2007

Regional Trade Agreements Revisited

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REGIONAL TRADE AGREEMENTS REVISITED

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SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN ECONOMICS

SINGAPORE MANAGEMENT UNIVERSITY
2007

ABSTRACT

The gravity model is a workhorse for econometric studies of the impact of regional trade agreements (RTAs). Despite its initial lack of theoretical basis, the model has been successfully derived from various trade theories. The latest theoretical derivation by Anderson and van Wincoop (2003) reveals that prior gravity studies have made the critical error of omitting the multilateral resistance variable, which results in biased estimates. Other recent studies have highlighted empirical issues with the commonly used procedure of log-linearizing the gravity model and estimating the parameters using Ordinary Least Squares (OLS) regression. Silva and Tenreyro (2006) point out that this method yields inconsistent estimates in the presence of heteroskedasticity. Helpman, Melitz and Rubinstein (2004) show that the concomitant practice of dropping observations with zero trade values (because the log-linearized model is not defined for such observations) will also give rise to biased results. To deal with these two issues of inconsistency and bias, we estimate the gravity model in its multiplicative form. Both cross-sectional and panel data analysis are performed, employing Poisson Pseudo Maximum Likelihood Estimator and Poisson Quasi-Conditional Maximum Likelihood Estimator respectively. Whilst analyzing the impact of RTAs in the light of the new estimation methods, this study will also re-evaluate the impact of the Asean Free Trade Area in the context of other major RTAs.

CONTENTS

LIST OF TABLES ii

LIST OF FIGURES iii

ACKNOWLEDGEMENTS iv

CHAPTER 1 INTRODUCTION 1

1.1 Regional Trade Agreements 1

1.2 Literature Review of Empirical Studies 6

CHAPTER 2 GRAVITY MODEL 8

2.1 Theoretical Model 8

2.2 Empirical Model 10

2.3 Variable Measures 15

CHAPTER 3 DATA AND METHODOLOGY 18

3.1 Cross Sectional Analysis 18

3.2 Panel Data Analysis 19

3.3 Data Sources 20

CHAPTER 4 RESULTS 22

4.1 Cross Sectional Analysis 22

4.2 Panel Data Analysis 27

CHAPTER 5 IMPLICATIONS FOR AFTA 29

5.1 Evaluation of AFTA 29

5.2 Effect of RTAs on AFTA Trade Flows 36

5.3 Recent Developments 36

CHAPTER 6 SUMMARY AND CONCLUSION 39

APPENDICES 42

LIST OF TABLES

Table 1: RTAs with ASEAN Member Countries (as of 1 March 2007) 5

Table 2: Summary of Previous Studies.. 6

Table 3: Methods for Dealing with Zero Trade Values... 12

Table 4: List of RTAs and Year of Inception or Change.. 20

Table 5: List of countries in sample... 21

Table 6: Coefficients for Panel Data Analysis... 27

Table 7: Top 10 Export Destinations of ASEAN Exports for 1990 and 2005 29

Table 8: AFTA CEPT List for 2001 31

Table 9: Correlation Between Export Structures of AFTA, NAFTA and EU15 Member Countries for 1990 and 2005 32

Table 10: Complementarity Indices for AFTA, NAFTA and EU15 for Years 1990 and 2005 ... 34

Table 11: Impact of Recent RTAs 37

Table 12: OLS Coefficients for Cross Sectional Analysis (Counterfactual Variables)................ 42

Table 13: OLS Coefficients for Cross-Sectional Analysis (RTA Dummies)............................... 43

Table 14: Poisson Coefficients for Cross-Sectional Analysis (Counterfactual Variables)........... 44

Table 15: Poisson Coefficients for Cross-Sectional Analysis (RTA Dummies).......................... 45

Table 16: Poisson Coefficients for Cross-Sectional Analysis (Counterfactual Variables)........... 46

Table 17:Poisson Coefficients for Cross-Sectional Analysis (RTA Dummies)........................... 47

Table 18: Poisson Coefficients for Panel Data Analysis 48

Table 19: Poisson Coefficients for Panel Data Analysis Recent RTAs....................................... 49

Table 20: List of Sample Countries for Analysis of New RTAs... 50

LIST OF FIGURES

Figure 1: Number of RTAs Notified and in Force 2

Figure 2: Poisson and OLS Estimates for RTA Dummies 23

Figure 3: AFTA Utilization Rates (Percent of Intra-ASEAN imports) 30

ACKNOWLEDGEMENTS

It is with mixed feelings that I pen the words on this page. It has been an exhilarating year for me, finally getting the opportunity to study the subject I so love. It has been pure indulgence. Yet, I cannot help but feel a sense of lingering sadness, knowing that this thesis marks the close of a chapter of my life. As I look back, I'm filled with gratitude for the many people many people who helped me along the way.

I would firstly like to express my sincere and heartfelt thanks to the following professors:

- Professor Hoon Hian Teck, for his patient guidance and encouragement throughout the entire course. His passion for Economics has truly been an inspiration and I can only hope that one day, through hard work and perseverance, I can attain to a fraction of the breadth and depth of the knowledge he possesses;
- Professor Tse Yiu Kuen, for his extremely kind and helpful comments;
- Professor Lee Myoung Jae, for graciously helping me sort out some econometric issues, even though he was already back in Korea;
- Professor Silva from the University of Essex, for bothering to go the extra mile to forward my queries on running Poisson regressions using STATA to colleagues who were more familiar with the program. I'm truly indebted to him for his assistance.

The journey of learning would have been most lonesome and dull if not for fellow companions along the way. I could not have gone as far as I have without the help and encouragement of my classmates. In particular, I would like to thank Martin, Mona and Anusha for unselfishly availing themselves whenever I was in need.

I am most blessed to have family members who have supported and cheered me on all the way. My brother's constant refrain of "you can do it!" never failed to pick me up whenever things looked bleak; my mum's prayers for me were, without a doubt, a source of great comfort and strength.

Last but not least, it is only fitting that I thank God, for, "every good thing bestowed and every perfect gift is from above" (James 1:17).

CHAPTER 1

INTRODUCTION

The gravity model is a workhorse for econometric studies of the impact of regional trade agreements (RTAs). Despite its initial lack of theoretical basis, the model has been successfully derived from various trade theories. The latest theoretical derivation by Anderson and van Wincoop (2003) reveals that prior gravity studies have made the critical error of omitting the multilateral resistance variable, which results in biased estimates. Other recent studies have highlighted empirical issues with the commonly used procedure of log-linearizing the gravity model and estimating the parameters using Ordinary Least Squares (OLS) regression. Silva and Tenreyro (2006) point out that this method yields inconsistent estimates in the presence of heteroskedasticity. Helpman, Melitz and Rubinstein (2004) show that the concomitant practice of dropping observations with zero trade values (because the log-linearized model is not defined for such observations) will also give rise to biased results. To deal with these two issues of inconsistency and bias, we estimate the gravity model in its multiplicative form. Both cross-sectional and panel data analysis are performed, employing Poisson Pseudo Maximum Likelihood Estimator and Poisson Quasi-Conditional Maximum Likelihood Estimator respectively. Whilst analyzing the impact of RTAs in the light of the new estimation methods, this study will also re-evaluate the impact of the Asean Free Trade Area (AFTA) in the context of other major RTAs.

This chapter gives an overview of the development of RTAs (section 1.1) and a literature review of empirical studies (section 1.2). Chapter 2 will give a more detailed discussion of the gravity model while Chapter 3 explains the methodological approach. Chapter 4 presents the results for selected RTAs. In Chapter 5, we re-evaluate the impact of AFTA in the context of the findings and discuss its implications. Chapter 6 concludes.

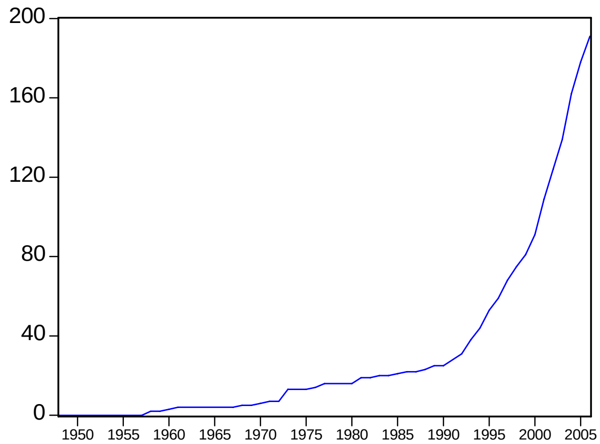
1.1 Regional Trade Agreements

1.1.1 Evolution of RTAs

The number of Regional Trade Agreements (RTAs) has grown dramatically since the 1990s, with the number of RTAs increasing seven-fold in the fifteen years spanning 1990 to

2005[1]. In fact, Mongolia is the only WTO member left who is not engaged in RTAs of one sort or another (Crawford and Florentino (2005)).

Figure 1: Number of RTAs Notified and in Force



Source: WTO Secretariat

The "First Regionalism" in the 1960s to 1970s, as termed by Bhagwati (1992), was sparked off by the formation of the European community in 1958. This first wave of regionalism was in the context of high general tariff levels, with some developing countries attempting to reduce costs of import-substituting industrialization by exploiting economies of scales through preferential opening of markets with one another. Bhagwati attributed the "Second Regionalism" in the 1980s to the shift in stance by the United States, the traditional champion of multilateralism, towards regionalism. Starting with the free trade agreement with Israel in 1985, the United States abandoned its long-standing opposition to regional arrangements.

The motivations for entering into RTA have also evolved over time with political and security considerations overshadowing economic ones. The more recent RTAs have shifted focus from removal of tariff barriers to 'new age' issues like e-commerce, services, foreign direct investment, government procurement, labor and environmental standards. Given that economic considerations increasingly take a second place in RTAs, there are concerns that the proliferation of RTAs will do more harm than good. Bhagwati has been a vocal opponent of RTAs, pointing

[1] Information on number of RTAs notified to the WTO the following website: http://www.wto.org/english/tratop_e/region_e/regfac_e.htm

out that the “spaghetti bowl” phenomenon of crisscrossing trade preferences and the associated rules of origin serve to confound rather than facilitate trade flows.

Although liberalization through RTAs is generally held to be a second-best option, the stalling of multilateral trade talks and the shift in policy stance by the US are two factors that continue to spur the proliferation of RTAs.

1.1.2 Effect of RTAs on Trade

Viner (1950) made seminal contributions to the analysis of RTAs, introducing the now familiar concepts of trade creation and trade diversion. Despite its simplicity, Panagariya (1999) maintains that Viner’s seminal concepts remain central to this day. RTAs are discriminatory by nature and involve only partial elimination of tariffs and, as pointed out by Viner, RTAs are not necessarily welfare improving. In fact, both countries left out of the RTA and countries within the RTA are susceptible to becoming worse off.

Trade creation takes place when, as a result of the preferential rate established by an RTA, domestic production of a product by a less efficient member country is displaced by the imports from more efficient member countries. This generates welfare gains for member countries as residents of member countries will pay less to purchase the same product, and these gains outweigh the loss in producer surplus and tariff revenues which occur as a result of the elimination of protection from competition from RTA partners.

Trade diversion occurs when as a result of preferences, imports from a low cost non-member country outside the RTA are displaced by imports from a higher cost member country. This not only represents a cost for the exporting country outside the RTA (that will see its exports reduced), but it also represents a cost for the importing country in the RTA. Consumers pay a lower price than before the preference was introduced, but the government loses tariff revenue. This generates a loss for the country as a whole.

Thus, an RTA can increase trade among members through trade creation (increased trade as a result of relative efficiency) or through trade diversion (increased trade as a result of preference). Therefore, an increase in intra-RTA trade arising from the establishment of a RTA does not necessarily mean that overall welfare of RTA members has increased. The increase in intra-RTA trade needs to be analyzed in conjunction with the result on trade diversion. For example, if there is no evidence of trade diversion, a positive and significant coefficient on the PTA-dummy can be imputed only to trade creation, hence the RTA is welfare improving. However, if there is evidence of trade diversion, overall welfare effects cannot be derived from the impact of the RTA on bilateral trade volumes.

1.1.3 Development of RTAs in ASEAN

ASEAN negotiated a preferential trade agreement within its membership in 1977, but serious progress in removal of barriers did not even get under way until 1987. As recently as 1989, the fraction of goods eligible for regional preferences was only on the order of 3 percent (Frankel (1998), pg 267). At the Fourth ASEAN Summit in Singapore in January 1992, ASEAN initiated the ASEAN Free Trade Area, or AFTA, which laid out a comprehensive program of regional tariff reduction, to be carried out in phases through the year 2008. This deadline was subsequently moved forward to 2003.

When the AFTA agreement was originally signed, ASEAN had six members (Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand). Vietnam joined in 1995, Laos and Myanmar in 1997, and Cambodia in 1999. All four countries were required to sign on to the AFTA agreement in order to join ASEAN, but were given longer time frames in which to meet AFTA's tariff reduction obligations.

The motivation for AFTA is not so much about integrating among ASEAN members, but rather to help ASEAN members co-operate in increasing their international competitiveness and integration with the world. In this sense, the “ultimate objective of AFTA is to increase ASEAN’s competitive edge as a production base geared for the world market” (AFTA Reader, 1993, p.1). In fact ASEAN has been adopting a brand of “open regionalism” that keeps membership open (as evidenced by the inclusion of newer members Myanmar, Laos, Cambodia and Vietnam), and non-discriminatory liberalization, where member countries are not precluded from extending preferential tariffs to non-member countries.

The momentum of RTAs among ASEAN members have picked up as well, with Singapore leading the way (See Table 1 for list of RTAs in force with ASEAN member countries as at 1 Mar 2007). Singapore has signed an FTA with Jordan, has launched negotiations with the Republic of Korea, Kuwait, Qatar, Panama, Peru, and is considering negotiations with Bahrian, Egypt and Sri Lanka. Singapore has ongoing negotiations with Canada, India, Mexico and P4 (Trilateral FTA comprising Chile, New Zealand and Brunei). Thailand has opened negotiations with New Zealand, signed an FTA with Australia, and is considering FTAs with the EFTA States and the US.

The Republic of Korea has been holding joint-study talks with ASEAN on plans for an FTA. ASEAN-China FTA came into force on 1 Jul 03. As for Australia and New Zealand, negotiations for an FTA between them and ASEAN countries were launched early 2005. India is also engaged in FTA negotiations with ASEAN and Thailand, having signed Framework Agreement with both, and is negotiating a Comprehensive Economic cooperation Agreement (CECA) with Singapore.

At the broader regional level, ASEAN, China, Japan and the Republic of Korea are discussing plans for an East Asian Community as a new framework for regional cooperation.

Table 1: RTAs with ASEAN Member Countries (as of 1 March 2007)

			GATT/WTO notification		
Agreement	**Date of entry into force**	**Date notified by Parties***	**Related provisions**	**Type of agreement**	**ASEAN Member Countries**
PTN	11-Feb-73	9-Nov-71	Enabling Clause	Preferential arrangement	Philippines
GSTP	19-Apr-89	25-Sep-89	Enabling Clause	Preferential arrangement	Indonesia, Myanmar, Philippines, Singapore, Thailand
Laos — Thailand	20-Jun-91	26-Nov-91	Enabling Clause	Preferential arrangement	Laos, Thailand
New Zealand - Singapore	1-Jan-01	4-Sep-01	GATT Art. XXIV	Free trade agreement	Singapore
New Zealand - Singapore	1-Jan-01	4-Sep-01	GATS Art. V	Services agreement	Singapore
Japan - Singapore	30-Nov-02	8-Nov-02	GATS Art. V	Services agreement	Singapore
Japan - Singapore	30-Nov-02	8-Nov-02	GATT Art. XXIV	Free trade agreement	Singapore
EFTA - Singapore	1-Jan-03	14-Jan-03	GATS Art. V	Services agreement	Singapore
EFTA - Singapore	1-Jan-03	14-Jan-03	GATT Art. XXIV	Free trade agreement	Singapore
ASEAN - China	1-Jul-03	24-Nov-04	Enabling Clause	Preferential arrangement	ASEAN
Singapore - Australia	28-Jul-03	25-Sep-03	GATS Art. V	Services agreement	Singapore
Singapore - Australia	28-Jul-03	25-Sep-03	GATT Art. XXIV	Free trade agreement	Singapore
United States - Singapore	1-Jan-04	17-Dec-03	GATT Art. XXIV	Free trade agreement	Singapore
United States - Singapore	1-Jan-04	17-Dec-03	GATS Art. V	Services agreement	Singapore
Thailand - Australia	1-Jan-05	27-Dec-04	GATT Art. XXIV	Free trade agreement	Thailand
Thailand - Australia	1-Jan-05	27-Dec-04	GATS Art. V	Services agreement	Thailand
Thailand - New Zealand	1-Jul-05	1-Dec-05	GATS Art. V	Services agreement	Thailand
Thailand - New Zealand	1-Jul-05	1-Dec-05	GATT Art. XXIV	Free trade agreement	Thailand
Jordan - Singapore	22-Aug-05	7-Jul-06	GATS Art. V	Services agreement	Singapore
Jordan - Singapore	22-Aug-05	7-Jul-06	GATT Art. XXIV	Free trade agreement	Singapore
Republic of Korea - Singapore	2-Mar-06	21-Feb-06	GATS Art. V	Services agreement	Singapore
Republic of Korea - Singapore	2-Mar-06	21-Feb-06	GATT Art. XXIV	Free trade agreement	Singapore
Japan - Malaysia	13-Jul-06	12-Jul-06	GATS Art. V	Services agreement	Malaysia
Japan - Malaysia	13-Jul-06	12-Jul-06	GATT Art. XXIV	Free trade agreement	Malaysia

1.2 Literature Review of Empirical Studies

Many studies have been made on the effect of RTAs. There are a variety of methodologies and interpretation of results differs according to specifications of the empirical model. We select three studies with contrasting methodologies and give a summary of the results in the table below.

Table 2: Summary of Previous Studies

Study by	Methodology	Results
Frankel (1998)	- Log-linearized model - Pooled OLS Regression - Intra-regional and extra-regional dummies	AFTA: Net trade creation EC: Net trade creation NAFTA: No significant trade creation but has trade diversion effects
Soloaga and Winters (2001)	- Log-linearized model - Tobit model - Intra-regional, regional export and regional import dummies	Cross-Sectional Analysis (levels) AFTA: Negative intra-regional dummy EU: Negative intra-regional dummy NAFTA: Positive intra-regional dummy Pooled Data AFTA: No significant effect on trade flows EU: Import and export diversion NAFTA: No significant effect on trade flows
Cheng and Wall (2005)	- Log-linearized model - Panel data with country pair fixed effects - Intra-regional dummies	AFTA: Not covered in study EU: Positive and significant at 10% level NAFTA: Positive and significant at 5% level

The gravity model is commonly estimated in its log-linearized form using OLS regression. The log-linearized specification means that observations with zero values have to be dropped because the logarithm of zero is undefined. As pointed out by Helpman, Melitz and Rubinstein (2004), this introduces bias into the coefficient estimates. Some studies have tried to go around this problem used the Tobit model. There has also been recent suggestions to use the Heckman selection model (for example, Linders and Groot (2006)) to correct for the bias of zero trade flows.

A recent paper by Silva and Tenreyro (2006) pointed out a further problem with the log-linearized specification. In the presence of heteroskedasticity, the log-linearized model gives rise to endogeneity problems as well. They propose estimating the model in its multiplicative form using Poisson pseudo maximum likelihood estimator (PPMLE). The PPMLE has an added advantage of being able to deal with zero trade values.

Another consideration when specifying the empirical model is the specification of the RTA dummies to capture the various effects on trade. An intra-regional trade dummy is added to the gravity model to capture trade creation effects. Earlier studies, for example Frankel (1998), include another extra-regional dummy to capture trade diversion effects of the RTA. However, following Soloaga and Winters (2001), recent studies have added two extra-regional dummies to capture separately import and export diversion effects.

The use of pooled or panel data is not new in gravity estimation. Pooled analysis is superior to cross-sectional analysis as it solves the problem of unobserved heterogeneity. The fixed effects model is used, although there are variations to the way fixed effect dummies are introduced. Cheng and Wall (2005) proposed two fixed effects for each pair of countries, one for each direction of trade. They show that alternative fixed-effects models proposed by Glick and Rose (2001), Mátyás (1997), and Bayoumi and Eichengreen (1997) are special cases of our model and that the restrictions necessary to obtain these special cases are not supported statistically.

Our study takes into account the issues raised in recent empirical studies. Details of our model specification are discussed in the following two chapters.

CHAPTER 2

GRAVITY MODEL

2.1 Theoretical Model

The most recent effort to derive the gravity model with micro-foundations is Anderson and van Wincoop (2003). They argue that trade between two regions is decreasing in their bilateral trade barrier relative to average barrier of the two regions to trade with all their partners. This average trade barrier is referred to as "multilateral resistance", compared with the bilateral resistance of trade. This multilateral resistance variable was often omitted from earlier gravity studies, which yield biased coefficients.

The derivation of the gravity equation derived by Anderson and van Wincoop (2003) is as follows:

Consumers in region j maximize their utility, as modeled by following CES utility function:

$$\left(\sum_i \beta_i^{1/\sigma} c_{ij}^{(\sigma-1)/\sigma} \right)^{\sigma/(\sigma-1)} \tag{2.1}$$

subject to the budget constraint:

$$\sum_i p_{ij} c_{ij} = Y_j$$

where c_{ij} is the consumption by region j consumers of goods from region i, σ is the elasticity of substitution between all goods, β_i is a positive distribution parameter, Y_j is the nominal income of region j residents, and p_{ij} is the price of region i goods for region j consumers.

This yields the nominal demand for region i goods by region j consumers:

$$X_{ij} = \left(\frac{\beta_i p_i t_{ij}}{P_j} \right)^{(1-\sigma)} Y_j \tag{2.2}$$

where p_i denotes the exporter's supply price, and t_{ij} the trade cost factor between i and j. Thus, p_{ij} is equivalent to $p_i t_{ij}$. Bilateral trade barriers are captured by the trade cost factor t_{ij}, where an increase in trade barriers is modeled by an increase in t_{ij}.

P_j is the consumer price index of j given by:

$$P_j = \sum_i \left(\beta_i p_i t_{ij}\right)^{1/(1-\sigma)} \tag{2.3}$$

This price index is the multilateral trade resistance, as it depends positively on trade barriers with all trading partners.

Market clearance implies:

$$Y_i = \sum_j X_{ij} = \sum_j \left(\beta_i t_{ij} p_i / P_j\right)^{1-\sigma} Y_j, \forall i \tag{2.4}$$

Assuming trade barriers are symmetric, $t_i = t_j$, it can be solved implicitly:

$$\beta_i p_i P_i = \theta_i^{1/(1-\sigma)}, \forall i \tag{2.5}$$

where $\theta = \frac{Y_i}{Y^W}$, which is region i's share of world income.

Substituting (2.5) into (2.2) gives the gravity equation:

$$X_{ij} = \frac{Y_i Y_j}{Y^w}\left(\frac{t_{ij}}{P_i P_j}\right)^{1-\sigma} \tag{2.6}$$

which is subject to

$$P_j^{1-\sigma} = \sum_i P_i^{\sigma-1} \theta_i t_{ij}^{1-\sigma} \; \forall j \tag{2.7}$$

Equation (2.7) has to be solved implicitly. Equation (2.7) is also defined as the multilateral resistance term.

Assuming $\sigma > 1$ [2], from equation (2.6), it is apparent that as bilateral trade barriers, t_{ij} between two countries increases, the exports between the two countries decreases. However, for a given bilateral barrier, t_{ij}, an increase of bilateral trade barriers between j and other trading partners will cause $P_j^{1-\sigma}$ to decrease (equation (2.7)). This will in turn cause X_{ij} to increase. Thus, trade between two countries is determined by bilateral trade barriers between themselves relative to trade barriers both countries face with all other trading partners. This is one of the major contributions by Anderson and

[2] Anderson and van Wincoop argue that the assumption of $\sigma > 1$ is consistent with empirical studies.

van Wincoop, highlighting that fact that the multilateral resistance term is required for correct specification of the gravity model.

2.2 Empirical Model

The stochastic version of Anderson and van Wincoop's model can be written as follows:

$$X_{ij} = \frac{Y_i Y_j}{Y^w} \left(\frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \eta_{ij} \tag{2.8}$$

where η_{ij} is the error factor with $E\left(\eta_{ij} \mid regressors\right) = 1$, assumed to be statistically independent of the regressors. This leads to

$$E\left(X_{ij} \mid regressors\right) = \frac{Y_i Y_j}{Y^w} \left(\frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \tag{2.9}$$

Coefficients for gravity models are traditionally estimated using ordinary least squares (OLS) regression by first log-linearizing the model. The log-linear specification of equation (2.8) can be written as follows:

$$\ln X_{ij} = \alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln t_{ij} + \alpha_4 \ln P_i + \alpha_5 \ln P_j + \ln \eta_{ij} \tag{2.10}$$

2.2.1 Problems With OLS Estimation of Log-Linear Specification

For consistent estimates, $E\left(\ln \eta_{ij} \mid regressors\right) = 0$. Since $E\left(\eta_{ij} \mid regressors\right) = 1$, $\ln\left[E\left(\eta_{ij} \mid regressors\right)\right] = \ln 1 = 0$. However, Jensen's inequality states that

$$E\left(\ln \eta_{ij} \mid regressors\right) \le \ln\left[E\left(\eta_{ij} \mid regressors\right)\right] \tag{2.11}$$

Thus, the condition of $E\left(\ln \eta_{ij} \mid regressors\right) = 0$ may not always hold.

Further, $E\left(\ln \eta_{ij} \mid regressors\right)$ depends on mean and higher-order moments of the distribution of η_{ij} [3]. Thus, if the variance of η_{ij} depends on the regressors, then $E\left(\ln \eta_{ij} \mid regressors\right)$ will also depend on regressors. This violates that condition for consistent estimates using OLS. Silva and Tenreyro (2006) found overwhelming evidence that the error terms in the log-linear specification of the gravity equation are heteroskedastic.

A second problem with using the log-linearized specification is the presence of zero trade flows. It is not uncommon to find two countries with only unilateral trade flows (ie $X_{ij} > 0$, but $X_{ji} = 0$) or zero bilateral trade flows (ie $X_{ij} = X_{ji} = 0$). This poses a problem because zero-value observations do not occur randomly. Zero flows mostly occur for trade between small or distant countries. However, due to the traditional log-linear specification of gravity models, observations with zero trade flows have to be dropped. A summary of the different approaches taken to deal with the problem of zero trade values is given below.

[3] This can be shown by a Taylor series expansion about constant, *a*:

$$\ln \eta_{ij} = \ln a + \sum_{n=1}^{\infty} (-1)^{n-1} \frac{(n-1)!}{n!} \frac{1}{a^n} \left(\eta_{ij} - a\right)^n$$

For example, if *a*=1= $E\left(\eta_{ij} \mid regressors\right)$,

$$\ln \eta_{ij} = \ln a + \sum_{n=1}^{\infty} (-1)^{n-1} \frac{(n-1)!}{n!} \left(\eta_{ij} - E\left(\eta_{ij} \mid regressors\right)\right)^n$$

$$E\left(\ln \eta_{ij} \mid regressors\right) = \sum_{n=1}^{\infty} (-1)^{n-1} \frac{(n-1)!}{n!} E\left[\left(\eta_{ij} - E\left(\eta_{ij} \mid regressors\right)\right)^n \mid regressors\right]$$

The above can be generalized for by taking

$$\ln \eta_{ij} = \ln a + \sum_{n=1}^{\infty} (-1)^{n-1} \frac{(n-1)!}{n!} \left(\eta_{ij} - E\left(\eta_{ij} \mid regressors\right) + E\left(\eta_{ij} \mid regressors\right) - a\right)^n$$

In general, the expectation of a logarithm depends on the entire shape of the distribution (Jensen's inequality), and therefore on all higher order moments, when they exist.

Table 3: Methods for Dealing with Zero Trade Values

Method	Disadvantage
Drop all observations with zero values	Produce biased estimates (Helpman, Melitz and Rubinstein (2004)).
Use $\ln\left(X_{ij}+1\right)$ as dependent variable	It is not obvious how to recover $E\left(X_{ij} \mid regressors\right)$ from a linear model for $E\left(\ln(X_{ij}+1) \mid regressors\right)$; results in biased estimates (Silva and Tenreyro (2006)).
Use Tobit model	Zero values in Tobit model occur when latent variable is less than or equal to zero. However, actual tradeflows can never be negative.
Use Heckman two-step selection method	Does not deal with endogeneity problem pointed out by Silva and Tenreyro (2006).

2.2.2 Proposed Estimation Method

The alternative to the log-linear specification would be to estimate the gravity model in its multiplicative form. For ease of discussion in this section, we re-write the deterministic gravity model as follows:

$$X_k = \exp\left(\mathbf{Z}_k^{'}\boldsymbol{\alpha}\right) \tag{2.12}$$

where X_k represents the k th observation of the dependent variable, X

$\mathbf{Z}_k$ represents $l \times 1$ vector of explanatory variables for the k th observation

$\boldsymbol{\alpha}$ represents the $l \times 1$ vector of coefficients

k represents all possible combinations of country pairs, (i, j), where $i \neq j$

l represents the number of explanatory variables

Silva and Tenreyro (2006) propose using the Poisson Maximum Likelihood (PML) to estimate the parameters. We describe the Poisson model below.

The density function of the Poisson distribution can be written as follows:

$$\Pr\left[\hat{X} = X\right] = \frac{e^{-\mu}\mu^{X}}{X!} \tag{2.13}$$

where μ is the rate parameter. The Poisson model is usually used to estimate count data, which means X takes on non-negative integer values.

The first two conditional moments of a Poisson distribution are

$$E\left(X_k \mid \mathbf{Z}_k\right) = \operatorname{var}\left(X_k \mid \mathbf{Z}_k\right) = \mu_k \tag{2.14}$$

where μ_k is parameterized as

$$\mu_k = \exp\left(\mathbf{Z}_k^{'}\boldsymbol{\alpha}\right) \tag{2.15}$$

Thus, $\operatorname{var}\left(X_k \mid \mathbf{Z}_k\right) = \exp\left(\mathbf{Z}_k^{'}\boldsymbol{\alpha}\right)$, indicating that the Poisson distribution is intrinsically heteroskedastic, thus addressing the heteroskedastic nature of the data employed in gravity studies.

One main characteristic of the Poisson model is the equality of the mean and variance. Deviation from this property leads to over or under-dispersion, indicating a poor fit of data to the Poisson model. However, McCullagh and Nelder (1989) argue that if the precise mechanism of over-dispersion or under-dispersion is not known, it is convenient to assume $\operatorname{var}\left[X_k \mid \mathbf{Z}_k\right] \propto \exp\left(\mathbf{Z}_k^{'}\alpha\right) = E\left(X_k \mid \mathbf{Z}_k\right)$. Even relatively substantial errors in the assumed functional form of $\operatorname{var}\left[X_k \mid \mathbf{Z}_k\right]$ generally have only a small effect on conclusions (McCullagh and Nelder (1989) pg 199) and we will still obtain estimates that are asymptotically consistent.

The log-likelihood function is

$$\ln L\left(\boldsymbol{\alpha}\right) = \sum_{k=1}^{n}\left[X_k \mathbf{Z}_k^{'}\boldsymbol{\alpha} - \exp\left(\mathbf{Z}_k^{'}\boldsymbol{\alpha}\right) - \ln \mathbf{X}_k!\right] \tag{2.16}$$

This gives the following first order conditions for Poisson Maximum Likelihood Estimator (PMLE):

$$\sum_{k=1}^{n}\left[X_k - \exp\left(\mathbf{Z}_k^{'}\mathbf{a}\right)\right]\mathbf{Z}_k = \mathbf{0} \tag{2.17}$$

Poisson pseudo-maximum likelihood (PPMLE) is computationally the same as the estimate obtained from (2.17). From (2.17), we observe that the summation of the left-hand side has expectation zero if $E\left(X_k \mid \mathbf{Z}_k\right) = \exp\left(\mathbf{Z}_k^{'}\boldsymbol{\alpha}\right)$. Thus, all that is needed for the PPMLE to be consistent is the correct specification of the conditional mean (Silva and

Tenreyro (2006), page 645). The added advantage is that the data need not be Poisson at all. Further, based on the result from Gourieroux, Monfort and Trognon (1984), the dependent variable need not even be an integer.

One last detail is the fact that the assumption $\text{var}\left[X_k \mid \mathbf{Z}_k\right] \propto \exp\left(\mathbf{Z}_k^{'}\boldsymbol{\alpha}\right)$ is unlikely to hold. Thus, the PPMLE does not take fully into account the heteroskedasticity present in the model. Thus, for inference, we will need to rely on robust standard errors[4].

For our study, we will use the PPMLE. Besides dealing with the problem of inconsistency in the presence of heteroskedasticity, PPMLE also provides a natural way to deal with the problem of observations with zero values.

The above can be easily extended to panel data. Wooldridge (1999) show that the fixed effects Poisson model is consistent very generally, where only the conditional mean need to be correctly specified. The proof of consistency of Poisson QCMLE (Quasi[5] Conditional Maximum Likelihood Estimator) by Wooldridge (1999) is briefly shown in the following:

Let $\left\{\left(\mathbf{X}_k, \mathbf{Z}_k, \phi_k\right)\right\}$ be a sequence of i.i.d. random variables, where $\mathbf{X}_k \equiv \left(X_{k1},...,X_{kT}\right)'$ is a $T \times 1$ vector, $\mathbf{Z}_k \equiv \left(\mathbf{Z}_{k1}^{'}, \mathbf{Z}_{k2}^{'},...,\mathbf{Z}_{kT}^{'}\right)'$ is a $T \times l$ matrix, and ϕ_k is an unobserved scalar effect. Consider the model

$$E\left(X_{kt} \mid \mathbf{Z}_k, \phi_k\right) = \phi_k \mu\left(\mathbf{Z}_{kt}, \boldsymbol{\alpha}\right), \quad t = 1,...,T \tag{2.18}$$

The conditional log-likelihood is

$$L_i\left(\mathbf{a}\right) = \sum_{t=1}^{T} X_{kt} \log\left[p_t\left(\mathbf{Z}_k, \mathbf{a}\right)\right] \tag{2.19}$$

where $p_t\left(\mathbf{Z}_k, \mathbf{a}\right) \equiv \mu\left(\mathbf{Z}_{kt}, \mathbf{a}\right) \Big/ \left(\sum_{r=1}^{T} \mu\left(\mathbf{Z}_{kr}, \mathbf{a}\right)\right), \quad t \neq r$

Consistency of the multinomial Pseudo Conditional Maximum Likelihood Estimator can be established by the following lemma:

[4] Also known as Eicker-White standard errors.
[5] Note that "quasi" and "pseudo" maximum likelihood estimators are used interchangeably in the econometric literature.

Lemma 2.1 Let $X_1, X_2, ..., X_T$ *be non-negative random variables with finite, non-zero means* $\mu_1^0, \mu_2^0, ..., \mu_T^0$*, and let* $\mathbb{R}_{++}^T$ *denote the subset of T-dimensional Euclidean space with strictly positive elements. Then* $\mu_0 \equiv \left(\mu_1^0, \mu_2^0, ..., \mu_T^0\right)$ *is the unique solution to*

$$\max_{\mu \in \mathbb{R}_{++}^T} \sum_{t=1}^{T} \mu_t^0 \log\left(\mu_t \Big/ \left(\sum_{r=1}^{T} \mu_r\right)\right) \tag{2.20}$$

From (2.19), $E\left[L_k\left(\mathbf{a}\right) | \mathbf{Z}_k, \phi_k\right] = \phi_k \sum_{t=1}^{T} \mu\left(\mathbf{Z}_{kt}, \boldsymbol{\alpha}\right) \log\left[p_t\left(\mathbf{Z}_k, \mathbf{a}\right)\right]$. By Lemma 2.1, $\boldsymbol{\alpha}$ maximizes $E\left[L_k\left(\mathbf{a}\right) | \mathbf{Z}_k, \phi_k\right]$ for any $\left(\mathbf{Z}_{k,} \phi_k\right)$. The law of iterated expectations then shows that α maximizes $E\left[L_k\left(\mathbf{a}\right)\right]$ over the parameter space. Consistency then follows under a standard identification assumption and regularity of conditions that ensure the uniform weak law of large numbers holds. Again robust standard errors are required for inference.

2.3 Variable Measures

Rewriting equation (2.10) in exponential form gives

$$X_{ij} = \exp\left(\alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln t_{ij} + \alpha_4 \ln P_i + \alpha_5 \ln P_j + \ln \eta_{ij}\right) \tag{2.21}$$

Based on the derivations in the preceding sections, the dependent variable, X_{ij} represents exports of country i to j. However, other measures have been used. For example, Soloaga and Winters (2001) used imports, while others have used the average of imports and exports. While import data is generally considered more reliable than export data (nations spend more on measuring import data to avoid tariff fraud), imports are recorded using c.i.f. prices, which are inclusive of transport costs. This results in endogeneity, as variables measuring transport costs will be correlated with the error term, yielding inconsistent estimates. To be consistent with theory and ensure consistency of estimates, we will rely on export data for our study.

For empirical estimation, the trade cost factor, t_{ij}, is not observable. t_{ij} is usually modeled in a log-linear function in terms of observable d_{ij}, the bilateral distance and τ_{ij} for any other border effects between region i and j exists, giving:

$$\ln t_{ij} = \rho_1 \ln d_{ij} + \rho_2 \tau_{ij} \tag{2.22}$$

Traditionally, τ_{ij} includes various other factors that may affect trade costs. For example whether two countries are contiguous, share a common official language or had common colonial links. We model trade cost factor as follows:

$$\ln t_{ij} = \rho_1 \ln d_{ij} + \rho_2 CONT_{ij} + \rho_3 LANG_{ij} + \rho_4 COL_{ij} + \rho_5 LL_i + \rho_6 LL_j \tag{2.23}$$

where

$CONT_{ij}$ is a dummy that takes value 1 if countries i and j are contiguous and 0 otherwise;

$LANG_{ij}$ is a dummy that takes value 1 if countries i and j share a common official language and 0 otherwise;

COL_{ij} is a dummy that takes value 1 if countries i and j had common colonial links and 0 otherwise;

LL_i is a dummy that takes value 1 if country i is landlocked and 0 otherwise;

LL_j is a dummy that takes value 1 if country j is landlocked and 0 otherwise.

The consumer price index P_i is also unobservable. Anderson and van Wincoop (2003) proposed a methodology to solve for P_i which requires custom programming to perform constrained minimization, which is cumbersome, especially if the study involves multiple countries.

The main argument of Anderson and van Wincoop (2003) is that trade between two regions is decreasing in their bilateral trade barrier relative to average barrier of the two regions to trade with all their partners. This average trade barrier is referred to as "multilateral resistance", as measured by the price indices. Other studies have used a remoteness variable to proxy for multilateral resistance, and we follow Wei (1996) by using GDP-weighted average distance to all other countries:

$$REM = \sum_h w_h d_{hi} \tag{2.24}$$

where

REM is the remoteness measure

d_{hi} is the bilateral distance between countries i and h

h is the trading partner;

w_h is country h's share of world's GDP

CHAPTER 3

DATA AND METHODOLOGY

In previous gravity studies, results have differed based on whether cross-sectional data or pooled data was used. For example, Frankel (1998) does not find a significant impact of NAFTA on intra-NAFTA trade when the analysis is run on the cross-country sample, while he estimates that the NAFTA bloc increases trade by 43 per cent with respect to otherwise similar countries, when data are pooled over 1970-92 (as cited by Piermartini and Teh (2005)).

However, it must be pointed out that cross-sectional analysis has its short-comings as it fails to control for unobserved heterogeneity among countries. This problem is mitigated by using panel data analysis.

For our studies we will examine both cross-sectional and panel data covering the period 1989 to 2005. The sections 3.1 and 3.2 discuss the two approaches in greater detail. Section 3.3 details the data used in our analysis.

3.1 Cross Sectional Analysis

Exports from country i to country j is explained by the following equation:

$$\begin{aligned} X_{ij} = \exp(&\alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln d_{ij} \\ &+\alpha_4 CONT_{ij} + \alpha_5 LANG_{ij} + \alpha_6 COL_{ij} + \alpha_7 LL_i + \alpha_8 LL_j \\ &+\alpha_9 \ln REM_i + \alpha_{10} \ln REM_j \\ &+\ln \eta_{ij}) \end{aligned} \tag{3.1}$$

In the empirical literature, this is often called the counterfactual, and it indicates the "normal" level of bilateral trade between two countries. For simplification of notation, we rewrite equation (3.1) as:

$$X_{ij} = \exp(E_{ij} + \ln \eta_{ij}) \tag{3.2}$$

To examine the effects RTAs on intra-regional trade, we need to introduce RTA dummies into the above equation, giving

$$X_{ij} = \exp(E_{ij} + \sum_r \beta_{1r} REG_r + \sum_r \beta_{2r} EX_r + \sum_r \beta_{3r} IM_r + \ln \eta_{ij}) \tag{3.3}$$

where

r indicates membership of the rth RTA

REG is the intraregional trade dummy that takes on value 1 if both countries are members of rth RTA and 0 otherwise;

EX is the export dummy that takes on value 1 if exporting country is member of rth RTA and 0 otherwise;

IM is the import dummy that takes on value 1 if importing country is member of rth RTA and 0 otherwise;

Coefficient β_{1r} captures the increase in intra-regional trade over and above that which is explained by the explanatory variables. Coefficient β_{2r} captures the effect of general MFN trade liberalization and *export* diversion while coefficient β_{3r} captures the effect of general MFN trade liberalization and *import* diversion. β_{2r} and β_{3r} can be interpreted as "openness" of the region to trade.

The approach for cross-sectional analysis we adopt is similar to Soloaga and Winters (2001). We perform 17 separate regressions (one for each year in the period 1989 to 2005). As mentioned earlier, the weakness of cross-sectional analysis is that unobserved characteristics of countries may be captured in the coefficients of the RTA dummies. As such, we seek to identify the 'level' effect of the RTAs on trade and the variation of their effect through time. To isolate the impact of RTAs, we would need to use panel data analysis.

3.2 Panel Data Analysis

To eliminate unobserved heterogeneity, we use a fixed effects model. We follow Cheng and Wall (2005) and specify two fixed effects for each pair of countries, one for each direction of trade. Due to this specification, bilateral variables that are constant over time (such as distance) will be dropped from the model. Additionally, the RTA dummies are also redefined to take on the value 1 only when the RTA comes into effect or when a major change to an RTA comes into effect.

For our analysis, we will consider the impact of the RTA or change to RTA as detailed below:

Table 4: List of RTAs and Year of Inception or Change

RTA	**Year**	**Event**
AFTA	1992	Inception
NAFTA	1994	Inception
EU	1995	Expansion from EU12 to EU15
MERCOSUR	1991	Inception
ANDEAN	1991	Renewal
CACM	1990	Renewal
ANZCERTA	1990	Elimination of all tariff and quantitative restrictions

The gravity equation for panel data analysis can be written as follows:

$$X_{ijt} = \exp(\gamma_{ij} + \lambda_t + \alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y + \alpha_3 \ln REM_i + \alpha_4 \ln REM_j + \sum_r \beta_{1r} REG_{rt} + \sum_r \beta_{2r} EX_{rt} + \sum_r \beta_{3r} IM_{rt} + \ln \eta_{ijt}) \quad (3.4)$$

where

γ_{ij} captures time-invariant fixed effects of unobserved country pair heterogeneity

λ_t captures all time-varying heterogeneity that is shared among country pairs

3.3 Data Sources

We have a sample of 54 countries covering the period 1989 to 2005 (see Table 5) giving a total of 2862 observations per year for cross-sectional data and 48654 observations in total for panel data. The 54 countries account for 74% to 80% of total world exports each year. We obtain export data from UN COMTRADE. Of the 48654 observations, 1553 have zero export values.

One major constraint in the selection of sample countries is the availability of complete data over the period covered. Due to incompleteness of data, we have exclude AFTA members Brunei, Vietnam, Cambodia, Myanmar and Laos. However, as these five countries account for only about 5% of total ASEAN exports, the effect is negligible. For this study, AFTA will refer to the ASEAN-5 members of Indonesia, Malaysia, Philippines, Singapore and Thailand. Similarly for EU15, we have also chosen to leave out Belgium and Luxemburg because of data availability. Belgium and Luxemburg account for less than 10% of total EU15 exports.

Table 5: List of countries in sample

SOUTH AMERICA	ASIA	NORTH AMERICA	EUROPE	OTHERS
MERCOSUR	AFTA	NAFTA	EU15	Israel
Argentina	Indonesia	Canada	Denmark	Egypt, Arab Rep.
Brazil	Malaysia	Mexico	France	Morocco
Paraguay	Philippines	United States	Germany	Tunisia
Uruguay	Singapore		Greece	
	Thailand	CACM	Ireland	
ANDEAN	(Brunei)	Costa Rica	Italy	
Bolivia	(Cambodia)	Guatemala	Netherlands	
Colombia	(Laos)	Honduras	Portugal	
Ecuador	(Myanmar)	Nicaragua	Spain	
Peru	(Vietnam)	(El Salvador)	United Kingdom	
Venezuela			(Belgium)	
		Others	(Lux)	
Others	ANZCERTA	Panama	*Accession in 1995*	
Chile	Australia		Austria	
	New Zealand		Finland	
			Sweden	
	Others			
	China		Others	
	Hong Kong		Cyprus	
	India		Hungary	
	Japan		Norway	
	Korea, Rep.		Poland	
	Taiwan, China		Switzerland	
			Turkey	

Note: The countries in brackets are members of the RTA, but are excluded from the study due to lack of data

We recognize the possibility of selection bias in our sample. However, the constraint of data availability is not easily resolved for studies involving trade data, and that remains a limitation in our study.

Trade data also does not differentiate between zero and missing values. So when one comes across missing values, the data could really be missing, or it could mean zero trade flows. For our study, we assume that all missing values mean zero values.

A further complication is this: even if UN COMTRADE reports the availability of export data for a particular country, it does not guarantee that data is complete. For example, even though Singapore exports are reported to be available in the UN COMTRADE database, the exports from Singapore to Indonesia for 1989 to 2002 were missing. In recognition of this, we also ran the analysis excluding observations involving exports from Singapore to Indonesia.

GDP figures are from World Bank World Development Indicators. Geographical data is obtained from CEPII.

CHAPTER 4

RESULTS

4.1 Cross Sectional Analysis

The coefficient estimates using OLS and PPMLE for cross-sectional data are summarized in Tables 12to 15 in the Appendix.

We tested for heteroskedasticity in the data for each of the 17 years using White's test. The null hypothesis of no heteroskedasticity was rejected at 1% level for all years. As pointed out by Silva and Tenreyro (2006), the presence of heteroskedasticity leads to both inefficient and inconsistent OLS estimates.

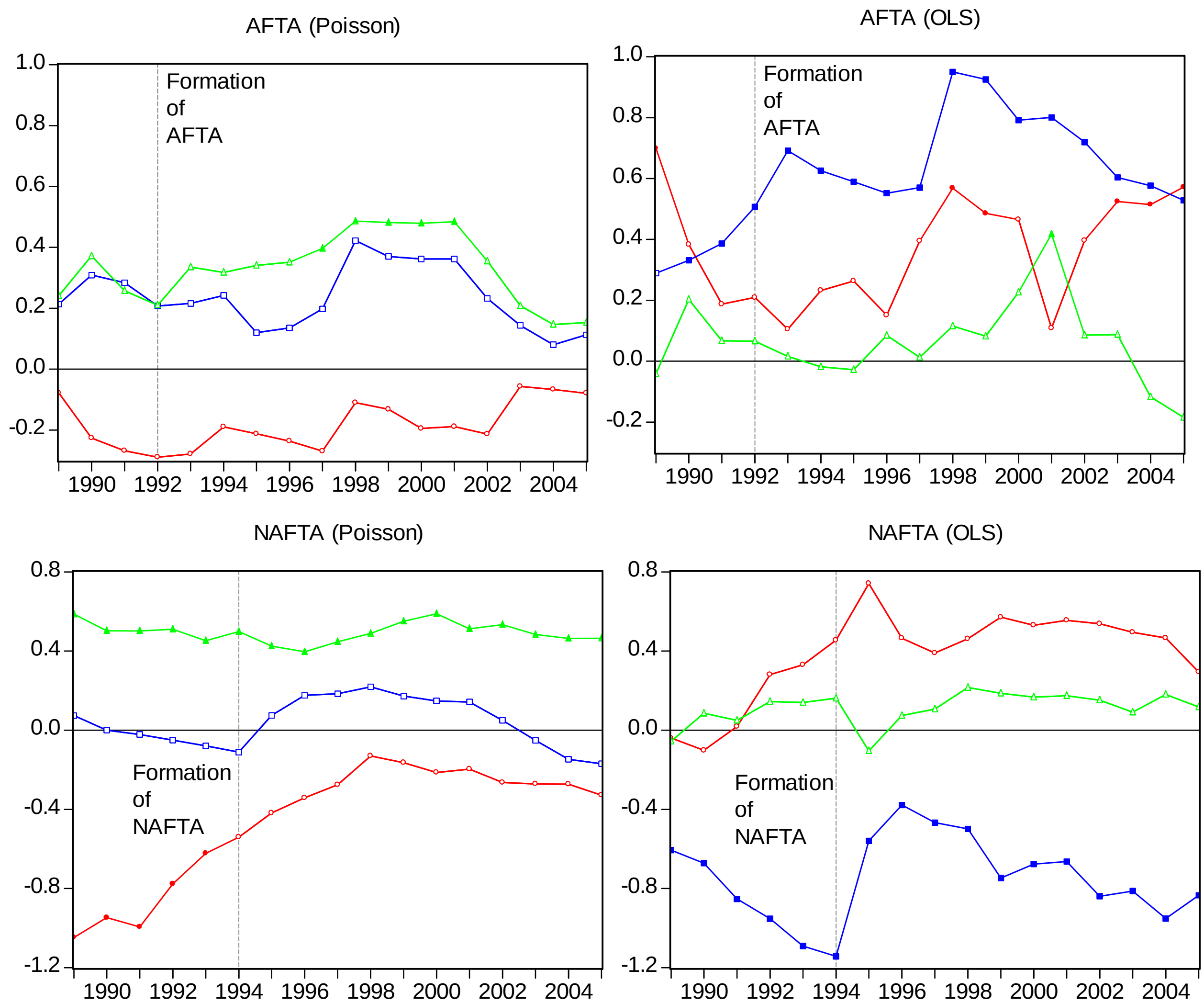
The signs of the coefficients produced by Poisson regression for the counterfactual variables are generally as expected. The coefficients for GDP are positive and highly significant throughout the period. Coefficients for distance are negative and highly significant throughout the period. Coefficients for contiguity and sharing a common language were positive and highly significant. Landlocked dummies had negative coefficients, though they were not always significant. Coefficients for remoteness variables were positive and mostly highly significant. However, we note that the colonial-tie dummy had negative coefficients, although they were insignificant half of the time. It is arguable whether colonial ties will really lubricate the trade between two countries; also, the colonial ties dummy is an imperfect measure of the similarity of political-social characteristics and may cause a bias in the estimates. The OLS estimates for the colonial ties dummy were also insignificant throughout the whole period.

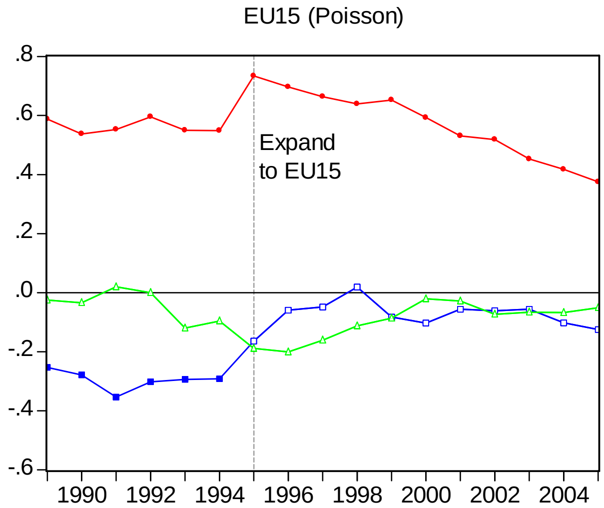
As for OLS, the sign of the coefficients for GDP, distance, common language dummy, landlocked dummy for importer, and remoteness were as expected. The colony dummy was negative but insignificant. Contiguity was positive, but mostly insignificant, which is a bit of a surprise. The landlocked dummy for importer posted a positive and significant coefficient for from 2000 to 2005, counter to expectations.

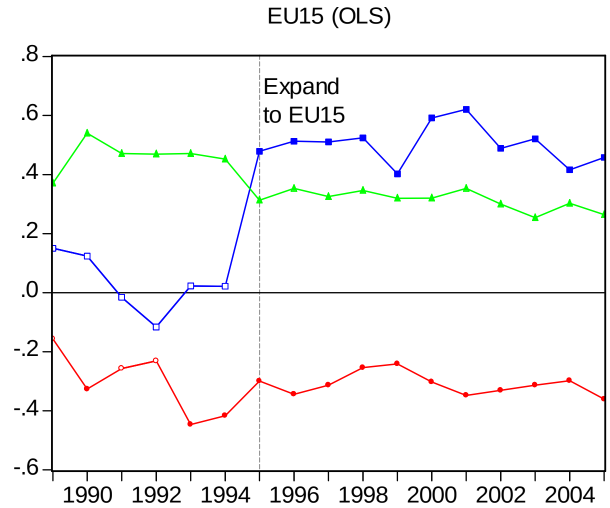
Thus overall, Poisson seems to do a better job for the geographical variables like contiguity and landlocked dummies. However, the negative coefficients for colonial dummy predicted by Poisson regression could warrant further investigation.

For ease of reference, the graphs of the coefficients for the RTA dummy variables are plotted over the 17 year period. We have included the graphs for the coefficients obtained by OLS for comparison purposes.

Figure 2: Poisson and OLS Estimates for RTA Dummies




EU15 (Poisson)
.8
.6
.4
.2
.0
-.2
-.4
-.6
Expand
to EU15
1990
1992
1994
1996
1998
2000
2002
2004


EU15 (OLS)
.8
.6
.4
.2
.0
-.2
-.4
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Expand
to EU15
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1992
1994
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2000
2002
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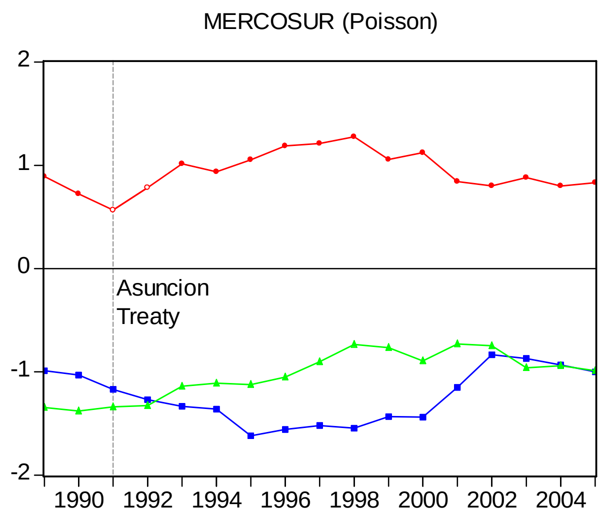
MERCOSUR (Poisson)
2
1
0
-1
-2
Asuncion
Treaty
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1992
1994
1996
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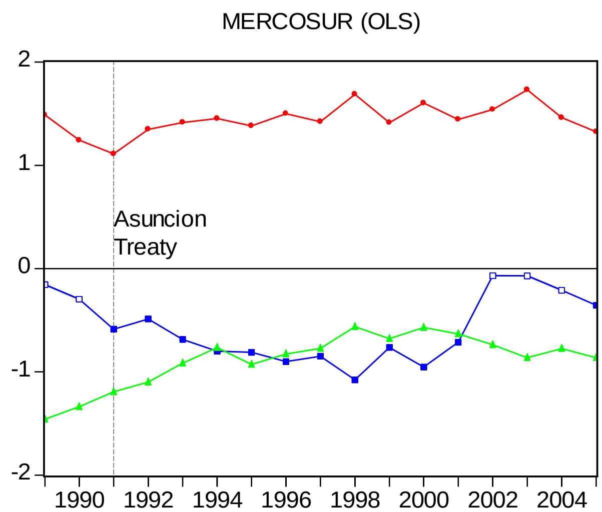
MERCOSUR (OLS)
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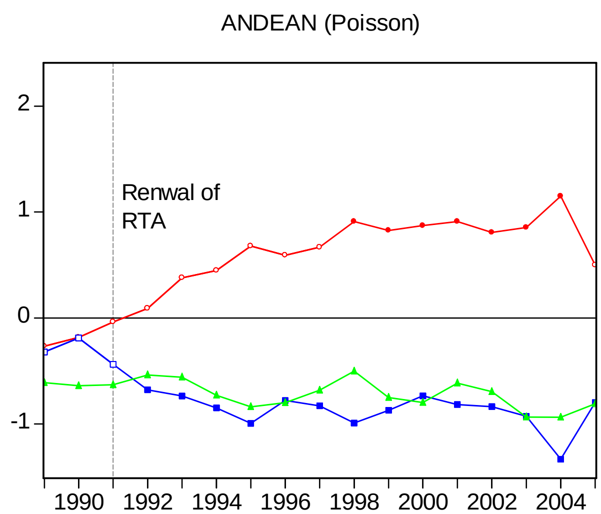
ANDEAN (Poisson)
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1
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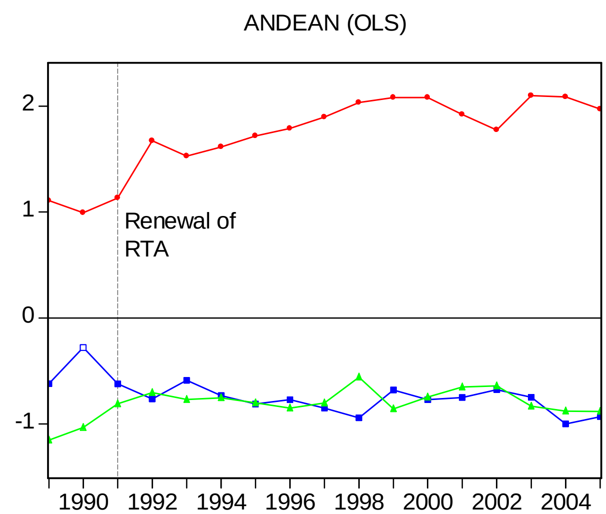
-1
Renwal of
RTA
1990
1992
1994
1996
1998
2000
2002
2004


ANDEAN (OLS)
2
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-1
Renewal of
RTA
1990
1992
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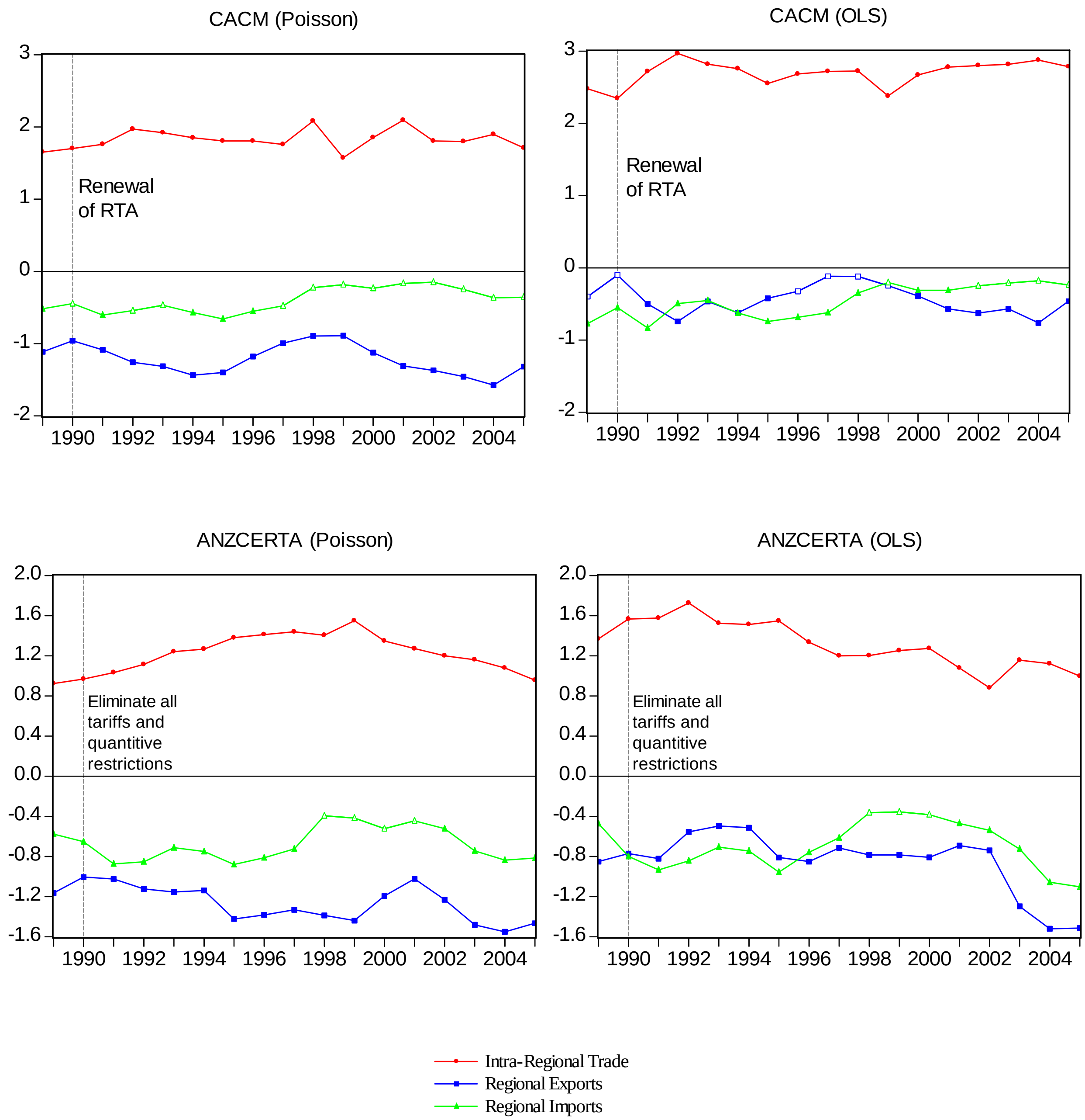


Note: Hollow symbols represent coefficients that are statistically insignificant

The graphs obtained for the case where we assume exports from Singapore to Indonesia from 1989 to 2002 were zero and the case where we exclude Singapore-Indonesia exports did not differ significantly. We report the coefficients for the Poisson estimates based on the former assumption in Tables 14 and 15, while Poisson estimates based on the latter are reported in Tables 16 and 17.

We observe that the graphs for Poisson estimates tend to be smoother than those for OLS. The "jumpiness" of the OLS coefficients could be a sign of the inconsistency present. Poisson could very well be painting a more realistic picture as one wouldn't expect trading relationships between countries to experience too much fluctuation from year to year.

The Poisson and OLS regressions paint rather different pictures for AFTA, NAFTA and EU15:

- For AFTA, Poisson regression yields RTA dummy coefficients are generally insignificant. OLS, on the other hand, gives significantly positive regional export dummy coefficients.
- For NAFTA, Poisson yields regional export dummy coefficients that are positive and significant while OLS yields regional import dummy coefficients that are negative and significant.
- EU has positive and significant coefficients for the intraregional trade dummy using Poisson but negative and significant coefficients for the same using OLS. Coefficients for regional exports and imports under Poisson are generally insignificant, but are positive and significant under OLS.

Of the three RTAs mentioned above, EU15 yielded the most contrasting results under the two different regressions. Poisson would suggest that EU15 member countries are trading more with each other compared to the rest of the world. However, OLS paints a picture of a very open region, with positive regional import and export dummy coefficients, and intraregional trade that is somewhat "underperforming" compared to trade with the rest of the world.

The picture presented using Poisson regression of EU15 would perhaps present a more accurate picture of trade flows by the EU15 countries. The high level of openness depicted by OLS regression seems contrary to the fact that the stagnant economy and high unemployment rates of 1970s and 1980s precipitated protectionist policies in the Europe. The 1990s have seen positive attempts at lowering trade barriers, as pointed out by Hanson (1998), and Poisson regression depicts a region that is not significantly open compared to the rest of the world. Also, given the fact that EU15 is one of the most integrated trading blocs, it seems unreasonable that the intraregional trade dummy is significantly negative.

Interestingly, the pictures for MERCOSUR, ANDEAN, CACM and ANZCERTA are very similar, with significantly positive coefficients for intraregional trade dummies, but negative and generally significant coefficients for regional import and export dummies. This picture holds true for both Poisson and OLS methods. However, it seems that OLS tends to yield higher coefficients for the intraregional trade dummy. For example, the coefficients for ANDEAN are in the region of 0 to 1 for Poisson but are in the region of 1 to 2 for OLS.

We would like to emphasize that the analysis of the levels do not indicate the effectiveness of the respective RTAs. To measure the impact of the RTA, we would need to analyze whether there has been a *change* in the coefficients in period before and after the RTA is effective. In the next subsection, we consider the impact of the RTAs by using panel data analysis.

4.2 Panel Data Analysis

Table 6: Coefficients for Panel Data Analysis

		Poisson		OLS	
RTA	Dummy	Coef	Std Err	Coef	Std. Err
AFTA	Intraregional	0.042	(0.153)	0.002	(0.080)
	Regional Exports	0.090	(0.070)	0.461**	(0.037)
	Regional Imports	-0.027	(0.051)	-0.034	(0.045)
NAFTA	Intraregional	0.501**	(0.121)	0.414**	(0.084)
	Regional Exports	-0.177**	(0.027)	-0.088**	(0.025)
	Regional Imports	-0.046	(0.060)	0.139**	(0.026)
EU15	Intraregional	-0.008	(0.039)	0.041	(0.026)
	Regional Exports	0.097**	(0.035)	0.002	(0.021)
	Regional Imports	0.071	(0.044)	0.020	(0.032)
MERCOSUR	Intraregional	0.190	(0.232)	0.068	(0.146)
	Regional Exports	-0.113*	(0.050)	-0.361**	(0.058)
	Regional Imports	0.492**	(0.050)	0.596**	(0.057)
ANDEAN	Intraregional	0.834**	(0.157)	0.690**	(0.170)
	Regional Exports	-0.433**	(0.070)	-0.247**	(0.074)
	Regional Imports	-0.042	(0.050)	0.279**	(0.061)
CACM	Intraregional	0.030	(0.247)	0.286	(0.260)
	Regional Exports	0.066	(0.104)	-0.160	(0.146)
	Regional Imports	0.242*	(0.106)	0.111	(0.114)

		Poisson		OLS	
RTA	Dummy	Coef	Std Err	Coef	Std. Err
ANZCERTA	Intraregional	0.400**	(0.119)	0.283*	(0.133)
	Regional Exports	-0.092	(0.059)	0.003	(0.086)
	Regional Imports	-0.166**	(0.059)	-0.136	(0.075)

*Note: (i) * Significant at 5% level; **Significant at 1% level*
(ii) Robust standard error is used

Panel analysis using Poisson regression reveals that AFTA was the only RTA which has had no significant impact on trade flows. NAFTA and ANDEAN both showed increased intra-regional trade and export diversion. ANZCERTA showed increased intra-regional trade and import diversion. Accession of Austria, Finland and Sweden increased regional export flows for EU15; CACM showed increased regional import flows.

OLS regressions are somewhat different from Poisson regressions. AFTA showed positive impact on regional exports. For NAFTA and ANDEAN, OLS shows increased regional export flows on top of increased intra-regional trade and export diversion. EU15 and CACM had no impact on all trade flows. MERCOSUR yielded similar results as Poisson. ANZCERTA had increased intraregional trade flows.

In the context of Vinerian analysis of the welfare impact on RTAs, export diversion will have an impact on world welfare. Soloaga and Winters (2001) only found evidence of trade diversion for EU and EFTA. However, our study reveals that export diversion is more widespread, and is evident in NAFTA, MERCOSUR and ANDEAN. Thus, it is apparent that RTAs are may not be beneficial to world welfare.

There is less evidence of import diversion, with only ANZCERTA posting a negative coefficient for the regional import dummy.

The above analysis is robust even when we exclude Singapore-Indonesia exports (see Table 18 in Appendix for the Poisson estimates).

CHAPTER 5

IMPLICATIONS FOR AFTA

5.1 Evaluation of AFTA

Table 7: Top 10 Export Destinations of ASEAN Exports for 1990 and 2005

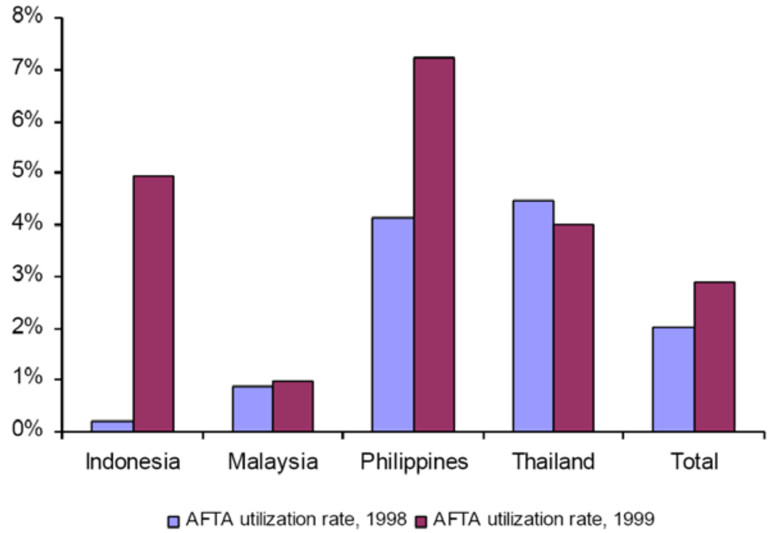
	1990		**2005**
United States	20.1%	ASEAN5	23.3%
Japan	18.5%	United States	14.2%
ASEAN5	18.1%	EU15	12.0%
EU15	16.0%	Japan	10.9%
Hong Kong	4.6%	China	8.1%
Taiwan	3.3%	Hong Kong	6.7%
South Korea	3.2%	South Korea	3.9%
Australia	1.9%	Taiwan	3.3%
China	1.9%	Australia	3.1%
India	1.2%	India	2.4%

Source: Computed from UN Comtrade Database

ASEAN-5 intra-regional trade accounts for 23.3 % of total ASEAN-5 exports in 2005, up from 18.1% in 1990. At first glance, it would seem that intraregional trade among AFTA members has improved. However, we have to bear in mind that the AFTA member countries have grown tremendously through the years, and trade volumes correspondingly increase with GDP growth. The results of the gravity model in the previous chapter has shown that after taking into account the GDP growth of AFTA member countries, AFTA members are not trading with each other more than what is expected. In fact, following the results from Poisson fixed effects panel regression, AFTA was the only RTA with insignificant impact on trade flows.

Other studies have come to a similar conclusion that the preferential arrangement among AFTA members has not been effective operationally. As noted by Baldwin (2007), overall in 1999, only 3% of total intra-ASEAN imports utilized ASEAN preferential rates (see Figure 3). The margin of preference given is too small to cover the administrative costs in complying with the rules of origin.

Figure 3: AFTA Utilization Rates (Percent of Intra-ASEAN imports)



Source: PriceWaterhouseCooopers presentation to the 10th Meeting of the ASEAN Directors-General Customs, 24 July 2002 (as cited by Baldwin (2007))

Another issue is the coverage of goods that are given preferential tariffs. The Common Effective Preferential Tariff (CEPT) is the main mechanism for AFTA. The CEPT-AFTA Agreement does not mandate all products undergo an immediate tariff reduction process. Each member of AFTA is allowed to have four types of product lists: an Inclusion List, a Temporary Exclusion List, a Sensitive List and a General Exception list. Only products in the Inclusion List are subject to immediate tariff reductions. Products in the General Exception List are permanently excluded from the tariff reduction process under the CEPT-AFTA Agreement.

A key feature of AFTA is that the concessions are granted on a reciprocal, product-by-product basis. Thus, AFTA actually does not provide for unconditional preference. For a product to enjoy CEPT concessions in an importing country, it must comply with the following conditions:

- The product is on the Inclusion List of both the exporting and importing country
- The tariff rate in the exporting country for the product is at or below 20 percent. If the tariff rate in the exporting country for the product is above 20 percent, the concessions can be given only when the CEPT tariff rate of the importing country for the same product is also above 20 percent
- The product is an ASEAN product in line with the AFTA rules of origin

In a study by Hafez (2004), he noted that although 98.36% of all tariff lines of the ASEAN-6 (ASEAN-5 plus Brunei) are already in the Inclusion List, and the average CEPT-Tariffs for these products were reduced from 12.76 percent in 1993 to 2.89 percent in 2002, approximately 1,600 products in the Inclusion List of the ASEAN-6 still have tariffs in excess of 5 percent. Significantly, the CEPT tariff rates under AFTA and the MFN rates are the same for as much as two-thirds of the tariff lines in the Inclusion List. Thus, trade among AFTA members was not freer than trade with the rest of the world.

Table 8: AFTA CEPT List for 2001

Country	Inclusion List	Temporary Exclusion List	General Exception List	Sensitive List	Total
Indonesia	7,190	21	68	4	7,283
Malaysia	9,654	218	53	83	10,008
Philippines	5,622	6	16	50	5,694
Singapore	5,821	0	38	0	5,859
Thailand	9,104	0	0	7	9,111
Brunei	6,284	0	202	6	6,492
Total	43,675	245	377	150	44,447
Percentage	98.26%	0.55%	0.85%	0.34%	100.00%

Source: Hafez (2004)

Apparently, even though RTAs are discriminatory in nature, AFTA has not conferred significant preferential tariff reductions to its members. This can be explained by the intense competition present among AFTA members. One indication of the intense competition among AFTA members is the strong similarity in their export structures. The export structures of the ASEAN-5 countries have become increasingly similar over the years. Following Lall and Albaladejo (2004), we measure the similarity in export structures between the ASEAN-5 countries by comparing the correlation coefficients of the export structures. In 1990, the two countries with the most similar export structure were Singapore and Malaysia, posting a correlation coefficient of 0.72. By 2005, the export structures of Malaysia, Philippines, Singapore and Thailand show great increase in similarity, with correlation coefficients that are 0.80 or more. Even though Indonesia’s export structure was not as similar compared to the rest, its correlation coefficients have increased vis-à-vis Philippines and Thailand. For NAFTA and EU15, even though the correlation of the member countries export structures have grown in similarity over the years, they do not display as high a correlation coefficient as AFTA.

Table 9: Correlation Between Export Structures of AFTA, NAFTA and EU15 Member Countries for 1990 and 2005

(a) AFTA

	Year 1990				
	IDN	MYS	PHL	SGP	THA
IDN	1.00				
MYS	0.49	1.00			
PHL	0.06	0.18	1.00		
SGP	0.45	0.72	0.12	1.00	
THA	0.08	0.31	0.29	0.35	1.00

	Year 2005				
	IDN	MYS	PHL	SGP	THA
IDN	1.00				
MYS	0.47	1.00			
PHL	0.25	0.89	1.00		
SGP	0.38	0.95	0.90	1.00	
THA	0.33	0.83	0.80	0.82	1.00

(b) NAFTA

	Year 1990		
	CAN	MEX	USA
CAN	1.00		
MEX	0.44	1.00	
USA	0.56	0.20	1.00

	Year 2005		
	CAN	MEX	USA
CAN	1.00		
MEX	0.66	1.00	
USA	0.52	0.69	1.00

(c) EU15

	Year 1990												
	AUT	DEU	DNK	ESP	FIN	FRA	GBR	GRC	IRL	ITA	NLD	PRT	SWE
AUT	1.00												
DEU	0.71	1.00											
DNK	0.36	0.35	1.00										
ESP	0.46	0.84	0.18	1.00									
FIN	0.58	0.29	0.12	0.15	1.00								
FRA	0.67	0.91	0.35	0.83	0.25	1.00							
GBR	0.62	0.71	0.42	0.59	0.23	0.76	1.00						
GRC	0.15	0.01	0.04	0.21	0.00	0.11	0.11	1.00					
IRL	0.16	0.18	0.34	0.04	-0.01	0.26	0.48	-0.04	1.00				
ITA	0.76	0.78	0.45	0.63	0.25	0.72	0.67	0.38	0.22	1.00			
NLD	0.37	0.47	0.52	0.44	0.19	0.49	0.68	0.24	0.52	0.45	1.00		
PRT	0.34	0.27	0.12	0.27	0.11	0.30	0.23	0.68	0.04	0.59	0.13	1.00	
SWE	0.77	0.80	0.30	0.67	0.73	0.72	0.60	-0.03	0.10	0.60	0.40	0.19	1.00

	Year 2005												
	AUT	DEU	DNK	ESP	FIN	FRA	GBR	GRC	IRL	ITA	NLD	PRT	SWE
AUT	1.00												
DEU	0.91	1.00											
DNK	0.49	0.45	1.00										
ESP	0.73	0.86	0.31	1.00									
FIN	0.44	0.38	0.36	0.25	1.00								
FRA	0.83	0.92	0.48	0.88	0.35	1.00							
GBR	0.73	0.77	0.73	0.62	0.50	0.74	1.00						
GRC	0.22	0.17	0.49	0.29	0.15	0.27	0.40	1.00					
IRL	0.15	0.23	0.35	0.07	0.02	0.25	0.41	0.12	1.00				
ITA	0.82	0.78	0.60	0.63	0.36	0.74	0.66	0.42	0.13	1.00			
NLD	0.34	0.45	0.49	0.34	0.32	0.43	0.67	0.35	0.60	0.37	1.00		
PRT	0.74	0.76	0.39	0.72	0.28	0.68	0.63	0.39	0.09	0.69	0.32	1.00	
SWE	0.82	0.82	0.56	0.69	0.76	0.76	0.79	0.24	0.15	0.67	0.40	0.65	1.00

Due to the competitive environment, Baldwin (2007) argues that there was “rampant unilateralism” in East Asia, including ASEAN-5 countries in the bid to win investments. The rise of China only served to heighten the competition in the region. This outward orientation of ASEAN-5 countries coupled with intense competition amongst them erodes impact of AFTA.

Another possible explanation for the poor showing in intraregional trade is the lack of complementarity of trade among ASEAN members. We calculate the trade complementarity index for the region to assess whether this is the case. The index of trade complementarity, C_{ij}, between two countries i and j is defined as:

$$C_{ij} = 1 - \sum_k \left(| m_{ki} - x_{kj} | / 2 \right)$$

where x_{kj} represents the share of good *k* in the exports of country *j*

m_{ki} represents the share of good *k* in the imports of country *i*

The index is zero when no good exported by one country is imported by the other, and 1 when the export-import shares exactly match. As such, it is assumed that higher index values indicate more favorable prospects for a successful trade arrangement between countries. The complementarity index was first used by Michaely (1994) to assess prospects for Latin American trade arrangements. The complementarity indices for AFTA, NAFTA and EU15 for the year 1990 and 2005 are shown in Table 10. A simple comparison of the average complementarity indices reveal that AFTA is lagging behind the other two regions in terms of trade complementarity. AFTA posted an average of 0.40 and 0.55 for 1990 and 2005 respectively; NAFTA posted 0.62 and 0.72 for the respective years while EU15 posted 0.64 and 0.66. Although AFTA trade patterns have shown greater complementarity over the 15 year period, a gap remains between AFTA and the other two regions.

Table 10: Complementarity Indices for AFTA, NAFTA and EU15 for Years 1990 and 2005

(a) AFTA

Year: 1990

		Importer				
		IDN	MYS	PHL	SGP	THA
Exporter	IDN		0.24	0.35	0.37	0.30
	MYS	0.34		0.43	0.63	0.44
	PHL	0.25	0.36		0.34	0.35
	SGP	0.44	0.55	0.53		0.55
	THA	0.29	0.39	0.35	0.46	

Average for 1990: 0.40

Year: 2005

		Importer				
		IDN	MYS	PHL	SGP	THA
Exporter	IDN		0.45	0.46	0.44	0.51
	MYS	0.36		0.64	0.73	0.58
	PHL	0.25	0.63		0.57	0.41
	SGP	0.46	0.78	0.74		0.67
	THA	0.46	0.63	0.57	0.63	

Average for 2005: 0.55

(b) NAFTA

Year: 1990

		Importer		
		CAN	MEX	USA
Exporter	CAN		0.53	0.62
	MEX	0.55		0.60
	USA	0.74	0.70	

Average for 1990: 0.62

Year: 2005

		Importer		
		CAN	MEX	USA
Exporter	CAN		0.57	0.67
	MEX	0.72		0.78
	USA	0.77	0.79	

Average for 2005: 0.72

(c) EU15

Year: 1990

		Importer												
		AUT	DEU	DNK	ESP	FIN	FRA	GBR	GRC	IRL	ITA	NLD	PRT	SWE
Exporter	AUT		0.66	0.70	0.64	0.70	0.69	0.68	0.68	0.67	0.61	0.66	0.64	0.72
	DEU	0.79		0.72	0.75	0.78	0.77	0.74	0.73	0.71	0.71	0.71	0.74	0.77
	DNK	0.61	0.61		0.62	0.60	0.61	0.61	0.65	0.62	0.61	0.62	0.58	0.64
	ESP	0.69	0.72	0.68		0.68	0.71	0.72	0.72	0.64	0.68	0.68	0.69	0.70
	FIN	0.54	0.54	0.59	0.55		0.54	0.54	0.57	0.50	0.52	0.52	0.53	0.55
	FRA	0.76	0.76	0.74	0.77	0.76		0.79	0.79	0.73	0.74	0.75	0.74	0.75
	GBR	0.74	0.77	0.76	0.79	0.78	0.80		0.75	0.78	0.75	0.79	0.72	0.81
	GRC	0.41	0.48	0.41	0.41	0.42	0.45	0.42		0.40	0.45	0.45	0.45	0.43
	IRL	0.47	0.51	0.50	0.51	0.48	0.51	0.55	0.51		0.55	0.54	0.45	0.49
	ITA	0.77	0.73	0.68	0.65	0.72	0.72	0.71	0.68	0.68		0.69	0.69	0.75
	NLD	0.65	0.76	0.74	0.71	0.70	0.76	0.73	0.73	0.74	0.75		0.65	0.70
	PRT	0.56	0.57	0.52	0.51	0.53	0.54	0.55	0.54	0.53	0.52	0.53		0.54
	SWE	0.71	0.65	0.66	0.68	0.70	0.66	0.66	0.65	0.61	0.64	0.63	0.65	

Average for 1990: 0.64

Year: 2005

		Importer												
		AUT	DEU	DNK	ESP	FIN	FRA	GBR	GRC	IRL	ITA	NLD	PRT	SWE
Exporter	AUT		0.73	0.72	0.67	0.68	0.70	0.72	0.63	0.66	0.72	0.58	0.73	0.74
	DEU	0.79		0.71	0.76	0.72	0.76	0.73	0.66	0.68	0.73	0.63	0.74	0.76
	DNK	0.69	0.68		0.67	0.65	0.68	0.68	0.68	0.63	0.67	0.62	0.67	0.71
	ESP	0.72	0.70	0.72		0.66	0.74	0.71	0.70	0.63	0.72	0.61	0.73	0.72
	FIN	0.57	0.55	0.60	0.54		0.55	0.53	0.49	0.48	0.55	0.51	0.53	0.61
	FRA	0.79	0.75	0.74	0.78	0.73		0.73	0.75	0.69	0.73	0.65	0.76	0.78
	GBR	0.76	0.79	0.74	0.73	0.77	0.78		0.71	0.72	0.75	0.72	0.74	0.80
	GRC	0.56	0.58	0.60	0.60	0.56	0.59	0.55		0.51	0.63	0.55	0.64	0.58
	IRL	0.39	0.42	0.39	0.35	0.37	0.39	0.45	0.38		0.39	0.50	0.39	0.39
	ITA	0.76	0.70	0.76	0.68	0.66	0.72	0.70	0.65	0.64		0.59	0.71	0.72
	NLD	0.68	0.74	0.70	0.70	0.70	0.74	0.70	0.68	0.74	0.69		0.69	0.71
	PRT	0.72	0.70	0.67	0.67	0.63	0.66	0.73	0.62	0.62	0.71	0.57		0.69
	SWE	0.74	0.70	0.71	0.68	0.72	0.67	0.71	0.62	0.60	0.71	0.59	0.69	

Average for 2005: 0.66

Source: Calculated using data from UN Comtrade database

5.2 Effect of RTAs on AFTA Trade Flows

From Table 7, we can see that the decline in share of AFTA exports to US and EU15 is apparent. From the analysis in the earlier chapters, we noted that there was no evidence of import diversion for NAFTA and expansion of EU12 to EU15. Thus, we are not able to attribute the decline to the formation of trading blocs.

A plausible explanation for the decline in export share to US and EU15 would likely be due to the increased competition AFTA members face from the rise of China. However, the flip side of competition with China is the increased avenue for regional co-operation. As it is, China's share of AFTA's exports has increased from 1.9% in 1990 to 8.1% in 2005. In line with this, ASEAN has recognized China's importance in the region and has managed to form the ASEAN-China Free Trade Area (ACFTA), which became effective in July 2003. We shall discuss the impact of this RTA with China together with the more recent developments in the following subsection.

5.3 Recent Developments

In the face of the stalling of the Doha round of trade talks, the proliferation of RTAs continued from the 1990s into the new millennium. The ACFTA was effective July 2003. Singapore has also taken an active role in forming bilateral trade agreements with its trading partners. AFTA's major trading partners US and EU were also involved in new RTAs, for example, EC-Mexico and US-Chile bilateral agreements. The following table summarizes the impact of the recent RTAs[6].

[6] Estimates were obtained using a sample of 98 countries over the period 1996 to 2005 (See Appendix Table 18 for complete list). We could increase the sample countries as data was more complete in the recent decade. The methodology follows what is described in Chapter 3.

Table 11: Impact of Recent RTAs

		Poisson		OLS	
RTA	Dummy	Coef	Std Err	Coef	Std Err
ACFTA	Intraregional	-0.125	(0.132)	-0.150**	(0.055)
	Regional exports	0.328**	(0.054)	0.277**	(0.024)
	Regional imports	0.248**	(0.059)	0.212**	(0.037)
Japan-S'pore	Intraregional	-0.093	(0.077)	-0.233**	(0.087)
	Regional exports	-0.044	(0.057)	-0.156**	(0.026)
	Regional imports	-0.021	(0.042)	0.134**	(0.048)
New Zealand-S'pore	Intraregional	0.164	(0.156)	-0.221	(0.134)
	Regional exports	-0.043	(0.062)	0.154**	(0.043)
	Regional imports	-0.075*	(0.034)	-0.014	(0.052)
S'pore Australia	Intraregional	0.040	(0.227)	-0.288	(0.173)
	Regional exports	-0.049	(0.065)	0.021	(0.040)
	Regional imports	-0.148**	(0.044)	-0.008	(0.056)
US-S'pore	Intraregional	-0.148	(0.139)	-0.312**	(0.091)
	Regional exports	-0.053	(0.065)	-0.243**	(0.049)
	Regional imports	-0.018	(0.050)	0.092	(0.078)
EU15 to EU25 expansion	Intraregional	0.011	(0.046)	-0.094*	(0.037)
	Regional exports	0.253**	(0.041)	0.315**	(0.034)
	Regional imports	0.018	(0.045)	0.057	(0.034)
EC-Mexico	Intraregional	-0.114**	(0.033)	-0.052*	(0.023)
	Regional exports	0.064**	(0.016)	0.002	(0.012)
	Regional imports	0.086**	(0.023)	0.051**	(0.017)
US-Chile	Intraregional	0.236	(0.136)	0.047	(0.086)
	Regional exports	-0.154*	(0.068)	0.135*	(0.060)
	Regional imports	-0.009	(0.057)	-0.046	(0.070)

*Note: (i) * Significant at 5% level; **Significant at 1% level*
(ii) Robust standard error is used

With reference to the results obtained using Poisson regression, both Japan-Singapore FTA and USA-Singapore FTA did not register any significant impact on trade flows. New Zealand-Singapore FTA and Singapore-Australia FTA both show signs of import diversion. United States-Chile FTA shows signs of export diversion. EC-Mexico FTA decreased intra-regional trade but increased regional exports and imports. Expansion of EU15 to EU25 increased regional exports. ACFTA increased both regional exports and imports.

Unfortunately, the agreement between Singapore and major trading partners US and Japan did not have any impact on trade flows. As for Singapore's agreements with Australia and

New Zealand, there is unfortunately evidence of import diversion, though disappointingly, both agreements did not affect intraregional trade flows.

With regards to major trading partners US and EU, there is again no evidence of import diversion due to new RTAs that were entered into by them. EU expansion to include ten new members in 2004 also did not show evidence of trade diversion. Thus, AFTA's exports to these two partners are not adversely affected by the new RTAs per se. However, US-Chile RTA shows signs of export diversion, which affects worldwide welfare.

Even when Singapore-Indonesia exports were excluded, the above analysis still holds. The minor difference that arises is that ACFTA now shows a significant negative impact on intra-regional trade flows.

CHAPTER 6

SUMMARY AND CONCLUSION

We re-evaluate the impact of RTAs on trade flows in view of the concerns of the possible bias and inconsistency of the traditional OLS estimation method. We find evidence of trade diversion for NAFTA, MERCOSUR, ANDEAN and US-Chile RTAs. The expansions of EU12 to EU15 and subsequently from EU15 to EU25 were benign, with no signs of trade diversion. The RTAs entered into by the US were less benign, with NAFTA and US-Chile FTA showing signs of export diversion, which adversely affect welfare for rest of the world.

With regards to AFTA, the new estimation method reveals that AFTA has had no significant impact on trade flows. The increase in share of intra-regional trade can basically be explained by the high growths of AFTA member countries, after controlling for distance and other trade related costs. The declining share of trade with major trading partners US and EU cannot be directly attributed to the RTAs which they have entered into as there is no evidence of import diversion. Unfortunately, the new RTAs that AFTA and Singapore entered into from 2000 onwards were generally not effective in promoting intraregional trade. The overall picture one gets about AFTA is that is has not had much impact on intraregional trade.

The ineffectiveness of AFTA on fostering intraregional trade can be attributed to a few major factors. Utilization rates of AFTA preferential rates are low, which is not surprising, given the fact that CEPT tariff scheme does not confer significant preferential treatment to AFTA members. The intense competition among member countries given the similarity of their export structures and markets take the wind out of the sails of regional integration. Even though complementarity of exports for ASEAN-5 members has improved over the years, AFTA is still lagging behind NAFTA and EU.

Despite the apparent lack of effectiveness of AFTA, the growth of RTAs in the region does not see any signs of abating. Besides the ASEAN-China FTA, ASEAN is actively pursuing free trade agreements with Korea, India, Australia and New Zealand. A “hub-and spoke” model of regional integration seems to be emerging. However, it remains to be seen whether these will facilitate regional trade or serve to confound further the “spaghetti bowl” of RTAs in the region.

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Table 12: OLS Coefficients for Cross Sectional Analysis (Counterfactual Variables)

Variable	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ln(GDP of Exporter)	1.185**	1.225**	1.237**	1.250**	1.305**	1.293**	1.273**	1.282**	1.314**	1.307**	1.317**	1.314**	1.314**	1.319**	1.337**	1.337**	1.369**
	(0.025)	(0.026)	(0.025)	(0.023)	(0.025)	(0.024)	(0.024)	(0.024)	(0.025)	(0.024)	(0.023)	(0.023)	(0.026)	(0.023)	(0.025)	(0.024)	(0.025)
Ln(GDP of Importer)	0.807**	0.815**	0.799**	0.818**	0.833**	0.840**	0.857**	0.844**	0.842**	0.828**	0.859**	0.871**	0.881**	0.901**	0.904**	0.912**	0.945**
	(0.024)	(0.024)	(0.023)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)	(0.023)	(0.023)	(0.022)	(0.023)	(0.022)	(0.023)
Ln(Distance)	-0.943**	-1.024**	-1.046**	-0.996**	-1.039**	-1.043**	-1.043**	-1.097**	-1.085**	-1.047**	-1.092**	-1.097**	-1.128**	-1.143**	-1.111**	-1.126**	-1.161**
	(0.045)	(0.045)	(0.042)	(0.042)	(0.041)	(0.039)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.042)	(0.042)	(0.041)	(0.042)	(0.043)	(0.043)
Contiguity	0.496**	0.325 *	0.314 *	0.281	0.309 *	0.239	0.150	0.130	0.183	0.170	0.155	0.183	0.156	0.070	0.115	0.110	0.100
	(0.161)	(0.163)	(0.152)	(0.149)	(0.145)	(0.142)	(0.137)	(0.131)	(0.133)	(0.130)	(0.135)	(0.136)	(0.141)	(0.141)	(0.144)	(0.146)	(0.145)
Common Language	0.895**	0.904**	0.905**	0.878**	0.971**	0.960**	0.966**	0.959**	0.907**	0.895**	0.883**	0.916**	0.944**	1.006**	0.951**	0.971**	0.952**
	(0.112)	(0.112)	(0.102)	(0.106)	(0.100)	(0.095)	(0.096)	(0.095)	(0.093)	(0.090)	(0.091)	(0.092)	(0.090)	(0.088)	(0.091)	(0.091)	(0.093)
Colony	-0.029	-0.102	-0.059	-0.051	-0.075	-0.038	-0.027	0.019	0.022	0.028	0.011	-0.039	-0.072	-0.145	-0.113	-0.186	-0.161
	(0.148)	(0.162)	(0.124)	(0.133)	(0.125)	(0.124)	(0.125)	(0.126)	(0.125)	(0.124)	(0.121)	(0.115)	(0.116)	(0.118)	(0.130)	(0.141)	(0.136)
Landlocked (Exporter)	0.195	0.219	0.122	-0.071	-0.141	-0.165	-0.107	-0.121	-0.032	0.071	0.095	0.219 *	0.392**	0.248 *	0.360**	0.405**	0.406**
	(0.129)	(0.122)	(0.118)	(0.110)	(0.113)	(0.106)	(0.103)	(0.111)	(0.107)	(0.110)	(0.105)	(0.101)	(0.103)	(0.100)	(0.100)	(0.101)	(0.104)
Landlocked (Importer)	-0.462**	-0.192	-0.315**	-0.357**	-0.311**	-0.406**	-0.381**	-0.474**	-0.432**	-0.375**	-0.423**	-0.475**	-0.484**	-0.489**	-0.475**	-0.469**	-0.468**
	(0.121)	(0.113)	(0.108)	(0.106)	(0.106)	(0.111)	(0.100)	(0.104)	(0.106)	(0.102)	(0.104)	(0.110)	(0.110)	(0.111)	(0.108)	(0.111)	(0.114)
Ln(Remoteness of Exporter)	1.146**	1.189**	1.337**	1.038**	1.082**	1.040**	1.755**	1.794**	1.760**	2.001**	1.764**	2.183**	2.283**	2.119**	2.480**	2.552**	2.644**
	(0.230)	(0.207)	(0.207)	(0.201)	(0.219)	(0.210)	(0.223)	(0.225)	(0.223)	(0.202)	(0.213)	(0.227)	(0.225)	(0.212)	(0.205)	(0.200)	(0.208)
Ln(Remoteness of Importer)	0.821**	1.017**	1.086**	1.036**	1.093**	1.167**	1.307**	1.265**	1.116**	0.802**	0.965**	0.830**	0.970**	1.158**	1.139**	1.533**	1.576**
	(0.240)	(0.226)	(0.222)	(0.211)	(0.224)	(0.227)	(0.227)	(0.229)	(0.222)	(0.204)	(0.216)	(0.245)	(0.230)	(0.207)	(0.211)	(0.209)	(0.211)
White's Test	657.8	671.7	506.8	639.2	629.6	616.6	686.1	712.6	676.9	647.2	621.2	645.1	610.6	690.6	656.6	800.4	489.3
pvalue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 13: OLS Coefficients for Cross-Sectional Analysis (RTA Dummies)

RTA	Dummy	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AFTA	Intraregional	0.699 *	0.383	0.187	0.210	0.105	0.232	0.263	0.151	0.395	0.568**	0.485 *	0.465	0.108	0.397	0.524 *	0.514 *	0.572 *
		(0.313)	(0.322)	(0.310)	(0.309)	(0.306)	(0.293)	(0.268)	(0.261)	(0.250)	(0.218)	(0.245)	(0.242)	(0.241)	(0.245)	(0.251)	(0.240)	(0.249)
	Regional export	0.289	0.331 *	0.387**	0.506**	0.691**	0.625**	0.589**	0.552**	0.570**	0.950**	0.925**	0.791**	0.800**	0.720**	0.603**	0.576**	0.528**
		(0.156)	(0.165)	(0.147)	(0.139)	(0.135)	(0.131)	(0.128)	(0.130)	(0.131)	(0.126)	(0.126)	(0.127)	(0.125)	(0.124)	(0.123)	(0.122)	(0.137)
	Regional import	-0.041	0.203	0.067	0.065	0.016	-0.019	-0.028	0.084	0.013	0.115	0.082	0.226	0.417**	0.085	0.087	-0.118	-0.185
		(0.151)	(0.154)	(0.147)	(0.142)	(0.151)	(0.140)	(0.138)	(0.137)	(0.142)	(0.142)	(0.141)	(0.145)	(0.137)	(0.132)	(0.141)	(0.139)	(0.142)
NAFTA	Intraregional	-0.039	-0.102	0.019	0.280	0.330	0.455	0.741	0.465	0.390	0.463	0.571	0.531	0.555	0.538	0.495	0.466	0.294
		(0.340)	(0.372)	(0.347)	(0.369)	(0.399)	(0.384)	(0.438)	(0.444)	(0.425)	(0.397)	(0.414)	(0.400)	(0.396)	(0.402)	(0.397)	(0.405)	(0.406)
	Regional export	-0.606**	-0.671**	-0.853**	-0.952**	-1.090**	-1.143**	-0.559**	-0.378**	-0.467**	-0.499**	-0.747**	-0.677**	-0.664**	-0.839**	-0.812**	-0.951**	-0.835**
		(0.123)	(0.122)	(0.118)	(0.120)	(0.124)	(0.117)	(0.113)	(0.101)	(0.104)	(0.108)	(0.120)	(0.119)	(0.127)	(0.126)	(0.112)	(0.123)	(0.106)
	Regional import	-0.056	0.086	0.050	0.145	0.140	0.162	-0.104	0.075	0.107	0.216	0.187	0.167	0.175	0.152	0.091	0.180	0.118
		(0.157)	(0.159)	(0.160)	(0.131)	(0.133)	(0.119)	(0.135)	(0.133)	(0.132)	(0.136)	(0.132)	(0.135)	(0.162)	(0.142)	(0.133)	(0.122)	(0.125)
EU15	Intraregional	-0.156	-0.326 *	-0.257	-0.231	-0.446**	-0.416**	-0.299 *	-0.344**	-0.313**	-0.254 *	-0.241 *	-0.302 *	-0.348**	-0.331**	-0.313**	-0.298 *	-0.360**
		(0.133)	(0.133)	(0.133)	(0.128)	(0.131)	(0.128)	(0.116)	(0.116)	(0.119)	(0.116)	(0.117)	(0.117)	(0.119)	(0.117)	(0.115)	(0.118)	(0.120)
	Regional export	0.151	0.124	-0.016	-0.116	0.023	0.021	0.479**	0.513**	0.511**	0.524**	0.403**	0.592**	0.621**	0.489**	0.521**	0.416**	0.458**
		(0.098)	(0.093)	(0.094)	(0.089)	(0.087)	(0.082)	(0.087)	(0.088)	(0.091)	(0.090)	(0.088)	(0.087)	(0.092)	(0.089)	(0.088)	(0.088)	(0.090)
	Regional import	0.371**	0.540**	0.471**	0.470**	0.471**	0.452**	0.314**	0.353**	0.326**	0.346**	0.320**	0.320**	0.353**	0.300**	0.254 *	0.303**	0.264 *
		(0.105)	(0.105)	(0.101)	(0.097)	(0.094)	(0.096)	(0.095)	(0.099)	(0.097)	(0.096)	(0.098)	(0.098)	(0.101)	(0.100)	(0.098)	(0.103)	(0.102)
MERCOSUR	Intraregional	1.487**	1.243**	1.110**	1.349**	1.415**	1.452**	1.382**	1.500**	1.422**	1.686**	1.413**	1.602**	1.443**	1.540**	1.730**	1.461**	1.324**
		(0.386)	(0.425)	(0.403)	(0.377)	(0.399)	(0.393)	(0.413)	(0.439)	(0.417)	(0.400)	(0.420)	(0.456)	(0.494)	(0.485)	(0.499)	(0.504)	(0.484)
	Regional export	-0.154	-0.296	-0.587**	-0.486**	-0.686**	-0.799**	-0.810**	-0.900**	-0.848**	-1.078**	-0.762**	-0.952**	-0.713**	-0.069	-0.071	-0.209	-0.355 *
		(0.156)	(0.155)	(0.148)	(0.150)	(0.154)	(0.149)	(0.148)	(0.150)	(0.142)	(0.132)	(0.136)	(0.135)	(0.136)	(0.139)	(0.135)	(0.140)	(0.143)
	Regional import	-1.459**	-1.337**	-1.193**	-1.099**	-0.916**	-0.765**	-0.927**	-0.827**	-0.773**	-0.563**	-0.679**	-0.570**	-0.632**	-0.739**	-0.862**	-0.774**	-0.863**
		(0.178)	(0.178)	(0.164)	(0.162)	(0.162)	(0.156)	(0.166)	(0.156)	(0.154)	(0.149)	(0.145)	(0.155)	(0.149)	(0.140)	(0.170)	(0.149)	(0.149)
ANDEAN	Intraregional	1.108**	0.994**	1.133**	1.672**	1.529**	1.614**	1.718**	1.789**	1.897**	2.033**	2.081**	2.081**	1.920**	1.774**	2.098**	2.087**	1.973**
		(0.324)	(0.326)	(0.293)	(0.258)	(0.285)	(0.296)	(0.239)	(0.275)	(0.266)	(0.255)	(0.301)	(0.263)	(0.270)	(0.266)	(0.252)	(0.263)	(0.265)
	Regional export	-0.620**	-0.278	-0.622**	-0.764**	-0.588**	-0.732**	-0.811**	-0.770**	-0.850**	-0.941**	-0.679**	-0.770**	-0.749**	-0.676**	-0.747**	-0.999**	-0.930**
		(0.163)	(0.156)	(0.163)	(0.160)	(0.152)	(0.150)	(0.150)	(0.158)	(0.152)	(0.136)	(0.141)	(0.152)	(0.144)	(0.137)	(0.136)	(0.139)	(0.144)
	Regional import	-1.153**	-1.032**	-0.809**	-0.704**	-0.769**	-0.753**	-0.801**	-0.851**	-0.803**	-0.558**	-0.857**	-0.746**	-0.652**	-0.641**	-0.832**	-0.879**	-0.882**
		(0.148)	(0.149)	(0.136)	(0.132)	(0.137)	(0.122)	(0.125)	(0.125)	(0.121)	(0.111)	(0.115)	(0.114)	(0.121)	(0.102)	(0.110)	(0.112)	(0.117)
CACM	Intraregional	2.478**	2.348**	2.718**	2.966**	2.818**	2.757**	2.551**	2.682**	2.719**	2.725**	2.380**	2.670**	2.778**	2.801**	2.815**	2.874**	2.784**
		(0.381)	(0.402)	(0.354)	(0.352)	(0.291)	(0.299)	(0.349)	(0.284)	(0.262)	(0.293)	(0.286)	(0.283)	(0.314)	(0.262)	(0.254)	(0.254)	(0.263)
	Regional export	-0.397	-0.099	-0.499 *	-0.743**	-0.466 *	-0.623**	-0.423 *	-0.326	-0.118	-0.121	-0.248	-0.391 *	-0.569**	-0.627**	-0.569**	-0.763**	-0.464 *
		(0.204)	(0.218)	(0.200)	(0.199)	(0.181)	(0.189)	(0.200)	(0.182)	(0.182)	(0.176)	(0.181)	(0.177)	(0.180)	(0.183)	(0.185)	(0.188)	(0.187)
	Regional import	-0.772**	-0.551**	-0.833**	-0.495**	-0.453**	-0.625**	-0.742**	-0.683**	-0.621**	-0.348**	-0.203	-0.311 *	-0.312 *	-0.248	-0.211	-0.178	-0.238
		(0.169)	(0.171)	(0.166)	(0.151)	(0.150)	(0.149)	(0.153)	(0.152)	(0.143)	(0.132)	(0.136)	(0.137)	(0.139)	(0.140)	(0.135)	(0.135)	(0.149)
ANZCERTA	Intraregional	1.369**	1.565**	1.575**	1.727**	1.525**	1.513**	1.548**	1.335**	1.200**	1.202**	1.253**	1.273**	1.079**	0.880**	1.156**	1.122**	0.997**
		(0.347)	(0.389)	(0.406)	(0.383)	(0.385)	(0.349)	(0.288)	(0.275)	(0.269)	(0.303)	(0.269)	(0.288)	(0.277)	(0.249)	(0.253)	(0.257)	(0.263)
	Regional export	-0.851**	-0.772**	-0.821**	-0.555**	-0.497 *	-0.513 *	-0.809**	-0.851**	-0.714**	-0.784**	-0.784**	-0.808**	-0.691**	-0.739**	-1.297**	-1.519**	-1.512**
		(0.229)	(0.222)	(0.219)	(0.213)	(0.224)	(0.211)	(0.208)	(0.216)	(0.204)	(0.185)	(0.194)	(0.194)	(0.188)	(0.185)	(0.188)	(0.186)	(0.189)
	Regional import	-0.473 *	-0.798**	-0.933**	-0.843**	-0.706**	-0.745**	-0.957**	-0.757**	-0.613**	-0.363	-0.355	-0.383	-0.471 *	-0.539**	-0.726**	-1.057**	-1.102**
		(0.213)	(0.240)	(0.249)	(0.232)	(0.216)	(0.204)	(0.212)	(0.200)	(0.197)	(0.194)	(0.190)	(0.211)	(0.209)	(0.188)	(0.198)	(0.206)	(0.208)

Table 14: Poisson Coefficients for Cross-Sectional Analysis (Counterfactual Variables)

Variable	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ln(GDP of Exporter)	0.852**	0.850**	0.851**	0.842**	0.834**	0.823**	0.801**	0.802**	0.809**	0.813**	0.799**	0.804**	0.795**	0.798**	0.791**	0.788**	0.799**
	(0.036)	(0.035)	(0.033)	(0.034)	(0.032)	(0.032)	(0.031)	(0.033)	(0.033)	(0.032)	(0.032)	(0.032)	(0.032)	(0.033)	(0.035)	(0.036)	(0.039)
Ln(GDP of Importer)	0.771**	0.772**	0.754**	0.744**	0.753**	0.749**	0.746**	0.759**	0.754**	0.758**	0.761**	0.777**	0.788**	0.784**	0.775**	0.765**	0.776**
	(0.029)	(0.030)	(0.029)	(0.028)	(0.024)	(0.024)	(0.023)	(0.025)	(0.025)	(0.025)	(0.025)	(0.026)	(0.027)	(0.028)	(0.029)	(0.031)	(0.033)
Ln(Distance)	-0.733**	-0.742**	-0.738**	-0.710**	-0.693**	-0.699**	-0.661**	-0.666**	-0.664**	-0.644**	-0.662**	-0.681**	-0.690**	-0.713**	-0.733**	-0.738**	-0.748**
	(0.054)	(0.053)	(0.053)	(0.051)	(0.051)	(0.051)	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)	(0.056)	(0.053)	(0.054)	(0.053)	(0.053)	(0.052)
Contiguity	0.609**	0.588**	0.654**	0.646**	0.613**	0.625**	0.616**	0.611**	0.622**	0.637**	0.646**	0.675**	0.669**	0.685**	0.656**	0.683**	0.700**
	(0.147)	(0.142)	(0.151)	(0.162)	(0.166)	(0.165)	(0.156)	(0.154)	(0.159)	(0.143)	(0.141)	(0.153)	(0.153)	(0.157)	(0.165)	(0.169)	(0.177)
Common Language	0.653**	0.683**	0.716**	0.763**	0.779**	0.765**	0.720**	0.677**	0.620**	0.552**	0.536**	0.515**	0.527**	0.579**	0.596**	0.578**	0.572**
	(0.144)	(0.142)	(0.146)	(0.157)	(0.149)	(0.149)	(0.153)	(0.154)	(0.150)	(0.142)	(0.143)	(0.146)	(0.144)	(0.146)	(0.153)	(0.155)	(0.156)
Colony	-0.215 *	-0.223 *	-0.289 *	-0.279 *	-0.256 *	-0.263 *	-0.232	-0.204	-0.185	-0.120	-0.109	-0.113	-0.147	-0.214	-0.274 *	-0.292 *	-0.319 *
	(0.109)	(0.111)	(0.116)	(0.123)	(0.122)	(0.119)	(0.122)	(0.122)	(0.122)	(0.119)	(0.116)	(0.118)	(0.115)	(0.123)	(0.128)	(0.133)	(0.134)
Landlocked (Exporter)	-0.386 *	-0.429 *	-0.520**	-0.488 *	-0.526**	-0.579**	-0.476**	-0.420**	-0.324 *	-0.191	-0.223	-0.264	-0.254	-0.264	-0.280	-0.312	-0.326
	(0.176)	(0.178)	(0.189)	(0.202)	(0.182)	(0.185)	(0.163)	(0.161)	(0.159)	(0.147)	(0.151)	(0.158)	(0.156)	(0.161)	(0.165)	(0.167)	(0.170)
Landlocked (Importer)	-0.110	-0.177	-0.197	-0.248	-0.338	-0.355	-0.411 *	-0.363 *	-0.322 *	-0.201	-0.192	-0.170	-0.164	-0.240	-0.250	-0.275	-0.253
	(0.183)	(0.177)	(0.184)	(0.193)	(0.195)	(0.194)	(0.159)	(0.154)	(0.154)	(0.145)	(0.143)	(0.154)	(0.152)	(0.157)	(0.162)	(0.166)	(0.170)
Ln(Remoteness of Exporter)	1.464**	1.267**	1.358**	1.468**	1.482**	1.385**	1.797**	1.812**	1.742**	1.858**	1.799**	1.792**	1.635**	1.770**	1.854**	1.869**	1.869**
	(0.347)	(0.313)	(0.319)	(0.362)	(0.426)	(0.429)	(0.467)	(0.487)	(0.483)	(0.412)	(0.451)	(0.499)	(0.473)	(0.472)	(0.458)	(0.442)	(0.444)
Ln(Remoteness of Importer)	1.104**	1.069**	1.254**	1.297**	1.094**	1.236**	1.291**	1.164**	1.078**	0.801 *	0.854 *	1.076**	0.973 *	1.076**	1.254**	1.324**	1.298**
	(0.362)	(0.335)	(0.346)	(0.344)	(0.338)	(0.357)	(0.343)	(0.344)	(0.364)	(0.345)	(0.365)	(0.411)	(0.378)	(0.363)	(0.348)	(0.341)	(0.344)

Table 15: Poisson Coefficients for Cross-Sectional Analysis (RTA Dummies)

RTA	Dummy	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AFTA	Intraregional	-0.078	-0.226	-0.268	-0.289	-0.279	-0.190	-0.212	-0.236	-0.269	-0.110	-0.132	-0.195	-0.189	-0.213	-0.057	-0.067	-0.079
		(0.324)	(0.315)	(0.304)	(0.286)	(0.286)	(0.298)	(0.293)	(0.277)	(0.259)	(0.224)	(0.242)	(0.243)	(0.237)	(0.240)	(0.249)	(0.249)	(0.253)
	Regional export	0.213	0.309	0.284	0.207	0.216	0.242	0.120	0.136	0.198	0.422	0.370	0.362	0.362	0.232	0.144	0.080	0.112
		(0.237)	(0.229)	(0.226)	(0.239)	(0.250)	(0.245)	(0.239)	(0.241)	(0.238)	(0.222)	(0.228)	(0.238)	(0.236)	(0.238)	(0.240)	(0.234)	(0.232)
	Regional import	0.241	0.372	0.258	0.210	0.336	0.318	0.340	0.351	0.396 *	0.486 *	0.482 *	0.479 *	0.484 *	0.355	0.208	0.147	0.153
		(0.232)	(0.227)	(0.230)	(0.226)	(0.204)	(0.204)	(0.191)	(0.185)	(0.192)	(0.197)	(0.200)	(0.206)	(0.200)	(0.202)	(0.204)	(0.202)	(0.206)
NAFTA	Intraregional	-1.047**	-0.947**	-0.994**	-0.777 *	-0.622 *	-0.541	-0.418	-0.341	-0.276	-0.130	-0.164	-0.213	-0.197	-0.264	-0.271	-0.273	-0.328
		(0.295)	(0.298)	(0.298)	(0.312)	(0.295)	(0.294)	(0.304)	(0.307)	(0.299)	(0.282)	(0.282)	(0.290)	(0.284)	(0.296)	(0.316)	(0.328)	(0.331)
	Regional export	0.074	0.000	-0.021	-0.051	-0.079	-0.111	0.076	0.176	0.185	0.219	0.172	0.148	0.143	0.050	-0.052	-0.147	-0.169
		(0.151)	(0.144)	(0.137)	(0.147)	(0.145)	(0.145)	(0.145)	(0.158)	(0.175)	(0.174)	(0.179)	(0.194)	(0.200)	(0.204)	(0.195)	(0.193)	(0.199)
	Regional import	0.586**	0.502**	0.502**	0.510**	0.452**	0.499**	0.425**	0.397**	0.447**	0.489**	0.551**	0.588**	0.513**	0.534**	0.484**	0.464**	0.465**
		(0.157)	(0.149)	(0.145)	(0.139)	(0.140)	(0.140)	(0.133)	(0.137)	(0.145)	(0.149)	(0.148)	(0.160)	(0.161)	(0.158)	(0.153)	(0.151)	(0.152)
EU15	Intraregional	0.588**	0.538**	0.552**	0.596**	0.550**	0.549**	0.734**	0.697**	0.664**	0.639**	0.652**	0.593**	0.531**	0.519**	0.453**	0.417**	0.375 *
		(0.158)	(0.150)	(0.147)	(0.143)	(0.142)	(0.141)	(0.142)	(0.142)	(0.142)	(0.143)	(0.145)	(0.148)	(0.148)	(0.152)	(0.153)	(0.157)	(0.159)
	Regional export	-0.253 *	-0.278 *	-0.354**	-0.302 *	-0.293 *	-0.292 *	-0.164	-0.059	-0.048	0.019	-0.082	-0.103	-0.056	-0.061	-0.056	-0.102	-0.125
		(0.123)	(0.124)	(0.117)	(0.134)	(0.127)	(0.126)	(0.145)	(0.157)	(0.158)	(0.153)	(0.157)	(0.157)	(0.159)	(0.170)	(0.178)	(0.182)	(0.186)
	Regional import	-0.025	-0.034	0.020	0.000	-0.120	-0.096	-0.189	-0.201	-0.161	-0.112	-0.086	-0.021	-0.028	-0.073	-0.066	-0.067	-0.051
		(0.130)	(0.132)	(0.128)	(0.128)	(0.125)	(0.124)	(0.125)	(0.130)	(0.132)	(0.133)	(0.131)	(0.135)	(0.132)	(0.131)	(0.134)	(0.134)	(0.135)
MERCOSUR	Intraregional	0.891 *	0.724 *	0.566	0.784	1.014**	0.936 *	1.054**	1.187**	1.210**	1.275**	1.056**	1.122**	0.843 *	0.801 *	0.880 *	0.800 *	0.831 *
		(0.347)	(0.354)	(0.354)	(0.413)	(0.384)	(0.365)	(0.352)	(0.342)	(0.344)	(0.317)	(0.375)	(0.368)	(0.393)	(0.392)	(0.359)	(0.377)	(0.384)
	Regional export	-0.989**	-1.031**	-1.169**	-1.269**	-1.334**	-1.361**	-1.618**	-1.558**	-1.519**	-1.544**	-1.433**	-1.438**	-1.149**	-0.833**	-0.869**	-0.933**	-0.999**
		(0.211)	(0.202)	(0.222)	(0.248)	(0.266)	(0.258)	(0.252)	(0.242)	(0.226)	(0.190)	(0.224)	(0.232)	(0.226)	(0.206)	(0.220)	(0.216)	(0.203)
	Regional import	-1.343**	-1.379**	-1.340**	-1.326**	-1.139**	-1.109**	-1.121**	-1.050**	-0.901**	-0.734**	-0.764**	-0.893**	-0.730**	-0.747**	-0.959**	-0.941**	-0.989**
		(0.199)	(0.209)	(0.234)	(0.234)	(0.212)	(0.220)	(0.218)	(0.200)	(0.200)	(0.189)	(0.220)	(0.231)	(0.238)	(0.227)	(0.222)	(0.222)	(0.214)
ANDEAN	Intraregional	-0.267	-0.184	-0.037	0.091	0.380	0.448	0.679	0.592	0.668	0.912**	0.826 *	0.873 *	0.911**	0.806 *	0.855**	1.150**	0.499
		(0.345)	(0.361)	(0.357)	(0.375)	(0.405)	(0.397)	(0.366)	(0.418)	(0.373)	(0.329)	(0.324)	(0.371)	(0.350)	(0.343)	(0.315)	(0.288)	(0.346)
	Regional export	-0.321	-0.189	-0.436	-0.677 *	-0.736 *	-0.848**	-0.994**	-0.778 *	-0.829**	-0.991**	-0.871**	-0.733 *	-0.816**	-0.836**	-0.928**	-1.332**	-0.798**
		(0.291)	(0.308)	(0.301)	(0.319)	(0.341)	(0.318)	(0.307)	(0.369)	(0.317)	(0.251)	(0.271)	(0.324)	(0.280)	(0.290)	(0.265)	(0.214)	(0.286)
	Regional import	-0.610**	-0.638**	-0.630**	-0.537 *	-0.558**	-0.729**	-0.837**	-0.799**	-0.681**	-0.501**	-0.750**	-0.796**	-0.613**	-0.694**	-0.935**	-0.936**	-0.810**
		(0.194)	(0.197)	(0.227)	(0.224)	(0.194)	(0.191)	(0.180)	(0.177)	(0.172)	(0.156)	(0.171)	(0.160)	(0.142)	(0.154)	(0.167)	(0.173)	(0.168)
CACM	Intraregional	1.652**	1.702**	1.760**	1.971**	1.922**	1.851**	1.806**	1.806**	1.759**	2.084**	1.574**	1.853**	2.095**	1.805**	1.799**	1.897**	1.711**
		(0.401)	(0.374)	(0.422)	(0.456)	(0.410)	(0.423)	(0.385)	(0.369)	(0.394)	(0.425)	(0.425)	(0.426)	(0.428)	(0.449)	(0.463)	(0.436)	(0.415)
	Regional export	-1.113**	-0.958**	-1.085**	-1.256**	-1.313**	-1.436**	-1.400**	-1.177**	-0.993**	-0.894**	-0.889 *	-1.125**	-1.310**	-1.371**	-1.454**	-1.574**	-1.317**
		(0.311)	(0.294)	(0.340)	(0.367)	(0.344)	(0.336)	(0.289)	(0.276)	(0.313)	(0.290)	(0.356)	(0.353)	(0.356)	(0.378)	(0.383)	(0.357)	(0.334)
	Regional import	-0.518 *	-0.445	-0.602 *	-0.542	-0.468	-0.568 *	-0.656 *	-0.551 *	-0.476	-0.223	-0.183	-0.234	-0.166	-0.150	-0.249	-0.365	-0.357
		(0.225)	(0.241)	(0.262)	(0.279)	(0.270)	(0.285)	(0.256)	(0.258)	(0.250)	(0.237)	(0.238)	(0.251)	(0.245)	(0.266)	(0.274)	(0.270)	(0.268)
ANZCERTA	Intraregional	0.924**	0.968**	1.034**	1.114**	1.241**	1.267**	1.380**	1.411**	1.439**	1.405**	1.549**	1.348**	1.271**	1.201**	1.162**	1.079**	0.957**
		(0.320)	(0.306)	(0.308)	(0.294)	(0.294)	(0.292)	(0.286)	(0.293)	(0.288)	(0.267)	(0.289)	(0.279)	(0.282)	(0.295)	(0.288)	(0.291)	(0.311)
	Regional export	-1.165**	-1.004 *	-1.025**	-1.123**	-1.154**	-1.138**	-1.422**	-1.381**	-1.331**	-1.386**	-1.438**	-1.193**	-1.023**	-1.230**	-1.481**	-1.550**	-1.464**
		(0.410)	(0.389)	(0.394)	(0.403)	(0.429)	(0.422)	(0.407)	(0.407)	(0.391)	(0.361)	(0.374)	(0.388)	(0.380)	(0.383)	(0.374)	(0.358)	(0.372)
	Regional import	-0.576 *	-0.652 *	-0.874**	-0.852**	-0.712**	-0.750**	-0.879**	-0.812**	-0.724**	-0.394	-0.416	-0.523	-0.444	-0.522 *	-0.743**	-0.836**	-0.815**
		(0.289)	(0.288)	(0.292)	(0.294)	(0.260)	(0.268)	(0.257)	(0.251)	(0.261)	(0.256)	(0.261)	(0.278)	(0.265)	(0.265)	(0.268)	(0.270)	(0.273)

Table 16: Poisson Coefficients for Cross-Sectional Analysis (Counterfactual Variables)

(Excluding Singapore-Indonesia Exports)

Variable	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ln(GDP of Exporter)	0.852**	0.85**	0.851**	0.842**	0.834**	0.823**	0.801**	0.802**	0.809**	0.813**	0.799**	0.804**	0.795**	0.798**	0.792**	0.788**	0.799**
	(0.036)	(0.035)	(0.033)	(0.034)	(0.032)	(0.032)	(0.031)	(0.033)	(0.033)	(0.032)	(0.032)	(0.032)	(0.032)	(0.033)	(0.035)	(0.036)	(0.039)
Ln(GDP of Importer)	0.771**	0.773**	0.754**	0.745**	0.753**	0.749**	0.747**	0.76**	0.754**	0.758**	0.762**	0.778**	0.789**	0.784**	0.774**	0.764**	0.774**
	(0.029)	(0.030)	(0.029)	(0.028)	(0.024)	(0.024)	(0.023)	(0.025)	(0.025)	(0.025)	(0.025)	(0.026)	(0.027)	(0.028)	(0.029)	(0.031)	(0.033)
Ln(Distance)	-0.734**	-0.743**	-0.739**	-0.711**	-0.694**	-0.701**	-0.662**	-0.668**	-0.665**	-0.645**	-0.664**	-0.682**	-0.691**	-0.714**	-0.73**	-0.735**	-0.745**
	(0.054)	(0.053)	(0.053)	(0.051)	(0.051)	(0.051)	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)	(0.056)	(0.053)	(0.054)	(0.053)	(0.053)	(0.052)
Contiguity	0.606**	0.585**	0.65**	0.642**	0.608**	0.618**	0.609**	0.605**	0.615**	0.632**	0.641**	0.668**	0.662**	0.678**	0.67**	0.697**	0.715**
	(0.148)	(0.142)	(0.152)	(0.162)	(0.167)	(0.166)	(0.157)	(0.155)	(0.160)	(0.143)	(0.141)	(0.154)	(0.153)	(0.158)	(0.165)	(0.169)	(0.176)
Common Language	0.652**	0.682**	0.714**	0.761**	0.777**	0.763**	0.717**	0.674**	0.618**	0.55**	0.534**	0.513**	0.525**	0.577**	0.601**	0.583**	0.577**
	(0.144)	(0.142)	(0.146)	(0.157)	(0.149)	(0.149)	(0.153)	(0.154)	(0.150)	(0.142)	(0.143)	(0.146)	(0.144)	(0.146)	(0.153)	(0.156)	(0.157)
Colony	-0.215 *	-0.222 *	-0.289 *	-0.279 *	-0.256 *	-0.263 *	-0.232	-0.203	-0.184	-0.119	-0.108	-0.113	-0.146	-0.213	-0.275 *	-0.294 *	-0.32 *
	(0.109)	(0.111)	(0.116)	(0.123)	(0.122)	(0.119)	(0.122)	(0.123)	(0.122)	(0.119)	(0.116)	(0.118)	(0.116)	(0.124)	(0.128)	(0.132)	(0.133)
Landlocked (Exporter)	-0.384 *	-0.427 *	-0.518**	-0.486 *	-0.523**	-0.575**	-0.473**	-0.417**	-0.322 *	-0.189	-0.221	-0.262	-0.251	-0.262	-0.284	-0.317	-0.331
	(0.176)	(0.178)	(0.188)	(0.202)	(0.182)	(0.185)	(0.162)	(0.161)	(0.159)	(0.147)	(0.151)	(0.158)	(0.155)	(0.161)	(0.166)	(0.168)	(0.171)
Landlocked (Importer)	-0.107	-0.174	-0.193	-0.245	-0.334	-0.349	-0.406 *	-0.357 *	-0.317 *	-0.198	-0.188	-0.165	-0.16	-0.235	-0.26	-0.286	-0.263
	(0.183)	(0.177)	(0.184)	(0.193)	(0.195)	(0.194)	(0.159)	(0.154)	(0.154)	(0.145)	(0.143)	(0.155)	(0.152)	(0.157)	(0.163)	(0.166)	(0.171)
Ln(Remoteness of Exporter)	1.466**	1.268**	1.36**	1.469**	1.483**	1.387**	1.8**	1.815**	1.745**	1.86**	1.802**	1.795**	1.637**	1.772**	1.85**	1.865**	1.865**
	(0.347)	(0.313)	(0.319)	(0.362)	(0.425)	(0.429)	(0.466)	(0.486)	(0.483)	(0.411)	(0.450)	(0.499)	(0.472)	(0.471)	(0.459)	(0.443)	(0.445)
Ln(Remoteness of Importer)	1.109**	1.073**	1.258**	1.301**	1.101**	1.246**	1.304**	1.176**	1.09**	0.807 *	0.863 *	1.088**	0.983**	1.086**	1.235**	1.304**	1.278**
	(0.362)	(0.335)	(0.345)	(0.343)	(0.338)	(0.356)	(0.343)	(0.343)	(0.364)	(0.345)	(0.364)	(0.410)	(0.377)	(0.362)	(0.348)	(0.340)	(0.343)

Table 17:Poisson Coefficients for Cross-Sectional Analysis (RTA Dummies)

(Excluding Singapore-Indonesia Exports)

RTA	Dummy	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AFTA	Intraregional	-0.028	-0.175	-0.218	-0.242	-0.229	-0.138	-0.16	-0.183	-0.214	-0.065	-0.081	-0.139	-0.134	-0.158	-0.173	-0.185	-0.2
		(0.319)	(0.309)	(0.299)	(0.282)	(0.282)	(0.293)	(0.287)	(0.271)	(0.253)	(0.219)	(0.236)	(0.237)	(0.231)	(0.235)	(0.238)	(0.236)	(0.239)
	Regional export	0.213	0.308	0.283	0.207	0.215	0.242	0.119	0.135	0.197	0.422	0.37	0.361	0.362	0.232	0.145	0.081	0.114
		(0.237)	(0.229)	(0.226)	(0.239)	(0.250)	(0.245)	(0.239)	(0.241)	(0.238)	(0.222)	(0.228)	(0.238)	(0.236)	(0.238)	(0.240)	(0.234)	(0.231)
	Regional import	0.24	0.371	0.257	0.209	0.334	0.316	0.338	0.35	0.395 *	0.485 *	0.48 *	0.477 *	0.483 *	0.353	0.211	0.15	0.156
		(0.232)	(0.227)	(0.230)	(0.226)	(0.204)	(0.204)	(0.191)	(0.185)	(0.191)	(0.197)	(0.200)	(0.206)	(0.200)	(0.202)	(0.204)	(0.202)	(0.205)
NAFTA	Intraregional	-1.045**	-0.945**	-0.991**	-0.774 *	-0.618 *	-0.536	-0.414	-0.337	-0.272	-0.126	-0.161	-0.208	-0.192	-0.259	-0.28	-0.283	-0.339
		(0.294)	(0.297)	(0.297)	(0.311)	(0.295)	(0.293)	(0.304)	(0.306)	(0.299)	(0.281)	(0.282)	(0.290)	(0.284)	(0.295)	(0.317)	(0.329)	(0.332)
	Regional export	0.075	0.001	-0.02	-0.05	-0.077	-0.109	0.077	0.179	0.186	0.22	0.174	0.15	0.144	0.052	-0.055	-0.15	-0.172
		(0.151)	(0.144)	(0.137)	(0.147)	(0.145)	(0.145)	(0.145)	(0.158)	(0.175)	(0.173)	(0.179)	(0.194)	(0.200)	(0.203)	(0.196)	(0.193)	(0.200)
	Regional import	0.588**	0.504**	0.503**	0.511**	0.454**	0.501**	0.428**	0.4**	0.45**	0.492**	0.554**	0.592**	0.516**	0.537**	0.478**	0.459**	0.46**
		(0.157)	(0.149)	(0.145)	(0.139)	(0.140)	(0.140)	(0.133)	(0.137)	(0.145)	(0.149)	(0.148)	(0.160)	(0.161)	(0.158)	(0.153)	(0.151)	(0.152)
EU15	Intraregional	0.587**	0.537**	0.552**	0.595**	0.55**	0.548**	0.733**	0.696**	0.663**	0.639**	0.651**	0.592**	0.53**	0.518**	0.455**	0.419**	0.377 *
		(0.158)	(0.150)	(0.146)	(0.143)	(0.142)	(0.141)	(0.142)	(0.142)	(0.142)	(0.143)	(0.145)	(0.148)	(0.148)	(0.151)	(0.153)	(0.157)	(0.160)
	Regional export	-0.252 *	-0.278 *	-0.353**	-0.301 *	-0.292 *	-0.29 *	-0.162	-0.057	-0.047	0.02	-0.081	-0.101	-0.054	-0.059	-0.059	-0.105	-0.127
		(0.123)	(0.124)	(0.117)	(0.134)	(0.127)	(0.126)	(0.145)	(0.156)	(0.157)	(0.153)	(0.157)	(0.157)	(0.159)	(0.170)	(0.178)	(0.183)	(0.186)
	Regional import	-0.024	-0.032	0.022	0.002	-0.118	-0.093	-0.184	-0.197	-0.157	-0.11	-0.083	-0.017	-0.025	-0.069	-0.073	-0.075	-0.058
		(0.130)	(0.132)	(0.128)	(0.128)	(0.125)	(0.124)	(0.125)	(0.130)	(0.132)	(0.133)	(0.131)	(0.135)	(0.132)	(0.131)	(0.134)	(0.134)	(0.135)
MERCOSUR	Intraregional	0.893 *	0.725 *	0.568	0.785	1.016**	0.939 *	1.056**	1.19**	1.213**	1.277**	1.058**	1.126**	0.846 *	0.804 *	0.873 *	0.793 *	0.824 *
		(0.347)	(0.354)	(0.354)	(0.413)	(0.384)	(0.365)	(0.352)	(0.342)	(0.344)	(0.318)	(0.375)	(0.369)	(0.393)	(0.392)	(0.359)	(0.377)	(0.384)
	Regional export	-0.989**	-1.031**	-1.169**	-1.269**	-1.334**	-1.361**	-1.618**	-1.558**	-1.519**	-1.544**	-1.434**	-1.438**	-1.149**	-0.833**	-0.869**	-0.933**	-0.999**
		(0.211)	(0.202)	(0.222)	(0.248)	(0.266)	(0.258)	(0.252)	(0.242)	(0.226)	(0.190)	(0.224)	(0.232)	(0.226)	(0.206)	(0.220)	(0.216)	(0.203)
	Regional import	-1.344**	-1.38**	-1.34**	-1.327**	-1.141**	-1.112**	-1.125**	-1.052**	-0.904**	-0.735**	-0.766**	-0.895**	-0.731**	-0.748**	-0.957**	-0.938**	-0.987**
		(0.199)	(0.209)	(0.234)	(0.234)	(0.212)	(0.220)	(0.217)	(0.200)	(0.199)	(0.189)	(0.220)	(0.231)	(0.238)	(0.227)	(0.222)	(0.222)	(0.214)
ANDEAN	Intraregional	-0.264	-0.181	-0.034	0.094	0.384	0.453	0.684	0.597	0.673	0.915**	0.83 *	0.878 *	0.916**	0.811 *	0.845**	1.14**	0.488
		(0.345)	(0.361)	(0.357)	(0.375)	(0.405)	(0.397)	(0.366)	(0.418)	(0.373)	(0.329)	(0.324)	(0.371)	(0.350)	(0.343)	(0.315)	(0.288)	(0.347)
	Regional export	-0.321	-0.189	-0.437	-0.678 *	-0.736 *	-0.848**	-0.995**	-0.778 *	-0.829**	-0.991**	-0.871**	-0.734 *	-0.817**	-0.837**	-0.927**	-1.331**	-0.797**
		(0.291)	(0.308)	(0.301)	(0.319)	(0.341)	(0.318)	(0.307)	(0.369)	(0.317)	(0.251)	(0.271)	(0.324)	(0.280)	(0.290)	(0.265)	(0.214)	(0.286)
	Regional import	-0.61**	-0.638**	-0.63**	-0.537 *	-0.557**	-0.729**	-0.838**	-0.799**	-0.681**	-0.501**	-0.749**	-0.796**	-0.613**	-0.693**	-0.937**	-0.938**	-0.812**
		(0.194)	(0.197)	(0.227)	(0.224)	(0.194)	(0.191)	(0.180)	(0.177)	(0.172)	(0.156)	(0.171)	(0.160)	(0.142)	(0.154)	(0.166)	(0.173)	(0.168)
CACM	Intraregional	1.653**	1.703**	1.761**	1.972**	1.923**	1.853**	1.808**	1.808**	1.761**	2.085**	1.576**	1.855**	2.097**	1.807**	1.796**	1.893**	1.707**
		(0.401)	(0.374)	(0.422)	(0.455)	(0.409)	(0.423)	(0.384)	(0.368)	(0.393)	(0.425)	(0.424)	(0.426)	(0.428)	(0.448)	(0.464)	(0.437)	(0.417)
	Regional export	-1.113**	-0.959**	-1.086**	-1.256**	-1.313**	-1.436**	-1.4**	-1.177**	-0.993**	-0.893**	-0.889 *	-1.125**	-1.309**	-1.371**	-1.454**	-1.573**	-1.317**
		(0.310)	(0.294)	(0.340)	(0.366)	(0.344)	(0.336)	(0.289)	(0.276)	(0.312)	(0.290)	(0.356)	(0.352)	(0.356)	(0.377)	(0.384)	(0.358)	(0.335)
	Regional import	-0.517 *	-0.444	-0.601 *	-0.541	-0.466	-0.567 *	-0.654 *	-0.549 *	-0.473	-0.222	-0.181	-0.231	-0.163	-0.147	-0.255	-0.371	-0.364
		(0.224)	(0.241)	(0.262)	(0.279)	(0.270)	(0.285)	(0.256)	(0.258)	(0.250)	(0.237)	(0.238)	(0.251)	(0.245)	(0.266)	(0.274)	(0.271)	(0.269)
ANZCERTA	Intraregional	0.923**	0.967**	1.032**	1.113**	1.239**	1.265**	1.377**	1.408**	1.436**	1.403**	1.547**	1.345**	1.269**	1.199**	1.166**	1.083**	0.96**
		(0.320)	(0.306)	(0.307)	(0.294)	(0.293)	(0.292)	(0.285)	(0.292)	(0.288)	(0.267)	(0.288)	(0.279)	(0.282)	(0.295)	(0.289)	(0.291)	(0.311)
	Regional export	-1.165**	-1.004 *	-1.024**	-1.123**	-1.154**	-1.137**	-1.422**	-1.381**	-1.33**	-1.386**	-1.437**	-1.193**	-1.023**	-1.23**	-1.482**	-1.551**	-1.465**
		(0.410)	(0.389)	(0.394)	(0.403)	(0.429)	(0.422)	(0.407)	(0.407)	(0.391)	(0.361)	(0.374)	(0.388)	(0.380)	(0.382)	(0.374)	(0.359)	(0.373)
	Regional import	-0.578 *	-0.654 *	-0.875**	-0.853**	-0.715**	-0.754**	-0.884**	-0.816**	-0.728**	-0.396	-0.42	-0.527	-0.447	-0.526 *	-0.736**	-0.829**	-0.807**
		(0.289)	(0.288)	(0.292)	(0.294)	(0.260)	(0.268)	(0.257)	(0.251)	(0.261)	(0.256)	(0.261)	(0.278)	(0.265)	(0.265)	(0.268)	(0.269)	(0.273)

Table 18: Poisson Coefficients for Panel Data Analysis

(Excluding Singapore-Indonesia Exports)

RTA	Dummy	Coef.	Std. Err.
AFTA	Intraregional	-0.015	(0.132)
	Regional exports	0.092	(0.070)
	Regional imports	-0.024	(0.050)
NAFTA	Intraregional	0.499**	(0.121)
	Regional exports	-0.175**	(0.027)
	Regional imports	-0.045	(0.060)
EU15	Intraregional	-0.008	(0.039)
	Regional exports	0.098**	(0.035)
	Regional imports	0.072	(0.044)
MERCOSUR	Intraregional	0.190	(0.233)
	Regional exports	-0.111*	(0.050)
	Regional imports	0.493**	(0.050)
ANDEAN	Intraregional	0.834**	(0.157)
	Regional exports	-0.431**	(0.070)
	Regional imports	-0.040	(0.050)
CACM	Intraregional	0.030	(0.247)
	Regional exports	0.067	(0.104)
	Regional imports	0.244*	(0.106)
ANZCERTA	Intraregional	0.399**	(0.119)
	Regional exports	-0.090	(0.059)
	Regional imports	-0.165**	(0.059)

Table 19: Poisson Coefficients for Panel Data Analysis Recent RTAs

(Excluding Singapore-Indonesia exports)

RTA	Dummy	Coef.	Std. Err.
ACFTA	Intraregional	-0.216*	(0.095)
	Regional exports	0.336**	(0.052)
	Regional imports	0.246**	(0.059)
Japan-S'pore	Intraregional	-0.083	(0.092)
	Regional exports	-0.047	(0.057)
	Regional imports	-0.019	(0.042)
New Zealand-S'pore	Intraregional	0.198	(0.166)
	Regional exports	-0.058	(0.059)
	Regional imports	-0.068*	(0.034)
S'pore Australia	Intraregional	0.078	(0.238)
	Regional exports	-0.082	(0.057)
	Regional imports	-0.136**	(0.040)
US-S'pore	Intraregional	-0.116	(0.112)
	Regional exports	-0.088	(0.062)
	Regional imports	-0.013	(0.048)
		0.011	(0.046)
EU15 to EU25 expansion	Intraregional	0.253**	(0.041)
	Regional exports	0.019	(0.045)
	Regional imports		
		-0.115**	(0.033)
EC-Mexico	Intraregional	0.063**	(0.016)
	Regional exports	0.087**	(0.023)
	Regional imports		
		0.223	(0.123)
US-Chile	Intraregional	-0.121	(0.066)
	Regional exports	-0.014	(0.055)
	Regional imports		

Table 20: List of Sample Countries for Analysis of New RTAs

Code	Country	Code	Country	Code	Country	Code	Country
ALB	Albania	EST	Estonia	MYS	Malaysia	SVN	Slovenia
ARG	Argentina	FIN	Finland	MDV	Maldives	ZAF	South Africa
AUS	Australia	FRA	France	MLT	Malta	ESP	Spain
AUT	Austria	GMB	Gambia, The	MUS	Mauritius	LCA	St. Lucia
AZE	Azerbaijan	GEO	Georgia	MEX	Mexico	VCT	St. Vincent and the Grenadines
BRB	Barbados	DEU	Germany	MDA	Moldova	SDN	Sudan
BLZ	Belize	GHA	Ghana	MNG	Mongolia	SWE	Sweden
BEN	Benin	GRC	Greece	MAR	Morocco	CHE	Switzerland
BOL	Bolivia	GTM	Guatemala	NLD	Netherlands	TWN	Taiwan
BRA	Brazil	HND	Honduras	NZL	New Zealand	TZA	Tanzania
BGR	Bulgaria	HKG	Hong Kong, China	NIC	Nicaragua	THA	Thailand
BDI	Burundi	HUN	Hungary	NER	Niger	TGO	Togo
CAN	Canada	ISL	Iceland	NOR	Norway	TTO	Trinidad and Tobago
CPV	Cape Verde	IND	India	PAK	Pakistan	TUN	Tunisia
CHL	Chile	IDN	Indonesia	PAN	Panama	TUR	Turkey
CHN	China	IRL	Ireland	PRY	Paraguay	UGA	Uganda
COL	Colombia	ISR	Israel	PER	Peru	UKR	Ukraine
CRI	Costa Rica	ITA	Italy	PHL	Philippines	GBR	United Kingdom
CIV	Cote d'Ivoire	JPN	Japan	POL	Poland	USA	United States
HRV	Croatia	KAZ	Kazakhstan	PRT	Portugal	URY	Uruguay
CYP	Cyprus	KOR	Korea, Rep.	ROM	Romania	VEN	Venezuela, RB
CZE	Czech Republic	LVA	Latvia	RUS	Russian Federation	YEM	Yemen, Rep.
DNK	Denmark	LTU	Lithuania	SEN	Senegal	ZMB	Zambia
ECU	Ecuador	MKD	Macedonia, FYR	SGP	Singapore		
EGY	Egypt, Arab Rep.	MWI	Malawi	SVK	Slovak Republic		