Non-conventional provisions in regional trade agreements : do they enhance international trade?

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Abstract

The scope of recent regional trade agreements (RTAs) is becoming much wider in terms of including several provisions such as competition policy or intellectual property. This paper empirically examines how far advanced, non-conventional provisions in RTAs increase trade values among RTA member countries, by estimating the gravity equation with more disaggregated indicators for RTAs. As a result, we find that the provision on competition policy has the largest impacts on trade values, following that on government procurement. Our further analysis reveals that the more significant roles of these two provisions can be also observed in the impacts on the intensive and extensive margins.

Keywords: Gravity; RTA; Extensive and intensive margins
JEL classification: F15; F20; F53

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Non-conventional Provisions in Regional Trade Agreements: Do They Enhance International Trade?

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1. Introduction

The coverage and depth of preferential treatment varies from one regional trade agreement (RTA) to another. Modern RTAs, and not exclusively those linking the most developed economies, tend to go far beyond tariff-cutting exercises. They provide for increasingly complex regulations governing intra-trade (e.g. with respect to standards, safeguard provisions, customs administration, etc.) and they often also provide for a preferential regulatory framework for mutual services trade. The most sophisticated RTAs go beyond traditional trade policy mechanisms, to include regional rules on investment, competition, environment and labour.

World Trade Organization (WTO) website

The scope of recent RTAs is becoming much wider. RTAs had been traditionally taken as a means to mainly reduce tariff rates. While their elimination is still the major purpose of RTAs, recently-concluded RTAs include various provisions on mobility of persons, government procurement, competition policy, intellectual property, E-commerce, dispute settlement, labor standards, environmental policy, technical cooperation, institutional mechanism, and so on. The coverage and depth of these provisions go beyond those in the WTO agreements such as the Government Procurement Agreement (GPA) or the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). For example, with the provision on government procurement, RTAs can lead to lower trade barriers in government procurement in developing (and some developed) countries that did not sign the GPA. Also, the provision on government procurement in RTAs can require lower monetary thresholds for contracts than the case of GPA. In turn, such “extended RTAs” not only reduce tariff rates but also enhance the cooperation and linkage in various economic fields among member countries.

In this paper, we empirically examine how far advanced, non-conventional provisions in RTAs increase trade values among RTA member countries. There are significant varieties among RTAs on which provision the RTA includes. For example, ASEAN-China Free Trade Area, South Asian Free Trade Area agreement,

Australia-Chile Free Trade agreement, and Economic Cooperation Organisation Trade Agreement do not include a provision on government procurement, that of intellectual property, that of competition policy, and that of dispute settlement, respectively. In contrast, North American Free Trade Agreement (NAFTA) incorporates all of these four provisions. As a result, if the existence of each provision has significant trade creation effects, such differences in RTAs' scope can lead to heterogeneous impacts on trade among RTAs, even though the magnitude of tariff reduction is identical among RTAs. In short, our analysis will contribute to detecting heterogeneous impacts of RTAs as well as to clarifying which provision matters in terms of the magnitude of trade creation effects. The results from our analysis can be useful in designing an RTA that would maximize the trade creation effects.

In order to assesssuch heterogeneous impacts of RTAs, we estimate the well-known gravity equation. In the literature of RTA evaluation, several studies have estimated the gravity equation with RTA dummy variables (e.g. Baier and Bergstrand, 2007; Caporale et al., 2009; Medvedev, 2010; Vicard, 2009). The typical dummy variable is the one taking unity if trading countries belong to the same RTA and zero otherwise. We decompose this simple one-zero RTA dummy into five variables. Among these five variables, one is applied bilateral tariff rates in order to capture the primary trade creation effects, i.e. the effects of tariff reduction. The rest of the variables are dummy variables indicating the existence of various non-conventional provisions in RTAs, namely government procurement, competition policy, intellectual property, and dispute settlement. For example, the government procurement dummy takes unity if the concerned RTA includes the provision on government procurement and zero otherwise. Other dummy variables are similarly defined. These four provisions are chosen because of the relative ease in identifying them in the agreements.[1] We investigate whether the coefficient for each of those variables in the gravity equation is estimated to be significantly positive or not.

Our decomposition of trade creation effects of RTAs contributes to the above-mentioned literature of RTA evaluation by gravity equations. In particular, our paper may be closest to Vicard (2009). He decomposes the simple one-zero RTA

[1] The existence of non-conventional provisions such as investment chapter is not examined in this paper because the depth of those provisions varies wildly among RTAs.

dummy variable according to the form/type of RTA, i.e., into four dummy variables of preferential arrangements, free trade agreements, customs unions and common markets. The assumption underlying in his analysis is that the coverage of RTAs is different among RTA types. For example, the preferential arrangement is expected to have the least coverage. Contrary to this expectation, his finding is that the magnitude of trade creation effects is not significantly different among those RTA types. Against his paper, as mentioned above, we decompose the simple RTA dummy according to specific functions of RTA. In other words, this paper explicitly measures the depth of RTAs by identifying several functions of RTA individually and examines the relationship between each function and its trade creation effects. Such an analysis will be a more direct and appropriate analysis on the relationship between the depth of RTAs and their trade creation effects.

In this paper, we also examine trade creation effects in more detail, by differentiating them into so-called “intensive margin” and “extensive margin”. Recently, the literature has investigated changes in trade values by decomposing those into changes in the number of varieties traded (extensive margin) and changes in trade values per variety (intensive margin). Some studies point to the importance of the extensive margin while others, the intensive margin. So far, the existing literature has produced mixed results. For example, Felbermayr and Kohler (2006) find that from 1950 to 1997, 40% of world trade growth came from extensive margin. Also, Debaere and Mostashari (2010) examine the changes in the impact of tariff reduction on extensive margin and find small effects of tariff reductions on extensive margin, relative to the overall growth in international trade. On the other hand, Liu (2009) finds that GATT/WTO has promoted trade in not only extensive margin but also intensive margin. In order to reach some conclusions, we need to further examine closely the changes of intensive and extensive margins.

Also in our context, it is important to examine the impacts of the above-mentioned provisions in RTAs on the extensive and intensive margins. To our best knowledge, few papers have investigated the impacts of RTAs on those margins. In particular, no studies have explored the impacts of the provisions in RTAs on those margins. In contrast, it is invaluable for policymakers to know whether RTAs increase more greatly the intensive margin or the extensive margin. If the trade creation effects

are mainly realized through intensive margin, then the political support for RTAs will be limited to firms and industries that are already trading. Contrary to this case, if those effects come mainly from extensive margin, then the political support can be broader to include those firms and industries that are currently not exporting but potentially can. As a result, if each provision on RTAs affects intensive margin and extensive margin differently, it may be possible to design RTAs so as to not only maximize the increase of trade values but also broaden the political support for the conclusion of RTAs. In short, our analysis can potentially derive an important implication from the political point of view.

The rest of this paper is organized as follows. The next section takes an overview of RTAs according to their coverage of provisions. Section 3 specifies our empirical framework to examine the impacts of those provisions on trade values, i.e. gravity equations. Their estimation results are reported in Section 4. We also examine the impacts of those provisions on the intensive and extensive margins separately. Lastly, Section 5 concludes.

2. Heterogeneous Regional Trade Agreements

Each RTA includes many provisions in different combinations. For example, as listed in Table 1, NAFTA has 22 chapters. In this paper, we focus on the role of four kinds of provisions in RTAs because those are relatively easy to be identified in the agreements; government procurement, intellectual property, competition policy, and dispute settlement. Taking the case of NAFTA as an example, we first take a brief look at the content of each provision.

=== Table 1 ===

The provision on government procurement lowers trade barriers in government procurement through better transparency in awarding contracts, information access, market access, and national treatment. The monetary thresholds for contracts are also often lowered to make public procurement a more contestable market. In the case of

NAFTA, Chapter 10 establishes the clause on government procurement. It requires each country to accord national treatment and non-discrimination in its procuring goods and services including construction services to federal government entities, government enterprises, and state and provincial government entities in other member countries. Such entities are explicitly set out in Annexes of the agreement. Also, the value of the awarded contract for those goods and services must be equal to or greater than a certain threshold, which is calculated and adjusted according to the U.S. inflation rate. This chapter is also important in the sense that Mexico, which does not sign the GPA, accords. As a result, the provision on government procurement gives foreign firms the access to government procurement market, which typically accounts for more than ten percent of GDP, resulting in increasing trade among member countries in this economically important and often highly protected market.

The provision on intellectual property includes the implementation of high protection of intellectual property required, or an agreement to forgo transition periods and privileges that developing countries and countries in economic transition negotiated during and after the Uruguay Round of GATT. In the case of NAFTA, Chapter 17 establishes intellectual property. Article 1701 prescribes that each country shall provide in its territory to the nationals of other member countries, adequate and effective protection and enforcement of intellectual property rights. Furthermore, it requires member countries to give effect to the provisions of several conventions such as the Paris Convention for the Protection of Industrial Property. This chapter also includes the protection of encrypted program carrying satellite signals, which is not included in TRIPS. As a result, the provision on intellectual property plays a role of strengthening its protection beyond that required by the WTO TRIPS Agreement and thus plays a role of increasing trade particularly of goods incorporating high technology among member countries.

The competition policy chapter contains commitments to ensure that anticompetitive business practices are proscribed, monopolies do not abuse their powers, there are avenues for complaints of unfair practices to be initiated, and the relevant authorities commit to cooperate and consult one another to facilitate enforcement. Chapter 15 in NAFTA establishes competition policy. It requires member countries to adopt or maintain measures to proscribe anticompetitive business conducts and to take

appropriate actions with respect thereto (Article 1501). FTA members are to consult and cooperate on the effectiveness of their national competition laws and to cooperate on the enforcement of those laws via mutual legal assistance, notification, consultation, and the exchange of information. In turn, the provision on competition policy contributes to minimizing the distortion of trade creation effects through the existence of anticompetitive policy.

The provision on dispute settlement requires consultations, makes available good offices, mediation, and conciliation, and provides for some form of arbitration if consultations are unsuccessful.[2] In the case of NAFTA, Chapter 20 establishes dispute settlement. NAFTA members are required to try to resolve Chapter 20 disputes through government-to-government consultations. If consultations are unsuccessful, the countries may request a meeting of the NAFTA Free Trade Commission (comprising of the trade ministers of the member countries). If the commission cannot resolve the dispute, a country may call for an establishment of a five-member arbitral panel, which is entitled to seek assistance from scientific experts. NAFTA permits countries to choose whether to resolve trade disputes through arbitration within NAFTA or before the WTO. As a result, with the provision on dispute settlement, firms' risk of causing diplomatic embarrassment becomes low, and thus firms do not need to become atrophic in expanding their trade.

Next, we take a look over these provisions not only in NAFTA but also in other RTAs. To do that, we employ the Asia - Pacific Trade and Investment Agreements Database provided by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). This database provides detailed descriptive and updated information on the provision of RTAs applicable to the ESCAP region. The latest available version of the database covers all the agreements reported to the WTO in which at least one party is in the ESCAP region. It also includes other agreements that have not been notified but for which there is official information readily available. For some RTAs, we also incorporate the data from the Free Trade Agreement Database for Asia provided by the Asia Regional Integration Center, the Asian Development Bank. As a result, we can examine 111 RTAs in the ESCAP region, which entered into force

[2] For more details, see Asian Development Bank (2008).

by 2009 (see Appendix A). Figure 1 depicts the change of the number of RTAs in the ESCAP region, showing the dramatic rise from around 40 in 2000 to above 100 in 2009.

=== Figure 1 ===

Table 2 shows the existence of each provision in our sample of RTAs. In the upper area of this table, we can see that all RTAs do not necessarily include all of the four provisions of our interests. While more than a half of the sample RTAs includes the provision on dispute settlement, the provisions on government procurement, competition policy, and intellectual property are less likely to be included (less than 50%). This may indicate that dispute settlement mechanism is perceived to be more essential in maximizing the trade creation effects of RTAs. Moreover, only 36% of RTAs include the government procurement provision. Given the fact that the government procurement issue was removed from the Doha agenda in 2004, its inclusion may be relatively difficult also in the negotiation for concluding RTAs.

=== Table 2 ===

The lower area of the table lists more detailed descriptions on the provisions. From this area, we can see that a half of RTAs are either those with all provisions (24%) or those without any provisions (27%). That is, there are still a significant number of RTAs that do not have any provisions. The rest of RTAs are widely different in terms of the coverage of provisions. The case with the relatively large share is the RTAs with only the provision on dispute settlement (15%). Thus, again we may say that dispute settlement mechanism is a relatively essential provision in RTAs. In addition, we can see that there are no RTAs that include only the provision on government procurement. This may also again indicate its difficulty in including this particular provision in RTAs. In other words, RTAs with the provision on government procurement are likely to include the other provisions. This wide variety of RTAs in terms of the depth and coverage has been the missing factor in the literature, leading to mixed results. By differentiating these provisions, our aim is to estimate the trade creation effects more precisely and to identify which provisions are more effective.

3. Empirical Framework

In this section, we first provide our empirical specification to examine the heterogeneous impacts of RTAs. After briefly introducing the traditional gravity equation, we present our extended gravity equation. Then we also discuss some empirical issues on the estimation of gravity equation for RTA evaluation, in addition to presenting our data sources.

3.1. Gravity Equation

In international economics, it is well known that a gravity equation is one of the most successful tools for quantitatively analyzing bilateral merchandise trade patterns. The gravity equation in international trade is formalized as follows:

$$\ln T_{ij} = \beta_0 + \mathbf{X}_i \boldsymbol{\beta}_1 + \mathbf{X}_j \boldsymbol{\beta}_2 + \mathbf{t}_{ij} \boldsymbol{\beta}_3 + \varepsilon_{ij}.$$

where T_{ij} represents bilateral goods exports of country i to country j. $\mathbf{X}_i$ and $\mathbf{X}_j$ are a vector of exporter-specific elements and a vector of importer-specific elements, respectively. $\mathbf{t}_{ij}$ is a vector of pair-specific elements. ε is a disturbance term. The traditional gravity equation has logs of importer's and exporter's GDPs as an importer-specific element and an exporter-specific element, respectively, and a log of distance between trading partners as a pair-specific element. Its estimation result always presents us with an excellent empirical fit. Relying on such properties, a large number of scholars have employed the gravity equation for the investigation of bilateral trade.

The recent issue in the gravity equation is the control for so-called "multilateral resistance terms". Under the usual assumptions in horizontal differentiation models based on the CES utility function, Anderson and van Wincoop (2003) derive the gravity equation including exporter's and importer's price indices, which are called "multilateral resistance" terms. As is known as an omitted-variable bias, the exclusion of the multilateral resistance terms from the gravity equation makes its OLS estimates biased. The most common way of controlling those terms, which is proposed by Feenstra (2002), is the inclusion of importer and exporter fixed effects (u_i and u_j) into the gravity equation as the following:

$$\ln T_{ij} = \mathbf{t}_{ij}\,\boldsymbol{\beta}_3 + u_i + u_j + \varepsilon_{ij}.$$

Their inclusion forces us to drop exporter-specific elements and importer-specific elements due to the perfect multicolinearity.

In the literature, several variables are introduced as pair-specific elements. In addition to the geographical distance, three dummy variables are commonly introduced:

$$\ln T_{ij} = \beta_1 \ln \text{Distance}_{ij} + \beta_2 \text{Contingency}_{ij} + \beta_3 \text{Language}_{ij} + \beta_4 \text{Colony}_{ij} + \beta_5 \text{RTA}_{ij} + u_i + u_j + \varepsilon_{ij}.$$

Contingency takes unity if two countries share the national border and zero otherwise. Language is a dummy variable taking unity if a common language is spoken by at least 9% of the population in both countries and zero otherwise. Colony is a binary variable indicating whether the two countries have had a colonial relationship. For the evaluation of RTAs, the simple RTA dummy is often included, which takes unity if two countries are the members of the same RTA and zero otherwise. This equation is also our baseline equation to be estimated.

We decompose this RTA variable into five variables to analyze more precisely the impacts of RTA on trade values. Specifically, our extended gravity equation is given by:

$$\ln T_{ij} = \beta_1 \ln \text{Distance}_{ij} + \beta_2 \text{Contingency}_{ij} + \beta_3 \text{Language}_{ij} + \beta_4 \text{Colony}_{ij} + \beta_6 \ln (1+\text{Tariff}_{ij}) + \beta_7 \text{Government}_{ij} + \beta_8 \text{Competition}_{ij} + \beta_9 \text{Intellectual}_{ij} + \beta_{10} \text{Dispute}_{ij} + u_i + u_j + \varepsilon_{ij}.$$

Tariff_{ij} indicates the applied tariff rates of country j on goods from country i. This variable captures the main role of RTAs, namely, tariff reduction. Government, Competition, Intellectual, and Dispute are dummy variables taking unity if two countries conclude on an RTA which includes the provisions on government procurement, competition policy, intellectual property, and dispute settlement, respectively. Unless two countries share the same RTA, these variables are set equal to zero. By estimating this equation, we investigate whether or not each provision contributes to boosting bilateral trade in addition to the impacts of tariff reduction.

3.2. Empirical Issues

We estimate these equations for manufacturing trade among 73 countries in year 2009, of which list is provided in Appendix B. The data on trade values are obtained

from the UN Comtrade. We aggregate the HS1992 6-digit level trade values into the single trade values of manufacturing industry (Sectors 2 to 4 in CPC provisional classification[3]) using the conversion table between CPC provisional classification and HS1992 available in the website of United Nations Statistical Division (UNSD).[4] The source of Distance, Contingency, Language, and Colony is the Centre d'Informations Internationales (CEPII) website. The information on RTAs is derived from the same source as in Section 2.

Our data source for tariff rates for manufacturing trade comes from the World Integrated Trade Solution (WITS)[5], which is now the most powerful software on tariff rates developed by the World Bank, UNCTAD, International Trade Center (ITC), UNSD, and WTO. In addition, some other sources are used for identifying exact tariff schemes for each trading partner.[6] In particular, we need to construct a list of member countries for WTO and each RTA. Also, the GSP beneficiaries are different across importers. The information on WTO and RTA are obtained from the WTO website. We use "The Regional Trade Agreements Information System" for obtaining the member list of RTA.[7] As for the GSP beneficiaries, we used several documents available in the United Nations Conference on Trade and Development (UNCTAD) website[8] in addition to official documents in the website of national customs in each country. We treat non-ad valorem tariff rates simply as missing. Also, for simplicity, we use the lower rates for mix tariff rates, though these treatments underestimate tariff rates to some extent. However, our focus on manufacturing industry obviously decreases the magnitude of these kinds of underestimation because non-ad valorem tariff rates and mix tariff rates are mostly applied in non-manufacturing industries.

We estimate the above gravity equations with the pseudo poisson maximum likelihood (PPML). In the literature, zero-valued trade is also becoming a major issue.

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[3] Sector 2 is food products, beverages and tobacco; textiles, apparel and leather products; Section 3 is other transportable goods, except metal products, machinery and equipment; Sector 4 Metal products, machinery and equipment.

[4] http://unstats.un.org/unsd/cr/registry/regdnld.asp?Lg=1

[5] http://wits.worldbank.org/WITS/

[6] We assume that all firms use the tariff schemes with the lowest rates though some firms may be forced to use the higher general tariff rates such as MFN rates because it is necessary to incur some kinds of fixed costs for the use of preferential tariff schemes (Demidova and Krishna, 2008).

[7] http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx

[8] http://www.unctad.org/Templates/Page.asp?intItemID=1418&lang=1

As Melitz (2003) suggests, the trade values can be systematically zero. However, taking logarithms drops such observations from the sample because zero trade is undefined in gravity equation. Since there is a systematic reason for zero trade, dropping observations with zero trade leads to our getting rid of potentially useful information and to yielding the sample selection bias. In order to naturally include zero trade in our sample, we employ the PPML estimation technique proposed by Silva and Tenreyro (2006). It enables us to estimate a gravity model which includes zero trades because the dependent variable is not log of trade but the actual trade value. Furthermore, since the independent variables enter in logs, their coefficients can be still interpreted as elasticities.[9]

Last, it is worth noting endogeneity issues on RTA-related variables. In the literature, there is no doubt that one-zero RTA dummy is not an exogenous random variable: countries decide systematically whether they conclude an RTA or not. Furthermore, the elements having influence on international trade between them also affect the decision on the RTA conclusion (see, for example, Baier and Bergstrand, 2004). Hence, one-zero RTA dummy is possibly correlated with the disturbance term. Without accounting for the endogeneity on the RTA dummy, the estimation of gravity equation with the one-zero RTA dummy by OLS results in yielding biases in the estimates. Baier and Bergstrand (2007) examine closely the endogeneity issue in the RTA dummy. As a result, they demonstrate that the most plausible estimates of the RTA impacts on international trade are obtained from the gravity estimation using panel data with bilateral fixed effects.

However, our use of cross-sectional data does not allow us to account for this issue with the similar method as Baier and Bergstrand (2007). There are two reasons why we could not construct the panel data. The first is because our RTA dataset does not include RTAs ineffective before 2010. Ignoring such ineffective RTAs will yield biases

[9] Another approach, which is proposed by Helpman, Melitz, and Rubinstein (2008), takes such a systematic sample selection into account (HMR method). This is the extended technique of the Heckman two-step estimation. The first step estimation examines the probability that two countries have positive trade values, and the second step estimation restricts to country pairs with positive trade and then examines its magnitude taking the results of the first step estimation into account. While the PPML assumes that the zero trade does not have anything special in spite of its systematic reason, this HMR method succeeds in accounting for the zero trade issue with taking the selection mechanics of trade into account. We employ the modified version of this HMR method in Section 4.2.

on our estimates. The second reason is because we do not know the year in which each provision is included in agreements. Although our database on RTAs includes the year of their entry into force, those provisions are sometimes included into agreements several years after RTAs' entry into force. Again, ignoring the difference in entry year between RTAs and their provisions will give rise to biases on our estimates. In particular, these kinds of biases may be more serious than the endogeneity biases. Nevertheless, we may need to interpret our estimates under the cross-sectional data carefully.

4. Empirical Results

In this section, we first present our estimation results on gravity equations specified in the previous section. Then, we examine the impacts of each provision in RTAs on the intensive margin and the extensive margin separately.

4.1. Gravity Results on RTA Variables

Our baseline result is reported in column (I) in Table 3. This equation includes the typical one-zero RTA dummy variable in most empirical studies. All coefficients have expected signs, though the coefficient for Colony is estimated to be insignificant. The geographical distance between trading partners is negatively correlated with trade values. The linguistic commonality and sharing of the national border encourage active trade between two countries. As is consistent with the findings in the previous studies, we obtain a significantly positive coefficient for the simple RTA dummy variable, indicating the positive trade creation effects. Specifically, RTAs increase bilateral trade by 23% (i.e. $e^{0.206}$-1).

=== Table 3 ===

We decompose this simple RTA dummy variable into five components. The result is reported in column (II). The results in the variables included in (I) are qualitatively unchanged. The variable of bilateral tariff rates has a significantly negative coefficient, as is consistent with our expectation. The results in four dummy variables on RTAs'

provisions are not necessarily consistent with our expectation. The significantly positive coefficient can be found only in the variable for competition policy. The dummy variables for government procurement and intellectual property have insignificant coefficients. Furthermore, the provision on dispute settlement has significantly negative effects on the trade. However, these results might be due to high correlation among those variables, namely multi-collinearity.

Next, we introduce four variables on RTAs' provisions separately in order to avoid multi-collinearity in a simple way. All of their coefficients are estimated to be positive. The provision on competition policy has the largest impacts on trade values (74%). The similar magnitude of trade creation effects can be found in the dummy variable for government procurement. Its provision increases trade values by 63%. The coefficient for intellectual property provision dummy is also significantly positive, though its magnitude is relatively small (22%). Contrast to these variables, the provision on dispute settlement has an insignificant coefficient. This insignificant result may indicate that (at least except for a limited number of large companies) each company does not care about the risk of causing diplomatic embarrassment.

We further control for one more variable, a WTO membership dummy variable. It takes unity if both of two countries are the member of WTO and zero otherwise. As mentioned before, the depth and coverage of provisions in the recent RTAs go beyond those in the WTO agreements. In order to confirm that these depth and coverage contributes to trade creation in addition to WTO effects, we examine the trade creation effects of each provision, while controlling for the WTO membership. The results are reported in Table 4. As is consistent with our expectation, the coefficients for WTO are estimated to be significantly positive, indicating that the WTO membership also contributes to increasing bilateral trade values (237%-411%). Importantly, the results in the above-introduced RTA dummy variables on provisions are qualitatively unchanged. Thus, our estimation reveals that the deeper provisions in RTAs than those in WTO agreements contribute significantly to trade creation.

=== Table 4 ===

Lastly, we also consider the lagged effects of each provision. The previous studies

using the simple one-zero RTA dummy variable examine the lagged effects of RTA, based on the fact that the actual implementation of an RTA involves a "phase-in" period, typically over five or ten years. For instance, NAFTA had 10-year phase-in period before its full implementation. The same kind of story could be obviously applied into our case. For example, each provision seems to take some time to work effectively. Its performance may get better through a kind of "learning-by-doing". As a result, the entire effects of each provision on trade values cannot be fully captured in the concurrent year only. Therefore, we include five-year lagged dummy variables of provisions. The results are reported in Table 5. Interestingly, all of the coefficients for provision variables are estimated to be significantly positive. Furthermore, their magnitudes are larger than those in contemporaneous estimation. These results imply that some gestation period may be needed for the fuller effects of each provision on trade to be realized.

=== Table 5 ===

4.2. Intensive Margin versus Extensive Margin

In the previous analysis, we found that each provision contributes to increasing trade values among member countries. In this section, we examine where such an increase of trade values comes from, the increase in the number of traded variety (extensive margin) or the increase in trade values per variety (intensive margin). Following Flam and Nordstrom (2011), we use the count of traded varieties (HS 6-digit level) as the measure of extensive margin. Total trade values divided by the count of traded varieties are used as the measure of intensive margin.

Flam and Nordstrom (2011) modify the method proposed by Helpman, Melitz, and Rubinstein (2008)[10], which controls for firm level heterogeneity and sample selection on the intensive margin, by further controlling for the pervasive presence of heteroscedasticity in trade data. Their estimation strategy is the following. In the first stage, they estimate the gravity equation for the extensive margin of trade, under the addition of instrumental variables in order not to let the identification of the extensive

[10] Also see footnote 9.

margin estimates depend solely on the normality assumption for unobserved trade costs. Then, the second stage estimates the gravity equation for the intensive margin of trade, under the introduction of a polynomial in the predicted number of traded varieties from the first stage estimation as a proxy for the fraction of exporting firms (possibly zero). In both stages, they employ the PPML estimation technique in order to further control for the heteroscedasticity in trade data. Also, the use of PPML enables them to include zero trade values per variety in the second stage and thus to take care of the selection biases.[11]

We follow this method proposed by Flam and Nordstrom (2011). We need to carefully choose instrumental variables in the first stage estimation. From the theoretical point of view, those variables should be associated with fixed trade costs such as regulation in trading (Helpman et al., 2008). In light of this, we use the sum of importer's and exporter's fragility indices. The Fragility Index, which is prepared by the Center for Systemic Peace[12], scores each country on both effectiveness and legitimacy in four performance dimensions: security, political, economic, and social. It ranges from 0 ("no fragility") to 25 ("extreme fragility"). A country's fragility is closely associated with its state capacity to manage conflict; make and implement public policy; and deliver essential services and its systemic resilience in maintaining system coherence, cohesion, and quality of life; responding effectively to challenges and crises, and continuing progressive development. Thus, this variable will be well related to fixed trade costs and thus serve as good instruments.

The results for the estimation on extensive margin and intensive margin are reported in Tables 6 and 7, respectively. There are four points to be noteworthy. First, coefficients for the usual gravity variables mostly have expected signs in both extensive and intensive margins. Moreover, as is consistent with the findings in the previous studies, estimates for the extensive margin are uniformly smaller in value than estimates for the intensive margin. Second, the simple RTA dummy has positively significant coefficients in both margins. Thus, the conclusion of RTAs increases both the number of traded varieties (15%) and the trade values per variety (180%), though the latter

[11] With this method, Flam and Nordstrom (2011) find that the firm heterogeneity and selection biases are small whereas the heteroscedasticity bias is large.
[12] http://www.systemicpeace.org/inscr/inscr.htm

magnitude may be too high. Third, as is consistent with the finding in Liu (2009), WTO membership increases both margins significantly, though again the impacts on intensive margin are too high. Fourth, as expected, the state fragility in trading pairs, which is used as a proxy for fixed trade costs, significantly decreases the number of traded varieties.

=== Tables 6 & 7 ===

The results for the decomposed RTA variables are as follows. First, the coefficients for bilateral tariff rates are insignificant in extensive margin but significantly negative in intensive margin. These results may be consistent with the finding in Debaere and Mostashari (2010) that tariff reduction has small impacts on extensive margin. Second, contrary to the results in Tables 2 and 3, the coefficients for dispute settlement are estimated to be significantly positive in both margins, after controlling for the firm heterogeneity (a polynomial in the predicted number of traded varieties). In other words, this result may indicate that omitting firm heterogeneity yields biases in the estimators. Third, the coefficient for intellectual property is estimated to be insignificant in the extensive margin. Thus, the provision on intellectual property encourages existing exporters to export more rather than facilitating entry of new firms into export markets. Last, like in the case of trade values, the provision on competition policy has the largest impacts on both margins, following the provision on government procurement. This seems to make sense. The aim of the competition policy is to ensure that anticompetitive behavior is curbed. This typically encourages entries of new firms, domestic or foreign. Similarly, by having a provision on government procurement, it is facilitating trades in goods that were not realized in the past, since procurement markets were highly protected in the past. By opening up this large protected market for trade can induce more goods to be traded. Thus, both of these provisions would have positive impacts on extensive and intensive margins.

Relative to intensive margin, our results on extensive margins are relatively smaller. There are two reasons for this. One is that simply there is little scope left for expansion of trade when measured in a number of varieties that are traded among countries because of the past success through WTO and other agreements. If that is the

case, then it is critical for RTA to have provisions that would go beyond WTO to open up sectors that were highly protected in the past. A provision on government procurement seems to be one area that is successful in doing so from our analysis. Secondly, our analysis is static. If taken a dynamic view as in Besedes and Prusa (2011), these new entrants/commodities would continuously be benefitted from the RTA (especially given the results on the larger impacts detected from the lagged RTA specification). Thus, having these provisions, especially competition policy and government procurement can slowly but surely broaden and solidify the supports for RTAs for the existing and new exporters.

5. Concluding Remarks

The scope of recent regional trade agreements (RTAs) is becoming much wider in terms of including several provisions such as competition policy or intellectual property. This paper empirically examines how much each provision in RTAs increases trade values among RTA member countries. In order to do so, we estimate the gravity equation with the PPML estimation technique with more disaggregated indicators for each RTA that is in force. As a result, we find that the provision on competition policy has the largest impacts on expanding trade, following that of government procurement. Our further analysis reveals that the more significant roles of these two provisions can be also observed in the impacts on the intensive and extensive margins. These results suggest that it is important to include the provisions of competition policy and government procurement not only for maximizing trade creation effects of RTAs but also for widening the political support for concluding RTAs.

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Appendix A. List of RTAs in ESCAP Region (111)

ACFTA, AJCEPA, ANZCERTA, APTA, ARMENIA-EU, ARMENIA-KAZAKHSTAN, ARMENIA-MOLDOVA, ARMENIA-RUSSIAN FEDERATION, ARMENIA-TURKMENISTAN, ARMENIA-UKRAINE, ASEAN, AUSTRALIA-CHILE, AUSTRALIA-THAILAND, AUSTRALIA-US, BHUTAN-INDIA, BIMSTEC, CHINA-CHILE, CHINA-HONG KONG, CHINA-MACAO, CHINA-PAKISTAN, CHINA-PAKISTAN-SERVICES, CHINA-SINGAPORE, CHINA-THAILAND, CISFTA, ECOTA, EFTA-KOREA, EFTA-SINGAPORE, EurAsEC, GEORGIA-ARMENIA, GEORGIA-AZERBAIJAN, GEORGIA-KAZAKHSTAN, GEORGIA-RUSSIAN FEDERATION, GEORGIA-TURKEY, GEORGIA-TURKMENISTAN, GEORGIA-UKRAINE, GSTP, GUAM, INDIA-AFGHANISTAN, INDIA-BANGLADESH, INDIA-CHILE, INDIA-GCC, INDIA-MERCOSUR, INDIA-NEPAL, INDIA-SINGAPORE, INDIA-SRI LANKA, INDIA-THAILAND, JAPAN-BRUNEI, JAPAN-CHILE, JAPAN-INDONESIA, JAPAN-MALAYSIA, JAPAN-MEXICO, JAPAN-PHILIPPINES, JAPAN-SINGAPORE, JAPAN-SWITZERLAND, JAPAN-THAILAND, JAPAN-VIET NAM, KAZAKHSTAN-UZBEKISTAN, KOREA-CHILE, KOREA-SINGAPORE, KYRGYZSTAN-ARMENIA, KYRGYZSTAN-KAZAKHSTAN, KYRGYZSTAN-MOLDOVA, KYRGYZSTAN-RUSSIAN FEDERATION, KYRGYZSTAN-UKRAINE, KYRGYZSTAN-UZBEKISTAN, LAO, PDR-THAILAND, MALAYSIA-PAKISTAN, MALAYSIA-UNITED STATES, MOLDOVA-UZBEKISTAN, MSG, NAFTA, NEW ZEALAND-CHINA, NEW ZEALAND-SINGAPORE, NEW ZEALAND-THAILAND, PAKISTAN-IRAN, PAKISTAN-MAURITIUS, PAKISTAN-SRI LANKA, PANAMA-SINGAPORE, PATCRA, PICTA, SAFTA, SINGAPORE-AUSTRALIA, SINGAPORE-JORDAN, SINGAPORE-PERU, SPARTECA, THAILAND-BAHRAIN, TRANS-PACIFIC SEP, TURKEY-ALBANIA, TURKEY-BOSNIA AND HERZEGOVINA, TURKEY-CROATIA, TURKEY-EC, TURKEY-EFTA, TURKEY-EGYPT, TURKEY-FYROM, TURKEY-ISRAEL, TURKEY-MOROCCO, TURKEY-PALESTINE, TURKEY-SYRIA, TURKEY-TUNISIA, UKRAINE-AZERBIJAN, UKRAINE-KAZAKHSTAN, UKRAINE-RUSSIAN FEDERATION, UKRAINE-TAJIKISTAN, UKRAINE-TURKMENISTAN, UKRAINE-UZBEKISTAN, UNITED STATES-AFGHANISTAN, UNITED STATES-ASEAN, UNITED STATES-LAO PDR, UNITED STATES-SINGAPORE, UNITED STATES-VIET NAM, US-CA TIFA

Appendix B. List of Sample Countries

Area	Country	Area	Country
Africa	Algeria	Asia	Pakistan
Africa	Morocco	Asia	Philippines
Africa	Mozambique	Asia	Russian Federation
Africa	Nigeria	Asia	Saudi Arabia
Africa	Sudan	Asia	Singapore
Africa	Tanzania, United Rep. of	Asia	Sri Lanka
Africa	Tunisia	Asia	Thailand
Africa	Zimbabwe	Europe	Albania
America	Argentina	Europe	Austria
America	Bolivia	Europe	Belarus
America	Brazil	Europe	Belgium and Luxembourg
America	Chile	Europe	Bosnia and Herzegovina
America	Ecuador	Europe	Bulgaria
America	Mexico	Europe	Croatia
America	Nicaragua	Europe	Cyprus
America	Paraguay	Europe	Czech Republic
America	Peru	Europe	Finland
America	Trinidad and Tobago	Europe	France
America	United States of America	Europe	Germany
America	Uruguay	Europe	Greece
America	Venezuela	Europe	Hungary
Asia	Afghanistan	Europe	Ireland
Asia	Armenia	Europe	Latvia
Asia	Azerbaijan	Europe	Macedonia (the former Yugoslav Rep. of)
Asia	Bhutan	Europe	Moldova, Rep.of
Asia	China	Europe	Netherlands
Asia	India	Europe	Portugal
Asia	Indonesia	Europe	Romania
Asia	Israel	Europe	Sweden
Asia	Japan	Europe	Switzerland
Asia	Jordan	Europe	Turkey
Asia	Kazakstan	Europe	Ukraine
Asia	Korea	Europe	United Kingdom
Asia	Kyrgyzstan	Pacific	Australia
Asia	Malaysia	Pacific	Fiji
Asia	Nepal	Pacific	New Zealand
Asia	Oman		

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Source: NAFTA Secretariat Website (http://www.nafta-sec-alena.org/en/view.aspx?x=343)

Table 2. Existence of Provisions in Sample RTAs

Government Procurement	Competition Policy	Intellectual Property	Dispute Settlement	Number	Percent
YES				40	36
	YES			46	42
		YES		53	48
			YES	67	60
YES	YES	YES	YES	27	24
YES	YES	YES	NO	4	4
YES	YES	NO	YES	4	4
YES	NO	YES	YES	3	3
NO	YES	YES	YES	2	2
YES	YES	NO	NO	0	0
YES	NO	YES	NO	1	1
YES	NO	NO	YES	1	1
NO	YES	YES	NO	3	3
NO	YES	NO	YES	5	5
NO	NO	YES	YES	8	7
NO	NO	NO	YES	17	15
NO	NO	YES	NO	5	5
NO	YES	NO	NO	1	1
YES	NO	NO	NO	0	0
NO	NO	NO	NO	30	27

Source: Asia - Pacific Trade and Investment Agreements Database (UN ESCAP)

Table 3. PPML Estimation for Gravity Equations

	(I)	(II)	(III)	(IV)	(V)	(VI)
Distance	-0.613***	-0.670***	-0.615***	-0.623***	-0.596***	-0.591***
	[0.042]	[0.047]	[0.043]	[0.043]	[0.044]	[0.045]
Language	0.326***	0.224**	0.207*	0.198*	0.199*	0.252**
	[0.109]	[0.101]	[0.107]	[0.105]	[0.112]	[0.113]
Contingency	0.247*	0.16	0.168	0.153	0.269**	0.268*
	[0.129]	[0.126]	[0.132]	[0.132]	[0.135]	[0.137]
Colony	0.137	0.201*	0.219*	0.216*	0.218	0.184
	[0.134]	[0.111]	[0.120]	[0.119]	[0.133]	[0.129]
RTA	0.206**					
	[0.084]					
Tariff		-2.487**	-2.061**	-1.885**	-2.683**	-2.983**
		[1.056]	[0.924]	[0.866]	[1.192]	[1.275]
Government		-0.229	0.490***			
		[0.169]	[0.103]			
Competition		1.049***		0.553***		
		[0.194]		[0.096]		
Intellectual		-0.187			0.196**	
		[0.138]			[0.089]	
Dispute		-0.241*				0.12
		[0.124]				[0.086]
Number of Observations	2,862	2,840	2,840	2,840	2,840	2,840
R-squared	0.9184	0.9433	0.9337	0.9372	0.9253	0.9242
Pseudo log-likelihood	-4.4E+11	-3.8E+11	-4.1E+11	-4.0E+11	-4.3E+11	-4.3E+11

Notes: ***, **, and * show 1%, 5%, and 10% significance, respectively. In parenthesis is a semi-robust standard error.

Table 4. Robustness Checks: Including WTO Dummy Variable

	(I)	(II)	(III)	(IV)	(V)	(VI)
Distance	-0.619***	-0.679***	-0.623***	-0.631***	-0.604***	-0.601***
	[0.042]	[0.046]	[0.042]	[0.043]	[0.044]	[0.044]
Language	0.304***	0.198**	0.201*	0.191*	0.184*	0.244**
	[0.107]	[0.099]	[0.106]	[0.104]	[0.110]	[0.111]
Contingency	0.230*	0.148	0.15	0.134	0.243*	0.248*
	[0.127]	[0.122]	[0.129]	[0.129]	[0.130]	[0.133]
Colony	0.058	0.145	0.145	0.144	0.14	0.106
	[0.119]	[0.106]	[0.110]	[0.109]	[0.121]	[0.117]
RTA	0.185**					
	[0.082]					
Tariff		-1.971**	-1.590*	-1.408*	-2.015*	-2.467**
		[0.972]	[0.875]	[0.817]	[1.064]	[1.205]
Government		-0.246	0.471***			
		[0.169]	[0.102]			
Competition		1.023***		0.537***		
		[0.195]		[0.095]		
Intellectual		-0.106			0.218**	
		[0.133]			[0.088]	
Dispute		-0.281**				0.108
		[0.122]				[0.084]
WTO	1.632***	1.214***	1.263***	1.244***	1.535***	1.406***
	[0.343]	[0.347]	[0.326]	[0.324]	[0.362]	[0.348]
Number of Observations	2,862	2,840	2,840	2,840	2,840	2,840
R-squared	0.9214	0.9444	0.9350	0.9385	0.9271	0.9259
Pseudo log-likelihood	-4.3E+11	-3.8E+11	-4.0E+11	-3.9E+11	-4.2E+11	-4.2E+11

Notes: ***, **, and * show 1%, 5%, and 10% significance, respectively. In parenthesis is a semi-robust standard error.

Table 5. Robustness Checks: 5-year Lagged Effects of Provision

	(I)	(II)	(III)	(IV)
Distance	-0.613***	-0.613***	-0.564***	-0.569***
	[0.042]	[0.042]	[0.044]	[0.044]
Language	0.214**	0.213**	0.231**	0.311***
	[0.105]	[0.105]	[0.103]	[0.103]
Contingency	0.099	0.094	0.069	0.148
	[0.124]	[0.123]	[0.131]	[0.135]
Colony	0.155	0.156	0.225*	0.121
	[0.107]	[0.107]	[0.121]	[0.116]
Tariff	-1.308	-1.255	-1.859*	-2.447**
	[0.863]	[0.852]	[1.036]	[1.208]
Government	0.607***			
	[0.125]			
Competition		0.627***		
		[0.125]		
Intellectual			0.537***	
			[0.133]	
Dispute				0.278***
				[0.097]
WTO	1.214***	1.214***	1.553***	1.287***
	[0.316]	[0.315]	[0.359]	[0.329]
Number of Observations	2,836	2,836	2,836	2,836
R-squared	0.9335	0.9335	0.9377	0.9311
Pseudo log-likelihood	-4.0E+11	-4.0E+11	-4.1E+11	-4.2E+11

Notes: ***, **, and * show 1%, 5%, and 10% significance, respectively. In parenthesis is a semi-robust standard error. Each dummy variable of provisions is five-year lagged.

Table 6. PPML Estimation for Gravity Equations: Extensive Margin

	(I)	(II)	(III)	(IV)	(V)	(VI)
Distance	-0.384***	-0.391***	-0.375***	-0.373***	-0.388***	-0.379***
	[0.029]	[0.032]	[0.031]	[0.031]	[0.033]	[0.031]
Language	0.200***	0.175***	0.162***	0.161***	0.169***	0.175***
	[0.051]	[0.048]	[0.049]	[0.049]	[0.049]	[0.052]
Contingency	0.006	-0.043	-0.032	-0.034	-0.01	-0.018
	[0.099]	[0.097]	[0.096]	[0.095]	[0.096]	[0.098]
Colony	0.305***	0.292***	0.322***	0.314***	0.333***	0.328***
	[0.079]	[0.076]	[0.077]	[0.076]	[0.081]	[0.080]
RTA	0.140***					
	[0.031]					
Tariff		-1.803	-1.508	-1.261	-2.213	-2.124
		[1.345]	[1.262]	[1.215]	[1.525]	[1.401]
Government		-0.115	0.215***			
		[0.114]	[0.051]			
Competition		0.478***		0.268***		
		[0.111]		[0.049]		
Intellectual		-0.168**			0.037	
		[0.079]			[0.054]	
Dispute		-0.008				0.075**
		[0.051]				[0.037]
WTO	0.808***	0.637***	0.716***	0.705***	0.791***	0.752***
	[0.190]	[0.191]	[0.192]	[0.190]	[0.203]	[0.197]
Fragility	-0.061	-0.073*	-0.075**	-0.070*	-0.081**	-0.075*
	[0.038]	[0.038]	[0.038]	[0.037]	[0.038]	[0.039]
Number of Observations	2,862	2,840	2,840	2,840	2,840	2,840
R-squared	0.8724	0.8784	0.8767	0.8781	0.8749	0.8734
Pseudo log-likelihood	-1.3E+05	-1.2E+05	-1.3E+05	-1.3E+05	-1.3E+05	-1.3E+05

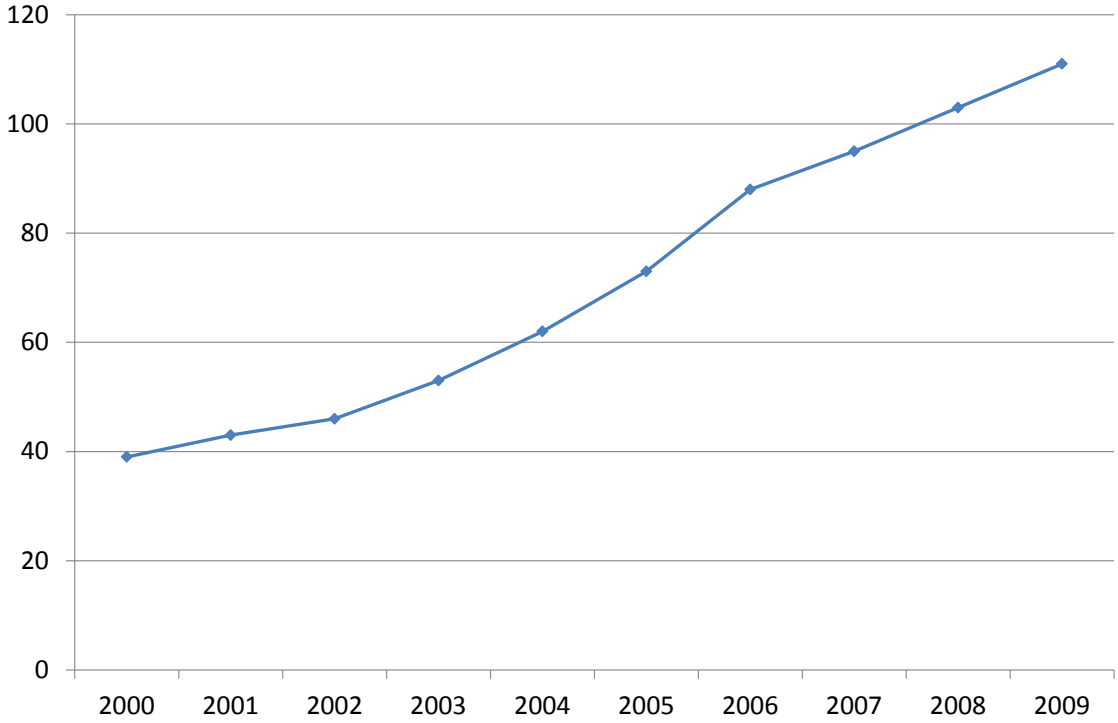
Notes: ***, **, and * show 1%, 5%, and 10% significance, respectively. In parenthesis is a semi-robust standard error.

Table 7. PPML Estimation for Gravity Equations: Intensive Margin

	(I)	(II)	(III)	(IV)	(V)	(VI)
Distance	-2.418***	-2.113***	-2.042***	-2.174***	-1.921***	-2.005***
	[0.767]	[0.652]	[0.633]	[0.669]	[0.589]	[0.641]
Language	0.985***	0.607**	0.584**	0.632**	0.502**	0.641**
	[0.369]	[0.280]	[0.267]	[0.278]	[0.254]	[0.285]
Contingency	0.417**	0.191	0.222	0.165	0.275	0.292*
	[0.180]	[0.154]	[0.176]	[0.183]	[0.173]	[0.174]
Colony	1.592**	1.429***	1.422**	1.502**	1.447***	1.402**
	[0.665]	[0.529]	[0.592]	[0.609]	[0.553]	[0.602]
RTA	1.031***					
	[0.289]					
Tariff		-7.854***	-6.545**	-5.894**	-8.535**	-8.893***
		[2.940]	[2.525]	[2.303]	[3.294]	[3.425]
Government		-1.082***	1.156***			
		[0.382]	[0.383]			
Competition		2.694***		1.681***		
		[0.859]		[0.495]		
Intellectual		-0.202			0.656***	
		[0.346]			[0.160]	
Dispute		-0.197				0.452***
		[0.167]				[0.172]
WTO	5.165***	3.752***	4.032***	4.204***	4.114***	4.110***
	[1.747]	[1.266]	[1.459]	[1.490]	[1.439]	[1.511]
Predicted number of varieties	-4.080**	-3.092*	-3.158*	-3.460*	-2.698*	-2.989*
	[1.975]	[1.673]	[1.686]	[1.791]	[1.538]	[1.695]
Square of predicted number	-0.271***	-0.309***	-0.266***	-0.291***	-0.293***	-0.271***
	[0.068]	[0.072]	[0.076]	[0.073]	[0.074]	[0.076]
Cube of predicted numer	0.017***	0.020***	0.017***	0.018***	0.018***	0.017***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
Number of Observations	2,862	2,840	2,840	2,840	2,840	2,840
R-squared	0.8989	0.8992	0.8956	0.8953	0.8998	0.8969
Pseudo log-likelihood	-1.1E+09	-1.1E+09	-1.1E+09	-1.1E+09	-1.1E+09	-1.1E+09

Notes: ***, **, and * show 1%, 5%, and 10% significance, respectively. In parenthesis is a semi-robust standard error.

Figure 1. Number of RTAs in ESCAP Region



Source: Asia - Pacific Trade and Investment Agreements Database (UN ESCAP)