

Firm-level Trade Creation and Diversion

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Abstract: Using highly-detailed import data in Thailand, this paper examines firm-level trade creation and diversion of regional trade agreements (RTAs). Specifically, focusing on firms that imported a concerned product from non-members but did not from RTA members in the initial year of our sample, we empirically investigate the birth of imports from RTA members under RTA schemes and the stop of imports from non-members at a firm-level. We find that firms are more likely to stop importing products with low RTA tariff rates or high most-favoured-nation tariff rates from non-members and to start importing such products from RTA member countries. However, from the quantitative point of view, there are very few firms that switch import sources from non-members to RTA members facing the introduction of RTA schemes.

Keywords: RTA; Trade creation; Trade diversion; Thailand

JEL Classification: F15; F53

1. Introduction

The trade creation and diversion have been key concepts in considering the economic effects of regional trade agreements (RTAs). Viner (1950) is a pioneering study on these concepts though those were discussed in the context of the customs union. Originally, the trade creation effects refer to the start of importing a product, which was formerly not imported at all, from an RTA member country. The trade

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diversion means the stoppage of importing a product from an RTA non-member country by starting to import the product from the member country instead. Such a switch may happen even if before-taxed prices from RTA non-members are cheaper than those from RTA members because RTA members enjoy lower RTA preferential tariff rates than general tariff rates such as most favoured nation (MFN). Trade diversion has for long been regarded as one of the sources for notorious “evils” resided in RTAs. Researchers have tried to quantify these effects since those play a crucial role in evaluating the whole impact of RTAs.

There are several ex-post empirical studies on trade creation and diversion.¹ Those studies mostly estimate the gravity equation by employing the aggregated trade data such as country-level (or country-sector-level) data. The recent examples include Soloaga and Winters (2001), Magee (2008), Carrere (2006), Dai et al. (2014), and Yang and Martinez-Zarzoso (2014). These studies differ particularly by estimation techniques. For example, while Carrere (2006) employs the Hausman-Taylor estimation technique, the multinomial poisson maximum likelihood is used in Yang and Martinez-Zarzoso (2014). These studies introduce various RTA dummy variables to differentiate trade creation and trade diversion effects, into gravity equations. In particular, Magee (2008) more carefully define these effects and quantify their absolute values.² As a result, Magee finds that trade creation effect presents an increase in intra-bloc trade by 89% after RTAs were in place for 18 years while there is little evidence of trade diversion. Also, Cipollina and Salvatici (2010) conduct a meta-analysis of 85 such studies and conclude that trade creation effects significantly exist.

Against this backdrop, our paper is the first one that examines trade creation and diversion at a firm-level. Our dataset consists of shipment-level customs data on Thai imports during 2007-2011. It covers all commodity imports in Thailand and carries information not only on firms, source countries, and commodities but also on tariff schemes (e.g., RTA scheme or MFN scheme)³ used for the imports. We believe that

¹ As summarized well in Magee (2008), another strand is the ex-ante studies. The typical is a computable general equilibrium (CGE) model simulation. In particular, many studies based on CGE models use variations of the Global Trade Analysis Project (GTAP) model. Examples of this approach include Brown et al. (1995), Cox (1995), Sobarzo (1995), and the studies surveyed in Baldwin and Venables (1995). There are also some studies that employ a simpler approach, which is based on the partial equilibrium model. Those studies include Karemera and Ojah (1998), Wylie (1995), and Kreinin and Plummer (1992). Although estimates in these studies are severely affected by the assumption on exogenous parameters such as demand elasticity, all papers show certain amounts of absolute values derived from trade diversion.

² Clausing (2001) directly examine the effects of tariff reduction through RTAs on trade.

³ The aggregated version of trade data according to tariff schemes has been employed in several papers, including studies on the determinants of utilization rates of preferential trade and the effects of preferential utilization on prices. The former kind of studies include Bureau et al. (2007), Cadot et

Thailand is a suitable importing country to examine the effects of RTAs on imports. As introduced in the next section, since the latter half of the 2000s, which is our sample period, Thailand and the Association of Southeast Asian Nations (ASEAN), of which Thailand is a member, have actively concluded RTAs with countries outside ASEAN. As a result, imports from RTA partner countries *under* RTA schemes rapidly grow in Thailand during that period.

The firm-level analysis provides microeconomic insights on trade creation and diversion. Their Vinerian version is derived basically from a simplistic international trade model for a homogenous good under perfect competition. Thus, in the Viner model, we do not need to introduce firm-level perspectives. However, the firm-level analysis clarifies the detailed effects of RTAs on firm-level imports that have been never investigated. This paper focuses on an interesting case from the view point of trade creation and diversion, specifically on firms that imported a concerned product from non-members but did not from RTA members. In such firms, we define firm-level trade creation as the birth of import from RTA members under RTA schemes, not MFN schemes. The firm-level trade diversion is simply defined as the stop of imports from RTA non-members. As mentioned above, this definition is a bit different from the Vinerian version of definition on trade creation and diversion. For example, the original definition of the trade creation refers to the start of importing a product, which was formerly not imported at all, from an RTA member country. On the other hand, the target of our firm-level trade creation is firms that used to import from non-members. In short, our interest lies in firm-level switching from imports from non-members to imports from members under RTA schemes.

Specifically, our empirical analysis is the following. We first examine some questions that have never been explored. For example, we investigate whether or not the conclusion of RTAs discourages firms that imported from RTA non-members to survive in the import market, and generates new importers from RTA members. Or does it encourage such existing firms to switch the source of import from non-members to members? We can also explore whether or not firms that imported from RTA members simply change their tariff schemes from MFN schemes to RTA schemes. Second, we investigate the determinants of firm-level trade creation and diversion. In particular, we shed light on the role of MFN rates and RTA rates in the import country, i.e., Thailand.

al. (2006), Francois et al. (2006), Manchin (2006), and Hakobyan (2015). Those studies find that the utilization of preferential schemes is higher in the products with larger tariff margins, larger volumes, and the less restrictive rules of origin. Examples of the latter kind are Cadot et al. (2005), Olarreaga and Ozden (2005), and Ozden and Sharma (2006), which find the rise of export prices after RTA schemes are utilized.

In addition to such “extensive margin” of import from RTA members and non-members, we further investigate their role in “intensive margin”, i.e., the magnitude of imports from RTA members and non-members.⁴

Our paper is related not only to the literature on trade creation/diversion but also to some other literatures. For example, several papers recently examine mechanisms on the survival of international transactions (e.g., Besedes and Prusa, 2006a, 2006b; Gorg, Kneller, and Murakozy, 2012; Nitsch, 2009). Those studies found, for example, that international transactions are likely to survive when those are exported by more productive firms, by countries with larger GDP, or by geographically-closer countries. Our paper is also related to some firm-level studies on the choice of tariff schemes in exporting. Employing the unique survey data, Takahashi and Urata (2010) and Hayakawa (2015) examine the role of firm sizes in terms of the number of employees. By employing the firm level data from the Generalized System of Preferences (GSP) utilization for exporting apparel products to Europe from Bangladesh, Cherkashin et al. (2015) structurally estimate the model on firms’ choice on tariff schemes. However, these studies do not explicitly examine trade creation/diversion. Also, the datasets used in these studies do not cover trade in all firms or in all industries.⁵

The rest of this paper is organized as follows. The next section provides our conceptual framework on firm-level trade creation and diversion. Section 3 introduces our dataset and then takes an overview of firm-level trade creation and diversion in Thailand. We report the results for our econometric analyses in Section 4. Last, Section 5 concludes on this paper.

2. Conceptual Framework

This section discusses how MFN rates and RTA preferential rates affect the birth and exit of import from RTA members and non-members. To simplify our discussion, we examine a firm’s import of a homogenous product, of which a market structure is perfect competition. That product is imported from two groups of countries, RTA non-member countries and future RTA member countries. We consider the import at two

⁴ Our sample period of 2007-2011 includes the global financial crisis. During the crisis, firms may tend to seek better trading partners, As a result, we may observe more frequent switches of trading partners.

⁵ In addition, there are some studies on the effects of tariff reduction on extensive and intensive margin. For example, employing product-level import data in the U.S., Debaere and Mostashari (2010) examined changes in the effect of tariff reduction on the extensive margin and found that tariff reductions had a small effect on the extensive margin relative to overall growth in international trade. On the other hand, we investigate these effects at a firm-level.

time points. RTA has not entered into force in the initial time while RTA schemes will be available in the latter time.

The unit import price of product i at time t is given by

$$\begin{aligned} P_{nit}^{MFN} &= (1 + MFN_{it})p_{ni} \\ P_{mit}^{MFN} &= (1 + MFN_{it})p_{mi} \\ P_{mit}^{RTA} &= (1 + RTA_{it} + Compliance)p_{mi}. \end{aligned}$$

P^S indicates the import price under tariff scheme S (i.e., RTA scheme or MFN scheme). MFN and RTA are MFN rates and RTA preferential rates, respectively. Subscripts n and m refer to non-member countries and member countries, respectively. p indicates c.i.f. prices (prices inclusive of cost, insurance, and freight), which are assumed to be time-invariant. For simplicity, we assume that the compliance costs of rules of origin (*Compliance*) enter in an ad-valorem fashion against c.i.f. prices.

To consider the effects of tariffs, we categorize the import structure of firms according to the four cases of import in the initial time, which are shown in Table 1. The first case is that a firm did not import a product from either member or non-member countries in the initial time. We do not discuss this case since it is infeasible to empirically examine all of the possible import patterns. Namely, since this case requires us to investigate non-importers in the initial time, we cannot restrict a set of firms to be investigated. Similarly, sets of products and export countries cannot be restricted, either. As a result, even if some firms to be examined can be specified, we need to examine whether or not such firms start importing each of *all* products from each of *all* countries through changes of tariff rates. Such an analysis is empirically infeasible.⁶

==== Table 1 ====

The second case is that a firm imported a product from member countries but did not import from any non-member countries. This case emerges when even under the initial level of MFN rates, production costs and thus c.i.f. prices are lower for the product from member countries than that from non-member countries, i.e., $p_{ni} > p_{mi}$. In this case, the introduction of RTA preferential rates just encourages to continue importing that product from member countries. If MFN rates are sufficiently high or RTA rates are sufficiently low, the applied tariff scheme of import from RTA members changes from MFN to RTA. However, it does not generate imports from non-member

⁶ This difficulty may be the reason why there are few empirical studies on the determinants of the birth of firm-product level trade. In contrast, as listed in the introductory section, there are several studies on the determinants of its exit.

countries because $p_{ni} > p_{mi}$. The same is true for any change or level of MFN rates. In short, firms' import patterns do not change in this case.

An interesting case is the third one, which is that a firm did not import a product from any member countries but did import it from non-member countries. This case becomes dominant if c.i.f. prices are lower in the product from non-member countries than that from member countries, i.e., $p_{ni} < p_{mi}$. In this case, depending on the level of MFN rates and RTA rates, the firm imports that product from either non-member countries under MFN scheme or member countries under RTA scheme. In particular, if RTA rates are sufficiently low compared with MFN rates (and compliance costs), this firm starts importing that product from member countries under RTA schemes and stops importing from non-member countries. Namely, firm-level trade creation and diversion emerge. On the other hand, the lower MFN rates will discourage such firms to switch the import origins.

The last case is that a firm imported a product from both member countries and non-member countries. Under the above setting, this case emerges simply if c.i.f. prices are same between products from member and non-member countries, i.e., $p_{ni} = p_{mi}$. While the reduction of MFN rates does not change the initial import pattern, low RTA rates would encourage firms to stop importing from non-member countries and to switch the applied tariff scheme of imports from member countries from MFN to RTA.⁷

Our empirical analysis focuses basically on the interesting case, i.e., the third case. Indeed, as mentioned above, it is infeasible to empirically examine the first case. Furthermore, in the second case, tariff rates play a role of only strengthening the initial import pattern. On the other hand, in the third case, we will see firm-level trade creation and diversion through the changes of tariff rates at the same time. In particular, as mentioned above, asymmetric patterns of tariff effects will emerge. Low RTA rates have positive and negative effects on the birth of imports from member countries and the survival of imports from non-member countries, respectively. Low MFN rates have the opposite effects on those. Also, it is feasible to empirically examine this case because we can restrict importers to those that imported from non-members but not from any RTA members in the initial year. The products to be examined can be also restricted to those that were imported from non-members in the initial year. Lastly, the fourth case is also investigated to some extent in our empirical analysis.

⁷ Furthermore, when assuming that this product is differentiated, this case will emerge if import prices from both kinds of countries are not sufficiently high and not so different. Also, if products are not sufficiently differentiated, lower RTA rates may discourage importing firms to continue imports from non-member countries. On the other hand, low MFN rates may encourage continuing not only imports from non-member countries but also imports from member countries under MFN schemes.

3. Data Overview

This section provides an overview of firm-level trade creation and diversion in Thailand. After introducing our dataset, we will show that very few firms switch their import source countries from RTA non-members to members.

3.1. Data Source

Our dataset is obtained from the Customs Office, the Kingdom of Thailand. It is transaction-level import data from 2007 to 2011 and covers all commodity imports in Thailand. In our sample period, we can keep the consistency of Harmonized Commodity Description and Coding System (HS) version for the product classification, i.e. HS2007. Our dataset contains customs clearing date, HS eight-digit code, export country, firm identification code, tariff scheme (e.g., RTA, MFN, etc.), and import values in Thai Baht (THB). We use the data on imports aggregated by the years in addition to source countries, HS eight-digit codes, firms, and tariff schemes. We classify tariff schemes into three categories including MFN scheme, RTA scheme, and the other schemes. The tariff payment for imports under “the other schemes” is exempted based on five schemes: bonded warehouses, free zones, investment promotion, duty drawback for raw materials imported for the production of export, and duty drawback for re-exportation.⁸

In our sample period, as listed in Table 2, Thailand has 10 RTAs, most of which are overlapped in their country coverages. Thailand has not only bilateral but also plurilateral RTAs with Japan, Australia, New Zealand, and India. With the members of the ASEAN, of which Thailand is also a member, Thailand has at least five RTA schemes. In this paper, we call the following 15 countries “RTA member countries”: Korea, China, Japan, India, Philippines, Viet Nam, Cambodia, Laos, Myanmar, Malaysia, Indonesia, Brunei, Singapore, New Zealand, and Australia. Except for Korea, with which Thailand concludes on an RTA in 2010, all these countries have been RTA partner countries for Thailand at least since the beginning of our sample period, i.e. 2007. The other countries are called “RTA non-member countries”.⁹

⁸ See Appendix A for these five schemes.

⁹ More precisely, all products do not necessarily have lower RTA rates than MFN rates in any RTAs. Furthermore, it depends on RTAs and thus on export countries which products can be exported to Thailand under the lower RTA rates than MFN rates. Also, RTA preferential rates in some products become available some years after RTAs’ entry into force. In this sense, “RTA member countries” should be classified according to not only countries but also products and years. However, such classification is too complicated to examine trade creation/diversion. Thus, we simply classify

==== Table 2 ====

Although Thailand had had RTAs since an earlier period than ours, the significant use of RTA schemes in Thailand's import just started during our sample period. Figure 1 reports imports under RTA schemes in addition to their shares in total imports. In this figure, samples are restricted only to combinations of commodity times export country in which any RTA rates are lower than MFN rates in 2007. In 2007, imports under RTA schemes still remained at a small magnitude. The share in total imports was only less than 1%. However, both the magnitude and share of imports under RTA schemes have dramatically increased since 2008. The share rises to 16 % in 2008 and further to 31% in 2011. In short, our sample period is the period when Thailand starts increasing imports under RTA schemes.

==== Figure 1 ====

3.2. Overview

We start from the overview of trade creation.¹⁰ Table 3 decomposes imports in 2011. For example, total imports are decomposed into imports from non-members (i) and those from members (ii). The latter imports occupy around 60% of all imports in 2011. The case of (iv) shows that among imports from members, those in "eligible products" are larger. In this table, the eligible products are defined as products in which RTA rates are lower than MFN rates in 2011. Otherwise, products are categorized into "ineligible products". If multiple preference schemes are available (e.g., AJCEP and JTEPA when exporting from Japan), the lower preferential rates are used in this categorization. Among imports in eligible products, 26% (= 614 billion THB / 2,387 billion THB) are the imports under RTA schemes (vii). In other words, even if lower preferential rates are available, most of the imports are under non-RTA schemes (i.e., MFN scheme or other scheme).

==== Table 3 ====

We further decompose imports of eligible products from RTA members under

imports according only to import origin countries. However, in our econometric analysis, we impose some restriction on exporter-product pairs, based on the RTA eligibility.

¹⁰ The product-level distributions of MFN rates, lowest RTA rates, and their difference, i.e., preference margin, in 2009 are provided in Appendix B.

RTA schemes in 2011. In the cases of (viii) and (ix), we identify whether or not such imports existed in 2007 (the start year of our dataset). We can see that more than half of such imports also existed in 2007. Namely, RTA users in 2011 were importers of eligible products from RTA members as of 2007. On the other hand, as shown in the case of (x), most of the RTA users that did not import from members in 2007 also did not import from non-members in 2007. In other words, such users are new importers from RTA members during this period rather than switch import source countries from non-members to members. The switching importers can be found in the case of (xiii), which shows less than 1% of all imports in Thailand. In sum, at least during our sample period, there are few firms that start importing a product from RTA members under RTA schemes by stopping importing that product from non-members, i.e., little firm-level trade creation. Almost all RTA users were either existing importers from RTA members (ix) or new importers (x).

In Table 4, we investigate import patterns in 2007 by RTA users in 2011, in terms of the number of transactions rather than of values. It shows the number and share of import transactions according to the existence of import from members under RTA schemes in 2011 and that of import from non-members in 2007. The former category is further decomposed according to the existence of import from members in 2007. From this table, we can see that most of the firm-product pairs that import under RTA schemes in 2011 do not exist in 2007. The number is 59,541. As a result, we may say that a significant effect of RTA is to create new importers. On the other hand, there are few pairs that imported from not members but non-members in 2007 and import from members under RTA schemes in 2011, i.e., little firm-level trade creation.

==== Table 4 ====

Next, we take an overview of trade diversion. As in Table 3, we decompose imports in 2007 in Table 5. As in 2011, the share of imports from non-members was 40% in 2007 (ii). Among those imports, near 40% are in eligible products (iv). In this table, the eligible products are defined as those for which preferential tariffs under at least one of the RTAs are lower than MFN rates in 2011. In such imports of eligible products from non-members, we focus on those under MFN rates (vi). Around 40% of those imports are by firms that did not import the same products from members in 2007 (viii). Among such a case, around 60% disappear in 2011 (x). Almost all transactions categorized into (x) are by firms do not import also from members in 2011 (xi). Namely, most of the firms that imported eligible products from non-members but not from

members in 2007 not only do not start importing from members but also stop importing from non-members in 2011. In short, such firms exit from import market *per se* rather than switch import sources. The switching cases, particularly firm-level diversion, is shown in (xiv) and (xv), which occupy trivial shares.

==== Table 5 ====

4. Econometric Analysis

This section conducts econometric analyses on the firm-level trade creation and diversion. As mentioned in Section 2, in this section, we focus on firms that imported a concerned product from non-members but did not from RTA members, i.e., case (iii) in Section 2. Then, we examine what kinds of import firm, product, and export country characteristics affect the birth of import from RTA members under RTA schemes and the exit of import from non-members.

4.1. Trade Creation

Let the initial year in Table 1 be 2007. Then, we examine the existence of import from RTA members during 2008-2011. Specifically, we restrict sample firm-product pairs only to those that imported from any non-members but did not import from RTA members in 2007. Then, we examine whether a firm gets engaged in importing a concerned product from each of members in each year under RTA schemes. We drop the import transactions under the other schemes. The products are restricted to those in which RTA rates are lower than MFN rates in each year.¹¹

Our empirical model of firms' choice on importing and utilizing RTA schemes is specified as follows. To take into consideration the fact that RTA users are always importers, we employ the Heckman probit model, of which framework is provided in Van de Ven and Van Pragg (1981). The selection equation describes firms' decision on whether to import a product from a member country in a year or not:

$$y_{IM}^* \equiv \max\{\pi_{MFN}, \pi_{RTA}\} = \mathbf{z}\boldsymbol{\gamma} + u_{IM}, \quad y_{IM} = \begin{cases} 1 & \text{if } y_{IM}^* > 0 \\ 0 & \text{if } y_{IM}^* \leq 0 \end{cases}.$$

For simplicity, we omit firm, product, export country, and year subscripts. π_{MFN} and π_{RTA} are gross profits from importing under MFN and RTA schemes, respectively. A vector of \mathbf{z} includes various elements that affect gross profits from importing. A vector of $\boldsymbol{\gamma}$

¹¹ If a firm imports from members under multiple schemes, we only use observations on the scheme with the largest import values.

indicates coefficients to be estimated. Namely, this equation indicates that firms choose to import if the gross profits from importing under either MFN or RTA scheme become positive.

Then, the outcome equation describes firms' decision on whether using MFN schemes or RTA schemes:

$$y_{RTA}^* \equiv \pi_{RTA} - \pi_{MFN} = \mathbf{x}\boldsymbol{\beta} + u_{FTA}, \quad y_{FTA} = \begin{cases} 1 & \text{if } y_{RTA}^* > 0, y_{IM}^* > 0 \\ 0 & \text{if } y_{RTA}^* \leq 0, y_{IM}^* > 0 \end{cases}$$

A vector of \mathbf{x} includes various elements that affect the difference between gross profits from importing under RTA and MFN schemes. A vector of $\boldsymbol{\beta}$ indicates coefficients to be estimated. This equation indicates that firms choose to import under RTA scheme if the gross profits from importing under RTA scheme are greater than those under MFN scheme. The disturbances in these two equations are assumed to be as follows:

$$u_{IM} \sim N(0,1), \quad u_{RTA} \sim N(0,1), \quad \text{corr}(u_{IM}, u_{RTA}) = \rho.$$

Our independent variables are as follows. A vector of \mathbf{z} includes MFN rates and RTA rates.¹² As discussed in Section 2, we expect that the higher MFN rates or the lower RTA rates encourage firms to import from RTA members. We also introduce a log of export costs per container in export country in order to control for fixed costs for exporting in the export side. On the other hand, a vector of \mathbf{x} includes preference margin. The larger margin will encourage firms to import under RTA schemes rather than under MFN schemes, as found in the previous studies on the determinants of RTA utilization rates.¹³ We also introduce a log of the fees for issuance of certificates of origin (CoOs) in export country, in order to control for fixed costs for RTA utilization in the export side.

In addition, as control variables, in both vectors of \mathbf{z} and \mathbf{x} , we include a log of total imports from the world at a firm-product-level (ln Total Imports), a firm-level dummy variable taking the value one if a firm gets engaged in exporting (Export dummy), a log of GDP, and a log of geographical distance between export country and Thailand. The former two firm-level variables are one-year lagged. Finally, we include year fixed effects to control for import country specific time-variant elements such as demand sizes, into both vectors.¹⁴

¹² If multiple preference schemes are available, the lower preferential rates are used for import observations under MFN schemes. For import observations under RTA schemes, we use preferential rates in the corresponding RTA scheme.

¹³ See footnote 3.

¹⁴ All firm-level data in addition to the data of MFN rates are obtained from Customs, Kingdom of Thailand, as used in the previous section. The data on GDP, which is deflated by GDP deflator, are drawn from World Development Indicator. We obtain the data on geographical distance from CEPII website. The data on CoOs fee are drawn from Table 1 in Hayakawa et al. (2015). Since this variable

The results are reported in column (I) in Table 6. We can find the significant result in ρ , indicating the existence of selection bias in the estimates in the equation of RTA use when simply estimating this model by probit rather than Heckman probit. In the equation of import, as is consistent with our prior expectation, the coefficients for RTA rates and MFN rates are negatively and positively significant, respectively. Namely, the lower RTA rates or the higher MFN rates encourage firms to start importing from RTA members. In the equation of RTA use, the coefficient for preference margin is estimated to be significantly positive, as is consistent with our expectation. Namely, when starting importing products with the larger preference margin from RTA members, firms are more likely to use RTA schemes rather than MFN schemes.

==== Table 6 ====

The results in the other variables are as follows. First, firms are more likely to import from RTA members with the lower export costs and then to utilize RTA schemes when importing from RTA members with the lower CoO fees. These results are consistent with our expectation. Second, larger sized firms in terms of total imports are more likely to import from RTA members but are less likely to utilize RTA schemes when importing. Although we did not consider the existence of fixed costs for switching import sources in Section 2, larger sized firms may be more likely to afford paying such costs. However, the result in RTA utilization is puzzling. When using RTA schemes in importing, firms just need to submit the certificates of origin prepared by exporting firms to customs. Namely, importers always prefer the use of an RTA if exporters afford using RTA schemes. Nevertheless, it is unclear why smaller sized firms are more likely to utilize RTA schemes when importing. Third, non-exporters are more likely to import from RTA members and then to utilize RTA schemes. Fourth, firms are more likely to import from RTA members with the larger economic sizes (i.e., GDP) or from the less distant members but are less likely to utilize RTA schemes when importing from such RTA members.

We present one kind of robustness checks on the above results. In the above analysis, we employ the balanced panel data on import from each of RTA members, in terms of years. For example, the dataset includes observations in all years (i.e., 2008-2011) for each firm-product-RTA member country pair even if positive imports in the corresponding pair appear in the middle year (e.g., 2009) and again exit in the later

is time-invariant, we do not include fixed effects for exporting countries. The basic statistics for our sample are provided in Appendix D.

year (e.g., 2010).¹⁵ However, the decision process by firms may be different before and after the first import from members (at least in our sample period) is started. Therefore, in this robustness check, from the estimation sample, we drop firm-product pairs after those pairs record the first positive imports from any RTA members. The results are reported in column (II) in Table 6 and show the qualitatively same results as those in column (I).¹⁶

4.2. Trade Diversion

Next, we examine the stop of importing from non-members. Specifically, we examine whether import transactions from non-members by firms importing a product from a non-member country but not from any member countries in 2007 continue to exist during 2008-2011. The products are restricted to those in which preferential rates of at least one RTA are lower than MFN rates as of 2008. We estimate a simple probit model on the above-mentioned existence of import transactions from non-member countries. The explanatory variables are same as a vector of \mathbf{z} , except for a log of export cost, which is used as one of the excluded variables in the analysis on trade creation. Another noteworthy difference is that the lowest RTA rates among all of available RTAs in Thailand are used for a variable of RTA rates.

The results are reported in column (I) in Table 7. As is consistent with our discussion in Section 2, the coefficient for MFN rates is estimated to be significantly positive, indicating that firms are more likely to stop importing products with the higher MFN rates from non-members. In contrast, RTA rates have a significantly negative coefficient. Namely, firms are more likely to stop when importing products with the lower RTA rates. In Table 6, we found that firms are more likely to start importing from RTA members in the case of products with the higher MFN rates or the lower RTAs. In particular, the larger difference between MFN rates and RTA rates encourages firms to import from RTA members under RTA schemes. Combining these results with those in import from members, we may say that firms are more likely to switch import sources from non-members to members under RTA schemes when importing products with the higher MFN rates or the lower RTAs.

==== Table 7 ====

¹⁵ See Appendix C1, which introduces the structure of our dataset for trade creation.

¹⁶ Appendix E reports the results of examining the birth of import from RTA members for the fourth case in Section 2. The results are similar to those reported in this subsection.

The other results are the following. First, the significantly negative coefficient for Total Imports indicates that the larger-sized importers are able to cope better with various kinds of idiosyncratic shocks (e.g., demand shocks on import countries) and thus to continue importing from non-members. Second, the coefficient for Export dummy is positively significant. In the analysis for trade creation, we found the significantly negative coefficient for this variable. Therefore, we can say that exporters are more likely to exit from the import market *per se* rather than switch import sources. Third, as found in Besedes and Prusa (2006b), the coefficient for exporter's GDP is significantly negative. The larger GDP in export countries leads to the lower uncertainty on demand there and thus enables exporters to continue devoting production resources to export activities. Last, as is consistent with the result in Nitsch (2009), the coefficient for distance is positively significant. Trading with the more distant countries obviously increases the uncertainty on fixed trade costs and may discourage firms to continue trading.

As in the case of trade creation, we present one kind of robustness checks on the above results. Namely, we drop firm-product pairs after those pairs record the first exit of import from any non-members because the decision process by firms may be different before and after the first exit of import from non-members (at least in our sample period).¹⁷ The results are reported in column (II) in Table 7 and show the qualitatively same results as those in column (I). In particular, the coefficient for MFN rates is estimated to be significantly positive.¹⁸

4.3. Intensive Margin

In this subsection, we examine the magnitude of imports from RTA members under RTA schemes and that of those from RTA non-members.¹⁹ The former magnitude is explored by estimating the Heckman model. The selection equation is formalized as in the outcome equation for the analysis of trade creation in Section 4.1. Namely, imports from an RTA member under RTA schemes can be observed only if gross profits from importing under RTA schemes are greater than those from importing under MFN schemes. As in Section 4.1, this relationship is specified as follows.

$$\mathbf{x}\boldsymbol{\beta} + u_{Extensive} > 0.$$

The outcome equation is a simple linear equation:

¹⁷ See Appendix C2, which introduces the structure of our dataset for trade diversion.

¹⁸ Appendix E reports the results of examining the exit of import from RTA non-members for the fourth case in Section 2. The results are similar to those reported in this subsection.

¹⁹ We again focus on firms that imported a concerned product from non-members but did not from RTA members, i.e., case (iii) in Section 2.

$$\ln \text{Imports} = \mathbf{z}\boldsymbol{\gamma} + u_{\text{Intensive}}$$

The dependent variable is a log of imports from an RTA member under RTA schemes. We do not include a log of export costs per container in a vector of \mathbf{z} here because fixed costs for exporting are expected not to affect the intensive margin (Helpman, Melitz, and Rubinstein, 2008). Also, the MFN rates are not included in this analysis on the imports under RTA schemes to focus on the effect of corresponding tariff rates on intensive margin.

The results are shown in column “Trade Creation” in Table 8. The most important result in the outcome equation (i.e., Intensive) is that RTA rates have a significantly negative coefficient. Namely, the imports of products with the lower RTA rates are larger. The noteworthy results in other variables are as follows. First, in the selection equation (i.e., RTA Use), GDP has a significantly positive coefficient, unlike the case of the outcome equation in Table 6, which takes into account the selection of importing. Namely, our result of export country’s GDP in RTA utilization is not robust and is unclear. Furthermore, the coefficient for GDP is negatively significant in the outcome equation. This result is not consistent with the typical results in gravity studies though the dimension of analysis is different (i.e., firm-product level or national level). Second, the significantly positive coefficient for Total Imports in Intensive will be a natural result.

==== Table 8 ====

Next, the magnitude of imports from non-members is examined by estimating the above outcome equation by ordinary least square (OLS) method. However, contrast to the above analysis, RTA rates are not included in this analysis on the imports from non-members. Instead, we introduce MFN rates into a vector of \mathbf{z} . The results are reported in column “Trade Diversion” in Table 7. Naturally, the coefficient for MFN rates is estimated to be significantly negative, indicating that the imports of products with the lower MFN rates are larger. The other variables have coefficients similar to the case of Trade Creation, in terms of signs.

5. Concluding Remarks

Using highly-detailed import data in Thailand, this paper examined firm-level trade creation and diversion of RTAs. Specifically, focusing on firms that imported a concerned product from non-members but did not from RTA members in the initial year,

we empirically investigated the birth of import from RTA members under RTA schemes and the stop of import from non-members at a firm-level. Our findings can be summarized as follows. Economic mechanisms work in the firm-level trade creation and diversion of RTAs. Namely, firms are more likely to stop importing products with the lower RTA rates or the higher MFN rates from non-members, but to start importing such products from RTA member countries. The magnitude of firm-level imports from RTA members and non-members is larger when importing products with the lower RTA rates and the lower MFN rates, respectively.

However, from the quantitative point of view, there are very few firms that switch import sources from non-members to RTA members through the introduction of RTA schemes. Most of the future RTA users have also imported a concerned product from RTA countries before their introduction. Or such users did not import that product at all before that. Furthermore, firms that imported from non-members before their introduction are likely to exit from the import market after that rather than switch to import from RTA members.

Our result of few “switching importers” will be because countries are likely to form RTAs with “natural trading partners”. Namely, countries tend to have large trade values with the future RTA partners even before their formation, as shown in Magee (2003) and Baier and Bergstrand (2004). Therefore, the future RTA users were likely to import a concerned product from RTA countries before the introduction of RTAs. This implies that the theoretical model well incorporating the selection process of RTA partners will not generate large trade diversion effects.

Finally, the case of Thailand in 2008-2011 provides an ideal sample set to assess the significance of trade creation and diversion at the micro level because this is at the timing of introducing RTA schemes in usage. How far we can generalize this case for other parts of the world at different timings is of course a matter of discussion. However, at least we can say that trade creation and diversion in the RTA formation may be over-emphasized in both the past academic literature and policy debates.

Appendix A. The Other Schemes

In addition to RTAs, there are five other privilege schemes in which importing firms in Thailand could enjoy preferential tariff treatments; namely, bonded warehouses, free zones, investment promotion, duty drawback for raw materials imported for the production of export, and duty drawback for re-exportation. While benefits under the first three are realized immediately at the time of importation, those under the latter two schemes are essentially the refund of the duty already paid which is collected when the exportation or re-exportation is achieved. The benefits offered under these five schemes, which may also vary among schemes, are different from those under RTAs at least in the following six aspects.

First, beneficiaries are different. Under RTAs, beneficiaries can be any importers, no matter what such goods are used for. In other words, they can be either manufacturers for domestic market, manufacturers for export markets, traders who import and distribute goods to customers, or final users of importing goods. Unlike RTAs, beneficiaries under bonded warehouses, free zones, and duty drawback schemes are required to be firms that import goods only for their production and exporting activities. For imports under investment promotion, beneficiaries are mixed depending upon the imported goods. For imports of machinery, beneficiaries could be manufacturers for either domestic or export markets. On the other hand, only manufacturers for export markets benefit from the investment promotion scheme during the importation of raw materials.

Second, lists of eligible goods are different. Under RTAs, eligible goods can be any goods tagged in the inclusion list. In other words, subject to negotiations among RTA members, they can be either raw materials, machinery, or final products. Unlike RTAs, eligible goods are mainly raw materials in most of the five schemes. Machinery to be used in the production process is ineligible under all except for free zones and investment promotion schemes. Imported goods to be used as final products are ineligible under all schemes. It is noted that duty drawback for re-exportation is applicable to any goods – either raw materials, machinery, or final products, provided that such goods do not undergo any transformation since the time they are imported until they are exported.

Third, the depths of customs duty reduction are different. Under RTAs, while tariffs for a large portion of traded goods are totally eliminated, some are still non-zero subject to their sensitiveness in liberalization and RTA's maturity. Tariff reductions under the five schemes vary, but most of them are deeper than RTAs. Tariffs for all raw materials imported under free zones, investment promotion, and bonded warehouses

schemes are virtually exempted. For machinery, imports under free zones are tariff-free while those under the investment promotion scheme may be either tariff-free or subject to a 50% tariff reduction, depending upon the decision by the Board of Investment of Thailand. Under the duty drawback schemes, firms may ask either for a full refund if raw materials are imported for the production of export or for nine-tenth or the excess of one thousand Thai baht of the duty already paid, whichever is higher, if goods are imported for re-exportation.

Fourth, benefits from exemption of other duties are different. On top of tariff reduction, certain schemes grant additional duty privileges to firms. The exemption of excise tax exists for goods imported under bonded warehouse and duty drawback for raw materials imported for the production of export. Privileges for firms in the free zones are among the top since imported goods are free of tariff, excise tax, and value-added tax.

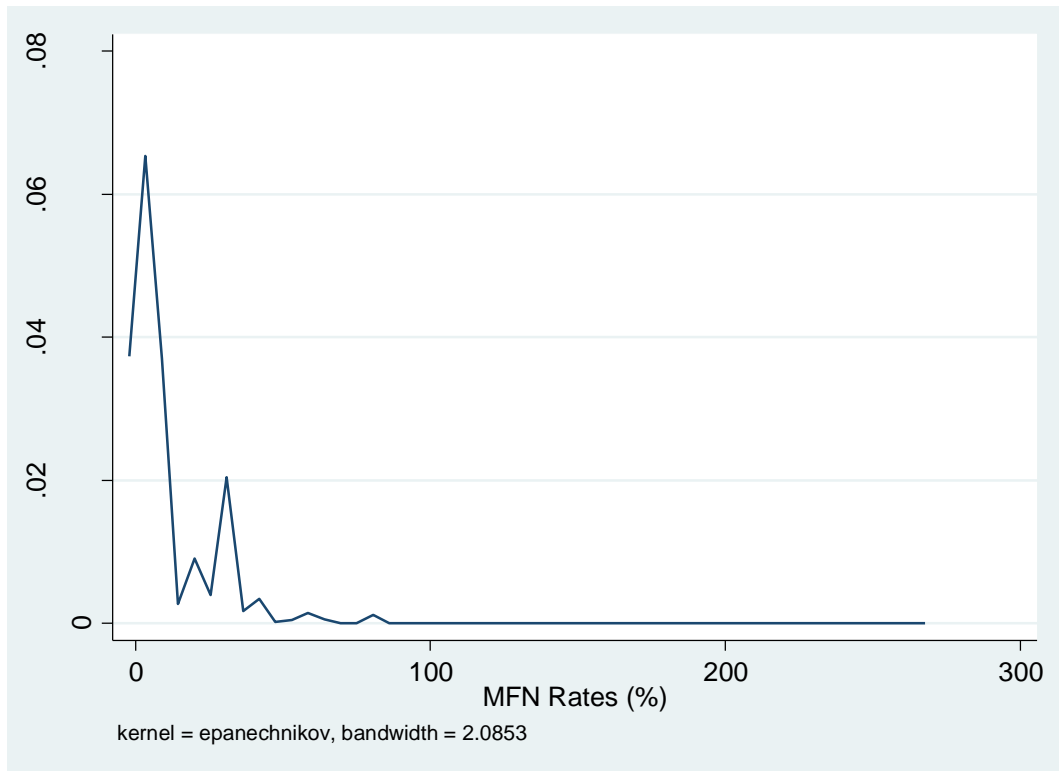
Fifth, qualification is different. Under RTAs, qualified goods are required to be produced in the RTA-member countries and meet the relevant originating criteria specified in the rules of origin. Failure to do so turns such goods unqualified and causes the denial of benefits under RTAs. On the other hand, it is totally not an issue for the importation under the five privilege schemes. It means that goods qualified for the schemes may be produced in and exported from anywhere in the world.

Last, burdens on importers to prove the eligibility are different. In order to claim benefits under the five schemes, importers are required to submit evidence of compliance to the authority in charge. The evidence of compliance includes production formula, necessity claim that explains why imports are preferred to locally produced goods, and other relevant documents. To some extent, this inevitably results in higher compliance cost. On the other hand, this evidence is not required for importers claiming for preferential benefits under RTAs. The only evidence needed is the certificate of origin issued by a competent authority in the exporting country. As a result, the burden and cost of proving the eligibility under RTAs is imposed mainly on exporters.

In conclusion, benefits offered and costs imposed vary among import schemes. Such differences may either encourage or discourage firms to switch their imports among RTAs, other privilege schemes, and MFN scheme. In addition to the lower cost of compliance, the broader coverage of eligible goods and beneficiaries who are able to claim preferential tariff treatments are advantages of the import switching to RTAs. On the contrary, the depths of customs duty reduction, the offer of other kinds of duty reduction, and the goods originating status requirement are among the top reasons why firms either switch to or remain in the other privilege schemes.

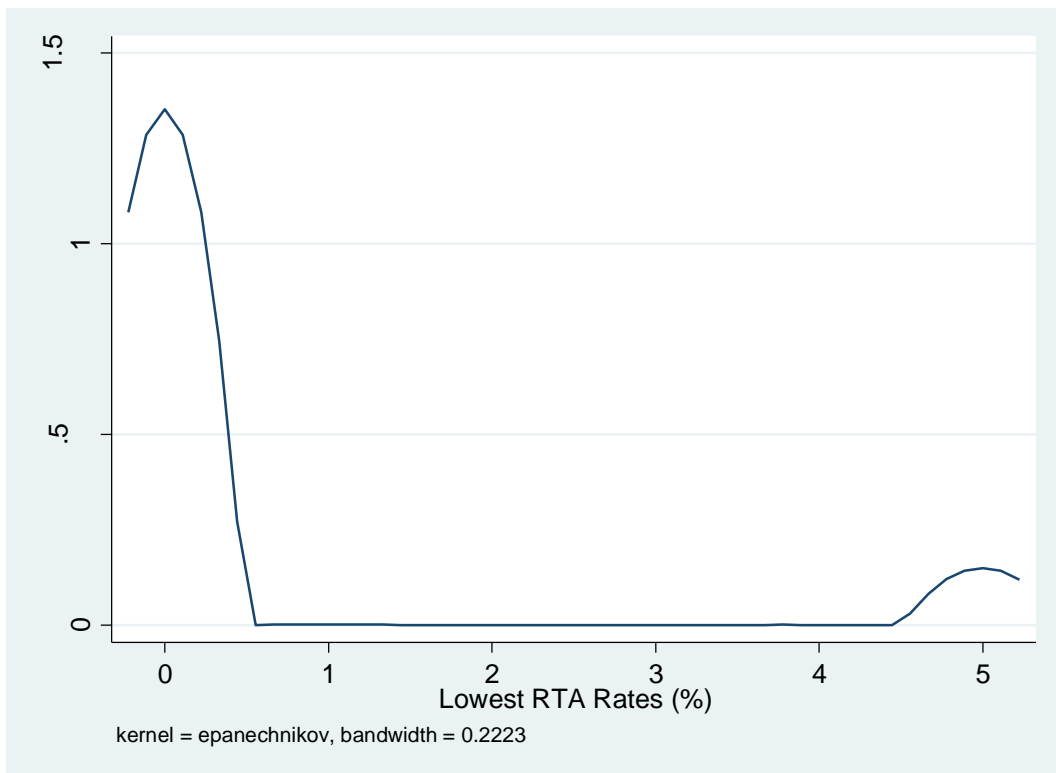
Appendix B. Tariff Rates in Thailand in 2009

Figure B1. Distribution of MFN Rates in 2009



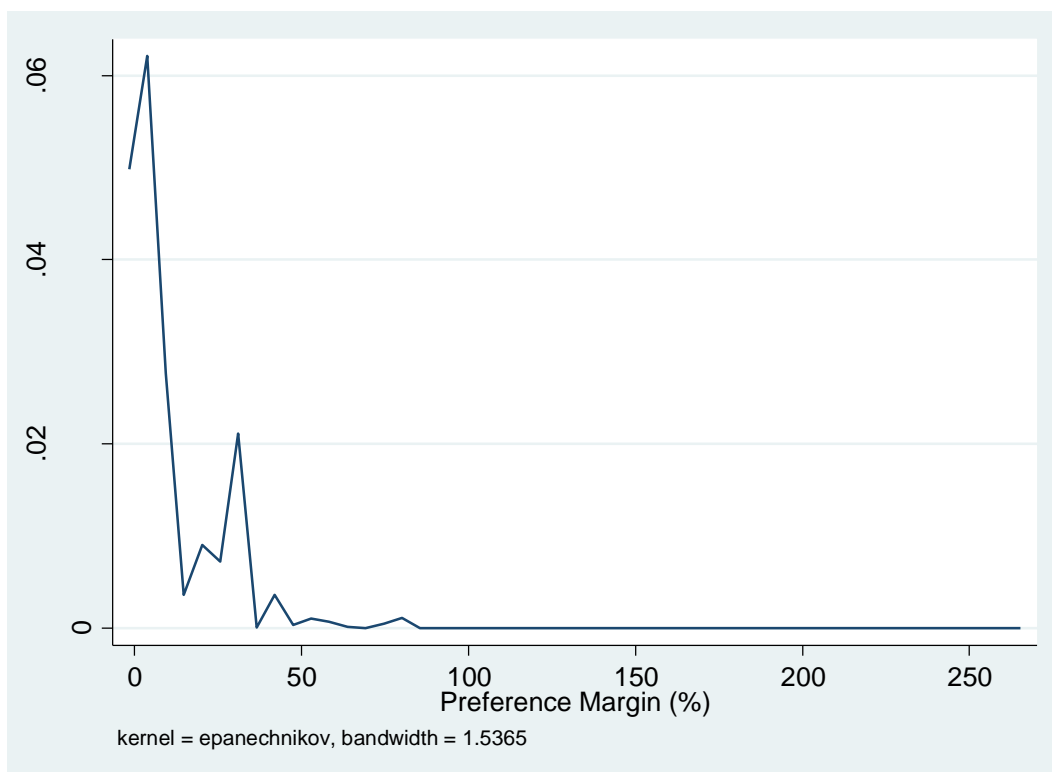
Source: Customs, Kingdom of Thailand

Figure B2. Distribution of Lowest RTA Rates in 2009



Source: Customs, Kingdom of Thailand

Figure B3. Distribution of Preference Margin in 2009



Source: Customs, Kingdom of Thailand

Appendix C. Construction of Dataset for Estimation

This appendix explains how we construct our datasets for econometric analyses. Such datasets for trade creation and diversion are separately introduced.

C1. Dataset for Trade Creation

We start from identifying importers from non-members in 2007. Thus, we restrict import data to those of import transactions from non-members in 2007, in which we leave information on firm ID, export country (Exporter), HS code, and import values (Values). In this dataset, only observations with positive import values are kept. Next, using these information, we construct the list of import firm-HS code pairs that existed in 2007, of which example is shown in Dataset 1 in Figure C1. Then, for each pair, we make a balanced panel dataset in terms of RTA member countries (15 countries in total) and years (2007-2011).²⁰ As a result, we obtain the dataset as shown in Dataset 2. Taking this dataset as master data, we merge the data on imports from RTA members according to firm, HS code, export country, and year. Finally, while we put zero value for imports in the unmatched part of the master data, the unmatched part of the data on imports from RTA members is dropped. As explained in Section 4.1, we further drop some kinds of observations.

Figure C1. Dataset for Trade Creation

Dataset 1			Dataset 2			
Firm ID	HS code		Firm ID	HS code	Exporter	Year
1	XXXX	➔	1	XXXX	Country 1	2007
1	YYYY		1	XXXX	Country 2	2007
3	ZZZZ		1	XXXX	:	2007
:	:		1	XXXX	Country 15	2007
			1	XXXX	Country 1	2008
			1	XXXX	Country 2	2008
			1	XXXX	:	2008
			1	XXXX	Country 15	2008
			1	XXXX	Country 1	2009
			1	XXXX	:	:
			1	XXXX	Country 15	2011
			1	YYYY	Country 1	2007
			1	YYYY	:	:
			1	YYYY	Country 15	2011
			3	ZZZZ	Country 1	2007
			3	ZZZZ	:	:
			3	ZZZZ	Country 15	2011
			:	:	:	:

²⁰ More precisely, as mentioned in Section 3.1, 14 countries are included as RTA member countries during 2007-2009. Namely, Korea is not included. For 2010 and 2011, we have 15 countries.

C2. Dataset for Trade Diversion

When constructing the dataset for trade diversion, we first restrict our original dataset only to observations of import from RTA non-members, as shown in Dataset 3 in Figure C2. Next, after deleting firm-HS code-exporter pairs that do not exist in 2007, we construct the balanced panel between firm-HS code-exporter pair and year. The example is presented in Dataset 4. Notice that an observation of “Firm 3-ZZZZ-USA” is dropped in Dataset 4 because of its non-existence in 2007. In this dataset, we put zero for Values in newly-created years. Then, we construct a list of firm-HS code pairs that have positive imports from RTA members in 2007, which is like Dataset 1 in Figure C2. Finally, we merge this list with Dataset 4 according to firm-HS codes. The unmatched part of the list is deleted. As explained in Section 4.2, we further drop some kinds of observations.

Figure C2. Dataset for Trade Diversion

Dataset 3					Dataset 4				
Firm ID	HS code	Exporter	Year	Values	Firm ID	HS code	Exporter	Year	Values
1	XXXX	USA	2007	40	1	XXXX	USA	2007	40
1	XXXX	USA	2008	10	1	XXXX	USA	2008	10
1	XXXX	USA	2009	14	1	XXXX	USA	2009	14
1	XXXX	USA	2010	39	1	XXXX	USA	2010	39
1	XXXX	USA	2011	32	1	XXXX	USA	2011	32
1	YYYY	France	2007	54	1	YYYY	France	2007	54
1	YYYY	France	2009	25	1	YYYY	France	2008	0
2	XXXX	UK	2007	75	1	YYYY	France	2009	25
3	ZZZZ	USA	2009	42	1	YYYY	France	2010	0
:	:	:	:	:	1	YYYY	France	2011	0
					2	XXXX	UK	2007	75
					2	XXXX	UK	2008	0
					2	XXXX	UK	2009	0
					2	XXXX	UK	2010	0
					2	XXXX	UK	2011	0
					:	:	:	:	:

Appendix D. Basic Statistics

Table D1. Basic Statistics in Trade Creation

	Obs	Mean	Std. Dev.	Min	Max
Statistics for (I) in Table 6					
Import	9,166,871	0.007	0.080	0	1
RTA Use	59,648	0.062	0.240	0	1
ln (1+MFN rates)	9,166,871	0.089	0.072	0.000	1.297
ln (1+RTA rates)	9,166,871	0.013	0.028	0	1.140
Preference Margin	9,166,871	0.083	0.080	0.000	2.657
ln Total Imports	9,166,871	17.407	2.721	4.143	26.412
Export dummy	9,166,871	0.694	0.461	0.000	1.000
ln GDP	9,166,871	29.307	2.038	25.839	32.882
ln Distance	9,166,871	7.609	0.884	6.264	9.198
ln CoO Fee	9,166,871	1.917	1.271	0.000	3.932
ln Export Cost	9,166,871	6.444	0.417	5.748	7.473
Statistics for (II) in Table 6					
Import	8,292,312	0.003	0.058	0	1
RTA Use	28,380	0.042	0.201	0	1
ln (1+MFN rates)	8,292,312	0.089	0.072	0.000	1.297
ln (1+RTA rates)	8,292,312	0.013	0.028	0	1.140
Preference Margin	8,292,312	0.082	0.080	0.000	2.657
ln Total Imports	8,292,312	17.320	2.733	4.143	26.412
Export dummy	8,292,312	0.686	0.464	0.000	1.000
ln GDP	8,292,312	29.294	2.036	25.839	32.882
ln Distance	8,292,312	7.606	0.885	6.264	9.198
ln CoO Fee	8,292,312	1.920	1.271	0.000	3.932
ln Export Cost	8,292,312	6.445	0.417	5.748	7.473
Statistics for Table 8					
RTA Use	59,648	0.062	0.240	0	1
ln Imports	59,648	10.668	2.644	0	20.669
Preference Margin	59,648	0.084	0.076	0.000	0.750
ln Total Imports	59,648	18.464	2.399	7.641	26.412
Export dummy	59,648	0.773	0.419	0.000	1.000
ln GDP	59,648	31.522	1.476	25.839	32.882
ln Distance	59,648	7.946	0.528	6.264	9.198
ln CoO Fee	59,648	1.977	0.974	0.000	3.932

Table D2. Basic Statistics in Trade Diversion

	Obs	Mean	Std. Dev.	Min	Max
Statistics for (I) in Table 7					
Import Exit	851,572	0.739	0.439	0	1
ln (1+MFN rates)	851,572	0.087	0.071	0.000	1.297
ln (1+RTA rates)	851,572	0.005	0.015	0	0.049
ln Total Imports	851,572	17.497	2.687	4.143	26.412
Export dummy	851,572	0.702	0.457	0	1
ln GDP	851,572	31.917	1.339	22.101	33.806
ln Distance	851,572	8.972	0.603	7.339	9.889
Statistics for (II) in Table 7					
Import Exit	347,253	0.568	0.495	0	1
ln (1+MFN rates)	347,253	0.089	0.073	0.000	1.297
ln (1+RTA rates)	347,253	0.008	0.018	0	0.049
ln Total Imports	347,253	17.373	2.729	4.143	26.412
Export dummy	347,253	0.668	0.471	0	1
ln GDP	347,253	31.975	1.327	22.298	33.806
ln Distance	347,253	8.970	0.604	7.339	9.889
Statistics for Table 8					
ln Imports	170,821	11.737	2.481	0	22.885
ln (1+MFN rates)	170,821	0.085	0.069	0.000	1.297
ln Total Imports	170,821	17.832	2.274	7.080	26.412
Export dummy	170,821	0.693	0.461	0	1
ln GDP	170,821	32.037	1.261	24.522	33.806
ln Distance	170,821	9.001	0.573	7.339	9.889

Appendix E. Extensive Margin for Case (iv)

This appendix reports the estimation results for firms categorized into the fourth case in Section 2. Specifically, we examine the birth of import from RTA members and the exit of import from RTA non-members. Explanatory variables are same as in Section 4. For the former analysis, we keep firm-product pairs that existed in 2007, in the dataset for trade creation, which is explained in Appendix C1. As in the baseline analysis in Section 4.1, we do not drop firm-product pairs after those pairs record the first positive imports from any RTA members because all pairs exist in 2007 in this estimation. The estimation results are reported in column “RTA Members”. For the latter analysis, we keep firm-product pairs in which any positive imports from RTA members were recorded in 2007, in the dataset for trade diversion, which is explained in Appendix C2. As in the analysis for the robustness check in Section 4.2, we drop firm-product pairs after those pairs record the first exit of import from any non-members. The estimation results are reported in column “RTA Non-members”.

Table E1. Extensive Margin for Case (iv)

	RTA Members				RTA Non-members	
	Import		RTA Use		Coef.	S.E.
	Coef.	S.E.	Coef.	S.E.		
ln (1+MFN rates)	0.644***	[0.023]			0.383***	[0.050]
ln (1+RTA rates)	-0.611***	[0.042]			-0.513***	[0.190]
Preference Margin			0.287***	[0.037]		
ln Total Imports	0.078***	[0.001]	-0.080***	[0.001]	-0.011***	[0.002]
Export dummy	0.015***	[0.005]	-0.114***	[0.007]	0.033***	[0.010]
ln GDP	0.456***	[0.002]	-0.417***	[0.003]	-0.099***	[0.003]
ln Distance	-0.344***	[0.006]	0.596***	[0.007]	0.036***	[0.006]
ln CoO Fee			0.001	[0.002]		
ln Export Cost	-0.345***	[0.007]				
Rho			-0.980	[0.002]		
Chi-squared statistics			3315.24			
Number of observations			2,342,424		149,922	
Censored observations			2,217,284			
Uncensored observations			125,140			
Pseudo R-squared					0.0628	
Log pseudolikelihood			-411539		-95809	

Notes: “Coef.” and “S.E.” show coefficients and the robust standard errors. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In all specifications, we include year dummy variables.

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Table 1. Import Pattern

	Import Status in the Initial Time	
	From RTA Members	From Non-members
(i)	NO	NO
(ii)	YES	NO
(iii)	NO	YES
(iv)	YES	YES

Table 2. RTAs by Thailand during Our Sample Period

FTAs	Members	Implementation
ASEAN Free Trade Area (AFTA)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	1993
Thailand-India FTA (TIFTA): Early harvest	India and Thailand	2004
Thailand-Australia FTA (TAFTA)	Australia and Thailand	2005
ASEAN-China FTA (ACFTA)	Brunei, Cambodia, China Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	2005
Thailand-New Zealand Closer Economic Partnership Agreement (TNZCEP)	New Zealand and Thailand	2005
Japan-Thailand Economic Partnership Agreement (JTEPA)	Japan and Thailand	2007
ASEAN-Japan Economic Partnership Agreement (AJCEP)	Brunei, Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	2009
ASEAN-Republic of Korea FTA (AKFTA)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Korea, Singapore, Viet Nam, and Thailand	2010
ASEAN-Australia-New Zealand FTA (AANZFTA)	Australia, Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, New Zealand, Philippines, Singapore, Viet Nam, and Thailand	2010
ASEAN-India FTA (AIFTA)	Brunei, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	2010

Source: Legal texts of RTAs

Table 3. Decomposition of Imports in 2011: Trade Creation (Million THB)

	Value	Share
(i) Imports from non-members in 2011	2,798,638	0.42
(ii) Imports from members in 2011	3,873,102	0.58
(iii) of an ineligible product	1,486,225	0.22
(iv) of an eligible product	2,386,877	0.36
(v) Scheme of imports from members in 2011 = MFN	946,411	0.14
(vi) Scheme of imports from members in 2011 = Others	825,607	0.12
(vii) Scheme of imports from members in 2011 = RTA	614,860	0.09
(viii) Existence of import of that product from that member in 2007 = YES	384,269	0.06
(ix) Existence of import of that product from that member in 2007 = NO	230,591	0.03
(x) Existence of import of that product from non-members in 2007 = NO	206,168	0.03
(xi) Existence of import of that product from non-members in 2007 = YES	24,423	0.00
(xii) Existence of import of that product from non-members in 2011 = YES	18,419	0.00
(xiii) Existence of import of that product from non-members in 2011 = NO	6,005	0.00
(xiv) Total	6,671,740	1.00

Source: Authors' computation.

Table 4. Import Patterns in 2007 by RTA Users in 2011

		Import from Members under RTA in 2011			
		NO		YES	
		Import from Members in 2007		Import from Members in 2007	
		NO	YES	NO	YES
Import from Non-members in 2007					
NO	Number	552,631	93,154	59,541	17,447
	Share	0.65	0.11	0.07	0.02
YES	Number	73,289	44,368	1,874	6,182
	Share	0.09	0.05	0.00	0.01

Source: Authors' computation.

Table 5. Decomposition of Imports in 2007: Trade Diversion (Million THB)

	Value	Share
(i) Imports from members in 2007	2,898,477	0.60
(ii) Imports from non-members in 2007	1,969,455	0.40
(iii) of an ineligible product	1,237,313	0.25
(iv) of an eligible product	732,142	0.15
(v) under Others	278,611	0.06
(vi) under MFN	453,531	0.09
(vii) Existence of import of that product from any members in 2007 = YES	259,421	0.05
(viii) Existence of import of that product from any members in 2007 = NO	194,110	0.04
(ix) Existence of that import from that non-member in 2011 = YES	73,139	0.02
(x) Existence of that import from that non-member in 2011 = NO	120,971	0.02
(xi) Existence of import of that product from any members in 2011 = NO	110,411	0.02
(xii) Existence of import of that product from any members in 2011 = YES	10,560	0.00
(xiii) Scheme of that import from members in 2011 = MFN/Others	8,824	0.00
(xiv) Scheme of that import from members in 2011 = RTA	803	0.00
(xv) Scheme of that import from members in 2011 = "MFN/Others" & RTA	933	0.00
(xvi) Total	4,867,932	1.00

Source: Authors' computation.

Table 6. Trade Creation: Extensive Margin

	(I)		(II)	
	Import	RTA Use	Import	RTA Use
ln (1+MFN rates)	0.547*** [0.022]		0.247*** [0.030]	
ln (1+RTA rates)	-0.534*** [0.053]		-0.225*** [0.068]	
Preference Margin		0.147*** [0.056]		0.536*** [0.104]
ln Total Imports	0.064*** [0.001]	-0.058*** [0.002]	0.051*** [0.001]	-0.039*** [0.003]
Export dummy	-0.013*** [0.004]	-0.070*** [0.010]	0.020*** [0.006]	-0.113*** [0.018]
ln GDP	0.313*** [0.002]	-0.291*** [0.006]	0.284*** [0.002]	-0.233*** [0.012]
ln Distance	-0.188*** [0.006]	0.550*** [0.011]	-0.152*** [0.007]	0.573*** [0.023]
ln CoO Fee		-0.029*** [0.005]		-0.028*** [0.010]
ln Export Cost	-0.427*** [0.007]		-0.433*** [0.009]	
Rho		-0.936 [0.007]		-0.914 [0.014]
Chi-squared statistics		1014.7		1014.7
Number of observations		9,166,871		8,292,312
Censored observations		9,107,223		8,263,932
Uncensored observations		59,648		28,380
Log pseudolikelihood		-318194		-168697

Notes: The parenthesis is the robust standard errors. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In all specifications, we include year dummy variables.

Table 7. Trade Diversion: Extensive Margin

	(I)	(II)
ln (1+MFN rates)	0.280*** [0.021]	0.459*** [0.032]
ln (1+RTA rates)	-1.143*** [0.105]	-1.131*** [0.127]
ln Total Imports	-0.055*** [0.001]	-0.057*** [0.001]
Export dummy	0.164*** [0.004]	0.116*** [0.006]
ln GDP	-0.053*** [0.001]	-0.044*** [0.002]
ln Distance	0.028*** [0.003]	0.037*** [0.005]
Number of observations	851,572	347,253
Pseudo R-squared	0.0126	0.1243
Log pseudolikelihood	-482312	-207913

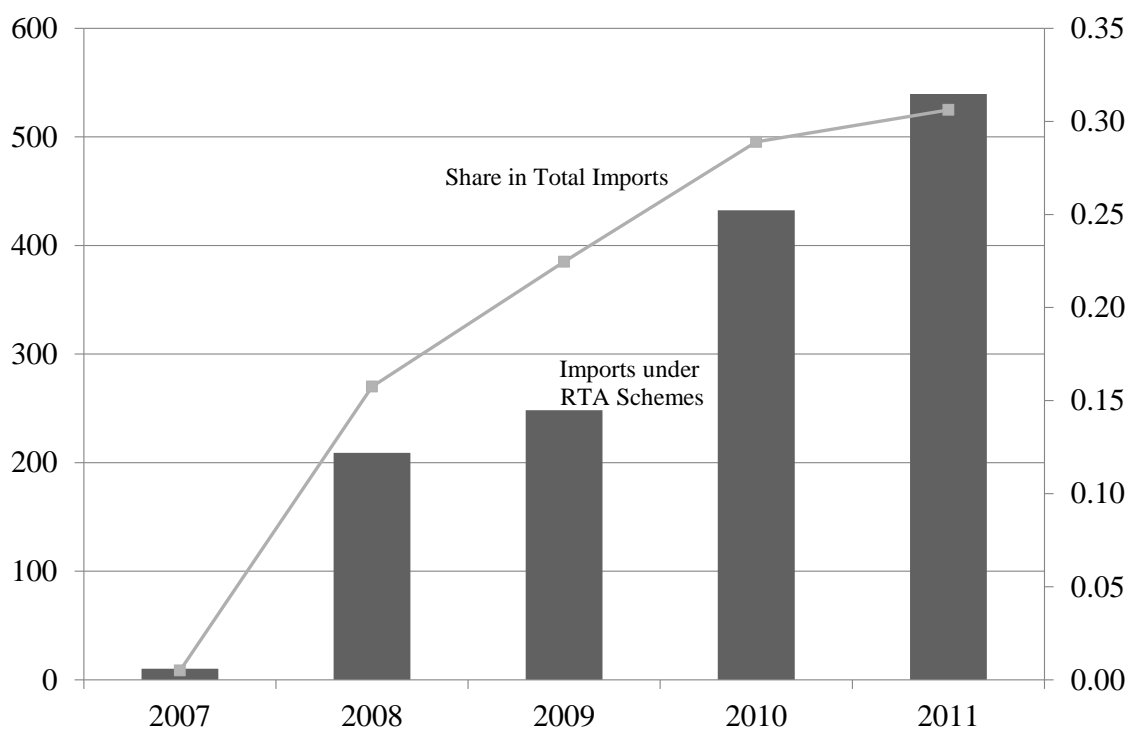
Notes: The parenthesis is the robust standard errors. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In all specifications, we include year dummy variables.

Table 8. Trade Creation and Diversion: Intensive Margin

	Trade Creation				Trade Diversion	
	RTA Use		Intensive		Intensive	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
ln (1+MFN rates)					-2.032***	[0.097]
ln (1+RTA rates)			-2.946**	[1.297]		
Preference Margin	1.787***	[0.104]				
ln Total Imports	-0.015***	[0.004]	0.264***	[0.020]	0.168***	[0.003]
Export dummy	-0.214***	[0.022]	-0.240***	[0.085]	-0.376***	[0.015]
ln GDP	0.100***	[0.009]	-0.084**	[0.035]	-0.036***	[0.006]
ln Distance	0.442***	[0.028]	0.033	[0.104]	0.029**	[0.013]
ln CoO Fee	-0.150***	[0.010]				
Rho			0.184	[0.073]		
Chi-squared statistics			6.03			
Number of observations			59,648		170,821	
Censored observations			55,972			
Uncensored observations			3,676			
R-squared					0.0371	
Log pseudolikelihood			-20664			

Notes: “Coef.” and “S.E.” show coefficients and the robust standard errors. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. In all specifications, we include year dummy variables.

Figure 1. RTA Imports in Thailand (Billion THB)



Source: Authors' computation.