# Trade Creation under Japan-Mexico FTA : Evidence from Disaggregated Data*

Hiroshi Mukunoki†

Faculty of Economics, Gakushuin University

**Abstract**

This paper investigates empirically whether Japan-Mexico FTA increases Japanese imports from Mexico, by using a panel data of Japanese imports at HS 6-digit level for 2003-2006. A triple-difference model is estimated to isolate the relative increase in imports of FTA-eligible products from Mexico to the increase in imports of non-eligible products from Mexico as well as those from non-Mexico countries. It is found that the implementation of Japan-Mexico FTA has significant trade-creation effects, and the magnitudes are large for products subject to tariff-rate quota and for those on which tariffs are reduced but not eliminated. It also has enlarged the variety of goods exported from Mexico to Japan.

**Key words**: free trade agreements, trade creation, Japan, Mexico

**JEL classification numbers**: F13, F14, F15

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†Address: Mejiro 1-5-1, Toshima-ku, Tokyo 171-8588. Fax: +81-3-5992-1275. E-mail: hiroshi.mukunoki<at>gakushuin.ac.jp

# 1 Introduction

Recently, the world economy experiences a remarkable increase in the number of regional trade agreements (RTAs). Now, many countries have multiple free trade agreements (FTAs) with foreign countries. Customs unions (CUs) such as EU are also expanding to include more countries.[1] Although Japan was a latecomer to the RTA boom, it now has FTAs with Singapore, Mexico, Malaysia, Chile, Thailand, and so on.

The proliferation of RTAs has evoked many researches to evaluate their effects. On the theoretical side, research focuses have now gone a step further than conventional trade-creation and trade-diversion effects (Viner, 1950). These researches include a comparison between multilateralism and regionalism, the effects of RTAs on foreign direct investments, and the effects of rules of origins.[2]

On the empirical side, the ex post evaluations of measuring trade-creation and trade-diversion effects of RTAs have been conducted intensively. It is worth noting that the almost all existing analyses have used a gravity model and estimated the coefficient of FTA dummies representing the membership of FTAs (see for instance, Frankel, 1997; Endoh, 1999; Soloaga and Winters, 2001; Fukao, Okubo, and Stern, 2003). While positive and significant trade-creation effects of RTAs are reported in many papers, Ghosh and Yamarik (2004) report that the robustness of the trade-creation effects are doubtful. Carrère (2006) found trade-creation effects are significant for many RTAs even if unobserved time-invariant heterogeneity among trade partner is taken into account. Eicher, Henn, and Papageorgiou (2007) found that only EU among 12 RTAs has significant trade-creation effect if a set of country-pair fixed effects is considered. Baier and Bergstrand (2007) have explored the

[1] In FTA, each member has independence in choosing external tariffs, while members jointly set common external tariffs in CU.

[2] See Panagariya (2000) and Mukunoki (2005) for a survey of recent theoretical developments on RTAs.

positive effects of RTAs on trade flows even if the endogeneity of RTA variables is considered. These existing analyses have mixed results and have not reached the common goal, which implies that estimating trade-creation effects is still an important research topic.

Although the set of analyses using gravity models provide valuable insights, one shortcoming is that the estimations were made with highly aggregated trade data. Although some papers consider the product-level differences, the decomposition is made at most HS 4-digit level. It is undoubtable that the existing studies using aggregated data provide useful insights especially in comparing the different RTAs, but it might pass up the opportunity to take a closer look at the effects of each RTA.

## 1.1 Aim and features

In this paper, we investigate the trade-creation effects of the Japan-Mexico Economic Partnership Agreement (henceforth, JMEPA), which is an FTA concluded between Japan and Mexico in September, 2004, and it has been in effect from April 1, 2005. JMEPA is known as the Japan's first full-fledged FTA in which Japan has liberalized imports of many agricultural and food products which have been historically considered as 'sensitive products'.[3] Assessing the impacts of JMEPA is useful to consider the future strategy of Japan's FTA and would have much policy implication.

In contrast to the existing studies, we use disaggregated data (HS 6-digit level) of Japanese imports from each country. The sample periods are from 2003 to 2006. The data set is a full-balanced panel of each country's exports to Japan which has more than 4 million observations. The estimations with disaggregated trade data

[3]The first FTA Japan concluded is that with Singapole, but the degree and the scope of additional trade liberalization under the FTA have been small.

has several advantages over the studies using aggregated data.

Firstly, we can distinguish closely the products that are eligible for preferential reduction of customs duties under JMEPA from those that are not. Under JMEPA, 14.6% of products on tariff-line basis are excluded from trade liberalization (see Kuno and Kimura, 2007). In addition, there are many products that are subject to trade liberalization but the effective tariffs on them has been already zero on the Most-Favored Nation (MFN) basis. For those products, JMEPA would have no direct effects and treating them equally with the 'truly' liberalized products may generate an estimation bias. By using disaggregated data, we can examine whether and how imports of FTA-eligible products with initially the non-zero MFN tariff are increased by JMEPA compared to imports of other products and imports of FTA-eligible products from other countries.

Secondly, using the disaggregated data help capture how different treatments among FTA-eligible products affect the significance and the magnitudes of trade-creation effects. In JMEPA, the schedules or the degree of trade liberalization are set differently among products. Table 1 summarizes the types of trade liberalization under JMEPA: (i) tariffs imposed on products in Schedule A, B1, B2 are eliminated by one-shot from the date specified, (ii) tariffs on products in Schedule B4, B5, B6, B8, C, and Ca, are gradually and evenly reduced to zero for specified years from the date of entry into force, (iii) tariffs on products in Schedule P is liberalized instantaneously at the date of entry into force, though they are not reduced to zero, (iv) tariff rate quotas are set for products in Q.

[Insert Table 1 around here]

It seems natural to suppose that the different treatments of FTA-eligible products would have different impacts on trade flows. We will explore the difference by distinguishing the products depending on the types of trade liberalization.

Finally, since our disaggregated panel-data contains many observations of zero imports, and the number of products with positive imports differs across sample years, we can examine how JMEPA affects the variety of products imported from Mexico. It has been argued that trade liberalization increases the value of trade in two ways: (i) an increase in the value of traded products that have been imported before the trade liberalization (the *intensive margin*), and (ii) an increase in the number of products that have not been traded beforehand (the *extensive margin*).[4] Trade liberalization under JMEPA might increases the number of products imported from Mexico, and the disaggregated data allow us to figure out the effect.

Studies on the *ex post* investigations of the effects of Japanese FTAs are relatively scarce. An exception is Urata and Okabe (2007), which explore the trade-creation effect of JMEPA by a gravity model with the country-pair fixed effects. Their estimations, however, are conducted by using the aggregated trade data or industry-level (HS 2-digit) trade data. Although Ando (2007) discusses the product-level effects of JMEPA, her gravity-model estimation as well as the comparison between the fitted trade-values and the real trade-values are conducted by using the aggregated trade data.

## 1.2 Methodology

Our estimation employs a triple-difference (i.e., difference-in-differences-in-differences) model, which is an extension of the difference-in-differences method of policy analysis. In the literature of international trade, the methodology has been used in Frazer and Biesebroeck (2007). They estimate the effects of African Growth and Opportunity Act, a unilateral reduction of U.S. tariffs for particular products imported from sub-Saharan African countries, on U.S. imports of eligible products

[4]See Hummels and Klenow (2005), for instance.

from eligible countries. To my best knowledge, however, this paper is the first attempt to estimate trade-creation effects of an FTA by the triple-difference method.

Specifically, we set three dummies that respectively takes a value of one (i) if the product is imported from Mexico, (ii) if the product is imported during the post-JMEPA periods, and (iii) if the product is FTA-eligible,. By using these dummies, we investigate whether the coefficient on triple-interaction of three dummy variables are positive and statistically significant in a model with a full set of dummies and their double interactions. Before providing regression specification, we discuss some advantages to use the methodology. Broadly speaking, we can avoid possible estimation biases associated with the standard difference-in-differences method.

Let $IM^i_{j,t}$ denote import of Japan for product $j$ from country $i$ in year $t$. Suppose product $F$ is an "FTA product" that is eligible for trade liberalization under JMEPA and product $NF$ is a "non-FTA product" that is excluded from the liberalization. We also denote $M$ as a index of Mexico and $NM$ as the index of a non-Mexico country. Let us consider two years: a year before JMEPA is implemented, say 2003, and a year after JMEPA is implemented, say 2006. The simplest method of evaluating the effects of JMEPA is to measure the difference between pre-FTA imports and post-FTA imports for the treatment group, that is, imports of FTA products from Mexico calculated by $D^M_F = IM^M_{F,06} - IM^M_{F,03}$. However, the difference cannot distinguish an increase in imports from Mexico caused by JMEPA with the increase caused by a specific trend common to all imports from Mexico. To control it, $D^M_F$ should be compared with the increase in imports of a non-FTA products, $D^M_{NF} = IM^M_{NF,06} - IM^M_{NF,03}$. Thus, we should take a difference-in-differences as

$$DD^M = D^M_F - D^M_{NF}.$$

However, the difference-in-differences experiment cannot exclude the possibility that there are some specific trends that are common to imports of the FTA prod-

uct from all countries. To control for the trends, we should calculate the triple difference as

$$TD = DD^{M} - DD^{NM}$$

where $DD^{M} = D_{F}^{NM} - D_{NF}^{NM} = (IM_{F,06}^{NM} - IM_{F,03}^{NM}) - (IM_{NF,06}^{NM} - IM_{NF,03}^{NM})$. Thus, the value of triple-difference, $TD$, isolates the 'pure' effects of JMEPA. Namely, the triple-difference estimation can identify whether JMEPA disproportionately increases imports of FTA products from Mexico compared to increase in imports of non-FTA products from Mexico, and also compared to the relative increases in imports of FTA products to non-FTA products from other countries.

A remainder of the paper is organized as follows. In Section 2, empirical specifications estimated in the paper are presented. In Section 3, we briefly describe the data. Section 4 reports the estimation results. Section 5 concludes the paper.

# 2 Specification

We examine whether trade liberalization under JMEPA has increased the Japanese imports from Mexico by using annual data from 2003 to 2006. To this end, we employ a triple-difference methodology to evaluate the effects.

## 2.1 Benchmark model

The triple-difference specifications in our regression are constructed by using three dummy variables (see Table 2), $Mexico$, $Inforce_{jt}$, and $FTA\_prod_{j}$. $Mexico$ is time-invariant and $Mexico = 1$ if a country is Mexico and $Mexico = 0$ otherwise. $Inforce_{jt}$ is time-variant and $Inforce_{jt} = 1$ for the periods preferential tariffs (including zero) is applied to product $j$, $Inforce_{jt} = 0$ otherwise. $FTA\_prod_{j}$ is time-invariant and $FTA\_prod_{j} = 1$ if product $j$ is an FTA product and $FTA\_prod_{j} = 0$ otherwise.

[Insert Table 2 around here]

While JMEPA enters into force at April 1 in 2005, the timings of the application of a preferential tariff are different among products. Specifically, products that follow Schedule B1 are liberalized from one-year after the date of entry into force (April 1, 2006), and those that follows Schedule B2 are liberalized from April 1, 2010. To capture the difference, we set $Inforce_{j05} = 0$ and $Inforce_{j06} = 3/4$ for the products in B1 and set $Inforce_{j05} = 0$ and $Inforce_{j06} = 0$ for those in B2. Besides that, for the products classified in HS 08.0610, trade liberalization under JMEPA is seasonal where tariffs are removed during April 1 to September 30 but MFN tariffs are applied during October 1 to March 31 in every year. We set $Inforce_{j05} = Inforce_{j06} = 1/2$ for the products. For other products, we set $Inforce_{j05} = 3/4$ and $Inforce_{j06} = 1$.

The basic specification is given by

$$\begin{aligned} \ln IM^i_{j,t} \;=\; & \beta_1(Inforce_{jt} \times FTA\_prod_j \times Mexico) + \\ & \beta_2(Inforce_{jt} \times FTA\_prod_j) + \\ & \beta_3(Inforce_{jt} \times Mexico) + \\ & \alpha_1(FTA\_prod_j \times Mexico) + \\ & \alpha_2 FTA\_prod_j + \alpha_3 Mexico + \alpha_4 Inforce_{jt} + \varepsilon^i_{j,t}. \end{aligned} \tag{1}$$

where $\ln IM^i_{j,t}$ is the logarithm of $IM^i_{j,t}$.[5]

The effects of JMEPA is measured by the triple interaction of these dummy variables. The basic specification in (1), however, is restrictive in that it assumes that non-Mexico countries have a single base level of imports into Japan. It also assumes the base level of imports are divided into those in pre-FTA periods and those in

[5]We add one unit yen to all import values before taking logarithms to make $\ln IM^i_{j,t} = 0$ when $IM^i_{j,t} = 0$.

post-FTA periods. To allow for heterogeneity in the base level of imports of a specific product from a specific country, and also heterogeneity in those in each period, a full set of product-country interaction of dummies, $country_i/product_j + year_t$, should replace the last four variables. $\alpha_1(Mexico \times FTA\_prod_j) + \alpha_2 FTA\_prod_j + \alpha_3 Mexico + \alpha_4 Inforce_t$. Thus, a less restricted specification is given by.

$$\begin{aligned} \ln IM^i_{j,t} &= \beta_1(Inforce_{jt} \times FTA\_prod_j \times Mexico) + \\ &\quad \beta_2(Inforce_{jt} \times FTA\_prod_j) + \\ &\quad \beta_3(Inforce_{jt} \times Mexico) + \\ &\quad country_i/product_j + year_t + \varepsilon^i_{j,t}. \end{aligned} \tag{2}$$

Our primary interest is on the coefficient, $\beta_1$, of the triple interaction term, $Inforce_t \times FTA\_prod_j \times Mexico$, which estimates the impacts of trade liberalization under JMEPA on imports from Mexico into Japan. The double interaction term, $Inforce_t \times FTA\_prod_j$, controls for import variations of FTA-eligible products irrespective of their origins after JMEPA is implemented, while the double interaction term, $Inforce_{jt} \times Mexico$, controls for import variations of Mexico irrespective of their FTA-eligibilities after JMEPA is in effect.

## 2.2 Different treatments of FTA products

Another extension of the benchmark model is to consider different treatments of FTA products in JMEPA. Even if products are eligible for liberalization, their liberalization schedules and/or the degree of liberalization are set differently among products. It is plausible to consider the different treatments of products have different magnitudes on import growth. We use category-specific FTA dummies to estimate the different impacts.

We consider four types of treatments, as was shown in Table 1. Firstly, as for products whose tariffs are eliminated by one shot (Schedule A and Schedule

B1), they are classified as Category F. Since sample periods of our estimation from 2003-2007, Schedule B2 is excluded from trade liberalization. Secondly, as for B4, B5, B6, B8, C, and Ca on which import tariffs are gradually and evenly reduced to zero, we re-classify them into Category G. Thirdly, products in Schedules P and Q are classified in the same name of original categories. Let $\Omega = \{F, G, R, Q\}$ be the set of these categories, we use four FTA-product dummies, $FTA\_prod_{kj}$ $(k \in \Omega)$, in considering the heterogenous treatments of FTA products.

The modified specification is given by

$$\begin{aligned} \ln IM^i_{j,t} \;=\; & \sum_{k\in\Omega} \gamma_{1k}(Inforce_{jt} \times FTA\_prod_{kj} \times Mexico) + \\ & \sum_{k\in\Omega} \gamma_{2k}(Inforce_{jt} \times FTA\_prod_{kj}) + \\ & \gamma_3(Inforce_{jt} \times Mexico) + \\ & country_i/product_j + year_t + \varepsilon^i_{j,t}. \end{aligned} \tag{3}$$

where $FTA\_prod_j = \sum_{k\in\Omega} FTA\_prod_{kj}$ holds. The coefficient, $\gamma_{1k}$, captures the category-specific impact of JMEPA.

As for categories F and G, the tariffs are supposed to be eliminated and the only difference between them is the schedule of tariff reduction. We can capture the effects that are specific to tariff elimination by adjusting the different phase-out periods of preferential tariffs in Category G and integrating them with Category A. Specifically, let $R_{j,t}$ be the degree of tariff reduction for product $j$ in year $t$ so that $R_{j,t} = 0$ holds in the case of no trade liberalization and $R_{j,t} = 1$ holds in the case of zero tariff. We also let $N_j$ be the length of phase-out years for product $j$. Then, we have $R_{j,05} = 1/N_j$ and $R_{j,06} = (1/N_j) \times (1/4) + (2/N_j) \times (3/4) = 7/4N_j$.[6] We modify (3) to include $FTA\_prod_{Ej,t} = R_{j,t} \times FTA\_prod_{kj}$ for $k \in \{F, G\}$ instead of $FTA\_prod_{Fj}$ and $FTA\_prod_{Gj}$. Note that now $FTA\_prod_{Ej,t}$ captures the degree of tariff reduction where $FTA\_prod_{Ej,t} = 1$ in the case of tariff elimination for

[6]Since $N > 3$, $Inforce_{Gt} \in [0, 1]$ holds.

product $j$.

### 2.3 Extensive margin

An extension of the benchmark model is to decompose variations of imports. Since our observation includes zero imports, the benchmark specification includes both the impacts at the intensive margin and those at the extensive margin. In order to extract the impacts of JMEPA at the extensive margin, the left-hand side of the benchmark model (2) is replaced by a dummy variable, $IM\_dummy^i_{j,t}$, which takes $IM\_dummy^i_{j,t} = 1$ if $IM^i_{j,t} > 0$ and takes $IM\_dummy^i_{j,t} = 0$ otherwise. The right-hand side of (2) remains unchanged. We employ a linear probability model to estimate $\beta_1$ and $\gamma_{1k}$ $(k \in \Omega)$.

## 3 Data Description

We use the full-balanced panel data of imports of Japan from all countries. Observation are annual data and sample periods are 4 years from 2003 to 2006. We choose the sample period because it contains both pre-FTA and post-FTA periods and the lengths of them are mostly balanced. In addition, HS codes are not changed during the sample period.[7] The annual import data of each product from each country in each year is taken at the HS 6-digit level from *Trade Statistics of Japan* provided by Ministry of Finance Japan.

We construct FTA-product dummies by referring to the documents of Annex 1 of JMEPA. While the import data are collected at HS 6-digit level, schedules of trade liberalization in Japan are specified at the 9-digit statistical code which consists of 6-digit HS code and 3-digit domestic code. In order to relate trade

[7]HS codes were changed at 2002 and at 2007. It is difficult to integrate the data with the different HS codes.

liberalization at 9-digit level to variations of import values at HS 6-digit level, FTA-product dummies at 9-digit level are weighted by the fraction of the total value of Japanese imports of each product from the world for the 9-digit level to those of aggregated imports for the corresponding 6-digit level in 2004. Thus, $FTA\_prod_{kj}$ is not a binary variable that takes zero and one but a continuous variable that takes between zero and one. Besides that, we can observe Japan commits to zero tariffs under JMEPA for some products whose effective tariffs have already been zero. For those products, JMEPA would have no impacts on trade flows. Therefore, we set $FTA\_prod_j = 0$ for them.

Although we have over 4 million observations, at this moment we estimate the effects of JMEPA for food stuff, animal or vegetable products. Our product category is shown in Table 3. The number of observations included in the current estimation is 483,800 (=590 (products) ×205 (countries) × 4 (years)).

[Insert Table 3 around here]

Since we introduce the full-set of country-product dummies, the (current) triple-difference estimation has 120,950 fixed effects.

# 4 Estimation Results

## 4.1 Benchmark model

The results for specification (2) is shown in column (1) of Table 4. The coefficient $\beta_1$ on the triple interaction term is positive and significant, which implies that trade liberalization under JMEPA has increased imports of Japan from Mexico. The coefficient, 0.414, means that the implementation of JMEPA have increased Japanese imports of FTA-eligible products from Mexico by 51.3%, on average.[8]

[8]The marginal FTA effect is calculated by $e^{\beta_1} - 1$.

The coefficients on $Inforce_{jt} \times FTA\_prod_j$ and on $Inforce_{jt} \times FTA\_prod_j$ are insignificant, indicating that import surges of FTA-eligible products from all countries and those of all products from Mexico are not observed during the post-FTA periods.

[Insert Table 4 around here]

For comparison, we also made the difference-in-differences estimation by limiting the sample only to imports from Mexico. A full set of product dummies and year dummies are included in the estimation. The result is shown in column (2) of Table 4. The effect of JMEPA is underestimated at -0.6% since the difference-in-differences estimation does not account for the overall decline in Japanese imports for FTA-eligible products.

## 4.2 Different categories of trade liberalization

The estimation results of specification (3) is shown in column (1) of Table 5, which presents how different types of trade liberalization under JMEPA have different impacts on the Japanese imports of FTA-eligible products from Mexico.

[Insert Table 5 around here]

All coefficients on the triple-interaction terms are positive and significant, which suggests that JMEPA has positive impacts irrespective of the type of trade liberalization. Their magnitudes, however, are different. The impacts of JMEPA are relatively small as for products subject to the elimination of tariffs. On average, Japanese imports from Mexico as for the products subject to the one-shot elimination (Category F) are 21.3% larger than those from the rest of the world during the post-FTA periods. As for the products subject to the gradual elimination (Category G), imports from Mexico are 27.9% larger than those from the rest of

the world during the same periods. In contrast, the implementation of JMEPA almost triplicates imports from Mexico (270.7% increase) for products subject to tariff reduction (Category R), and it even quadruplicates them (430.6% increase) for products to which tariff rate quotas are applied (Category Q).

From the viewpoint of a standard trade theory, these results are somewhat paradoxical because, if evaluated at the same initial tariff level, the degree of trade liberalization by a tariff elimination is larger than that by a tariff reduction or by a tariff-rate quota. One possibility is that the set of products for which tariffs are not eliminated are products with the high initial tariffs. In fact, the products which categorized in P and Q are 'sensitive products' such as kinds of pork, cuttlefish, beef, chicken, orange juice, etc. To adjust the product-specific difference in the degree of trade liberalization, we need to estimate a tariff-elasticity of the JMEPA effect for each category by using the pre-FTA and the post-FTA tariff rates. Another possible explanation is that JMEPA excludes from tariff elimination the products which are more sensitive to tariff reduction. To evaluate the effect, we should consider the endogenous determination of the product categorization. These issues remain for future research.

In column (2) of Table 5, $FTA\_prod_{Fj}$ and $FTA\_prod_{Gj}$ is replaced by $FTA\_prod_{Ej}$. As defined in Section 2.2, $FTA\_prod_{Ej}$ integrates the sum of $FTA\_prod_{Fj}$ and $FTA\_prod_{Gj}$ weighted by the extent of tariff reductions and so it capture the overall effects of elimination of tariffs. The coefficient on $Inforce_t \times FTA\_prod_{Ej} \times Mexico$ is 0.169 and significant, indicating that given the effects of JMEPA are identical across F-products and G-products, JMEPA has increased Japanese imports from Mexico by 18.4% on average during the post-FTA period if the product is subject to one-shot elimination of tariffs. If the product is subject to a gradual elimination, say elimination with four steps (i.e., Schedule B4), JMEPA has increased the imports of that product from Mexico by 18.4%/4=4.6% during the fiscal year of 2005 and by 9.2% during the fiscal year of 2006.

In column (3) of Table 5, the results of the corresponding difference-in-differences estimation are provided. Compared to the triple-difference estimation, the standard errors of coefficients rises while the estimated values of the coefficients and mostly unchanged. As a result, the effects of JMEPA for Categories F, R, G, and also E become insignificant. This is because the difference-in-differences estimation does not take into account a trend of Japanese imports from non-Mexico countries.

### 4.3 Extensive margin

In Table 6, the estimation results of the linear probability model are provided. Overall, the significant effects of JMEPA at extensive margin are observed in column (1). The 0.032 coefficient on the triple-interaction term implies that JMEPA raises the probability that Japan imports FTA-eligible products from Mexico by 3.2%.

[Insert Table 6 around here]

The results which consider the heterogeneity in the type of liberalization in column (2) and (3) suggests that the probability of importing from Mexico of products subject to tariff reduction (R) or tariff-rate quota (Q) has increased significantly after the implementation of JMEPA, while the effects are not significant as for the products subject to a tariff elimination.

## 5 Conclusion

This paper has investigated whether JMEPA increases Japanese imports from Mexico. A features of our paper is to estimate a triple-difference model. With controlling for full set of product-country fixed effects and common trends specific to imports from Mexico and specific to FTA-eligible product categories, we have

found that JMEPA has significant trade-creation effects, and their magnitudes are large for products subject to tariff-rate quota and for those on which tariffs are reduced but not eliminated. JMEPA has also been associated with the Japan's import growth at the extensive margin.

These results suggest that trade creation effects of FTAs can be unexpectedly large if we distinguish FTA-products with non-FTA products and also distinguish them with FTA-products with zero MFN tariffs. Also, considering the heterogenous treatment of products in trade liberalization is important to evaluate the trade effects of FTAs.

There is a room for future research. It would be easy to relate disaggregated import data to the pre-liberalized level of tariff rate of each product. An FTA dummy employed in this class of studies captures the changes in trade flows by the implementation of the FTA, not the changes in trade flows by changes in tariff-rate. Multiplying the FTA dummy by the gap between the pre-FTA tariff rate and the post-FTA tariff rate allow us to investigate the import elasticity to a tariff-changes under the FTA. Besides that, we can also explore how the stringency of rules of origin affects the impacts of JMEPA since the rules of origin under JMEPA are set differently among products.

# References

[1] Ando, M. (2007) "Impacts of Japanese FTAs/EPAs: Post Evaluation from the Initial Data", RIETI Discussion Paper Series 07-E-041

[2] Baiera, S.L. and J.H. Bergstrand (2007) "Do Free Trade Agreements Actually Increase Members' International Trade?", *Journal of International Economics* 71(1), pp. 72-95

[3] Carrère, C. (2006) "Revisiting the Effects of Regional Trade Agreements on Trade Flows with Proper Specification of the Gravity Model", *European Economic Review* 50, pp. 223–247

[4] Eicher, T., C. Henn, and C. Papageorgiou (2007) "Trade Creation and Diversion Revisited: Accounting for Model Uncertainty and Natural Trading Partner Effects," Working Papers UWEC-2007-18, University of Washington, Department of Economics

[5] Endoh, M. (1999) "Trade Creation and Trade Diversion in the EEC, the LAFTA and the CMEA: 1960-1994", *Applied Economics*, 31, 207-216.

[6] Frankel, J. (1997) *Regional Trading Blocs in the World Economic System*, Institute for International Economics, Washington, DC.

[7] Frazer, G. and J.V. Biesebroeck (2007) "Trade Growth under the African Growth and Opportunity Act", NBER Working Paper No. W13222.

[8] Fukao, K., T. Okubo, and R.M Stern (2003) "An Economiertic Analysis of Trade Diversion under NAFTA", *North American Journal of Economics and Finance* 14. pp.3-24.

[9] Ghosh, S. and S. Yamarik (2004). "Are Preferential Trade Agreements Trade Creating? An application of Extreme Bounds Analysis", *Journal of International Economics*, 63, pp.369-395.

[10] Hummels, D and P. Klenow (2005) "The Variety and Quality of a Nation's Exports", *American Economic Review* 95(3), pp.704-723.

[11] Kuno, A. and F. Kimura (2007) "Nihon no Keizai Renkei Kyotei (EPA) ni okeru Boueki Jiyuka Suijun no Hyoka: Houhouron-teki Kadai to Bumonbetsu-Sangyobetsu Hyoka", KUMQRP Discussion Paper Series DP2007-002, Keio University

[12] Mukunoki, H. (2005) "Understanding the Effects of Preferential Trade Agreements: A Theoretical Overview", *GEM Bulletin* (Gakushuin University), Vol.25, pp.31-51

[13] Panagariya, A. (2000) "Preferential Trade Liberalization : The Traditional Theory and New Developments", *Journal of Economic Literature* 38(2), pp. 287–331.

[14] Soloaga, I. and L. A. Winters, (2001) "Regionalism in the Nineties: What Effect on Trade?", *North American Journal of Economics and Finance* 12(1), pp. 1-29

[15] Urata, S. and M. Okabe (2007), "The Impacts of Free Trade Agreements on Trade Flows: An Application of the Gravity Model Approach", RIETI Discussion Paper Series 07-E-052

[16] Viner, J. (1950) *The Customs Union Issue*, Carnegie Endowment for International Peace, New York.

Table 1: Schedule of trade liberalization under JMEPA

| Schedule | Description | Category | |
|---|---|---|---|
| A | Elimination of custom duties from the date of entry into force of the agreement (i.e, April 1, 2005) | F (one-shot elimination) | |
| B1 | Elimination of custom duties from April 1, 2006 | | |
| B2 | Elimination of custom duties from April 1, 2010 | — | |
| B4 | Elimination of custom duties in 4 equal annual installment as from the date of entry into force of the agreement | G (gradual elimination) | |
| B5 | Elimination of custom duties in 5 equal annual installment as from the date of entry into force of the agreement | | E |
| B6 | Elimination of custom duties in 6 equal annual installment as from the date of entry into force of the agreement | | |
| B8 | Elimination of custom duties in 8 equal annual installment as from the date of entry into force of the agreement | | |
| C | Elimination of custom duties in 10 equal annual installment as from the date of entry into force of the agreement | | |
| Ca | Elimination of custom duties in 11 equal annual installment as from the date of entry into force of the agreement | | |
| P | Customs duties are reduced to the rate specified as from the date of entry into force of the agreement | P (tariff reduction) | |
| Q | Tariff rate quotas are implemented | Q (tariff rate quota) | |
| X | Excluded from any reduction or elimination of customs duties | — | |

Table 2: FTA Dummies

| | | |
|---|---|---|
| Mexico Dummy | Mexico<br>$Mexico = 1$ | Non-Mexico<br>$Mexico = 0$ |
| In-force Dummy | After Implimentation<br>$Inforce_t = 1$ | Before Implemantation<br>$Inforce_t = 0$ |
| Product Dummy | FTA-Products<br>$FTA\_prod_j = 1$ | Non FTA–Products<br>$FTA\_prod_j = 0$ |

Table 3: Industry Aggregate

| Industry | HS code | No. of products (6-digit) |
|---|---|---|
| Food stuff, animal, or vegetable products | 01, 02, 03, 04, 07, 08, 09, 10, 11, 16, 17, 18, 19, 20, 21, 22, 23, 24 | 590 |
| Raw materials | 05, 06, 12, 13. 14, 15, 25, 26, , 40.01-40.02, 41.01-41.03, 43.01, 44.01–44.08, 45.01-45.02, 47, 50.01-50.03, 50.10-50.90, 51.01-51.05, 52.01–52.03, 53.01-53.05, 55.01-55.07, 63.09-63.10, 71.0210-71.0221 71.0310 71.0420, 71.05, 72.01-72.06, 74.01, 74.04, 75.01, 75.03, 76.02, 78.02, 79.02, 80.02. 81.01-81.05, 81.07-81.10, 81.12 | 461 |
| Mineral fuels | 27 | 42 |
| Manufactured products | 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40.03-40.17, 41.04-41.07,41.12-41.15, 42, 43.02-43.04, 44.09-44.21, 45.03-45.04, 46, 48, 49, 50.04-50.07, 51.06-51.13, 52.04-52.12, 53.06-53.11, 54, 55.08-55.16, 56-62, 63.01-63.08, 64, 65, 66, 67, 68, 69, 70, 71.01, 71.0229-71.0239, 71.0391-71.0399, 71.0410, 71.0490, 71.06-71.07, 71.0820, 71.09-71.18, 72.07-72.29, 73, 74.13-74.19, 75.08, 76.10-76.16, 78.06, 79.07, 80.07, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97 | 4133 |
| Re-import goods, etc. | 00, 71.0811-71.0813 | 4 |

Table 4: Benchmark Results

| | (1) | (2) |
|---|---|---|
| | $\ln IM$ | $\ln IM$ |
| Country Sample | All | Mexico |
| Product Sample | Food | Food |
| Method | TD | DD |
| Marginal FTA Effect | **0.513** | **0.507** |
| Inforce×FTA_prod×Mexico | **0.414** | **0.410** |
| | (5.51)*** | (2.50)** |
| Inforce×FTA_prod | -0.002 | |
| | (-0.49) | |
| Inforce×Mexico | -0.046 | -1.408 |
| | (-1.00) | (-0.34) |
| Observation | 483800 | 2360 |
| Number of fixed-effects | 120950 | 590 |

Notes: t-statistics in parentheses: * significance at the10% level, ** significance at the 5% level, *** significance at the 1% level

Table 5: Results with Different Categories of Liberalization

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | $\ln IM$ | $\ln IM$ | $\ln IM$ | $\ln IM$ |
| Country sample | All | All | Mexico | Mexico |
| Product sample | Food | Food | Food | Food |
| Method | TD | TD | DD | DD |
| Marginal FTA Effect | | | | |
| Elimination (E) | | **0.184** | | 0.178 |
| – One-shot elimination (A) | **0.213** | | 0.205 | |
| – Gradual elimination (G) | **0.279** | | 0.282 | |
| Tariff reduction (R) | **2.707** | **2.593** | 2.762 | 2.647 |
| Tariff quota (Q) | **4.306** | **4.150** | **4.275** | **4.119** |
| Inforce×FTA_prod_E×Mexico | | **0.169** | | 0.164 |
| | | (1.84)* | | (0.82) |
| Inforce×FTA_prod_A×Mexico | **0.193** | | 0.187 | |
| | (2.10)** | | (0.94) | |
| Inforce×FTA_prod_G×Mexico | **0.246** | | 0.249 | |
| | (2.09)** | | (0.97) | |
| Inforce×FTA_prod_R×Mexico | **1.310** | **1.279** | 1.325 | 1.294 |
| | (2.72)*** | (2.66)*** | (1.27) | (1.24) |
| Inforce×FTA_prod_Q×Mexico | **1.669** | **1.639** | **1.663** | **1.633** |
| | (9.76)*** | (9.61)*** | (4.47)*** | (4.41)*** |
| Inforce×FTA_prod_E | -0.005 | -0.006 | | |
| | | (-0.92) | | |
| Inforce×FTA_prod_A | -0.005 | | | |
| | (-0.84) | | | |
| Inforce×FTA_prod_G | 0.003 | | | |
| | (0.39) | | | |
| Inforce×FTA_prod_R | 0.015 | 0.014 | | |
| | (0.44) | (0.42) | | |
| Inforce×FTA_prod_Q | -0.006 | -0.007 | | |
| | (-0.51) | (-0.57) | | |
| Inforce×Mex | -0.046 | -0.016 | 0.014 | -1.721 |
| | (-1.00) | (-0.36) | (0.12) | (-0.42) |
| Observation | 483800 | 483800 | 2360 | 2360 |
| Number of fixed-effects | 120950 | 120950 | 590 | 590 |

Notes: t-statistics in parentheses: * significance at the10% level, ** significance at the 5% level, *** significance at the 1% level

Table 6: Results for import growth at extensive margin

| | (1) | (2) | (3) |
|---|---|---|---|
| | $IM\_Dummy$ | $IM\_Dummy$ | $IM\_Dummy$ |
| Sample country | All | All | All |
| Sample product | Food | Food | Food |
| Method | TD | TD | TD |
| Marginal FTA Effect | **0.032** | | |
| Elimination (E) | | | 0.011 |
| – One-shot elimination (A) | | 0.014 | |
| – Gradual elimination (G) | | **0.026** | |
| Tariff reduction (R) | | **0.164** | **0.161** |
| Tariff quota (Q) | | **0.112** | **0.108** |
| Inforce×FTA_prod×Mexico | **0.032** | | |
| | (3.47)*** | | |
| Inforce×FTA_prod_E×Mexico | | | 0.011 |
| | | | (0.95) |
| Inforce×FTA_prod_A×Mexico | | 0.014 | |
| | | (1.20) | |
| Inforce×FTA_prod_G×Mexico | | **0.026** | |
| | | (1.76)* | |
| Inforce×FTA_prod_R×Mexico | | **0.164** | **0.161** |
| | | (2.75)*** | (2.69)*** |
| Inforce×FTA_prod_Q×Mexico | | **0.112** | **0.108** |
| | | (5.25)*** | (5.10)*** |
| Inforce×FTA_prod | -0.001 | | |
| | (-0.60) | | |
| Inforce×FTA_prod_E | | | -0.001 |
| | | | (-0.62) |
| Inforce×FTA_prod_A | | -0.004 | |
| | | (-0.45) | |
| Inforce×FTA_prod_G | | -0.001 | |
| | | (-0.44) | |
| Inforce×FTA_prod_R | | 0.001 | 0.001 |
| | | (0.16) | (0.17) |
| Inforce×FTA_prod_Q | | -0.001 | -0.001 |
| | | (-0.37) | (-0.37) |
| Inforce×Mexico | -0.006 | -0.006 | -0.003 |
| | (-1.12) | (-1.12) | (-0.53) |
| Observation | 483800 | 483800 | 483800 |
| Number of fixed-effects | 120950 | 120950 | 120950 |

Notes: t-statistics in parentheses: * significance at the10% level, ** significance at the 5% level, *** significance at the 1% level