.

Tijuana I4: 2,850, 000 dlls.

Correlation evaluation of the Covid19 and productivity and quality levels

This part of the investigation was made to determine the type of industry of the ten industries where was made the scientific study, and where was illustrated that affect with major grade the presence of the Covid19 pandemic, in the industries with great quantity of workers in the manufacturing areas, which was presented in tables 4 (before the investigation) and 5 (after the investigation).

Table 4 Correlation evaluation of the effect for the presence of the Covid19 pandemic cost of import taxes and the productivity and quality indices in the ten industries evaluated before the investigation

Parameters Industries	Quantity of Workers and Workers Affected	Productivity Level, %	Quality Level, %
Ensenada I1	450-40	55	56
Ensenada I2	610-60	48	58
Mexicali I1	990-90	59	60
Mexicali I2	1230-100	50	55
Mexicali I3	1510-110	54	53
Mexicali I4	1430-130	56	54
Tijuana I1	2310-130	49	57
Tijuana I2	2180-160	50	59
Tijuana I3	2090-150	52	60
Tijuana I4	2240-140	54	57

Table 5 Correlation evaluation of the effect for the presence of the Covid19 pandemic cost of import taxes and the productivity and quality indices in the ten industries evaluated after the investigation

Parameters Industries	Quantity of Workers and Workers Affected	Productivity Level, %	Quality Level, %
Ensenada I1	450-15	89	85
Ensenada I2	610-20	90	88
Mexicali I1	990-30	92	88
Mexicali I2	1230-40	89	86
Mexicali I3	1510-40	83	89
Mexicali I4	1430-60	86	90
Tijuana I1	2310-50	85	90
Tijuana I2	2180-40	89	88

Tijuana I3	2090-70	87	86
Tijuana I4	2240-60	88	85

In tables 4 and 5 are showed the relationship of the workers affected by he Covid19 pandemic and the productivity levels before and after the investigation, where in the presence of the Covid19 was made this scientific study with strict health regulations. In this analysis if observed about the quantity of workers in each industrial company evaluated, two ranges of numerical data with the total quantity of workers in each industry where was made the investigation and the workers affected by the occurrence of the Covid19 pandemic. In this section of the scientific study, was observed that after the investigation, the quantity of workers decreased and the productivity and quality indices increased, in comparison with the period before of made the investigation. In both cases the decrease in the quantity of workers affected and the increase in the productivity and quality levels was around of 20% at average.

Evaluation of use of internal marketing

This section of the scientific study was made to determine the relationship of the application of the internal marketing and the productivity and quality levels, which are represented in tables 6 and 7.

Table 6 Evaluation of correlation of the application of internal marketing and the productivity and quality indices in the ten industries evaluated before the investigation

Parameters Industries	Attitude and Effort of Workers, %	Productivity Level, %	Quality Level, %
Ensenada I1	54-59	55	60
Ensenada I2	55-60	60	6
Mexicali I1	53-61	55	59
Mexicali I2	56-52	59	58
Mexicali I3	50-54	63	60
Mexicali I4	58-60	62	56
Tijuana I1	56-55	64	60
Tijuana I2	57-53	62	62
Tijuana I3	55-59	65	63
Tijuana I4	57-70	66	61

Table 7 Evaluation of correlation of the application of internal marketing and the productivity and quality indices in the ten industries evaluated after the investigation

Parameters Industries	Attitude and Effort of Workers, %	Productivity Level, %	Quality Level, %
Ensenada I1	88-86	88	89
Ensenada I2	85-80	86	92
Mexicali I1	86-84	89	88
Mexicali I2	84-84	90	85
Mexicali I3	89-83	92	86
Mexicali I4	83-85	88	88
Tijuana I1	82-88	89	84
Tijuana I2	85-83	90	86
Tijuana I3	82-86	85	88
Tijuana I4	84-89	86	89

Tables 6 and 7 illustrate the relationship of the attitude and effort, measured con respect to the operative yielding and the productivity and quality levels, where were observed that after the investigation increased the attitude and effort in percentages and was same to the productivity and quality levels. This was relevant, because indicates that the strategic

method used by the directive and managers with the internal marketing increase the economic gains and with this, the ten industries evaluated survived to the period of the presence of the Covid 19 pandemic and the high cost of the import taxes.

4. CONCLUSIONS

The global growth about the commerce in all regions of the world is very relevant, and for this reason the majority of the countries have commercial trades to interchanges products as agricultural, industrial, science and technology; principally. This is an interesting aspect between countries of Mexico and United States of America (USA), where in the Mexican Republic are installed essentially in the border zone between both countries, a lot industrial company of different type of industrial processes. These industries generate diverse type of jobs, depending of the type of industry, where are as aerospace, agricultural, biomedical, electronic, metallic, plastics, textile and wood industries. In this border zone around all border line about both countries are installed in the Mexico side, a lot USA industries, and one relevant aspect about the Free Commerce Trade (FCT), developed from 1994 between these countries, is the topic of the taxes of the raw materials provided from the USA to Mexico, where the USA industries need spend 16% of the cost of the raw materials to enter to the Mexico country, where were observed in the ten industries evaluated. This is for the FCT, and is the same case when raw materials are from Canada, which is the other country of the FCT, and other countries as China, England, France, Germany, Italy, Japan, Korea, Netherlands and Spain; the taxes are same that countries of the FCT. Also, the presence of the Covid pandemic caused problematic situations in the ten industries evaluated and supported by the internal marketing to convince to the workers of the manufacturing processes to make his industrial operations with good attitude and effort, was very relevant this aspect.

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