

# **Determinants of Japanese Foreign Direct Investments: A Comparative Study Between Brazil and Mexico, from 2005 to 2017**

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## Abstract

Foreign direct investments have been part of the strategy of multinational companies, in order to reach new markets and increase profitability. In the case of the Japanese companies, it could not be different, with investments spread all over the world. The pattern of Japanese investments overseas and the analysis of the characteristics of the investments in Brazil and Mexico are the aim of this study. Despite the Japanese immigration and the long tradition of cultural exchange, the economic cooperation and the volume of Japanese investments never reached the values as other regions, in the world. However, the volume of investment has presented a change in pattern, during the last years. In 2005, Mexico signed an Economic Partnership Agreement that helped Japanese companies to increase their presence, in the country, although the Japanese investments, in Brazil, at the year of 2011, reached US\$ 7,536 million dollars, the highest amount, in their cooperation history. From these points of view, this study examines the determinants of Japanese investments, in Brazil and Mexico, through a sectoral analysis of the Japanese investments, in both countries, and an econometric analysis about the factors. The empirical results show that Japanese investments follow the efficiency-seeking strategy, in Mexico (that are related to both economic partnerships and production networks), while, in Brazil, it follows the market seeking strategy (that are related to economic situation).

*Keywords:* Brazil. Japan. Mexico. Foreign direct investments. Determinants. Geopolitical economy

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## Glossary

- ADF: Augmented Dickey Fuller Test
- AIC: Akaike's information criteria
- ASEAN: Association of Southeast Asian Nations
- BRICS: Brazil, Russia, India, China and South Africa
- CSN: Companhia Siderurgica Nacional
- EURO: European Union Currency
- EU: European Union
- FDI: Foreign Direct Investment
- FPE: Final Prediction Error
- GATT: General Agreement on Trade and Tariffs
- GDP: Gross Domestic Product
- HQIC: Hannan and Quinn information criteria
- IR: International Relations
- JAPEX: Japan Petroleum Exploration
- JBIC: Japan Bank for International Cooperation
- JEXIM: Export-Import Bank of Japan
- JOGMEC: Japan Oil Gas and Metals Corporation
- MERCOSUR: South American Common Market
- NAFTA: North American Free Trade Agreement
- TPP: Trans-Pacific Partnership
- USIMINAS: Usinas Siderurgicas de Minas Gerais S.A
- VECM: Vector Error Correction Model

## Chapter I: Introduction

### 1.1 Background

Throughout the world, the research about

Foreign Direct Investments and the factors that determine the decision of companies to invest abroad have been deeply studied by researchers. With the development of multinational and transnational corporations, authors, such as Caves (1971)<sup>1)</sup> and Dunning (1973)<sup>2)</sup>, have studied the pattern of the internationalization of companies, in overseas markets. The predominant factors for the decision of investments in one country should vary from another country, due to the different macroeconomics and microeconomics factors that influence, in the analysis (difference in interest rates, currency values, market size, GDP, average salary, as many as other variables). These differences make the analysis wider, since the examination of specific countries and periods of time could be valuable, to understand the different aspects that affect the determinants of Foreign Direct Investment.

For example, in the case of Japan, Japanese FDI patterns of investment, in overseas markets, has also been focused, on studies from different perspectives and different chains of thoughts, from authors, including Kojima (1978)<sup>3)</sup>, Roger Farrell (2008)<sup>4)</sup> and Tanaka (2009)<sup>5)</sup>, and the period of time and the nuances, in the types of investments, have been deeply analysed. Regarding a more specific region, as Latin America, and two specific countries (Brazil and Mexico), the literature about Japanese investments, in Brazil, for example, has been limited to studies of the pattern of investments, until the year 2005, such as the works of Renato Furuse Martins (2010)<sup>6)</sup> and Alexander Uehara (2007)<sup>7)</sup>, and, in the case of Mexico, part of the literature are focus on the benefits of the Japan-Mexico trade agreement, the bilateral relations and the impact of the global crises, in this relationship, as the papers of Melba Falck Reyes (2012)<sup>8)</sup> and Martha Elena Campos Ruiz, Leo

Guzman Anaya and Guadalupe Lugo Sanchez (2018)<sup>9</sup>.

The changes, in Japanese pattern of investments, and the variation of Brazil and Mexico economies, during the period 2005-2017, created a perspective of changes, in the way that Japan could see both countries as economic partners. Due to this background, the current study aims to analyse the Japanese Foreign Direct Investments, in these two recipient countries (Brazil and Mexico), due to the similarities (developing countries, with increasing economic cooperation with Japan, but geographically and culturally distant), even though with differences, considering FDI attraction.

## 1.2 Statement of the problem

The international cooperation and external relations, between Japan and Latin American countries, have been established for more than a hundred years. For example, the Japanese immigrants in Brazil, Peru and Mexico, at the beginning of the 20th century and after World War II, had strong impact, in the societies of the recipient countries and created a vivid active community, in different sectors of the economy. In Brazil, according to Alexandre Uehara (2002), until 1970, when it registered the last wave of Japanese immigration, more than two hundred thousand Japanese nationals immigrate to the country. In the 1980s and 1990s, the reverse flux of immigration also happened, with a movement called *dekaseguis*<sup>10</sup>, when the sons of the Japanese immigrants moved back to Japan, attracted by the flourish of the Japanese economy.

In contrast, the economic cooperation, between Japan and Latin America countries, never flourished, if it is compared with other regions, especially if we emphasize the number

of Japanese descendants, living in the area. Alexandre Uehara (2002) pointed that the geographical distance, the cultural differences and the political structure of the Japanese companies made the economic cooperation weaker.

However, the lack of economic cooperation presented changes, in the past years. In September 2004, the Japanese ex-prime minister Junichiro Koizumi signed an Economic Partnership Agreement<sup>11</sup> (EPA) with the Mexican ex-president Vicente Fox. The agreement includes quotas for Mexican products to enter Japan with less tax charge. For the Japanese side, the agreement helped the Japanese companies to establish, in Mexico, to compete with equality of conditions with European and American companies. This agreement was the second free trade agreement signed by the Japanese. at that time, after the agreement signed with Singapore, and the first treaty signed with a Latin American country.

In the case of Brazil, instead of not having a direct trade agreement, the Japanese FDI, in the period, had significantly increased, reaching, in 2011, US\$ 7,536 million<sup>12</sup>) the maximum value of Japanese investments, in Brazilian history. However, political instabilities and economic changes made the trajectory of Japanese investments not as constant as other countries. The impeachment of Brazilian past president Dilma Roussef and the uncertainties about the Brazilian economy made, in the past years, a decreasing, in the volume of Japanese investments, in Brazil.

However, the change in patterns of investments, in both countries, and the many uncertainties about the topic, leads us to a puzzle situation, that helped to build up the main question of this research: **Which are the determinants that affect the decision of**

## **Japanese Foreign Direct Investments, in Brazil and Mexico?**

### **1.3 Research purpose and methodology**

The study aims to analyse the characteristics and motivations that lead the Japanese direct investment, in Brazil and Mexico, from 2005 to 2017. The project investigates, through a detailed study, the characteristics of the Japanese projects that were implemented, in Brazil and Mexico, and its subsequent impact on business relationship, among the countries.

To establish comparison, the research focused on the sectoral analysis of the Japanese investments, in both countries, and it had use one analytical model, based on Vector Error Correction Model (VECM) methodology, as part of the time series analysis, which checks plausible economic relations. The model included variables to explain FDI and the relevance of them, in the results. For example, to explain FDI, we can use factors, as GDP growth, exchange rate, interest tax, commodities price and economic openness, and, with the time series analysis, to check the correlation and the predominant factors that had influence, in the period.

The final point to pick the countries Brazil and Mexico is because both countries are the highest recipients of Japanese FDI, in Latin America, and Mexico has a direct free trade agreement with Japan, although Brazil does not have any trade, which affects FDI differently. This study is also aiming to identify the Japanese investments trends through Japanese perspective. The different results, as well as the similarities, which are expected, can enrich the research and help future scholars to understand Japanese investments, in the region.

About more specific methodological procedures, the data (quantitative research) have been collected in different ways, as books

and documents about the 2005-2017 period. The documentary research has been made, through the systematic monitoring of specialized media and the examination of public documents (that are available for research), that confirm or strongly suggest investing, in the countries.

### **1.4 Relevance of the study**

This research could be relevant for policy-makers and scholars, whose study Japanese Foreign Direct Investments strategies, providing data and economic analysis for a better understanding of Japanese Foreign Direct Investment (FDI). It can improve public policies, in the field, and future strategies. Despite Japanese immigration and cooperation have been deeply studied, by scholars, the new pattern of Japanese investments, in the region, is still a new topic, that can help future researchers for a better understanding of multilateral relations.

### **1.5 Hypothesis**

The hypothesis to be tested are:

1. Japanese multinational company's strategy for developing countries are related to Dunning's eclectic paradigm, using the efficiency-seeking and resource-seeking strategies, but, in recent years, this pattern has changed to market-seeking objectives.

2. Japanese investments, in Mexico, are mainly related to efficiency-seeking strategy, due to the trade liberalization conditions.

3. Japanese investments, in Brazil, are related to market-seeking strategy, due to Brazilian domestic market's conditions.

4. Trade liberalization has positive effect, in attract FDI. However, the industry concentration makes the impact of investments in the economy weaker.

5. Governments and public institutions have positive effect, on investments decisions.

## 1.6 Structure of the thesis

This study has 5 chapters. After the present introductory chapter, the study structure will be as follows:

Chapter 2: Sectoral analysis of Japanese FDI, in Brazil, using Brazilian Institute of Foreign Trade data, the study aims to identify the sectors, in which the Japanese investments are allocated and its geographical distribution.

Chapter 3: Sectoral analysis of Japanese FDI, in Mexico, using Mexican Ministry of Economy data, that includes Japanese Foreign Direct Investment statistics, in the country, the study aims to make both sectoral and geographical analysis of the Japanese investments, in order to identify in which sectors the Japanese FDI are allocated and the geographical distribution of this investments.

Chapter 4: Analysis of the results and the analytical model, that are based on the Vector Error Correction Model (VECM) methodology. Using Brazil and Mexico's collected data, by year, during the period 1990-2015 and using the analytical model and time series analysis, the research intends to determine how the factors affect Japanese investments.

Chapter 5: Conclusion and policy recommendations.

The structure of the thesis is divided in five chapters. After the introduction, progressively the study enters, in the analytical process, in order to identify the determinants of Japanese investments, passing through both countries' sectoral and econometrics analysis.

In order to analyse the theories, in the field, and to create a theoretical framework for the study, the next section, Overview of Japanese investments, in Brazil, will analyse the pattern of Japanese investments, in Brazil, through an historical, sectoral and geographical analysis of the investments, in the country, during the

period.

## Chapter II: Overview of Japanese investments, in Brazil

### 2.1 Introduction

In order to analyse Japanese investments, in Brazil, from 2005-2017, this chapter will do (1) the historical background of the Japanese investments, in Brazil, (2) a brief analysis of Brazilian economic situation, in the period, and (3) the geographical and sectoral analyses of the Japanese investments, in Brazil, from 2005 to 2017. The last part of this chapter will be the conclusion.

The geographical analysis will use the investment values, separated by States of the Brazilian confederation, although the sectoral analysis will divide the investments by economic sectors. During the analysed period, the investments pattern has changed, depending on time. Within the period, it was possible to see the highest value of Japanese FDI, in Brazil, in a single year (US\$ 7,536 million). The study will also focus, specially, on how the impeachment of the ex-president Dilma Roussef affected the Japanese investments, in Brazil, considering this turbulent moment of Brazilian economy. In addition to both the changes in Brazilian domestic condition and the new pattern of Japanese investments, in the developing countries, this chapter aims to evaluate if these investment trends follow any investment patterns, which has already been studied, by past scholars, in order to identify new patterns. The results will help researchers to understand the characteristics of Japanese investments, in Brazil, and how the macroeconomic conditions could affect the investments, in the sectoral analysis.

## 2.2 Analysis of Japanese investments, from 2005-2017

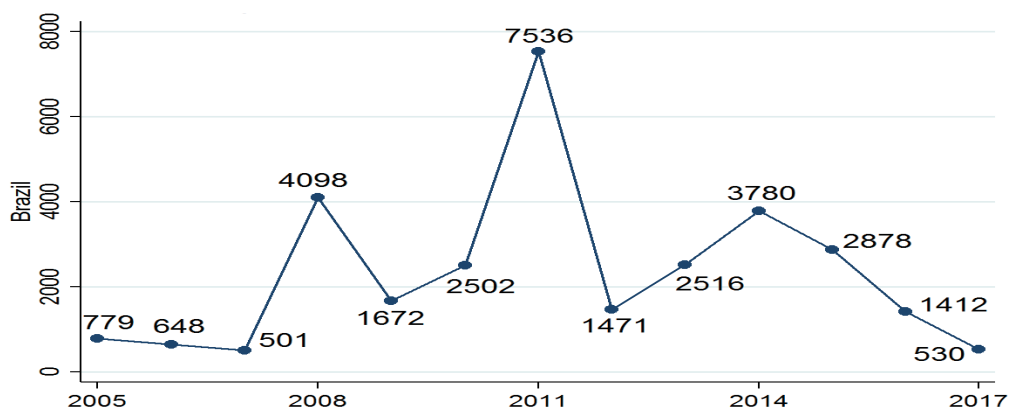
The period from 2005 to 2017, which is studied in the beginning of this chapter, was a growth period, in Brazilian economic history, increasing the perspectives of Brazil, as a counter-hegemonic power, as part of the BRICS (Brazil, Russia, India, China and South Africa), in

the geopolitical scenario. The positive economic perspectives and the growth of Brazilian economy, together with political stability, enabled the highest levels of investments from Japanese companies, in Brazilian history. It is possible to analyse, from **Figure 2.1** and **Table 2.1**, the evolution of Japanese investments, during the period. The volume of investments

**Table 2.1. Value of Japanese FDI, in Brazil, by Year, in Million Dollars (2005-2017)**

Year	Total investments
2005	779.1
2006	647.5
2007	500.9
2008	4098
2009	1672
2010	2502
2011	7536
2012	1471
2013	2516
2014	3780
2015	2878
2016	1412
2017	530
Total Value	28395

Source: Brazilian Central Bank report, on Japanese FDI, in Brazil.



Source: Report from Brazilian Ministry of Trade and Commerce, about Japanese FDI, in the country.

**Figure 2.1. Value of Japanese FDI, in Brazil, by Year, in Million Dollars (2005-2017)**

reached peak levels, in 2011, with the amount of 7,536 million dollars. The examination of the evolution of the investments, the companies that were responsible for these investments and the sectors in which the values were distributed are approached, in the next fragment of the chapter. Furthermore, it is also possible to analyse the impact of the Brazilian political instability and the results of the GDP growth, to the years of 2015, 2016 and 2017.

In order to analyse the different paths of Japanese investments and its periods of time, it is necessary to divide the 2005-2017 period in two different phases, according to both political and economic situation. In the years from 2005 to 2011, which comprises the end of the first mandate of president Lula, his second mandate and the first year of ex-president Dilma Rouseff mandate, it is possible to see the increment of the values, especially, in energy, metallurgy and manufacturer industry sectors.

The increment on the price of commodities and the good performance of Brazilian economy attracted the companies that were interested in the growth of its domestic market. From 2011 to 2017, it is possible to analyse, even at the first three years, the recovered investments, since part of these values are due to energy sector deals and there is the perspective of recovery of the Brazilian economy, due to 2014 Football World Cup and 2016 Olympics mega events, hosted by the country. But, from 2015 to 2017, it is possible to see the strong decreasing, in values, that can be correlated to the poor GDP growth performance, in the period.

However, it is necessary a detailed picture of the period, to analyse every single sector and its investment characteristics, because the factors that bases the investment decisions shall be different, according to the ambition or the strategy of the companies, in different

segments. Due to that, the next fragment of the chapter will analyse each sector and the type of investments, which were made by Japanese companies, in Brazil, and will bring the conclusions of this study, regarding these investments.

The data were collected from RENAI (Brazilian national network of investments), which is a branch of Brazilian Ministry of Trade. These data comprise every investment announced, in the country, from 2005 to 2017, including investment, reinvestments and modernization operations. It is possible to divide the data by country and by sector, in order to obtain the results of the Japanese investments.

The quantity of Japanese investments, in Brazil, reached 382, with an amount of 85,461 million dollars. However, the total Japanese FDI announced, in Brazil, according to the **Table 2.1**, was 28,395 million dollars, for the 2005-2017 period. The discrepancy in values can be understandable, since mixed capital companies (for example, Usiminas) can be counted as Japanese investment, in the second table, although the flux of capital can come from other countries. Due to these difficulties, in establishing a proper classification, this study will include only investments classified as Japanese capital.

### 2.2.1 Manufacturing industry

According to Roger Farrell, by the year 2004, the Latin America manufacturing industry represented only one-tenth of the number of firms, compared with the number of affiliates, in East Asia. This small proportion, compared with other parts of the world, reflects the long history of import substitution policies, in the region, and the lack of single market. However, there are the attempts of MERCOSUR. Kimura and Ando (2003)<sup>13)</sup> reinforced this concept and stated that



the production/networks, in Latin America, are less developed, compared to East Asia. Latin America is seen as “far” for Japanese firms, in terms of geography, culture and historical background.

On the other hand, in recent years (2005-2017), in Brazil, the growth ratio of economy increased and the high demand for manufactured products (cars, electronics) appeared, on the domestic market, incrementing the volume of investments from Japanese companies, in these sectors. The increase, in the new “middle class” purchasing power, “in Brazil, made companies increase their investments, in plants and modernization processes of them, in the purpose of keeping themselves competitive, in the market.

### 2.2.2 Automobile sector

Japanese companies have a long tradition, in assembling cars and motor bicycles, in the Brazilian market. Honda and Yamaha entered the market, in the beginning of the 1970s, and, after that, Toyota entered, and, in recent years, Nissan followed them. Once Nissan has French and Japanese capital, the sectoral analysis included the totality of its capital, although this amount has no Japanese origin only. The presence of Japanese companies, in the Brazilian market, could be seen in the percentage of

market share, which the Japanese companies have on it. According to a specialized website, Toyota, Honda and Nissan were in the top 10 of sales, in Brazil, in the year 2017<sup>14)</sup>: Toyota was in the 6<sup>th</sup> position, with 189,569 units sold; Honda was in the 8<sup>th</sup> position, with 131,096 units sold; and Nissan was in the 10<sup>th</sup> position, with 78,810 units sold.

In order to keep themselves competitive, in Brazilian market, Japanese companies invested, in the period from 2005 to 2017, a total of 6,446 million dollars, in the implementation and expansion of their plants. The Honda factory plant, in Sumare city, that assemble Honda Civic and Honda Fit car models, the Toyota factory plant, in Porto Feliz city, and the Nissan plant, in Resende city, are examples of implementation of investment, on the automobile factories, during the period, that could give the impact on **Table 2.2** final total value.

Both Nissan and Toyota values are related to the construction of new factory plants. Mitsubishi invested in the expansion of an existing factory, in Goias state, and Suzuki invested in the construction of a new factory, which is producing a specific car model, therefore, this plant is not in a large-scale production.

### 2.3 Geographical distribution

To analyse the geographical distribution

**Table 2.2. Total Values of Investments, by Company, in the Automobile Sector (2005-2017)**

Company	Value
Nissan	2,212
Toyota	2,199
Honda	1,192
Mitsubishi	643
Suzuki vehicles	200
Yamaha	0.43

Source: Report on Japanese FDI, in Brazil, from the Ministry of Trade and Commerce<sup>15)</sup>.

Notes: Values in million dollars.

of the Japanese investments, the study uses Ministry of Trade and Commerce's information on investments, in Brazil, during the period, although this data focus only investments that are original from Japan. Therefore, companies with mixed capitals, such as Usiminas, which is a partnership between Italy, Argentina, Brazil, and Japan, are excluded from the analysis. The investments from "non-identify" regions are not included in the research, either. In order to have a picture about the Japanese investments, it was making a table with the fields "State", "Number of investments", "Main companies" and "Total value, in million dollars".

Analysing **Table 2.3**, it is possible to see that the states of Sao Paulo, Amazonas and Minas Gerais were the areas with larger concentrations of the Japanese investments. The reason for this is that Amazonas is a "Free Trade zone", hosting both local and international companies. The companies in the manufacturing sector, such as electronic components, motorbikes and home appliances assembling, are localized in Manaus. Sony and Panasonic are examples of Japanese companies, in this area.

The Japanese investments, in Minas Gerais state, can be divided into the categories of natural resources and factoring and assembling.

**Table 2.3. Geographical Distribution of the Japanese Companies, in Brazil, by state**

State	Number of investments	Companies	Value
Acre	1	Nishinbo	22.16
Amazonas	130	Sony, Panasonic, Konica, Hitachi, Yamaha, Kawasaki motors	2264
Bahia	4	Bridgestone, Brazil Kirin	513.89
Ceara	1	Brazil Kirin	63.08
Goiias	3	Mitsubishi motors and Suzuki	843.1
Minas Gerais	9	Cenibra, Panasonic, Toshiba, Japan Brazil Paper	3195
Mato Grosso do Sul	2	Brazil Kirin, Naturally Anil	46.23
Mato Grosso	1	Hitachi Koki	5.2
Para	1	Brazil Kirin	75.57
Pernambuco	3	Ajinomoto, Niagro Nichirei Sumitomo Rubber industries,	321.82
Parana	6	Furukawa industrial, Kyb do Brasil	719.24
Rio de Janeiro	6	Nissan, Mitsui corporation	1948
Rio Grande do Sul	5	Honda energy, Multilab, Japan tobacco international	150.09
Santa Catarina	2	Terlogs Marubeni, Takada electric	100.1
Sao Paulo	67	NTT, NEC, Asahi Glass, Toyota, Honda, Nikon, Yakult, Daikin	5290

Source: Report from Brazilian Ministry of Trade and Commerce, about Japanese FDI, in the country.

Notes: Values in million dollars.

The investments in natural resources are related to mining and both paper pulp and celluloses factories. As part of the investments in celluloses, the Japan Brazil Paper company has stock shares composition from JBIC loans and Japanese companies, such as OJI paper, Itochu and Nippon paper industries. Those with factoring as reason of investments, examples are Toshiba, that has a factory in the municipality of Betim, and Panasonic, with a factory in the municipality of Extrema.

However, the state with the highest amount of Japanese investments, in Brazil, is Sao Paulo. In addition to the long tradition of the Japanese immigration (the state's region concentrated the largest numbers of Japanese immigrants and, afterwards, the most vivid Japanese community, in Brazil), Sao Paulo state is also the economic centre of Brazil, accounting for 32.12% of Brazilian GDP, in 2015. Japanese companies are concentrated in different areas, depending on the sectors of the area (i.e., IT, car manufacturing, food industry, glass, rubber and electronics). In car manufacturing sector, Honda opened the second factory, in Brazil, in Sao Paulo state, and Toyota also opened a factory, for assembling Etios and Corolla car models. Also, it should be mentioned that the investments in industries, such as glass industry, and sales and services have happened, in Brazil. For example, in the case of Nikon, it opened their first subsidiary, in Brazil, at Sao Paulo, since the state has benefits that goes from the possibility of economic growth to the increase in consumer demand for products of Japanese companies.

In other Brazilian states, such as the South region the investments are related to state's characteristics. For example, in Rio Grande do Sul, the investments were related to tobacco industry, due to the preferable

producer condition of some parts of the state. In Santa Catarina, the investments are related to the implementation of gas and energy infrastructures, due to the presence and contribution of Marubeni group, in the energy state company. In Parana, they are related to the rubber industry, with Dunlop's investments, in the implementation of a new factory.

In the Southwest, the investments are related to both food and agribusiness industries. In the North and Northeast, they are related to food and consumption. In the state of Rio de Janeiro, surprisingly, the values for Japanese investments are low, compared to Sao Paulo and Manaus, being Rio de Janeiro the second economic vector with 10,8% contribution for the total Brazilian GDP. But, the investments, for the implementation of a new Nissan factory, and the Mitsui corporation investments, in steel sector, made higher the presence of Rio de Janeiro state, in the volume of investments.

## 2.4 Conclusion

The possible conclusion, after the analysis of Japanese investments for the mentioned period is that there are two main motivations for Japanese investments, in the country: resource-seeking and market-seeking. As resource-seeking, it can be cited the investments in areas, as the iron ore and metallurgy, by Japanese multinational giants, as Nippon Steel and Sumitomo metal, even acquiring shares of strategic companies of the sector, as Usiminas and CSN. Going further, the investments in the energy sector, due to Japan's energy situation, and the boom of the ethanol field, made Japanese companies, as Sumitomo, increase investments, specially, in ethanol, due to the unique conditions of Brazil, as a bio combustibles producer. Also, it should be remarked the investments in gas distribution and

the participation of Mitsui, in gas distribution state-owned companies.

Other important motivation, in Japanese investments, is the market-seeking strategy, in Brazil. The GDP growth, in the study period, as well as the increasing of per capita income, made Japanese companies, as Sony, Panasonic, Hitachi and Toshiba, in the electro-electronics market, and Honda, Toyota, Yamaha, in the automobile market, increase investments, due to the rising demand of the domestic markets. This type of investment has also been affected by the slowdown of Brazilian economy, in 2016 and 2017.

However, the fluctuations of the period have been considered, when the Japanese companies, despite the economical insecurities, in the 1980s and in 1990s, have invested, in the country, not only looking for short-term operations, but in order to increase production capacity.

The results from the sectoral analysis shows that the pattern of Japanese investment, in the country, from 2005 to 2017, has strong correlation with GDP performances, which is possible to see, in **Table 2.1** and **Table 2.3**. However, it was found that, in addition to the strong correlation with the economic performance, in specific sectors, as energy and resource-seeking industries, the investments values should have more relation with the specific commodity price than the economic performance, in the period. In chapter 5, at the econometrics analysis, these empirical assumptions will be tested.

In the next section of the thesis, the study aims to analyse the Japanese investments, in Mexico, to make both its sectoral and geographical analysis, in order to identify the pattern of investments and, according to Dunning's eclectic paradigm definition, what

kind of strategy Japanese companies follow, in Mexico. Considering that the Japanese investments, in Brazil, have follow both market-seeking and energy-seeking strategies, in the case of Mexico, how does Japanese companies invest? This is the discussion of the next chapter.

### **Chapter III: Overview of Japanese Investments, in Mexico**

#### **3.1 Introduction**

This chapter aims to analyse Japanese investments, in Mexico, from 2005 to 2017. The first part of the chapter will be (1) one brief analysis of the Mexican economy, during the period, and, after the analysis of Japanese investments, this chapter is divided in (2) the sectors, (3) the geographical distribution and a specific analysis on the (4) Japanese manufacturer industry, in Mexico. The last part will be the conclusion.

In Mexico, the investments are conditioned to trade agreements, as NAFTA and the Japan-Mexico trade. Due to these circumstances, the amount of investments is not as high as Brazil, but the fluctuation and the instability of the country are not so high, as the Brazilian case, due to the less dependency of these investments on country's economic performance. However, by adopting Dunning's eclectic paradigm investments classification, the Japanese investments, in the country, could be classified as efficiency-seeking, due to the fact that the production is not designated directly to the domestic market, since it is made, mostly, by multinational companies and their affiliates, aiming to improve the producing network.

However, Mexican economists points out the fact that, even GDP was positive, during the period, the performance of GDP per capita

indicators was not good, compared with other developing countries of the region.

### **3.2 Analysis of Japanese investments, from 2005-2017**

Japanese companies have a long tradition of investments, in Mexico. In 1966, Nissan started their first plant, in Cuernavaca, Morelos state. Despite the little number of Japanese immigrants, in the country, compared to other countries, as Brazil or the United States, since Mexico received Japanese immigration, especially, after the World War II. The factor that decided Japanese companies to be established, in the country, especially increased, after the introduction of trade liberalization measures, that led to the NAFTA agreement. In 1995, Honda started their operations, in Jalisco state, with the building of an automobile factory, and, after that, the number of Japanese companies, in the country, has been increasing, year by year.

In order to analyse the Japanese investments, in Mexico, during the period, it should be cited the work from Melba Falck Reyes (2016)<sup>17)</sup>, that analyses Japanese companies' networks, in the country. According to the scholar, there were three main factors that contributed to the increasing of the values of investments, in Mexico, reaching the expressive number of 900 companies, by the year 2016, almost duplicating the number, in the last 5 years.

The first aspect that should be mentioned is the Japan-Mexico trade agreement, which started in 2005. In the Vicente Fox government, Mexico had made efforts for internationalization and, also, followed by the next presidents, through 12 trade agreements, with the total number of 47 countries. Japan is the only country of Asia with an Economic Partnership Agreement (EPA) with Mexico. The agreement has the goal of promoting trade and attract

investments. However, this agreement is called as "second generation trade agreement", since it includes development cooperation, as well as economic cooperation.

The second factor that explain it is the large number of Japanese companies that has established, in Mexico, based on the stagnated Japanese domestic economic situation, during the last two decades. The slow economic growth and the high labour costs, especially in the manufacturing sector, made the Japanese companies less competitive. In order to maintain their competitiveness, the Japanese companies had to expand their overseas production networks, in countries as Vietnam and Mexico, in order to take advantages on labour costs and tariffs conditions. Due to these questions, the Japanese multinational companies had to search for places with lower production costs, compared to Japan.

The third factor, that is cited by Falck Reyes (2016), is the technological development, in the communications and IT sectors, which made possible the fragmentation of the production and affected how multinational companies' production networks and their third-party companies are structured. The multinational companies have a large network of suppliers and their production impacts, not only to the local market, but, also, to the interregional connections of the receptor countries. Putting it in a concrete example, being a part of NAFTA, Mexico became an attractive place for the multinational companies, since the country could export to the United States and develop an integrated network of production. This is the same case of Vietnam, which is part of ASEAN, and Czech Republic, that is part of the European Union.

The main characteristic of Japanese investments, in Mexico, is the concentration

of investments in the Manufacturer sector, especially, in the Automobile sector, assembling cars, motorbikes and trucks. For example, Nissan, Mazda, Toyota and Honda have production plants, in the country, and these multinational companies also attracted other companies, which produce auto parts and components to them. The production network of the auto parts created a production cluster, not only by the Japanese car manufacturer companies, but, also, included other foreign companies, as the Korean Hyundai and the German Volkswagen.

Analysing the total amounts of Japanese investments, in Mexico, as it is possible to see, in **Table 3.1**, the values have been increasing, gradually, with special emphasis to the values, after the global crises, with a small slowdown, in the years of 2016 and 2017.

The high values for reinvestments and transactions between companies could be understood, due to the characteristics of these companies, acting in the country. The

high number of multinationals companies and production networks made the transactions being inside the company or between their affiliates and companies that directly works with them.

Values from 2016 and 2017 could be explained, partially, due to the uncertainties about the NAFTA agreement and the role of Mexico, as a manufacturer producer, especially, after Donald Trump became the United States president, at the beginning of 2017.

Despite the influence of the external conditions, in Japanese investments, in the country, it was possible to be stated that the production networks were already established and, in recent years, and had more diversification, apart from the automobile sector. For example, the Mizuho bank's operations, in Mexico, started at the year 2017, and the cooperation, in the energy sector, with the photovoltaic projects and wind energy, has the JBIC economic support.

**Table 3.1. Japanese FDI, in Mexico, by type of investments, from 2005 to 2017**

Year	Total	Investments	Reinvestments	Transactions between
2005	312.6	167.6	56.1	88.9
2006	461.2	147.8	48.2	265.2
2007	673.0	326.3	62.1	284.5
2008	814.8	155.3	525.0	134.5
2009	759.8	669.8	20.4	69.6
2010	1,309.7	705.3	134.7	469.7
2011	1,092.9	471.5	327.0	294.5
2012	2,348.6	1,295.0	350.9	702.7
2013	2,145.7	1,134.4	504.7	506.6
2014	2,276.9	639.1	607.6	1,030.2
2015	2,050.3	656.9	794.1	599.4
2016	1,777.6	839.2	527.7	410.7
2017	1,641.3	689.8	745.0	206.5
Total	17,664.5	7,898.1	4,703.4	5,063.0

Source: Ministry of Trade of Mexico

Notes: Values in million dollars

### 3.3 Sector distribution

The sector that concentrate Japanese investments, in the country, was the Manufacturer. Analysing the **Table 3.2**, it is possible to see that the division between the total value of Japanese investments and the manufacturer sector values still represent the largest amount. In the total value of 21,867 million dollars, the manufacturer sector represents the total amount of 18,083 million dollars, that corresponds to 82.5% of the total volume of investments.

Other sectors, as mining and banking, were growing, in the country, in recent years. Mizuho bank started the operations, in Mexico, in 2017, for instance. However, the main investments, related to the beginning of its operations, in the country, happened in previous years. The operations related to the bank sector, in Mexico, were in the hands of North American and Spanish enterprises, as Citibank and BBVA, and they are making the entrance of Japanese companies, in local market, to be difficult.

In the mining sector, Japanese companies

were active, but, if compared to Brazil and Chile or, even, Mexico, which had large reserves of different kind of minerals, Japanese companies, as Sumitomo, have reduced amounts of projects, in Mexico. The Japanese companies have been investing in the areas of commerce and food, in recent years, although the amount of investments is not in a large-scale. For example, the export of Japanese Sake and fashion products are part of the different kind of investments portfolio that Japanese companies have, in the country.

By the specific analysis of the manufacturer sector, it is possible to see, in **Table 3.3**, that the Automobile industry denotes the most significant sum, representing 60.6% of the total values. The other relevant industries, in the manufacturer sector, are electronics, plastic, chemical and metallurgy. It happens because of the Automobile industry, so, this manufacture will be approached more specifically, in the next part of the study, due to that.

In the electronics sector, companies, as

**Table 3.2. Japanese FDI, in Mexico, by Sector, from 2005 to 2017**

Year	Total	Agriculture	Minerals	Manufacturer	Banking	Food	Commerce
2005	312.6	0.0	0.0	239.3	14.3	0.3	57.8
2006	461.2	0.0	0.0	425.8	0.0	1.2	55.1
2007	673.0	73.9	0.0	563.7	5.8	4.9	30.7
2008	814.8	8.9	0.0	719.9	1.5	0.2	18.5
2009	759.8	8.4	0.0	717.7	3.3	0.7	-3.0
2010	1,309.7	0.0	0.0	744.1	32.1	-0.6	21.8
2011	1,092.9	0.0	0.0	912.8	0.0	-0.3	20.3
2012	2,348.6	0.0	1.3	1,891.0	1.2	210.0	61.6
2013	2,145.7	1.2	0.0	1,581.4	3.2	1.5	87.1
2014	2,276.9	0.0	17.0	2,141.0	27.4	-1.7	169.3
2015	2,050.3	0.0	55.3	1,658.1	12.1	1.4	222.9
2016	1,777.6	0.0	3.7	1,346.9	126.7	2.6	47.7
2017	1,641.3	0.0	24.0	1,350.3	18.2	4.7	161.7
Total	21,867.8	93.1	116.5	18,083.2	272.8	247.1	1,111.0

Source: Ministry of Trade of Mexico

Notes: Values in million dollars

**Table 3.3. Japanese FDI, in Mexico, by Manufacturer Sector, from 2005 to 2017**

Year	Manufacturer sector	Automobile industry	Electronics	Plastic	Chemical	Metallurgy
2005	239.3	195.0	66.0	16.4	0.0	0.6
2006	425.8	95.8	192.0	100.2	4.2	6.3
2007	563.7	144.1	131.2	188.8	0.1	6.8
2008	719.9	370.4	188.9	107.7	0.3	-1.1
2009	717.7	113.1	481.4	35.3	1.8	7.1
2010	744.1	300.8	315.3	41.3	-0.4	9.2
2011	912.8	472.6	161.7	51.3	52.8	98.7
2012	1,891.0	1,252.0	262.6	95.0	84.9	61.2
2013	1,581.4	1,018.4	79.4	153.0	44.4	12.9
2014	2,141.0	1,515.0	117.5	113.5	91.4	118.3
2015	1,658.1	1,062.8	143.8	114.6	58.9	149.3
2016	1,346.9	766.8	195.0	141.2	38.7	80.4
2017	1,350.3	1,046.3	47.3	30.9	34.7	41.2
Total	18,083.2	10,956.9	3,016.5	1,287.7	472.0	599.0

Source: Ministry of Trade of Mexico

Notes: Values in million dollars

Panasonic, with a factory in Ixtapaluca, near Mexico City, Sharp and Sony, had a large history of presence, in the country. However, the trajectories of these companies have been irregular, due to the production factors. For example, Sony sold its plant<sup>18)</sup> to the Taiwanese company Hon Hai Precision, in 2009, and Sharp sold their operations, in Mexico, to the Chinese company Hisense, leader in the production of LCD and smart televisions, in 2015.

In the plastic sector, different Japanese companies act, in the plastic injection moulding machine, in the country, being the sector responsible for investments related to the automobile industry and part of the industrial cluster, that was created by the companies.

### 3.3.1 Japanese Automobile industry, in Mexico

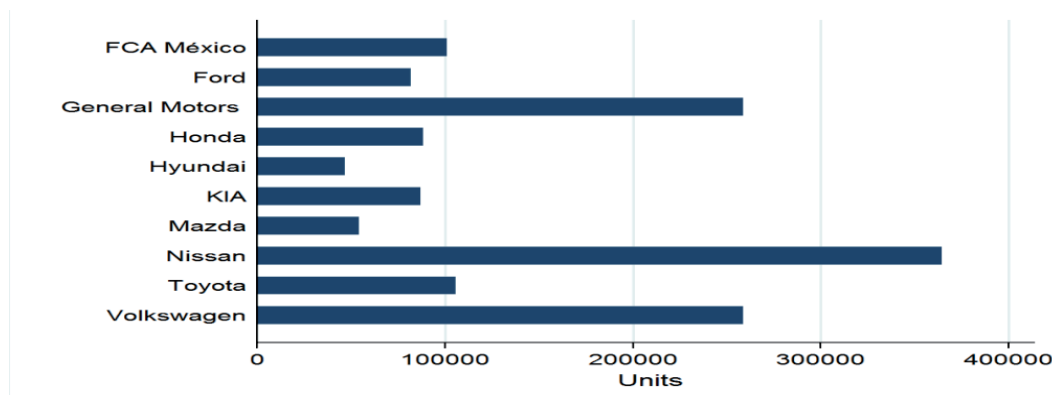
As seen, in the precedent fragment of the chapter, the automobile sector and, especially, the car making industry, concentrates the largest part of Japanese investments, in

Mexico. In the period from 2005 to 2017, the Japanese automobile companies invested, in the country, 10,956.9 million dollars, from an investment budget of 21,867.8 million dollars, that represents 50.15% of the total amount of investments.

Even in the domestic market, Japanese companies had large market shares, as is possible to see, in **Figure 3.1**, but just part of the production remains in the country, even though the factories mainly export their products to other markets, such as United States, Canada and South America.

Analysing each company, in the top ten list of car sellers, in Mexico (in which are not included some companies, as Suzuki, or the motorbike sector), Nissan have two factories, in Aguascalientes and Morelos, that exports to different countries, Toyota have also two plants, in Baja California and Guanajuato, and Honda have three plants, being one in Jalisco and two in Guanajuato.





Source: Soloautos.mx. [online] Retrieved from: <https://soloautos.mx/noticias/detalle/analisis-de-ventas-todos-los-numeros-los-que-suben-y-los-que-bajan/ED-LATAM-8090/>

**Figure 3.1. Number of Cars Units Sold, in Mexico, in 2017**

As it is possible to see, in this brief analysis of the automobile manufactures, most of the companies are located in regions, as Baja California, Guanajuato, Aguascalientes and Morelos, in which the cluster of companies can produce the components and, also, assembly the whole product, inside the same production chain. The car manufacturer production, in Mexico, started in the border states of Nueva Leon and Baja California and in the central states of Aguascalientes and Morelos. However, in recent years, plant locations have been expanding to other regions, such as San Luis Potosi and Queretaro.

It is noteworthy that the manufacturer clusters definition came from Porter (1998)<sup>19)</sup>, that defines a cluster as “a group geographically closed of firms and institutions, with similarities”. The proximity of the firms will generate transactions under a competition environment, leading to specialization and operation excellence. The role of the government and institutions, in this process, can be a facilitator. A cluster has a regional characteristic and its location and tariffs can be a definitive advantage.

In Mexico, the tariff conditions for the companies called “*maquiladoras*”, the geo-

graphical condition, between the United States and South American countries, and the government efforts for trade liberalization, supported the automobile manufacturers to create the clusters, especially, in borderline and central states.

In the **Figure 3.2**, extracted from the paper of Melba Falck Reyes (2016), it is possible to perceive the Japanese companies that are established, in Mexico, relatively to the big companies of the automobile sector. In addition to the plant and the production of cars, it is possible to see how the components and the cluster of companies, related to the sector, can impact the final product.

Due to the high value of investments, Japanese companies have been one of the main investors, in Mexico, at the sector. According to Melba Falck Reyes (2012)<sup>20)</sup>, the trade agreement was the key factor to establish these automobile clusters and the good relationship between both countries, helping Japan to be the Automobile leader, in the country.

### 3.4 Geographical distribution

The geographical distribution of the companies can be divided by the production



Notes: Directly retrieved from Falck Reyes, Melba E. 2016. “Red de inversion japonesa en Mexico”. “Japanese Network of investments” Mex.cuencapac [online]. vol. 5, n. 14, pp. 13-17.

**Figure 3.2. Number of Japanese Companies of Car Manufacturing Industry, in Mexico**

**Table 3.4. Japanese investments value, in the period 2005-2012, by state federation**

State	Value
Aguascalientes	4,324.50
Baja California	2,237.20
Chiapas	82.6
Chihuahua	894.6
Ciudad de México	1,852.70
Coahuila de Zaragoza	342.6
Colima	115.9
Durango	90.1
Estado de México	1,349.00
Guanajuato	2,640.50
Jalisco	1,084.30
Morelos	1,348.00
Nuevo León	1,473.30
Oaxaca	425.3
Querétaro	597.1
San Luis Potosí	647.9
Sonora	131.4
Tamaulipas	1,601.90
Veracruz de Ignacio de la Llave	112.9
Yucatán	19.3
Zacatecas	313.6

Source: Ministry of Trade of Mexico

Notes: Values in million dollars

clusters, especially, in the automobile sector. Besides that, the predominance of Japanese investments concentrates the volume of investments, in eight states: Aguascalientes, Baja California, Ciudad de Mexico, Guanajuato, Jalisco, Morelos, Nueva Leon and Tamaulipas.

It should be remarked that the eight states that received the largest values of Japanese investments are manufacturer clusters that concentrates industries related to the automobile sector and other types of industries, as chemicals and glass.

By analysing by state, in order to explain the reasons of the investments, it is possible to say that Estado de Mexico and Ciudad de Mexico (which includes Mexico City and the near cities) concentrate investments, in the service sector, and various Japanese companies have their headquarters, in the city, due to the central economic importance of the state. In the case of Tamaulipas, the geographical situation (a border state with Texas) made the *maquiladoras* expansion, despite the insecurity problems, that are related to the drug cartels, and its correlated questions, in the control of the state.

Baja California has its geographical location near California and it also hosts manufacturer company's clusters, such as Toyota, as well as the reduction of costs to export to the United States, because of the NAFTA trade agreement. This has resulted in the concentration and the increasing of Japanese companies. However, the geographical region with the highest levels of Japanese investments is the central part of Mexico, such as Aguascalientes and Guanajuato. There are clusters not only for automobile companies, but also for Japanese companies. As it is possible to analyse, from **Table 3.5**, the number of both Japanese companies and Japanese residents concentrate in these states, which shows the reason why these places

concentrate Japanese investments.

### 3.5 Conclusion

The pattern of Japanese investments, in Mexico, has been changing, through the years, due to economic agreements and international economic situation. The NAFTA agreement and the consolidation of the manufacturer sector, in special, at the *maquiladora* companies, which attract the Japanese companies to increase investments, especially, in the border regions of Baja California and Tamaulipas. However, the evolution of Japan-Mexico relations and the NAFTA agreement, signed in 2005, helped the Japanese companies to be more present, in Mexico market, especially at some sectors, as the automobile.

On one hand, the new patterns of production networks and the improvements, in supply chain systems, made Mexico attractive for investments, due to its geographical location, that could reduce costs and improving tariff conditions, making easier to the cluster of specialized companies to export to main markets, such as the United States.

On the other hand, the extreme dependency of FDI and foreign capital, made the Mexican domestic economy vulnerable to the fluctuations of the global markets. As it was possible to see, in the 2009 economic performance, sectors that depends on the global sales, such as the automobile one, can affect directly the Mexican economy and the lack of autonomy of the Mexican central government on domestic economy made the situation more difficult to companies and citizens. Other aspect that should be pointed is the concentration of foreign direct investments, in the Manufacturer sector. Despite the difficulties of Japanese companies to enter, in some Mexican markets, as banks or services, the lack of a mixture of investments

**Table 3.5. Number of Japanese Companies (upper line) and Residents (lower line), in 10 states of Mexico, from 2005 to 2017**

State	2011	2012	2013	2014	2015	2016
Guanajuato	14	47	92	150	187	234
	201	692	904	1208	1430	2144
Mexico City	153	163	172	177	197	215
	2991	3181	3086	3278	3210	3418
Aguascalientes	25	33	52	72	94	119
	592	718	740	831	920	1340
Nuevo Leon	67	71	76	74	83	91
	654	704	621	648	607	660
Queretaro	14	19	28	42	63	88
	184	208	298	358	429	644
Jalisco	27	28	34	45	53	68
	510	548	525	527	525	665
Baja California	64	65	73	64	68	62
	149	146	146	159	159	164
San Luis Potosi	5	10	21	34	46	53
	65	63	72	131	223	321
Mexico	28	29	32	32	34	36
	476	463	442	461	468	466
Coahuila	14	14	20	30	30	31
	117	135	141	144	138	144

Source: Adapted from a table of the cited article<sup>21)</sup>.

made the Japanese investments dependent on the specific conditions of the sectors, as well.

The 2005 trade agreement had a positive impact, both on the Japan and Mexico bilateral relations, but, according to Melba Falck Reyes (2012), two factors are important to the consolidation of the Japanese interests, in the country, in the long-term: the increase of competitiveness, in the Mexican economy, and the Mexican position, in global FDI, in order to compete with other emerging countries and keep attractive to companies, that will not migrate to other countries with more comparative advantages. In my point of view, I would like to include, in addition, that the Mexico-United States relation and the position of President Donald Trump against Mexico, in

the agreements, are also a key to keep Japanese investments, as well as the TPP (Trans-Pacific agreement) could also improve the position of Mexico, as main target of Japanese investments.

After identifying, in the sectoral analysis, that the Japanese investments pattern, in Mexico, follows Dunning's eclectic paradigm of efficiency-seeking strategy, in order to export to other countries, the chapter tried to analyse the conditions that make the manufacturing sector and, in special, the automobile industry, predominant, regarding Japanese investments, in Mexico. As it was possible to see, from **Table 3.3** and **Table 3.5**, the concentration of Japanese investments, in the industrial clusters, are in the centre of the country and in the states near the border with United States. From the empirical

analysis, the factors that affect the investments decision, in Mexico, are more related to its tariffs and product's destination.

The next section of the thesis presents an econometric analysis for Brazil and Mexico, from 1990 to 2017, in order to identify the factors that determinate Japanese investments, in both countries.

## **Chapter IV: Econometrics analysis from Brazil and Mexico**

### **4.1 Introduction**

This chapter aims to analyse the determinants of Japanese foreign direct investments, in Brazil and Mexico. However, due to the lack of quarterly data for Japanese investments, in Brazil, the study divides the structure of the chapter in two different parts, the analysis of yearly Japanese investments, in Brazil and Mexico, from 1990 to 2017, and the econometrics analysis about this data, aiming to identify common aspects and divergent points that affect Japanese FDI decisions, in both countries, and test the correlation between economic variables and the amount of Japanese investments.

For the purpose of this study, it was constructed an estimated analytical model, by using the Vector Error Correction Model (VECM) methodology. It should be observed that the econometrics methodology was adapted from the previous work of Priscila Gomes de Castro, Elaine Aparecida Fernandes and Antônio Carvalho Campos (2012)<sup>22</sup>, that analysed the determinants of FDI, in Brazil and Mexico, from the period 1990-2010, and the empirical analysis of the determinants of FDI, in Brazil, after 1990<sup>23</sup>. The present thesis used a similar approach (the VECM model), even though limited to Japanese investments, with

adaptation, due to the difficulties to find the database that was applied to the studies.

The different factors that could affect the Japanese FDI decisions led to the formation of different datasets, in order to explain the factors that could elucidate the determinants of Japanese investments, in both countries. Other paper that contributed, as methodological reference, by using the Vector Error Correction Model, was the paper of Helis Cristina Zanuto, Andrade Santos, Claudeci da Silva and Thais Andreia Araujo de Souza (2016), about the determinants of Foreign Direct Investments, in Brazil, from the year 1990 to 2017. In addition to empirical evidences, from FDI determinants, in the country, the factors and the correlation between the variables have been approached, in this chapter.

### **4.2 Methodological procedure and definition of variables**

From both theoretical framework and literature revision, it was possible to select variables that could influence significantly, in the behaviour of Japanese investments, in both countries. In order to test the correlation between the variables and the value of Japanese investments, the selection of the variables was the following: Japanese FDI can be explained by the logarithm of GDP, the logarithm of commodities price, the inflation annual tax, the logarithm of currency nominal exchange rate and the investment as a GDP percentage.

In this study, we use the Vector Error Correction Model to investigate the correlation between the factors, listed above, and the Japanese FDI, in Brazil and Mexico. According to Jenkin Graham (2014)<sup>24</sup>, the VEC models help to trace corrections, if there is the co-integration relationship between variables, which makes the VEC model a VAR model with

co-integration constraints. Due to this, the VEC model can restrict long-term behaviour of endogenous variables and be convergent with their co-integration relation.

In order to apply the VECM methodology, we develop the following formula, considering both independent and dependent variables, in order to analyse the pattern of Japanese investments, in both countries.

$$ljfdi = \alpha + lgdp_t \beta_1 + lcurr_t \beta_2 + lcomm_t \beta_3 + infl_t \beta_4 + invgdp_t \beta_5 + \varepsilon_t \quad (1)$$

In which:

ljfdi: Logarithm of Japanese investments

lgdp: Logarithm of GDP

lcurr: Logarithm of currency exchange nominal rate

lcomm: Logarithm of commodities prices index

infl: Inflation annual tax, divided by the interest rate

invgdp: Percentage of the GDP from Foreign Direct Investments

$\alpha$ : The intercept term

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ : The slope of each coefficient

$\varepsilon$ : Error term

For  $t$ , it refers to the specific year of analysis. To be able to investigate the correlation between the factors and the Japanese FDI, in the country, the final equation came as a result of a modified linear panel model, in which the Japanese FDI, in the country, is the independent variable and GDP Log, currency Log, commodities prices Log, inflation Log and GDP's FDI percentage Log are the dependent variables.

#### 4.2.1 Dataset

In the Brazilian case, the annual data for Japanese investments was collected in the

Brazilian Central bank annual report for overseas investments, by country, the GDP values were collected from the World Bank database, in current US\$ dollars, the currency data, from the World bank dataset, as nominal exchange rate, the commodities prices, from the World Bank commodities price data (the data is monthly, but it was converted to annual, by using the monthly values and making an average number for the annual prices, for different commodities, as oil, coal and iron ore), the inflation data, from the IPEA (Brazilian Institute of Applied Economic Research) and the investments as GDP percentage, from the World Bank dataset.

For Mexico, the data sources were international entities, as the World Bank, in the case of commodities price, GDP and exchange rate, though both inflation and GDP's percentage of Foreign Direct investment data were from the national statistics bureau of Mexico (INEGI).

It was difficult to include other variables to the model for different reasons. First, the aim of the thesis was to develop a model that were similar for both countries, but it was not possible to find quarterly data that could compare Japanese investments, in both countries, on available statistics. Second, the absence of a larger sample has limited the annual analysis for the period 1990-2017, as well as the inclusion of more variables could hamper the operation, on both VAR and VEC consume models, regarding their freedom degrees.

On variables relationship, it is expected that Japanese FDI and lagged GDP (as market size) have a positive relationship, as having access to large markets means access to large domestic demand and it is related to market-seeking strategy, according to the Dunning's eclectic paradigm, as well. For GDP's investments percentage, the higher values of investments, in the country, shows the openness of economic



Notes: The illustration reports the logarithm results for each variable used, in the case of Brazil, to analyse the Japanese Investment, GDP, Currency, Investment as part of GDP, Commodities price and Inflation values. For both IFL and Invgdp variables, it was not necessary to use the Logarithm form. The diagrams refer to Brazil, in the period from 1990 to 2017.

**Figure 4.1. Graphs in Logarithm, with results for Brazil**



Notes: The illustration reports the logarithm results for each variable used, in the case of Mexico, to analyse the Japanese Investment, GDP, Currency, Investment as part of GDP, Commodities price and Inflation values. For both IFL and Invgdp variables, it was not necessary to use the Logarithm form. The diagrams refer to Mexico, in the period from 1990 to 2017.

**Figure 4.2. Graphs in Logarithm, with results for Mexico**



policies. In the case of commodities price, if the prices increase the investments, in resource-seeking actives, as oil, coal and iron, it has a positive relation with the FDI. In the case of inflation, the presence of outliers, especially in Brazilian situation, can make it difficult to find the correlation with the Japanese investments.

From the selection of the data for the econometric model, the series received treatments, to run and avoid outliers. The series inflation was seasonally adjusted. In the year 1990 graphic, for example, the values showed strong seasonal movements. All the series were transformed in log and the inflation series for Mexico and Brazil started in the year 1996. The graphs can be seen, in the **Figure 4.3** and **Figure 4.4**.

### 4.3 Econometrics tests

After the verification of tendency and constant, the following step was to make the

Augmented Dickey-Fuller (ADF), for the 1%, 5% and 10% levels of significance. This test analyses the stationarity of the series. According to the results, that can be seen, in **Table 4.3**, the test was conducted in two time series data, one for Brazil, for the yearly data from 1990 to 2017, and one for Mexico, for the yearly data from 1990 to 2017.

The presence of a unit root was tested, for all levels, as well as the first differences of the variables. The ADF test regression equation can be expressed as:

$$\Delta y_t = c + \alpha y_{t-1} + \sum_{j=1}^k \delta_j \Delta y_{t-j} + \varepsilon_t \quad (2)$$

In which:

$\Delta$ : the first difference operator

$ay$ : the dependent variable

$\theta$ : the white-noise disturbance

$\Delta y_{t-1}$ : the lagged first difference

The **Table 4.1** shows the results and, in

**Table 4.1. Augmented Dickey Fuller Test**

	Brazil annual	Mexico annual	1% Critical Value	5%Critical Value	10% Critical value
Japanese	-1.252	-1.558	-3.743	-2.997	-2.629
$\Delta$ Japanese	-7.641***	-4.083***	-3.743	-2.997	-2.629
GDP	-0.744	-1.871	-3.743	-2.997	-2.629
$\Delta$ GDP	-3.162**	-4.774***	-3.743	-2.997	-2.629
Currency	-2.096	-1.653	-3.743	-2.997	-2.629
$\Delta$ Currency	-2.98**	-3.779***	-3.743	-2.997	-2.629
Inflation	-2.038	-1.378	-3.743	-2.997	-2.629
$\Delta$ Inflation	-5.359***	-3.695**	-3.743	-2.997	-2.629
FDI as Percent GDP	-2.135	-2.47	-3.743	-2.997	-2.629
$\Delta$ FDI as Percent GDP	-3.497**	-6.028***	-3.743	-2.997	-2.629
Commodities	-1.183	-1.183	-3.743	-2.997	-2.629
$\Delta$ Commodities price	-3.499**	-3.499**	-3.743	-2.997	-2.629

Source: Researcher's results, using Stata.

Note: \*\*\* 1% significant; \*\* 5% significant; \* 10% significant.

the case of Brazil, the ADF test, using the first difference, GDP, Currency, GDP's FDI percent and Commodities showed stationary on level of probability of 5%. Japanese investments and Inflation were stationary, in first difference. In the case of Mexico, it was found, without the first difference, no series that rejected the null hypothesis of presence of unitary root. However, when it was differentiated, both series inflation and commodities were significant, at 5%, but the other ones were significant on the probability of 1%. According to the results, once most series have unitary root, it should be tested the existence of long-term relation between them.

The existence of co-integration, in the series, implicates the occurrence of a combination, in the linear stationary of the series. This relation and the residuals, in the long-term, can be stationeries, in levels, despite the tendency of a common behaviour, in the long-term.

For the Johansen test, the variables were selected, according to the econometric model, presented before, and the lag test criteria were made by using Final Prediction Error (FPE), Akaike's Information Criteria (AIC), Schwarz's Bayesian Information Criteria and Hannan and Quinn Information Criteria (HQIC).

The results found that, for the number of lags necessary to use, in the Johansen test, was lag (1), due to the annual form of data.

The results for Johansen's co-integration, on the other tests, indicated the existence of the co-integration of the variables, since the null hypothesis were rejected. Only for Brazil, when  $r=0$ , the maximum eigen value test is not significant. The existence of co-integration, on the series, implies the stationary value, on linear combination, and the variables integrated, in the first order.

After the Johansen's test, the VEC was

**Table 4.2. Johansen co-integration test**

Country	H0	Maximum eigen value	Critical value 5%	Trace test	Critical Value 5%
Brazil	$r=0$	34.4473	39.37	105.2584*	94.15
	$r \leq 1$	31.4354*	27.07	70.811*	47.21
Mexico	$r=0$	60.9319*	39.37	163.3239*	94.15
	$r \leq 1$	44.0858*	27.07	102.392*	47.21

Source: Researcher's results, using Stata.  
 Note: \* significant value

**Table 4.3. Co-integration Vector, normalized on the FDI variable**

Country	Variables	Japanese	GDP	Currency	Inflation	Percent	Commodities
Brazil	Coefficients	1	2.470716**	0.955097**	0.357674**	-0.46381**	-6.57835**
	Standard Error		1.477868**	0.676573**	0.087345**	0.136739**	2.320294**
Mexico	Coefficients	1	-3.37418**	1.379881**	0.184144**	1.029445**	2.448194**
	Standard Error		0.339269**	0.219219**	0.026264*	0.118784**	0.283105**

Source: Researcher's results, using Stata.  
 Note: \* 5% significant

estimated, in the long-term relationship, to see the Japanese FDI and its determinants, which results can be found, in the **Table 4.3**. Analysing the results, for the sensitivity of Japanese FDI, considering the variables of the model, it is possible to attest that the co-integration coefficients that affects the Brazilian model, show GDP as the variable that exerts the greater influence, on Japanese FDI, together with currency exchange. However, the unexpected result was the negative coefficient for the commodities prices, showing that the increasing in commodities makes decrease the Japanese investments, in Brazil, although the results showed that the commodities price indicator do not specify the values by commodities prices, denotating that the empirical finding of the price of the commodities, regarding Japanese Investments, in Brazil, should be revised.

In the case of Mexico, the model showed strong correlation between currency, GDP's FDI percentage and commodities, for the Japanese

investments. In the Mexican model, the negative rate for GDP showed that Japanese FDI had fewer sensitive changes, in the variables, when GDP changes. The expected results for currency and GDP's FDI Percent show that the Mexican economic liberalization exerts great influence, in the Japanese FDI, in the country, though the positive results for Commodities price. The unexpected results, according to the empirical findings, for the commodities prices, in Brazil and Mexico, suggests that the model should be refined, but, due to the fact that the analysis is extended from the year 1990, the results can be explained because of the commodities prices from 1990 to 2005.

In order to analyse the historical forecast error variance decomposition, we draw the **Table 4.4**, for the Japanese FDI, in the period 1990-2017. Since it comprises 27 years, it would be difficult to summarize the information, then we decided to divide this 27-year period by 9, which makes easier the visualization of the analysis.

**Table 4.4. Forecast Error Variance Decomposition**

Country	Period	S. E.	LJPFDI	LGDP	Lcurr	Invgdp	Lcommod	Inflation
Brazil	1	0.176604	100	21.2983	3.6199	1.0562	20.238	9.274
	2	0.10284	84.0676	14.914	2.6087	0.4557	14.6804	13.7877
	4	0.082323	70.5951	11.8841	2.5571	0.5088	12.5944	12.0937
	6	0.082081	63.0188	11.4765	3.0562	0.512	12.2579	10.9081
	9	0.087214	54.0311	11.8776	3.2624	1.2507	12.5004	11.5418
Mexico	1	0.13465	100	0.3813	0.7513	0.4545	2.6422	0.5938
	2	0.090899	81.0142	8.6148	9.2443	13.9694	10.3386	1.8633
	4	0.035667	78.8858	10.6364	11.9726	13.4364	15.3703	4.4405
	6	0.024427	77.5733	10.1341	11.4313	14.4359	16.674	4.6547
	9	0.02095	76.0738	9.4966	10.8442	14.7736	17.0605	4.6328

Cholewsky Ordering: LJFDI, LGDP, Lcurr, invgdp, Lcommod, Inflation,  
Source: Researcher's results, using Stata.

Notes: The nine periods represent periods of three years, for Brazil and Mexico, in the period from 1990 to 2017. The table reports, using the Forecast Error Variance Decomposition, for the lag values, in the first difference.

Analysing the results, it is possible to see the dynamic behaviour, over time, using the exogenous shocks, in the variables. The results, in both models, show that the forecast error variance of Japanese FDI can be explained by the stock of Japanese FDI, in Brazil, by 84.06%, after the first shock, and, in Mexico, 81.01%. For the 9 periods, it is possible to see the decreasing of the results, in the Brazilian model, to 54.03%, and, in Mexican, to 76.07%. Also, for the 9 periods, 11.87% of the forecast error variance can be explained by GDP, 12.50%, by commodities price, 11.54%, by the inflation and 1.25%, by currency, in the Brazilian model. It means that, in short-term period, variables, as commodities price, inflation and GDP, had influence, in the Japanese investments, in the country. In the case of Mexico, GDP, with 9.49%, and inflation, exerts the lower influence, in the Japanese investments, in the 9 periods. Commodities price, with 17.06%, GDP's FDI percentage, with 14.77%, and currency, were the other factors that have great influence, in the Japanese FDI, in Mexico, during the same period.

From the results, it is possible to analyse that, in the long-term, the changes, in GDP, inflation and commodity price, had impact, in the Japanese companies' investments decision trends, in Brazil, as it is also possible to see, in **Figure 4.3**. This illustration uses the Impulse Response Function (IRF) methodology, that can be used to determine the response of an endogenous variable, toward a shock from other variables. The IRF representation also supports the research, in order to identify the length of the impact of the shock from one variable to the others. Also, in the case of Brazil, it was possible to analyse that the trend, in the IRF shocks with Japanese Investments, although GDP, during the first two periods, showed a decline,

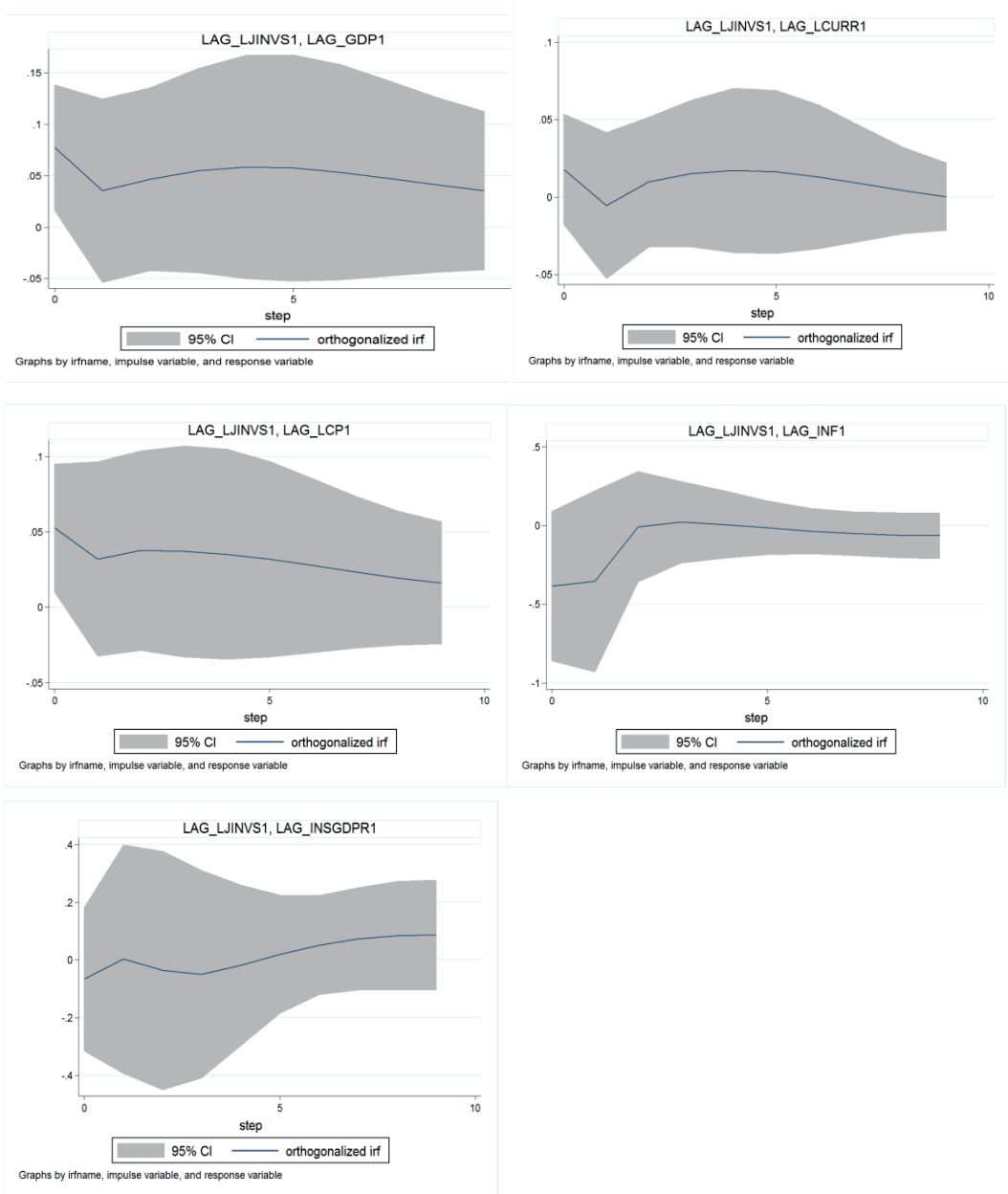
then, a growth, but, in the last terms, shows a decreasing trend, which suggests that the Japanese investments, in the country, will keep decreasing, unless there are changes, in both economic and political scenes.

The graphs show that, despite inflation and GDP investment's percentage, the values decreased, for the correlation between GDP, Currency and commodities price, during the first two periods (from 1990 to 1996), due to the high inflation and the economic uncertainties, in Brazil. Nonetheless, after the economic stabilization and the Real currency, introduced in the country, it remained stable, with an increasing trajectory, until the periods 6 and 7. It is possible, also, to analyse the decreasing values of Japanese investments, related to GDP and commodities price, in the last two terms.

In the case of Mexico, it is possible to see the influence of Japanese investments and the GDP's FDI percentage, in the first three terms (1990 to 1999), and the posterior stabilization, after the trade agreement of 2005. This could be explained by the initial euphoria, for the Mexican trade policies, and the NAFTA signing, in 1994. As it is possible to observe, the Japanese investments and the GDP have initial negative trend, in the first terms, but a stable trend, especially after the trade agreement. Considering the commodities price, the increasing in values of commodities also supported the increasing, in the relation, although due to the unexpected results, from the empirical findings, the next models should be revised, and a new research should be conducted.

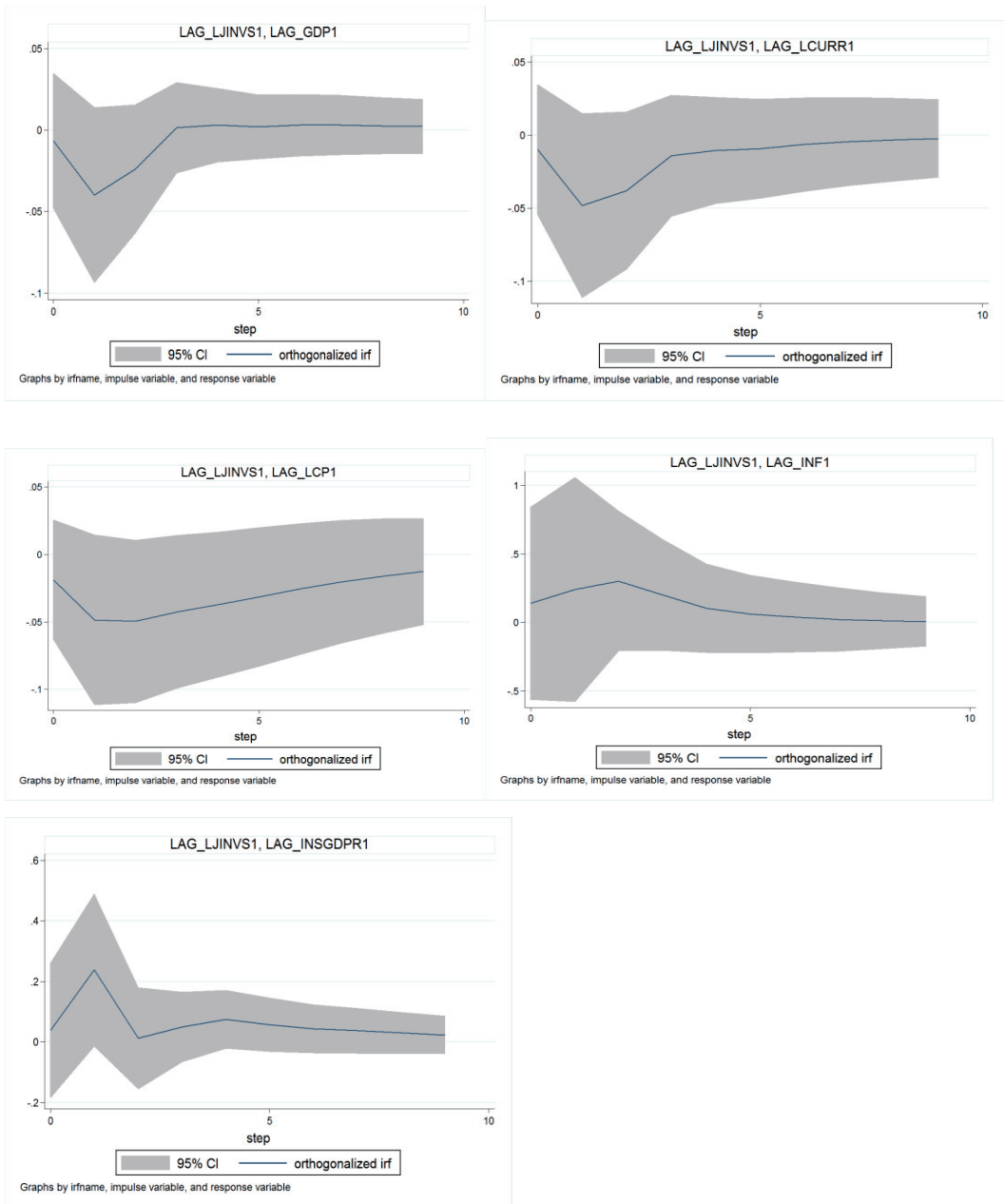
#### 4.4 Conclusion

Different theories have explanatory power to analyse the determinants of the FDI, in one country or region. However, the difficulties increased, when explaining both flow and



Notes: The illustration reports the shocks of Lag of Japanese Investments to the endogenous variables, in nine periods, making possible to analyse the investments trends, in short-term periods.

**Figure 4.3. Orthogonalized IRF graphs, for Brazil, for 9 periods<sup>25)</sup>**



Notes: The illustrations report the shocks of Lag of Japanese Investments to the endogenous variables, in nine periods, making possible to analyse the investments trends, in short-term period.

**Figure 4.4. Orthogonalized IRF graphs, for Mexico, for 9 periods<sup>26)</sup>**

causalities of the investments, from one country, in a specific period. Between the theories that aggregates aspects of microeconomics and companies' business perspective and location aspects and macroeconomics points of view, there is the Dunning's eclectic paradigm. The results from the analysis of the Japanese FDI flow to both Brazil and Mexico show that these countries have been increasing their efforts, in order to attract Japanese investments and it indicate, also, that both countries have common factors to attract FDI, as market size, economic partnerships and natural resources. In addition, their efforts, during the 1990-2017 period, to control the economy and support FDI had positive impact. However, the econometric model and the empirical studies have a different length of time: the econometric model measures from 1990 to 2017 and the empirical, from 2005 to 2017, what could show important points, until 2005, and the nuances, in the investments, after 2005.

Regarding the econometric model, the results attested that the domestic market (expressed by GDP) and the trade openness (expressed by GDP's FDI percentage), as factors that helped, in the decision of Japanese investments. For the Brazilian model, the results showed that domestic market (especially, after 1996), economic openness and currency, were determinants for Japanese investments. Inflation was a key determinant, until 1996, and commodities showed not as relevant as expected, from the empirical studies, but, as already pointed, the different length of time (the commodities price increased and impacted, in the period from 2004 to 2011) could affect the results.

Similarly, using the Dunning's eclectic paradigm classification, the determinants for Japanese investments, in Brazil, followed the

market-seeking strategy, due to the strong correlation with GDP performance.

In the case of Mexico, the results showed that both currency and commodities prices are the main determinants. Inflation and economic openness were key determinants, in the beginning of 1990s, but, in opposite to the Brazilian results, both GDP performance and dependency for Japanese investments is lower than Brazil's. Using the eclectic paradigm theory, it is possible to attest that Japanese companies, in Mexico, follow the efficiency-seeking strategy. However, it should be pointed that the commodity prices also had impact, in the investments. These results show a different tendency, than the empirical studies, and the model for this variable, should be changed.

In addition to the trends and results showed, in this part of the analysis, the next section will show the conclusion, approaching the main findings of the research, in a context that could be possible to analyse the results of the study from the perspectives of Japanese investments, in the period, in Brazil and Mexico. The possibility of analysis about the relations between the countries and the further paradigm, in the relation of both countries, could support the empirical findings to be transformed, in policy analysis.

## **Chapter V: Summary of main findings**

The present chapter presents the summary of the main points of the research and how the analysis can contribute to the understanding of the pattern of Japanese investments, in Brazil and Mexico.

The long tradition, in cultural exchange, and the Japanese immigration to both countries, compared with other regions of the world, the economic cooperation were not as strong as

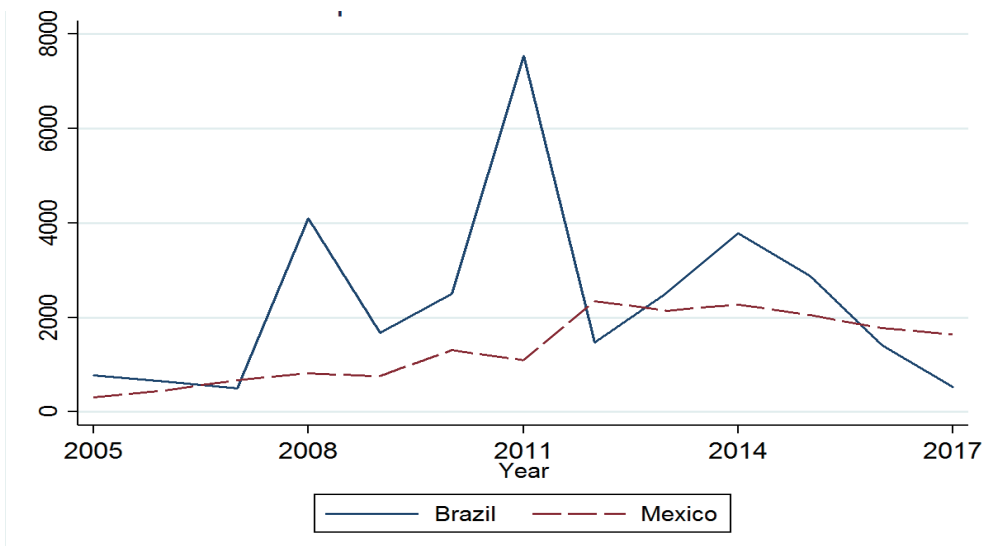
other regions. However, in the recent trend, it is possible to see a change, in the pattern of Japanese investments, with both countries attracting higher amounts of FDI.

In spite of the expansion of Japanese multinational company’s investments, in the world markets, especially in the 1980s, Brazil and Mexico were not seen as target markets for the company’s strategy and could not increase the FDI values, in comparison with other countries, as the United States or China. In the 1990s, the efforts for economic stabilization, from both countries, as well as Mexico trade policies of economic liberalization, entering NAFTA, started to increase the values for investments, in Mexico, specially, at the Manufacturing sector, as part of the production network, in order to export to the United States market.

The consolidation of the change and the increasing values of Japanese FDI, after the year

2005, increased the attention of the Japanese companies to both countries, as it was possible to see, from the empirical studies. However, in the 1990s, the initial euphoria for the sign of NAFTA and the economic stabilization of both countries, passed to a state of uncertainty, because, for example, the Asian Financial Crisis, the sudden devaluation of the Brazilian Real and the 1995’s crises, in Mexico. From 2005, when Mexico signed the trade agreement with Japan, the Brazilian economy started to present better economic performance.

Nevertheless, it is difficult to define a similar pattern of investments for both economies, because they belong to different trade areas and the motivations of the companies, in establishing in both countries, are different. As it is possible to see, from **Figure 5.1**, the Japanese FDI strategy, in Brazil, follow the market-seeking approach, with dependency of the economic performance, although, in Mexico, it follows



Source: Researcher’s illustration, from reports on Japanese FDI, by Ministry of Trade and Commerce of Brazil and Ministry of Trade of Mexico)

**Figure 5.1. Compared total Japanese FDI, in Brazil and Mexico, from 2005 to 2017, in million-dollar value**



the efficiency-seeking strategy, due to the trade agreements the country is participant. The analysis of the graph shows that, during the studied period, despite Brazil had higher investments values, during most of the years, the oscillation and the difficulties to keep high values of investments should be the most important subject and not be put aside.

The market-seeking strategy can attract higher values of investments, in the short-term, but the lack of trade agreements and cooperation tools, in the economic field, can make the multinational companies migrate to other countries, when the market is not economically rewarding. One example of the volatility of the capital, in the market-seeking investments. was the investment made by Kirin group, in Brazil, buying the shares of Schincariol group (at that time, the second beer brewery, in the country), in 2011. As it reflects, in **Figure 5.1**, that year was a period of positive market perspectives for Brazilian domestic market growth. However, especially after 2014, the perspectives changed and, in 2017, Kirin sold their shares to Heineken, after continuous 6 years of economic loss.

In the case of Mexico, instead having the economic trade agreement with Japan and economic cooperation partnership, the efficiency-seeking strategy and the dependency of foreign capital, as well as the industry concentration, can have also undesired consequences. The concentration, in the Manufacturer industry, specially, the car maker segment, made external crises, as the Lehman Brothers shock, and the situation, during that period, for the automobile industry, with fusions and acquisitions, between the main companies of the sector, made the value of investments stable, but not as higher as compared with the potential of the country, which will be confirmed. The need for diversification of the industrial park

and the shift for the entrance of small and medium Japanese companies, in areas, such as robotics or electronics components, are trends that are possible to be observed, in recent years, establishing in industrial clusters, as Nueva Leon. This will be the trend to be observed, in future studies, although it did not reflect, in the results of this thesis.

### 5.1 Policy Implications

In the preceding section, the main findings of this study have been summarized, which could have implications, in Brazilian, Mexican and Japanese governments' policies purposes. First, this study has identified, using a sectoral analysis, the pattern of Japanese investments, in Brazil and Mexico. The results showed that the investments, in the case of Brazil, are according to the Dunning's eclectic paradigm of market-seeking and energy-seeking strategies and, in the case of Mexico, the efficiency-seeking strategy.

From the empirical results and the econometrics analysis, it was possible to identify the pattern of Japanese investments, in both countries, and it could be possible to make an individual analysis, as well, in order to give policy recommendations.

In the case of Brazil, the correlation between GDP growth and Japanese investments makes the volume of investments dependent on the economic performance. In order to diversify investments sources, the Brazilian government should increase efforts, in establish economic trade alliances and trade partnerships. Compared with Mexico situation, the lack of a direct trade agreement makes the values fluctuation increases, according to the economic situation. The econometrics analysis also shows, in **Figure 4.3**, with the shocks, in nine economic periods, that the relation between Japanese

Investments and GDP performance presented growth, in the first shocks, after stability, but, in the last years, they are presenting a decreasing trend. This confirms that, unless Brazil, Japan government and private actors make efforts to establish partnerships, in order to change the situation, the trend. Soon, is for the decreasing of investments.

On the other hand, in the case of Mexico, the sectoral analysis showed that the trade agreement established in 2005 supported the Japanese companies to keep the investments, in the country, despite 2009's financial crises. However, the sectoral analysis also showed that the concentration of Japanese companies, in the Manufacturing sector, especially in the automobile industry, made the values of investments slowed increased, in comparison with Brazil. The volume of investments, in Mexico, are lower, comparing with Brazil, since the companies follow the efficiency-seeking strategy, in the country, because of the tariffs condition. The concentration of companies, in one specific sector, in special if the companies are focus on external markets, made the economy vulnerable to the fluctuations of one specific sector.

From the econometrics analysis, it was possible to recommend that the dependence of one main variable (in the case of Brazil, GDP, and, in the case of Mexico, trade openness) make the value of Japanese investments vulnerable, in the case of the variable did not perform well. The findings from the study suggest that the efforts from the governments and private actors should be increased. The **Figure 4.3** and the **Figure 4.4** show that the descendent trend of Japanese investments, in the case of Brazil, and the stabilized trend, in the case of Mexico, still creates space to implementing measures and to increase bilateral relations, from Japan, with

both countries.

## 5.2 Limitation and Future Research Needs

Despite the empirical findings and the analysis made, in this study, there are some limitations, on this thesis, considering the understanding of the whole situation of Japanese investments.

The first limitation is related to the selection of the countries, that could make the study a problem of selection bias, making its assumptions applicable only for the two studied countries. However, the inclusion of more countries and a longer length of time should be applicable, for the next studies.

The second limitation is related to the econometrics analysis of the study. The lack of quarterly data made the sample size restricted from the yearly analyses, that avoid a more specific analysis of the period. Using the yearly analysis also impacted, in the results, because the length of time of the study, from 2005 to 2017, is just a part of a bigger analysis, from the years 1990 to 2017, making the results not applicable to the hole target length of study. For future studies, the inclusion of more countries with similar characteristics (other Latin American countries, for example) could improve the results of the research and, in the case of the econometrics analysis, the quarterly data from 2005 to 2017 would improve the details of the specific time studied.

## 5.3 Conclusion

The International Relations role, in trade agreements, and countries' bilateral relations can contribute to understand the determinants of the investments from Japanese companies, in Brazil and Mexico. The first contribution of this thesis is the analysis of the factors that influence, in investments decisions. However,

trade agreements do not ensure high amounts of FDI flow, do not give security to keep investing, in the country, and do not provide a long-lasting relation. It is all conditioned by market fluctuations.

The direct trade agreements, which have an important role and showed definitive impacts, in these economies, still create doubts and debates, in the field. From the past literature review, we attest that the trade agreements establish a long-term relationship between countries and the companies should have a surer environment, in order to invest. The empirical results of the study show, however, that, in Mexico, Japanese investments did not grow so much, as compared with Brazil, in the study period, since the variance between years is not high. Even with economic crises and uncertainties, as the Lehman shock crisis, the values of investment were not reduced drastically. The economic agreements are costly to withdraw and ensure, in the long-term stability, for the investments.

In the Brazilian case, the absence of a direct trade agreement with Japan makes possible to see that the investments are related to economic performance and the amounts of investments should be reduced drastically, if the economic performance did not reach the expected levels. In order to improve cooperation with Japan, and to establish a long-term cooperation, it is recommended to Brazil to have a trade agreement with Japan. Recently, in the political field, the importance of trade agreements has been minor, from the economic perspective, but

it should be led to more consolidated economic relations.

The second finding of the research is, despite the assumptions attested, in the hypothesis to be tested, the study could explore that the Japanese company's strategy, in developing countries, are related to both efficiency-seeking and resource-seeking, changing to market-seeking objectives, as it was possible to see, in the case of Brazil, and, gradually, we could see, in the case of Mexico. From the empirical analysis of Japanese investments, in the world, from 2005 to 2017, it was also possible to analyse the strategy shift, from the Japanese companies, to a more market-seeking strategy, in developing economies, due to their growth potential.

Although this result was already expected, the third finding of the research is related to the dependency of one main variable. It should be avoided, in order to keep Japanese FDI growing. In the case of Brazil, the dependency from the GDP performance and, in the case of Mexico, the dependency from trade liberalization, make those variables to be the main factors, in the decisions of Japanese investments, in these countries. Despite the path to change the dependency of these variables is still far to be completed, the efforts of the governments and private actor should be concentrated in changing the structure of investments and the aiming for more diversification, in the case of Japanese trade relations.

## Notes

- 1) Caves, Richard E. 1971. "International Corporations: The Industrial Economics of Foreign Investment." *Economica, New Series*, 38, no. 149: 1-27.
- 2) Dunning, J. H. 1973. "The determinants of international production" *Oxford Economic Papers*, 25: 289-325.
- 3) Kojima, Kiyoshi. 1975. "International Trade and Foreign Investment: Substitutes or Complements". *Hitotsubashi Journal of Economics*, 16, issue 1, p. 1-12.
- 4) Farrell, Roger. 2008. "Japanese Investment in

- the World Economy” *Books, Edward Elgar Publishing, number 1943.*
- 5) Tanaka, Kiyoyasu. 2009. “Re-estimating the Knowledge-Capital Model: Evidence from Japanese and US Multinational Enterprises” *Global COE Hi-Stat Discussion Paper Series: Institute of Economic Research, Hitotsubashi University.*
  - 6) Martins, Renato Furuse. 2010. “Os determinantes do investimento japonês no Brasil: um estudo através dos censos de 1995, 2000 e 2005 e de sua respectiva indústria automobilística no país”. “The determinants of Japanese FDI, in Brazil, through the data of 1995, 2000 and 2005 and the automobile industry, in the country” *Master thesis in Economics – Pontifícia Universidade Católica de São Paulo, São Paulo.*
  - 7) Uehara, Alexandre. 2007. “O crescimento econômico e os investimentos diretos japoneses no Brasil”. “The economic development and the Japanese FDI, in Brazil”. *Revista Eletrônica Fundação Japão, São Paulo.*
  - 8) Melba, Falck Reyes. 2012. “Japanese Foreign Direct Investment in Mexico and the Impact of the Global Crisis” *GCG Georgetown University – Universia January-April, Vol. 6, Num. 1. ISSN: 1988-7116.*
  - 9) Ruiz, Martha Elena Campos, Anaya, Leo Guzman and Sanchez, Guadalupe Lugo. 2018. “Impact of Japanese direct investment in Mexico: the case of Japanese immigration and automotive industry, in Bajío region” *The Institute for Economic Studies – Seijo University.*
  - 10) Uehara, Alexandre. 2004. “Relacionamento Brasil-Japão: história, análise e perspectivas”. “Relationship between Brazil and Japan: history, analysis and perspectives”. *Relações Sul-Sul: Países da Ásia e o Brasil. 1ª ed. São Paulo: Aduaneiras, p. 251-276.*
  - 11) Dekaseguis is a terminology from the Japanese language word 出稼ぎ, that means “to go out for saving”. The terminology applies for the migrant worker that goes to other places, in order to save money and support their families, which are living in their own country or province.
  - 12) “Japan-Mexico trade agreement”, accessed in July 12th, 2018. Retrieved from: <https://www.mofa.go.jp/region/latin/mexico/agreement/index.html>.
  - 13) “Data from Brazilian Central Bank”, accessed in May 18th, 2018. Retrieved from: <https://www.bcb.gov.br/htms/Infecon/SeriehistFluxoInvDir.asp>
  - 14) Kimura, F. and Obashi, A. 2011. “Production Networks in East Asia: What We Know So Far”. *ADB Working Paper 320. Tokyo: Asian Development Bank Institute.*
  - 15) “Number of car sales in Brazil”, accessed in October 27th, 2018. Retrieved from: <https://www.autoo.com.br/emplacamentos/marcas-mais-vendidas/2017/>
  - 16) “Report on FDI in Brazil, from the Ministry of Trade and Commerce”, accessed in October 27th. Dataset available at: <http://investimentos.mdic.gov.br/conteudo/index/item/12>
  - 17) “GDP percentage by state in Brazil”, accessed on October 21th, retrieved from: <https://www.investe.sp.gov.br/por-que-sp/economia-diversificada/pib/>
  - 18) Falck Reyes, Melba E. 2016. “Rede de inversión japonesa en México”. “Japanese Network of investments” *Mex.cuencapac [online]. vol. 5, n. 14, pp. 13-17.*
  - 19) “Venta de la Fábrica de Sony para empresa Taiwanesa” “Sony sells factory to a Taiwanese company”, accessed in November 14th, retrieved from: <https://www.informador.mx/Economia/Fabrica-de-Sony-en-Mexico-pasara-a-empresa-taiwanesa-20090831-0001.html>
  - 20) Porter, Michael E. 2000. “Location, Competition and Economic Development: local clusters in a global economy” *Economic Development Quarterly, February 2000, Vol. 14, Issue 1, pp. 15-20.*
  - 21) Falck Reyes, Melba. 2012. “Japanese Foreign Direct Investment in Mexico and the Impact of the Global Crisis” *GCG Georgetown University – Universia, v. 6, n. 1, ISSN: 1988-7116.*
  - 22) Ruiz, Martha Elena Campos; Anaya, Leo Guzman; Sanchez, Guadalupe Lugo. 2017. “Impact of Japanese direct investment in Mexico: the case of Japanese immigration and automotive industry in Bajío region”, accessed

- on November 22<sup>th</sup>, retrieved from: <http://www.seijo.ac.jp/research/economics/publications/research-report/jtmo42000000mul-att/a1526016712800.pdf>
- 23) Castro, Priscila; Aparecida Fernandes, Elaine; and Campos, Antônio. 2013. "The Determinants of Foreign Direct Investment in Brazil and Mexico: An Empirical Analysis". *Procedia Economics and Finance*.
- 24) Santos, H. C. Z. A.; Silva, C.; Souza, T. A. A. 2016. "Análise Empírica da Determinação do Investimento Estrangeiro Direto no Brasil para o Período Posterior a 1990". "Empirical analysis of the determinants of FDI in Brazil after the period of 1990" *Encontro de Economia da Região Sul, 2016, Florianópolis. Anais do XIX Encontro de Economia da Região Sul*.
- 25) Jenkin Graham. 2014. "Determinants of GDP: A VECM Forecasting and Granger Causality for Eight European Countries". *MA Thesis for Economics*.
- 26) Each period represents 3 years. Due to the data was collected from 1990 to 2017, comprising 27 years, the author decided to divide it in 9 periods and analyse the shocks periods separately.
- ### References
1. Castro, Priscila; Aparecida Fernandes, Elaine; Campos, Antônio. 2013. "The Determinants of Foreign Direct Investment in Brazil and Mexico: An Empirical Analysis". *Procedia Economics and Finance*.
  2. Caves, Richard E. 1971. "International Corporations: The Industrial Economics of Foreign Investment." *Economica, New Series, 38, no. 149: 1-27*.
  3. Denisia, V. 2010. "Foreign direct investment theories: An overview of the main FDI theories" *European Journal of Interdisciplinary Studies, No. 3*.
  4. Desbordes, Rodolphe; Vicard, Vincent. 2007. "Foreign direct investment and bilateral investment treaties, an international political perspective" *Work document from Centre d'Economie de la Sorbonne 2007. 45 - ISSN: 1955-611X. 2007*.
  5. Dunning, J. H. 1973. "The determinants of international production". *Oxford Economic Papers, 25: 289-325*.
  6. Dunning, J. H. 1980. "Toward an eclectic theory of international production", *The International Executive, vol. 22, no. 3, pp. 1-3*.
  7. Dunning, J. H. 1981. "Explaining the international direct investment position of countries: towards a dynamic or developmental approach", *Weltwirtschaftliches Archive, vol. 117, no. 1, pp. 30-64*.
  8. Dunning, J. H.; Lund an, Sarianna. 2008. "Institutions and the OLI Paradigm of the Multinational Enterprise". *Asia Pacific Journal of Management*.
  9. Falck Reyes, Melba E. 2016. "Red de inversion japonesa en Mexico". "Japanese Network of investments" *Mex.Cuencapac [online]. vol. 5, n. 14, pp. 13-17. Accessed on November 10th, retrieved from: <[http://www.scielo.org.mx/scielo.php?script=sci\\_arttext&pid=S2007-53082016000200013&lng=es&nrm=iso](http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2007-53082016000200013&lng=es&nrm=iso)>. ISSN 2007-5308*.
  10. Falck Reyes, Melba. 2012. "Japanese Foreign Direct Investment in Mexico and the Impact of the Global Crisis" *GCG Georgetown University - Universia, v. 6, n. 1, ISSN: 1988-7116*.
  11. Farrell, Roger. 2008. "Japanese Investment in the World Economy" *Books, Edward Elgar Publishing, n. 1943*.
  12. Feldhoff, Thomas. 2015. "Japan's Food Security Issues: A Geopolitical Challenge for Africa and East Asia?" *Journal of Global Initiatives: Policy, Pedagogy, Perspective: Vol. 9: No. 1, Article 7*.
  13. Hymer, S. H. 1976. "The international operations of national firms: A study of direct foreign investment", *MIT press Cambridge, MA, vol. 7, p. 73-77*.
  14. Jenkin Graham. 2014. "Determinants of GDP: A VECM Forecasting and Granger Causality for Eight European Countries". *MA Thesis for Economics*.
  15. Kimura, F.; A. Obashi. 2011. "Production Networks in East Asia: What We Know So Far". *ADB Working Paper 320. Tokyo: Asian*

- Development Bank Institute.*
16. Kojima, Kiyoshi. 1975. "International Trade and Foreign Investment: Substitutes or Complements" *Hitotsubashi Journal of Economics*, 16, issue 1, pp. 1-12.
  17. Krugman, Paul R.; Obstfeld, Maurice; Melitz, Marc J. 2003. "International economics: theory & policy". Boston, MA: Pearson Addison-Wesley.
  18. Lipsey, R. E. 2004. "Home-and host-country effects of foreign direct investment" *Challenges to globalization: Analysing the economics University of Chicago Press*, pp. 333-382.
  19. Lomeli Vanegas, Leonardo; Murayama Rendon, Ciro "Mexico frente a la crisis: hacia un nuevo curso de desarrollo" "Mexico facing the crises, a new path for the development" *Economíaunam*, vol. 6, n. 18, 2009, pp. 7-60. *Universidad Nacional Autónoma de México Distrito Federal, México.*
  20. Martins, Renato Furuse. 2010. "Os determinantes do investimento japonês no Brasil: um estudo através dos censos de 1995, 2000 e 2005 e de duas respectivas indústrias automobilísticas no país". "The determinants of Japanese FDI in Brazil through the data of 1995, 2000 and 2005 and the automobile industry in the country" *Master thesis in economics – Pontifícia Universidade Católica de São Paulo, São Paulo.*
  21. Porter, Michael E. 2000. "Location, Competition and Economic Development: local clusters in a global economy" *Economic Development Quarterly*, Feb. 2000, Vol. 14 Issue 1, p15, 20p, 4 diagrams.
  22. Ragusa, Frank; Barzideh, Nathaniel. 2014. "Abenomics and Japanese Monetary Policy: A Path to Economic and Ethical Recovery" *Wharton Research Scholars*. 112.
  23. Rugman, A. M.; Verbeke, A. 2001. "Subsidiary-Specific Advantages in Multinational Enterprises" *Strategic Management Journal*, 22 (3), pp. 237-250.
  24. Ruiz, Martha Elena Campos; Anaya, Leo Guzman; Sanchez, Guadalupe Lugo. 2018. "Impact of Japanese direct investment in Mexico: the case of Japanese immigration and automotive industry in Bajío region" *The Institute for Economic Studies Seijo University.*
  25. Santos, H. C. Z. A.; Silva, C.; Souza, T. A. A. 2016. "Análise Empírica da Determinação do Investimento Estrangeiro Direto no Brasil para o Período Posterior a 1990". "Empirical analysis of the determinants of FDI in Brazil after the period of 1990" *Encontro de Economia da Região Sul, 2016, Florianópolis. Anais do XIX Encontro de Economia da Região Sul.*
  26. Singh, Harinder and Jun, Kwang W. 1995, "Some new evidence on determinants of foreign direct investment in developing countries" No. 1531, *Policy Research Working Paper Series, The World Bank.*
  27. Szostak, Charles R. 1984. "Success of Japanese management! Lessons for American managers". *Graduate Student Theses, Dissertations, & Professional Papers*. 3775.
  28. Tanaka, Kiyoyasu. 2009. "Re-estimating the Knowledge-Capital Model: Evidence from Japanese and US Multinational Enterprises." *Global COE Hi-Stat Discussion Paper Series: Institute of Economic Research, Hitotsubashi University.*
  29. Uehara, Alexandre. 2007. "O crescimento econômico e os investimentos diretos japoneses no Brasil" "The economic development and the Japanese FDI in Brazil". *Revista Eletrônica Fundação Japao, São Paulo.*
  30. Uehara, Alexandre. 2004. "Relacionamento Brasil-Japão: história, análise e perspectivas". Relationship between Brazil and Japan: history, analysis and perspectives". *Relações Sul-Sul: Países da Ásia e o Brasil. 1ed. São Paulo: Aduaneiras, v., p. 251-27.*
  31. Wilhelm, S. K.; Witter, M. S. D. 1998, "Foreign direct investment and its determinants in emerging economies" *United States Agency for International Development, Bureau for Africa, Office of Sustainable Development.*
- Internet sources
32. Data from Brazilian Central Bank", accessed in May 18<sup>th</sup>, 2018. Retrieved from: <https://www.bcb.gov.br/htms/Infecon/SeriehistFluxoInvDir.asp>.
  33. "GDP percentage by state in Brazil", accessed on October 21<sup>th</sup>, 2018. Retrieved from: <https://www.investe.sp.gov.br/por-que-sp/economia->

- diversificada/pib/.
34. “Japan-Mexico trade agreement”, accessed in July 12<sup>th</sup>, 2018. Retrieved from: <https://www.mofa.go.jp/region/latin/mexico/agreement/index.htm>
35. “JBIC annual report year 2017”, accessed in August 27<sup>th</sup>, 2019. Retrieved from: <https://www.jbic.go.jp/en/information/annual-report/year-2017.htmla>.
36. “Joint External Debt”, accessed in August 27<sup>th</sup>, retrieved from: <https://www.jedh.org/>.
37. “Number of car sales in Brazil”, accessed in October 27<sup>th</sup>, 2018. Retrieved from: <https://www.autoo.com.br/emplacamentos/marcas-mais-vendidas/2017/>.
38. “Report on FDI in Brazil, from the Ministry of Trade and Commerce”, accessed in October 27<sup>th</sup>, 2018. Dataset available at: <http://investimentos.mdic.gov.br/conteudo/index/item/12>.
39. “Motorbike sales in Brazil”, accessed in October 27<sup>th</sup>, 2018. Retrieved from: <https://suzanecarvalho.blogosfera.uol.com.br/2016/01/11/ranking-de-emplacamento-das-21-marcas-de-motos-vendidas-no-brasil/>.
40. “Análisis de ventas todos los numeros los que suben y los que bajan”, accessed in October 27<sup>th</sup>, 2018. Retrieved from: <https://soloautos.mx/noticias/detalle/analisis-de-ventas-todos-los-numeros-los-que-suben-y-los-que-bajan/ED-LATAM-8090/>
41. “Sony sells factory to a Taiwanese company”, “Venta de la Fabrica de Sony para empresa Taiwanese”, accessed in November 14<sup>th</sup>, 2018. Retrieved from: <https://www.informador.mx/Economia/Fabrica-de-Sony-en-Mexico-pasara-a-empresa-taiwanesa-20090831-0001.html>.