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Economic impact of Economic Partnership Agreement Mexico – Japan

- theoretical and empirical aspects -

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Economic Partnership Agreement Mexico - Japan: Analysis of Trade Creation and Trade Diversion 1999-2013

María Guadalupe Lugo Sánchez

Abstract

This document seeks to make an empirical analysis of the effects of the Economic Partnership Agreement between Mexico and Japan (EPAMJ) regarding trade creation and trade diversion. Trade flows between 23 countries for the period 1999 to 2013 are employed. The methodology is an ex post model that estimates trade creation or trade diversion using the gravitational equation. The results suggest that since its entry into force the EPAMJ has created trade for both nations. No evidence of trade diversion is found as results indicate that the EPAMJ has increased Mexico and Japan's trade with the other countries analyzed.

1. INTRODUCTION

Mexico and Japan economic relations date back to 1888, when the Treaty of Friendship, Commerce and Navigations is signed, being for Japan the first of its kind with a western Country (Okabe, 2004). Over the years, the two nations maintained a friendly exchange and in 2001 President Vicente Fox Quesada proposed a feasibility analysis of signing a Free Trade Agreement with Japan. After 14 rounds of negotiations¹⁾, the two countries saw fit to sign a treaty whose purpose is to regulate, in a legal framework, trade, investments and mobility of people.

By signing this agreement with Mexico, Japan will gain access to the markets

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¹⁾ Secretariat of Economy, Mexico. http://www.economia.gob.mx/

of all the countries that Mexico has partnered with; specifically, the Free Trade Agreement with North America (NAFTA) will act as a platform to market products with neighboring countries in northern Mexico, because Japan lacks of trade agreements with the United States (Falck, 2002). Mexico has a network of 10 Free Trade Agreements with 45 countries, 30 Reciprocal Investment Promotion and Protection Agreements (RIPPAs) and 9 Trade Agreements (Economic Complementation and Partial Scope Agreements) within the framework of the Latin American Integration Association (ALADI)². Japan, on the other hand has signed 14 FTAs and EPAs with 18 countries and is negotiating 8³.

Perhaps, the fact that Japan and Mexico are considered to have complementary economies, motivated the latter to seek economic partnership:

Japan:	Mexico:			
Has the world's fourth largest economy with a GDP per capita of 36,654 usd	Abundant supply of young and skilled workforce with an average age of 27			
Population has an average age of 45 years old with highly educated workforce	Economy that requires increasing levels of domestic investment and FDI			
Seventh source of global FDI	Importer of high-tech products and systems			
One of the countries with higher saving rates	Producer and exporter of value-added products. Maquila resources			
Leading producer and exporter of high technology products	Producer and exporter of agricultural products			
Main market in Asia of Mexican exports	Primary destination for Japanese exports in Latin America			

²⁾ In addition, Mexico is an active participant in multilateral and regional organisms and forums such as the World Trade Organization (WTO), the Asia-Pacific Economic Cooperation (APEC) and the Organization for Economic Cooperation and Development (OECD). Ibid.

³⁾ Agreements signed: Singapore, Mexico, Malaysia, Chile, Thailand, Indonesia, Philippines, Brunei, Switzerland, Viet Nam, India, Peru, Australia, ASEAN. In negotiations: Mongolia, Canada, Colombia, China and Korea, European Union, The Gulf Cooperation Council (GCC) and the Regional Comprehensive Economic Partnership (RCEP) from http://www.mofa.go.jp/policy/economy/fta/

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When analyzing the case of foreign trade for the Japanese economy exports accounted for 14% of GDP in 1993. Its highest levels were recorded in 2007 and 2008 when the share reached 21% of GDP; it dropped to 16% following the financial crisis of the subsequent year. Imports accounted for only 9% in 1993 growing at a slow rate, reaching 18 per cent in 2011. In aggregate terms, foreign trade represents 37% of total GDP for Japanese economy.

Foreign trade accounts for an important part of Mexico's economy. For instance, in 1993 total exports represented only 10% of Mexico's GDP; however a year after the signing of NAFTA the share of exports increased to 15%. Imports on the other hand represented 13% in 1993 and only grew 1% after the signing of the trade with the northern partners, and reached its highest levels at 30% during 2000. In aggregate terms, foreign trade rose from 23% in 1993 to account for 54% of total GDP in 2011. This amount reflects the significance that trade represents for the economy of Mexico⁴.

Signing the EPA will allow Japan to access Mexican markets enjoying preferential treatment, to protect Japanese investors in Mexico and, will get access to participate in government (public) bids. For Mexico, the EPA with Japan is a strategy of diversification of trade and investment in Asia, by exporting Mexican products, importing products of technological nature under a preferential tariff, attracting investment flows to different sectors and, by reaping the benefits of bilateral cooperation like open markets, services and capital.

Japan's interest in partnering with Mexico was evident since the negotiation stages, granting the elimination of 91% of tariffs on the date of entry into force of the EPA, 4% by 2010 and the rest by 2015. Mexico agreed to eliminate only 40% of its tariff at the entry into force, 9% by 2010 and 49.5% during 2015^{5} ; this asymmetry in favor of Mexico reflects the intentions from Japan to strengthen their ties. 91% of products of Mexico's industrial and, 92% of the agricultural sectors are free to enter Japanese markets (see **figure 1**).

 $^{4) \}quad \text{Source: Author's calculations based on data from Penn World Tables}$

⁵⁾ The remaining 1.5% will be eliminated in intermediate periods or are excluded. Data from the Secretariat of Economy.

Five years after entry into force, the results of the EPA shows an increase on trade flows for both countries. According to Mexico's secretariat of economy 19 per cent of the exports registered belonged to agricultural goods, and the rest to industrial products. Before the EPA, exports from Mexico to Japan were decreasing. Mexico imports intermediate inputs and capital goods from Japan, which are later, incorporated into domestic production.

Economic integration as a result of EPAs implies a preferential treatment for member countries and the opposite for non-members; this may result in changes in the pattern of trade between members and non-members. Integration represents free trade between member countries, but at the same time, the different tariffs for the non-members can cause diversion of trade, forcing members into trade at higher costs.

Trade creation and trade diversion are two effects that result from integration. Trade creation occurs when, as a result of economic integration, the origin of domestic goods with high production costs shifts to a production from the business partner with lower production costs, which implies an increase in welfare. Trade diversion is registered when, as a result of integration, the origin of products changes from a non-member with lower costs, to a member with higher production costs, causing a decrease in welfare.



Figure 1 Tariff Elimination: Percentage of Each Country's Tariff

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The interest in knowing which effect is present for the case of EPA between Mexico and Japan is what motivated this study.

2. OVERVIEW OF THE TRADE IN MEXICO AND JAPAN

Due to commitments with the United States and Canada under NAFTA, Mexico is forced to eliminate the system of tax exemption on imports of materials and equipment used in the production of exports to the United States, affecting the Japanese companies established in Mexico. Japanese maquiladoras in turn, pressured their government to take the necessary measures to protect them. In 2004, Mexico became the first commercial partner of Japan in Latin America.

The demands from the electronic and automobile industry to the Japanese government coupled with its recently adopted foreign policy encouraged the signing of the economic partnership agreement with Mexico (Falck, 2009). The trade agreement became effective on April 1st, 2005. During the first four years of its entry into force, Mexican imports from Japan grew at an annual average rate of 5.7%, while exports grew an average of 9% over the same period.

The agricultural sector represents a great opportunity for Mexico's trade, as Japan, due to its geographical characteristics, has limited territorial extension with suitable soil for agriculture. Therefore, it is a large importer of products of this sector. Currently this market is being exploited by China, which in the last decade has increased its exports of products such as mushrooms, onions and leek.



Figure 2 Mexican trade flows with Japan

According to the Secretariat of Economy, Mexico supplies avocado, lemon and melon; other products exported to Japan are mangos, frozen orange juice, banana, beef, sardines and tuna.

But Mexico exports a very low percentage of vegetables and fruits to Japan; US is the main destination of Mexican production, being the proximity one of the reasons to trade with the neighbor country. In North America, Mexico has an assured market, but such economic dependency is risky, and Japan can be an excellent alternative (Tani, 2005).

Not only the agricultural sector is important for the trade between Mexico and Japan. Investment flows also create a strong impact on Mexico's GDP through the creation of new jobs and technology transfer; for all these reasons it could be assumed that a trade agreement has positive effects on the economies of countries that are part of it.

3. THEORETICAL FRAMEWORK

The present study is based on the static effects defined by Jacob Viner (1950) that result from economic integration between countries. The purpose is to explain the resulting effects on welfare from the EPA Mexico - Japan.

Trade Creation occurs when economic integration provides a change in the origin of products, from a domestic production with high production costs to a production from the business partner with low production costs, which implies an increase in welfare.

Trade Diversion occurs when the change in the origin of the good passes from a producer who is not a trading partner, with relatively low production costs, to one that is a business partner and has high production costs (due to tariff differences), which promotes welfare loss.

If commercial integration generates trade among member countries, then it is considered that there is trade creation; if such integration replaces trade with nonmember countries then we have the case of trade diversion (Krugman & Obstfeld, 1994). Trade creation and trade diversion are static effects of economic integration since they happen as a direct result of it.

Since, as a result of economic integration both cases may occur it is important to estimate the effects of a trade agreement. The theory suggests that trade agreements may be beneficial or harmful, depending on the countries that are involved and the relationship that exists between trade creation on trade diversion (Magee, 2007).

4. PREVIOUS STUDIES ON TRADE CREATION AND TRADE DIVERSION

The existing studies on trade creation and diversion are based on the seminal work of Jacob Viner (1950). However, the methodology used to measure variables has changed over time; Verdoorn (1954) and Janssen (1961) use general equilibrium models, and by removing the variable "internal trade tariffs", they measure the effects on trade flows and determine whether trade creation or trade diversion is generated. Jan Tinbergen (1962) proposed a model based on the "Universal theory of gravity" of Newton to measure trade flows between countries known as the "gravity model of trade", used to measure the total exports from one country to another by using a small number of variables. Since its introduction to the field of international economics, the gravity equation became the most frequently used method to measure trade creation and trade diversion, allowing the inclusion of specific variables for each FTA and adapting to specific characteristics of the countries involved and therefore, adjusting the model allows for more reliable results.

Empirically, the first attempt to measure trade creation and trade diversion corresponded to Balassa (1967). The author analyzes the case of the European Economic Community (EEC) through *ex post* comparisons of income elasticity of demand for imports in intra-area and extra-trade area where, positive changes in elasticity of demand for imports indicates creation of trade. Balassa compares the income elasticity of demand for imports prior to the entry into force of the EEC (1953-1959) with the subsequent period to the entry into force (1959-1965), finding gross trade creation (taking into account all groups of goods). The effect of preferential

rates is also seen in the study of Balassa, finding changes in the origin of goods such as rubber, a product that was supplied by non-member countries and that, after the entry into force of the preferential rates, it would be supplied by member countries of the EEC. Likewise, price discrimination to products from not members' countries resulted in a slowdown of the extra-area imports.

Aitken (1973) and Pelzman (1977) studied the diversion of trade in the EEC and member countries of the Council for Mutual Economic Assistance (CMEA); Han (1992) on the other hand, focused on non member countries of the European Community (EC) and found that non-members from Asia saw their exports negatively affected during the decade of the 60's, and positively for the decades of the 70's and early 80's, as a result of the EC. These studies estimated hypothetical trade flows based on the pre-integration period and compared their estimates with current trade flows. Endoh (1999) mentions that this methodology is not suitable because pre-integration periods are not comparable with post integration periods. Furthermore, this methodology only observes static changes on trade flows.

Later Anne Krueger (1999) measured the effects of NAFTA with special emphasis on patterns of trade between Mexico and the United States. The author examines data for the period 1980-1998 for NAFTA members and the rest of the world (represented by a sample of 61 countries that accounts for approximately 80% of world trade) to see if the level of imports from non-members has decreased while intra NAFTA trade has grown. Analyzes the changes in volumes and patterns of trade between groups of goods for NAFTA countries and the rest of the world by estimating the determinants of trade patterns using a system of gravitational equations. The data analyzed by Krueger indicates trade growth between NAFTA members; even though two-thirds of Mexico's trade is carried out with the United States (before the entry into force of NAFTA), an increase in trade flows between these two countries indicating trade creation, was noted. Krueger (2000) extends the analysis of her previous study, focusing on trade flows between the United States and Mexico registered during the three years after the entry into force of NAFTA to a level of aggregation of 4 digits, in order to perceive creation or diversion of trade at intra-industry level. Again trade creation is found and proposes to conduct a study

in order to analyze the future behavior of trade flows, assuming that they will be affected as a result of changes (gradual elimination of assets) in tariffs.

Jayasinghe and Sarker (2007) conduct a more disaggregated study within the framework of NAFTA for the years 1985-2000, using the gravity equation to determine trade creation and trade diversion on 6 agricultural products: red meat, grains, vegetables, fruits, sugar and oilseeds. These goods were selected because of their importance on the trade within the NAFTA countries. The results show that intraregional trade has grown within the framework of NAFTA; likewise, NAFTA has prompted trade diversion with countries around the world. The results show a significant increase in trade of red meat, vegetables, grains and sugar among member countries, while in the case of oilseeds; the NAFTA countries have traded more with non-member countries.

Because the EPAMJ is a relatively recent agreement, the effects of trade creation or diversion have not yet been extensively explored. Ando (2007) conducted a study on the impacts of EPAs signed between Japan and Singapore and compares them with those recorded between Japan and Mexico. By using gravity equation examines if trade has increased as a result of trade liberalization associated with the EPAs mentioned. The author finds that the impact on the resulting trade agreement with Singapore was not significant due to the fact that tariff reduction has been very limited in this agreement. For the EPAMJ finds a positive impact on trade, an increase in exports and in Japanese investment. Finally Mukunoki (2008) uses a model of third differences to analyze Japanese imports to a level of aggregation of 6 digits for the period 2003-2006 under the EPAMJ. The author finds that the implementation of the agreement has significant trade creation effects for Japan. It recorded an increase in Japanese imports of products from Mexico. Also found an increase in a variety of goods exported from Mexico to Japan.

5. DATA AND METHODOLOGY

An econometric analysis based on macroeconomic data was conducted using the gravity equation to evaluate the static effects generated from the entry into force of the EPAMJ, in order to determine whether economic integration has generated trade creation or trade diversion.

This research focuses on analyzing trade creation and trade diversion for the EPAMJ for the years 1999-2013 using total trade flows of a sample of 23 countries, which accounted for 91% of total world trade during the study.

The countries included in the sample are Australia, Austria, Belgium, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Netherlands, Poland, Russia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

The gravity model was chosen because it is the most frequently used methodology in studies that seek to quantify trade creation and diversion, and also provides the flexibility to adjust to the particular characteristics of the EPAMJ.

The model proposed by Jayasinghe and Sarker (2007) will be followed as it allows to estimate the effects of regional trade agreements (RTAs) on trade flows.

The basic formulation in international trade for modeling gravity equations is as follows:

$$TOTTRADE_{ijt} = \alpha_0 Y_{it}^{\beta 1} Y_{jt}^{\beta 2} (Y_{it} / N_{it})^{\beta 3} (Y_{jt} / N_{jt})^{\beta 4} D_{ij}^{\beta 5} U_{ijt}$$
(1)

Taking natural logarithms:

$$ln \ TOTTRADE_{ijt}$$

$$= ln\alpha_0 + \beta_1 \ lnY_{it} + \beta_2 \ lnY_{jt} + \beta_3 ln(Y_{it}/N_{it}) + (Y_{jt}/N_{jt}) + \beta_5 lnD_{ij} + lnU_{ijt}$$

$$(2)$$

Where,

TOTTRADE $_{ijt}$ = Trade between country *i* with country *j* on year *t*; Y_{nt} = Income of country *n* on year *t* when n = *i*,*j*; N_{nt} = Population in country *n* on year *t* when n = *i*,*j*; D_{ij} = Distance between countries *i* and *j*; U_{ijt} = Error term.

Adding other variables that affect trade between countries, and variables to estimate the effects of EPAMJ on trade creation and trade diversion in equation (2).

Following Jayasinghe and Sarker (2007), the model is extended:

In TOTTRADE ijt

 $= \alpha_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln GDPPC_{it} + \beta_4 \ln GDPPC_{jt} + \beta_5 \ln DISTCAP_{ij} + \beta_6 \ln CONTIG_{ij} + \beta_7 \ln COMLANG_{ij} + \beta_8 TC_{ij} + \beta_9 TD_{ij} + U_{ijt} \forall i < j$ (3)

where $i = 1, ..., n; j = 1, ..., n; i \neq j$

Where,

TOTTRADE $_{ijt}$ = Total trade between country *i* and country *j* on year *t*; $GDP_{nt} = GDP$ of country *n* on year *t* when n = i, j; $GDPPC_{nt} = GDP$ per capita of country *n* on year *t* when n = i, j; $DISTCAP_{ij} = Distance$ between countries *i* y *j*; $CONTIG_{ij} = 1$ if both countries share a border; $COMLANG_{ij} = 1$ if both countries share language; tc = 1 if country *i* and country *j* are members of EPAMJ, 0 otherwise. ttd = 1 when country *i* or country *j*; one of them is member of EPAMJ, 0 otherwise. $U_{iit} = Error$ term.

In equation (3), *TOTTRADE* _{ijt} is the value of total bilateral trade in current US dollars between countries *i* and *j* on year *t*. *GDP*_{it} and *GDP*_{jt} is the nominal Gross Domestic Product (GDP) in US dollars for countries *j* on year *t*. *GDPPC*_{it} and *GDPPC*_{jt} represent GDP per capita in US dollars of the country *j* on year *t*. *DISTCAP*_{ij} represents the distance in kilometers between the capital cities of *j* following the great circle formula that uses the geographic coordinates of cities. *CONTIG*_{ij} and *COMLANG*_{ij} are bivalent variables that take the value of 1 if countries *i* and *j* share a common border and language respectively. Additional control variables for years t-1 are added.

The *tc* variable reflects that both countries belong to the EPAMJ and a significant and positive coefficient indicates that the EPA has stimulated trade. In other words, we have evidence of trade creation. The variable *td* on the other hand, indicates EPAMJ effects on trade flows from Mexico and Japan with non-member

countries of the agreement. For this case, a negative and significant coefficient represents trade diversion. Note that the EPAMJ entered into force in 2005, so the tc and td variables can only take the value 1 from 2005 on, to capture the ex post effects of the agreement.

The specification (3) allows us to observe the effects of the EPAMJ on trade flows of the members of the agreement with the other countries in the sample.

For data panel analysis, the econometric techniques such as ordinary least squares (OLS), Generalized Least Squares with Fixed Effects (GLS-FE) and Generalized Least Squares with Random Effects (GLS-RE) were used. Due to the characteristics of our data, GLS-RE allows the use of variables that do not change over time. Given our specification, those variables are *DISTCAP*, *CONTIG*, and *COMLANG*.

6. RESULTS

Table 6 shows the results of the regression using the specification (3). GDP variables have the expected positive coefficients for the three econometric techniques employed (excluding the variable GDP_j for the GLS-FE model) and are significant at 99% confidence; as they are expressed in logarithms we can interpret the coefficients as elasticities. A GDP increase affects trade flows positively. Coefficients for GDPPC_i and GDPPC_j are only significant for the regression with fixed effects and OLS, although the coefficient for the latter is negative. For DISTCAP, coefficients are negative and significant, which is expected; the coefficients indicate that a 1% increase in distance between countries, decreases trade flows in 78%.

The variable that indicates if two countries share a common border (CONTIG) also resulted positive and significant, and indicates that trade flows increase for neighboring countries. The coefficients for language only resulted significant for OLS meaning that language can positively affect trade flows, but did not result significant for the other models, so these results are considered inconclusive.

For our variables of interest, the coefficients of trade creation resulted statistically significant at 99% confidence interval for GLS-RE and GLS-FE. The

Log (Total Trade)			
	OLS	GLS-RE	GLS-FE
Log (GDP _i)	0.78***	0.66***	0.43***
	(59.35)	(22.71)	(2.99)
Log (GDP _i)	0.86***	0.75***	0.14
	(76.80)	(22.01)	(1.04)
Log (GDPPC _i)	-0.01	-0.03	0.25*
	(-0.74)	(-0.89)	(1.66)
Log (GDPPC _i)	-0.02***	-0.05	0.57***
	(-2.17)	(-1.37)	(4.12)
Log (DISTCAP)	-0.78***	-0.78***	
	(-58.49)	(-16.07)	
CONTIG	0.57***	0.63***	
	(11.03)	(3.32)	
COMLANG	0.10***	0.16	
	(2.50)	(1.02)	
TC	.028	0.31***	0.38***
	(0.12)	(2.76)	(3.30)
TD	-0.21***	0.13***	0.15***
	(-5.27)	(6.93)	(8.14)
	-		
Constant	15.74***	-8.91***	-0.96
	(-35.97)	(-11.94)	(-0.31)
R-squared	0.81	0.86	0.86
\mathbf{X}^2		23363.65	
$Prob > X^2$		0.00	
F	1832.76		3782.03
Prob > F	0.00		0.00
Number of Obs	3795	3795	3795
Number of Groups		253	253

Trade Creation and Trade Diversion 1999-2013 **Table 6** Panel Regression - Trade Results of Gravity Model

Economic Partnership Agreement Mexico - Japan: Analysis of

Notes

* Significance at 90%

** Significance at 95%

*** Significance at 99%

Numbers in parentheses indicate t statistics (or z in the case of random effects).

Source: Results of estimates calculated with STATA statistical software.

Hausman test was conducted and suggested the use of the FE model.

Results from the model indicate that the EPAMJ has trade creation properties for member countries and non-member countries. On average 46%more trade is shown⁶. This result was confirmed with a non-negative trade

⁶⁾ The percentage effect of the dummy variable is calculated according to Halvorsen and Palmquist (1980). If the estimated coefficient for the variable TC is β_8 , then the percentage of the effect is equal to $\{\exp(\beta_8) - 1\} \times 100\%$.

diversion coefficient. In turn, this coefficient was positive and significant at 99% confidence interval for GLS-RA and GLS-FE.

This seems to indicate that the EPAMJ has not only created trade between member countries, but has also stimulated trade between non-member countries analyzed in the sample.

7. CONCLUDING REMARKS

In recent years economic integration between countries as economic strategy has increased significantly. This importance is also reflected in the number of trade partners and trade agreements that Mexico has signed. Existing studies focus on the analysis of the static effects of trade agreements, being NAFTA the center of attention because of the importance it has on trade flows for both, member, and non member countries. The gravity equation has dominated the empirical research on international trade, and has been used to estimate the impact on trade flows for different forms of economic integration. However, very little research has been done to analyze the impact of AAEMJ. In the present study the effects of AAEMJ on trade flows from 23 countries for the period 1999-2013 were analyzed; the results of this study suggest that the EPAMJ created trade between the two nations and has even promoted trade between members and non-members of the agreement.

In addition, the results show that the EPAMJ has also encouraged bilateral trade flows between non-members.

According to the coefficients, the size of the economy and the fact that countries share a common border promotes trade; while the distance between countries affects it negatively.

The results of the variable language are inconclusive, which prevents us to interpret their influence on trade flows.

According to the model by Jayasinghe and Sarker (2007) used in this research, the trade creation variables are positive and highly significant. That is, increased trade flows positively impact on Mexico in economic welfare terms, according to the theory proposed by Viner (1950). The trade diversion variables are significant but not negative for the present study. Thus, it can be confirmed that the EPAMJ created trade; however we cannot conclude whether trade has been diverted for EPAMJ non-members.

For Mexico, Japan is an important trading partner for the Japanese nation has shown a great willingness to formalize their business relationship with our country. As mentioned above, the removal of a large percentage of tariffs on Mexican goods that gained free entry to the Japanese market demonstrates the interest that Japan has in our nation. They are considered complementary economies, due to geographical, cultural and economic characteristics of each country. An EPA between these nations represents great opportunities for trade for both countries. It is important to analyze, in terms of welfare, the effects that trade agreements have on the Mexican economy, specifically the Economic Partnership Agreement between Mexico and Japan.

8. LIMITATIONS OF THE STUDY

The EPAMJ is a relatively young agreement and studies on their impact on trade are still scarce. Further studies could focus on analyzing the bilateral trade flows at a more disaggregated level (e.g. at sectorial level, or even to product level).

It is also of great interest to understand why Mexican exporters are not taking full advantage of the import quotas established by Japan.

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