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FTA Influence on Trade Creation and Diversion by Regional Trading Blocs*

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Using Augmented Gravity Model in Panel context covering 9,832 country pairs (184 countries) over 9 years, this study examines trade creation and trade diversion effects of Regional Trading Blocs in presence of overlapping FTAs with reference to seven selected Regional Blocs, namely; ASEAN, NAFTA, EFTA, DR-CAFTA, EU, CARICOM and SAARC networked with 79 FTAs. The main research question is whether an FTA between an outsider and insider country of a Regional Trading Bloc creates trade for both parties equally or unequally. We found economically plausible and statistically significant evidences that outsider-countries trading with Regional Blocs are adversely exploited by insider-countries for their own benefits, rather than mutual, in absence of FTAs. More interestingly it was found that the countries being exploited can effectively reverse their adverse position by forming an FTA with the Regional Blocs concerned. Trading "with an FTA" is always more beneficial for both parties than trading "without an FTA," though the benefits are unequal.

JEL Classification: F14, F15
Keywords: regional trading blocs, Free Trade Agreements,
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1. INTRODUCTION

The landscape of the present World Trading System can be viewed as a three-faced object having Multilateralism, Regionalism, and Bilateralism in each side. Today, every country in the world is a member of at least one regional, multilateral or bilateral trading agreement.

The Geographic proximity coupled with the similarity in economic, cultural, historical characteristics has necessarily fostered enthusiasm towards Regional Trading Blocs (RTB). There have been widespread attempts towards RTBs in 1960s but the origin of RTB descends back to centuries as long as there have been nation-states that discriminated trade policies in favor of some valued neighbors and against others. "Regional trading arrangements have at times played major roles in political history. For example, the German Zollverein, the custom union that was formed among 18 small states in 1834, was a step on the way to the creation of the nation of Germany later in the century" (Frankel, 1997).

During the past few decades the World Trade Organization (WTO)[1] has been working mostly towards an arena of multilateralism, where the concept of Most Favored Nation (MFN) was regarded to be of paramount importance. The Trade Expansion Act of 1962, which is known as Kennedy Round of trade negotiations, brought together 53 countries accounting for 80% of international trade to cut tariffs by an average of 35%. In the Tokyo Round (1979) approximately 100 nations agreed to further tariff reductions and to the reduction of non-tariff barriers such as quotas and licensing. The most remarkable multilateral negotiations took place following the Uruguay Round, which was launched in 1986 and concluded almost 10 years later with conformity to reduce industrial tariffs, agricultural tariffs and subsidies, and to protect intellectual property rights. However, the most recent one, Doha round almost collapsed in 2006 after five year prolong talks as both USA and EU kept themselves more on the defensive side. Nevertheless, GATT/WTO has shown major deviations from the MFN concept allowing

[1] Known as GATT-General Agreement on Trade and Tariffs prior to 1995.

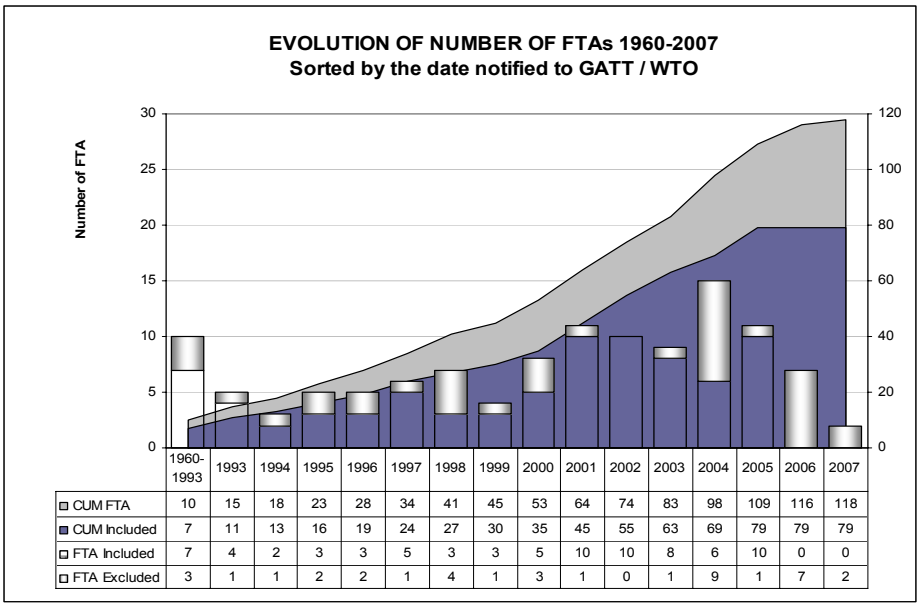
countries to form Regional Trading Agreements (RTA), Custom Unions (CU) or Preferential Treading Agreements (PTA) under Article-XXIV subject to a several conditions including that the trade barriers against non-members not be made more restrictive than before. Presently, there are more than 30 Multilateral RTAs notified to WTO.

In recent past, Free Trading Agreements (FTA) on bilateral basis have become the pioneering driving force of trade liberalization because narrower pacts are easier to negotiate, less time consuming and they can closely address the needs of both parties. Very often they can lay the groundwork for larger accords. During the recent past, especially after 1995, the number of FTAs grew so rapidly that the relevant literature uses the terminology of "Proliferation of FTA" to signify the explosion in number of FTAs. Quantifying the actual number of RTAs presently in the world is a methodological challenge for many reasons. There are 194 RTAs notified to WTO as at September 24, 2007. This includes 114 FTAs, 18 Custom unions, 49 Economic Integration Agreements, and 13 partial scope arrangements. However, this could not be the actual number because there are many RTAs/FTAs, which are still under negotiation but so far not notified to WTO. According to Roberto, Luis and Cristelle (Roberto *et al*., 2007) the total number of RTAs active and in force by end 2006 were 214 and there are approximately 70 RTAs not notified, 30 just signed and yet to implement, 65 under negotiation and at least another 30 proposed. If all these are implemented, we will be having a global RTA network of 400 RTAs by 2010.

The figure 1 shows the evolution of FTAs (related to goods) from 1960 to 2007 (Note that inactive FTAs or FTAs related to services and investment have been excluded). It can be seen that the FTA proliferation is mostly evident during the period from 2000 to 2006.

It is interesting to see the performance of the global trade during the FTA proliferation era. The authors' calculations using WTO statistics suggest approximately 18% of the total world merchandise exports took place under 705 bilateral FTAs by year 2005. This is a remarkable percentage when we

Figure 1



	1960-1993	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CUM FTA	10	15	18	23	28	34	41	45	53	64	74	83	98	109	116	118
CUM Included	7	11	13	16	19	24	27	30	35	45	55	63	69	79	79	79
FTA Included	7	4	2	3	3	5	3	3	5	10	10	8	6	10	0	0
FTA Excluded	3	1	1	2	2	1	4	1	3	1	0	1	9	1	7	2

Notes: "FTA included" are the FTAs considered in this study. "FTA excluded" arises for tow reasons. Either (a) Study period may not cover the time of their occurrence or (b) the dataset does not include at least one party related to the omitted FTA. The total number of FTAs considered in this study is 78. In fact, this number should be read as 705 in terms of number of bilateral FTAs

Source: Author's calculation using WTO statistics.

recall that there more than 25,000 country pairs[2)] in the world presently trading among each other. This is similar to claiming that 18% of world trade takes place among of 3% of the total number of trading pairs acting under FTAs. In fact, the number of FTAs is not overwhelming but the trade under them is remarkably outstanding.

Turning towards the RTB's performance during the proliferation period, the statistics suggest that the proportion of intra-trade (trade among members) and extra-trade (trade between members and non-members) of

[2)] Given 198 countries in the world, potential number of trading pairs is (198^2-198)/2=19,503 and therefore potential Export Flows are 19,503*2=39,006. But actual number is around 25,000 as not all countries trade with all the other countries in the world.

Table 1 Intra and Extra Bloc Merchandise Trade of Selected Regional Trading Blocs 1999-2005

	1999	2000	2001	2002	2003	2004	2005
European Union (25)							
Intra-exports	69%	68%	67%	67%	68%	68%	67%
Extra-exports	31%	32%	33%	33%	32%	32%	33%
Intra-imports	67%	64%	65%	66%	67%	66%	65%
Extra-imports	33%	36%	35%	34%	33%	34%	35%
NAFTA							
Intra-exports	54%	56%	55%	57%	56%	56%	56%
Extra-exports	46%	44%	44%	43%	44%	44%	44%
Intra-imports	40%	40%	39%	38%	37%	35%	34%
Extra-imports	60%	60%	61%	62%	63%	65%	66%
ASEAN							
Intra-exports	22%	24%	23%	23%	24%	25%	25%
Extra-exports	78%	76%	77%	77%	76%	75%	75%
Intra-imports	23%	23%	22%	24%	24%	23%	24%
Extra-imports	77%	76%	78%	76%	76%	76%	76%

Source: World Trade Organization.

RTBs, except for few, has continued be same as before without a noticeable change. For example, we show the trading performance of EU, ASEAN and NAFTA below in table 1.

As shown in table 1, EU has shown higher trade integration among member countries[3)] reporting EU intra-exports over 68% of total exports and EU intra-imports over 67% of total imports. In other words, it is only 30% of EU trade is shared with the rest of the world (ROW) while 70% of EU trade occurs within the bloc. This composition does not seem to have changed during the 7-year period concerned. This follows the idea that EU still treats

[3)] The member states are Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom of Great Britain and Northern Ireland.

the non-member countries exactly as the way they used to treat them seven years ago.

By contrast, ASEAN shows relatively poor trade integration among members[4] accounting only for 22% of inter-bloc trade while more than 76% of total trade is dealt with ROW. This is apparently the opposite of the EU trading behavior.

While EU and ASEAN found their positions in two extremes, and rather stationary, NAFTA[5] has shown a moderate and dynamic picture. The most interesting observation is that NAFTA has noticeably changed its direction of imports while continued to keep direction of exports unchanged during the period concerned. In other words, NFTA has opened up avenues for the countries in ROW to expand their export markets well into NAFTA while other RTBs either have been unable to get rid of the originally default position or have not attempted to do so for the past seven years.

This scenario gives birth to our research question whether a bilateral FTA between a member and a non-member country of RTB creates trade for the non-member or exploits the non-member for the benefit of RTB itself. In answering this question, we will consider seven RTBs namely EU, NAFTA, ASEAN, EFTA, DR-CAFTA, SAARC and CARICOM, which are linked to outside countries through 79 FTAs. Accordingly, the objectives of the study are as follows.

i) To differentiate Trade Creation (TC) and Trade Diversion (TD) Effects of selected Regional Trading Blocs from their Gross Trade Creation (GTC) Effect.

ii) To identify whether a bilateral FTA between a member and a non-member country of RTB creates trade for the non-member or exploits the non-member for the benefit of RTB itself.

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[4] ASEAN was established by the five original member countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand in August 1967 in Bangkok. Brunei Darussalam joined in January 1984, Vietnam in July 1995, Lao PDR and Myanmar in July 1997, and Cambodia in April 1999.

[5] North American Free Trade Agreement (NAFTA) is the world's largest free trade formed by USA, Mexico Canada in January 1994.

In general, trade diversion takes place when a certain RTB diverts trade, away from a more efficient country outside the RTB, towards a less efficient country within the RTB merely expecting the benefits from abolition of tariff or any other trade barriers. The first question addresses the issue whether RTBs are actually creating trade or just diverting trade flows from the non-members to the members, eventually not making any fertile contribution to the world trade.

The second question is novel in the sense that we are the first to raise this question regarding the RTBs and FTAs interactive effects. We focus on the performance of RTB outsider countries entering into FTAs with RTB insider countries. It is interesting to see whether an outsider gains from an FTA or at least the FTA helps to reverse any trade diversionary effect resulted from RTB itself. Sometimes, FTAs may be undesirable to the outsider when the insider expands its market beyond the RTB and exploits the outsiders' market for his own benefit rather than sharing mutual benefits equally.

The rest of the paper is organized as follows; the section 2 is devoted for a brief literature review. The Data and methodology is elaborated in the section 3 followed by the empirical result and discussion in the section 4. The section 5 presents concluding remakes, limitations and the scope for future work.

2. LITERATURE REVIEW

The term Regional Trading Agreements (RTA) is inherently vague for the reason that WTO uses it to denote all type of regional agreements including FTAs. So do many researchers. In order to avoid confusion, in this paper we use 'RTB' to denote Regional Trading Blocs, despite of the many different terms used in the original papers.

The Augmented Gravity model has been extensively used in trade literature to ascertain the RTA/RTB and FTA impact. Given the sample is unbiased the estimated gravity model suggests the "natural level of trade" for

the sample, which could infer to the underling population at a chosen significance level. Then the dummy variables representing the selected RTBs will capture any "abnormality" above (or below) the natural level resulted from the impact of the RTB concerned.

There are numerous attempts to measure trade creation (TC) and trade diversion (TD) effects of RTBs descending from Balassa (1967). Many former studies, Aitken (1973) and Pelzman (1977) for example, uses a single indicative binary variable to measure RTB impact. Using a sample of 63 countries Frankel (1992) and Frankel and Wei (1993) estimate trade creation in European Bloc and NAFTA, ASEAN and APEC in 1980s. For the most part, Frankel and Wei (1993) uses a single RTB dummy. It measures only the gross trade creation effect but reveals nothing about the non-member countries' trade and therefore is an incomplete measure to identify real TC effect.

However, later work by Frankel *et al*. (1995), Frankel and Wei (1995, 1996), and Frankel (1997) estimated the gravity model more acceptably using two dummies; intra-bloc dummy (1 if both belong to same RTB) and extra-bloc dummy (1 if only one belongs to RTB) to differentiate between TC and TD effects. They found evidence for trade creation in the EU, EFTA, APEC, ASEAN and NAFTA, and for diversion in EU and NAFTA. Masahiro (1999) also shows the failure of using a single RTB dummy variable and instead uses intra-bloc dummy and extra-bloc dummy to differentiate between TC and TD effects of EEC,[6] LAFTA[7] and CMEA.[8]

Ghosh and Steven (2004) defines RTB in both ways discussed above and tests for the fragility of TC effect of 12 RTBs[9] using extreme bound analysis. Using least squares estimator, where all weight is attached to the sampling distribution, they found that eight or more of the twelve RTBs in question are trade creating but at the extreme bounds, when all weight is attached to the

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[6] European Economic Community.
[7] Latin American Free Trade Association.
[8] Council of Mutual Assistance.
[9] Twelve RTB included; EU, EFTA, EEA, CACM, CARICOM, NAFTA, LAIA, ANDEAN, MERCOSUR, ASEAN, ANZCERA, APEC.

prior distribution, none of the RTBs are trade creating. They ended with a challenging conclusion that the pervasive trade creation effect found in the literature reflects not the information content of the data but rather the unacknowledged beliefs of the researchers.

Benjamin (2004) uses Gravity Model to study the proposed China-ASEAN Free Trade Area (CAFTA) proposed to be implemented by 2010. How would trade between the integrating area and the rest of the world be affected; will there be net trade creation or net trade diversion effects; are some of the issues being discussed. However, we would claim they never modeled TC and TD effects accurately and therefore conclusions must have been based on their prior beliefs rather than what the data revealed.

Using Gravity model, Tang (2005) examines whether NAFTA. ANZCER and ASEAN would result in TC among the member countries and TD with the non-members during 1999 to 2000. He also establishes intra-bloc dummy and extra-bloc dummy to capture the TC and TD effects correctly. The results show that the TC among the member countries is higher, particularly the ANZCER and ASEAN but ANZCER has resulted in TD for the non-member countries, whereas ASEAN has resulted in a trade increase for the non-member countries. Surprisingly, they conclude the formation of NAFTA has no significant effect on trade with the non-member countries, as their trade flows remain quite low. We believe the conclusion regarding NAFTA severely suffers from extreme sampling bias because Tang (2005) derived this conclusion observing non-randomly selected 11 countries (7 European and 4 East Asian) trading with NAFTA.

Analogous pattern of handling dummy variables can be seen in the Gravity model by Volker (2007) where he ascertains the impact of the G7/G8 countries[10] on the trade among 175 countries over the period from 1948 through 1999. Though G7/G8 is neither RTB nor FTA, Volker found G7/G8 is consistently associated with a strong positive effect on trade.

[10] The G7 is a coalition of the major industrial countries: UK, USA, France, Germany, Italy, Japan, and Canada. In 1998 G8 was created when of Russia joined G7.

Sucharita and Steven (2004) introduces a new measure of RTA membership into Gravity model based on the degree of implementation as well as type of RTA. i.e., preferential trade agreement (PTA), free trade area (FTA), customs union (CU), common market (CM) and monetary union (MU). Their findings show that RTAs create intra-bloc trade regardless of their type and that more integrated RTAs generate greater total trade creation. Further, a proposed FTA, CU or MU raises the volume of intra-bloc trade, while a proposed CM lowers intra-bloc trade. Moreover, a proposed CM and MU raises the trade flow outside the bloc, while a proposed CU diverts trade from those countries outside the bloc.

The studies so far discussed attempted to identify TC and TD effect of RTBs using utmost two dummies; intra-bloc dummy (1 if both belong to same RTB) and extra-bloc dummy (1 if only one country belongs to RTB). Carrere (2006) put forward a very sound argument that three dummies for one RTB are required to distinguish between TC and TD effect. The idea is simple but sounds amazing. The extra-bloc dummy hitherto used does not clearly indicate possible TD effect for the non-member countries, and more seriously, a significantly positive estimate for extra-bloc dummy could lead to the rather misleading conclusion that the selected RTB is trade creating for non-member countries whereas the real case may be, possibly, other way round. Carrere (2006) uses gravity model to assess ex-post effect of EU, ANDEAN, CACM, NAFTA, LAIA, ASEAN and MERCOSUR. The study uses a set of panel data comprising of 130 countries over the period 1962-1996. The correct number of dummy variables allows distinguishing between the TC and the TD effects realistically. In contrast to previous estimates, Carrere (2006) shows that RTBs have generated a significant increase in trade for members, often at the expense of the ROW. We also define RTB dummies analogous to Carrere (2006), but extend it one-step further to capture RTB and FTA interactive effects, as we will elaborate under the section 3.

Even though much ink has been spilled on the issue of RTB impacts in general, there is little work done purely on FTAs. On theoretical ground,

Kennan and Riezman (1990) shows that countries may lower external tariffs against other countries after endorsing an FTA. Richardson (1993) shows that governments tend to reduce external tariffs to minimize the tariff revenue losses caused by the shift of imports from the outsiders to FTA partners. Bagwell and Staiger (1999) asserts that changing terms of trade in presence of an FTA generates an extra force to lower external tariffs. On contrary, Cadot *et al*. (1999) argues that countries entering into FTAs may also have reasons to raise their non-preferential tariffs. Using an oligopolistic-political-economy model, in which the external tariffs of FTA members and the decision to form FTAs are endogenously determined, Emanuel (2005) shows that FTAs are primarily beneficial to the multilateral trading system. In addition, FTAs encourage their member countries to lower their external tariffs, deeply enough to enhance the trade even between FTA members and non-members.

In a study considering ASEAN countries' FTAs with U.S.A., Naya and Michael (2006) concludes that it will be an important motivation for ASEAN countries in seeking FTAs with the United States to gaze at the need to "reclaim" MFN status in the U.S. market, which has been eroded due to U.S. FTAs with other countries.

In this literature review, we attempted to show how Gravity model has been applied to evaluate impact of RTBs and FTAs as two separate concerns. However, one clear lapse in literature is that little or no attention paid to RTB and FTA interactive effect. RTB and FTA impact so far has been estimated in isolation without considering the fact that they may have significant interactive effects on TC and TD. This paper attempts to bridge this knowledge gap in literature evaluating TC and TD effects of six RTBs overlapping with 79 FTAs (see Appendix table A1 for FTA list).

3. METHODOLOGY

3.1. Model

As the major analytical tool, this study effectively uses Augmented Gravity Model, which has been extensively used in trade literature for policy analysis. We consider pair-wise annual trade flows among 184 countries (see Appendix table A2 for country list) for 9 years from 1997 to 2005 so that FTA proliferation era is covered. We estimate the Gravity Model with adequate controls to account for natural level of trade expected from any random country pair and then will employ dummy variables to capture abnormal trade arising from trading blocs, FTAs and their interactive effects.

The Augmented Gravity Model in Panel Data context will be,

$$\begin{aligned}\ln X_t^{ij*} = {} & \beta_0 + \sum_{t=1998}^{2005} \beta_t yd + \beta_{gdpgdp} \ln(gdp_t^i \cdot gdp_t^j) + \beta_{disrad} \ln disrad^{ij} \\ & + \beta_{pricei} \ln price_t^i + \beta_{pricej} \ln price_t^j + \beta_{tax} tax_t^j + \beta_{remoi} \ln remo_t^i \\ & + \beta_{remoj} \ln remo_t^j + \beta_{border} border^{ij} + \beta_{colony} colony^{ij} + \beta_{lbi} lb^i \\ & + \beta_{lbj} lb^j + \beta_{curr} Curr^{ij} + \beta_{ilandi} iland^i + \beta_{ilandj} iland^j + \beta_{fta} FTA_t^{ij} \\ & + \beta_1 D1_t^{ij} + \beta_2 D2_t^i + \beta_3 D3_t^j + \beta_{2\,fta} D2_t^i \cdot FTA + \beta_{3\,fta} D3_t^j \cdot FTA + u_t^{ij},\end{aligned} \tag{1}$$

where, X_t^{ij} is the PPP adjusted value of export flows from *i* to *j*; *yd* denotes time dummies from 1997 through 2005; $(gdp_t^i \cdot gdp_t^j)$ is the product of PPP adjusted GDPs of country *i* and *j*; $disrad^{ij}$ is a combined proxy variable for external transport cost (measured by Great Cycle Distance between two countries) and internal transport cost (measured by the radius of a circle fitted to the geographical area of the country); $price^i$ and $price^j$ are the relative prices of the two countries measured by the PPP exchange rate over nominal exchange rate; tax_t^j is the average import tariff rate of the importing country against all other countries; $remo_t^i$ and $remo_t^j$ are two index numbers standing for the relative economic remoteness of the two countries, which is

the sum of the distances to the five nearest countries weighted by their GDPs; $border^{ij}$ is a dummy equal to one if countries share a common border, zero otherwise; $colony^{ij}$ is a dummy equal to one if one country used to be a colony of the other or both had been colonized by the same colonizer, zero otherwise; lb^{i} and lb^{j} are two dummies equal to one if country i or j is landlocked, zero otherwise; $Curr^{ij}$ is a dummy equal to one if countries share a common currency, zero otherwise; $iland^{i}$ and $iland^{j}$ are two dummies equal to one if country i or j is an island, zero otherwise; FTA_t^{ij} is a dummy equal to one if countries trade under an FTA, zero otherwise; All variables are in natural logs.

The tail-end dummy variables which differentiate among TC, TD and NTC resulting from RTBs are of paramount importance to our study. There are four possible scenarios $(n=4)$ describing intra-bloc and extra-bloc bilateral trade flows. Hence, we use $(n-1=3)$ number of dummies.

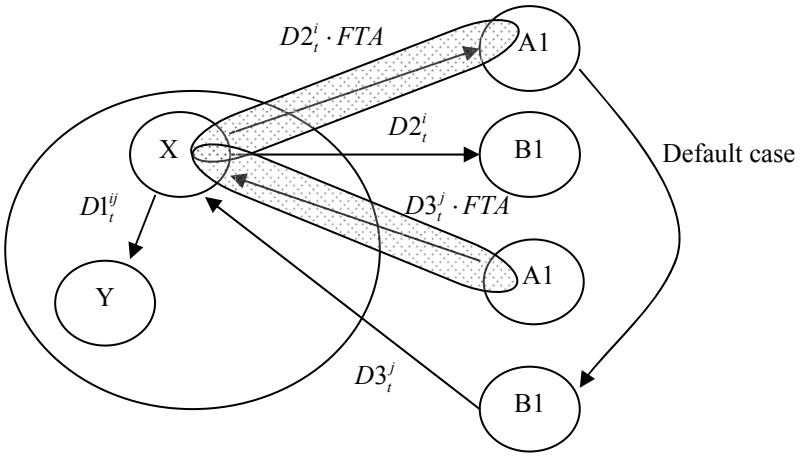
$D1_t^{ij}$ =1 if both countries belong to same RTB, 0 otherwise
$D2_t^{i}$ =1 if only the exporter belongs to RTB, 0 otherwise
$D3_t^{j}$ =1 if only the importer belongs to RTB, 0 otherwise

The natural intercept of the model stands for the default case, where neither exporter nor importer belongs to same RTB. In addition, we define two interactive dummies to capture RTB and FTA overlapping effect. Figure 2 shows the configuration of five dummies to capture RTB, FTA individual effect and their interactive effects.

$D2_t^{i} \cdot FTA$ =1 if insider exporting to outsider under a FTA, 0 otherwise
$D3_t^{j} \cdot FTA$ =1 if insider importing from outsider under FTA, 0 otherwise

At the very outset, a few comments are due regarding the decomposition of trade into export and imports and the threefold RTB dummy variables used in this study. Deviating from the historically estimated gravity models, we purposively use Exports (X) as the dependent variable in place of total

Figure 2 Configuration of RTB and FTA interaction Dummy Variables



Note: X, Y countries belong to RTB whereas A1, B1 belong to ROW. Arrows show the direction of trade while shaded ellipse show the presence of FTA.

trade (X+M). It can be shown that one cannot clearly identify TC and TD impact of FTA when X+M is used. For example, suppose that China and India formed an FTA and as a result, the Chinese exports to India increased by 15 billion dollars, and for some reason the Indian exports to China decreased by 5 billion dollars. Unfortunately, when X+M is used one observes that FTA has boosted the China-India trade by 10 billion dollars, even though the underlining reality is that India has lost while China has gained substantially from FTA. Taking X and M as two observations rather than aggregated one will avoid the chance of misinterpretations of this nature.

As shown in the literature review, Aitken (1973) Pelzman (1977) and Frankel and Wei (1993) used a single indicative binary variable to measure RTB effect, which is incomplete for the reasons it measures only the gross trade creation effect. It is worth elaborating as to why three dummy variables are required to differentiate between trade creation (TC) trade diversion (TD) and net trade creation (NTC) effects of RTB. Using a single dummy (similar to $D1_t^{ij}$ above) one might conclude that the economic integration, perhaps,

trade intensity within RTB is above the average when the coefficient for RTB dummy is found to be significantly positive. The dilemma is that it reveals nothing about what is happening to the non-member countries as a consequent of so-called integration. Sometimes, it might be the case that RTB members gain at a cost to ROW, which cannot be captured by using a single dummy variable.

Even though later work by Frankel *et al*. (1995), Frankel and Wei (1995, 1996), and Frankel (1997) used two dummies; intra-bloc dummy (1 if both belong to same RTB) and extra-bloc dummy (1 if only one belongs to RTB) we do not believe they too could estimate TC and TD effects acceptably. The major drawback of those studies arises from the cross-sectional nature of data used. The estimated values for the proposed dummies in a cross sectional model will indicate the 'abnormality' of trade flows at a given time compared to the benchmark of "natural level of trade." For example, when extra-bloc dummy is found to be significantly negative, it indicates that bloc members trade with outside countries below the natural level of trade. It is wrong to interpret this situation as trade diversion. That is simply because in a cross-sectional analysis, we do not have information whether extra-bloc had been trading below the natural level even before the formation of the RTB concerned. Therefore, we have to have at least two time periods to identify TC/TD effects of RTB. In other wards, same cross-sectional unit needs to be observed at least in two times before and after the formation of RTB. If it is not possible owing to data infeasibility, two time periods with a reasonable gap subsequent to the RTB formation will serve the purpose. In short, our argument is that TC/TD effects of RTB is neither a cross-sectional phenomena nor a time series phenomena but an issue to deal with panel data.

We estimate the model using panel data comprising of 9,832 cross-sections observed over nine time periods from 1997 to 2005. Nevertheless, the variations of slope coefficients including that of RTB, could be marginal between two consecutive years. Thus, we rewrite the model to signify how the slope coefficients change for a wider interval from 1997 (the base year) to 2005 as follows.

$$
\begin{aligned}
\ln X_t^{ij*} = {} & \beta_0 w + \sum_{t=1998}^{2005} \beta_t yd^* + \beta_{gdpgdp} \ln(gdp_t^i \cdot gdp_t^j)^* \\
& + \delta_{gdpgdp} yd05 \cdot \ln(gdp_t^i \cdot gdp_t^j)^* + ... + \beta_{fta} FTA_t^{ij*} \\
& + \delta_{fta} yd05 \cdot FTA_t^{ij*} + \beta_1 Dl_t^{ij*} + \delta_1 yd05 \cdot Dl_t^{ij*} + \beta_2 D2_t^{i*} \\
& + \delta_2 yd05 \cdot D2_t^{i*} + \beta_3 D3_t^{j*} + \delta_3 yd05 \cdot D3_t^{j*} + \beta_{2\,fta} D2_t^i \cdot FTA^* \\
& + \delta_{2\,fta} yd05 \cdot D2_t^i \cdot FTA^* + \beta_{3\,fta} D3_t^j \cdot FTA^* \\
& + \delta_{3\,fta} yd05 \cdot D3_t^j \cdot FTA^* + v^{ij*}.
\end{aligned} \tag{2}
$$

The definitions for the variables will be the same as before except that the superscript stars denote they are transformed variables in to Feasible Generalized Least Squares (FGLS) weighted by cross-sectional weights[11] to remove heteroskedasticity.

v^{ij*} is the composite error term. The expected signs for the augmented model are,

$$
\begin{aligned}
& \beta_{gdpgdp} > 0,\ \beta_{disrad} < 0,\ \beta_{pricei} < 0,\ \beta_{pricej} > 0,\ \beta_{tax} < 0,\ \beta_{remoi} < 0, \\
& \beta_{remoj} < 0,\ \beta_{border} > 0,\ \beta_{colony} > 0,\ \beta_{lbi} < 0,\ \beta_{lbj} < 0,\ \beta_{curr} > 0,\ \beta_{ilandi} > 0, \\
& \beta_{ilandj} > 0,\ \beta_{fta} > 0.
\end{aligned}
$$

Although we exhibit results for the whole model, our main interest lies with the tail end dummy variables. For example, controlled for all the other factors β_{fta} is the return to FTA in 1997 and $\beta_{fta} + \delta_{fta}$ is the return to FTA in 2005. Therefore, δ_{fta} is the change in return to FTA between two periods. Similarly, β_1 is the intra-block RTB effect in 1997 and $\beta_1 + \delta_1$ is the intra-

[11] Note that w in equation (2) should not be read as the overall intercept for FGLS estimates. It is the intercept for the base year. OLS intercept is converted to another variable by GLS transformation itself and hence intercept term ceases to exist in GLS/WLS/EGLS $Y = \alpha + \beta X + u$: OLS, whereas $\frac{Y}{w} = \beta\frac{\alpha}{w} + \beta\frac{X}{w} + \frac{u}{w}$: WLS.

block RTB effect in 2005. Thus δ_1 is the change in the intra-block RTB effect between two periods. Other coefficients need to be analogously defined.

Estimating above model will help us to identify the TC, TD and NTC effect of RTB over the nine-year period concerned. Recall that our dependant variable not total bilateral trade but bilateral exports and also our concern is not pure cross-sectional. Therefore, our definition for TC and TD may necessarily differ from any other previous study. For clarity, let us define

$\delta_1 > 0,\ \delta_2 > 0,\ \delta_3 > 0$: Pure Trade Creation (Intra-bloc and extra-bloc trade growing over time)

$\delta_1 > 0,\ \delta_2 < 0,\ \delta_3 < 0$: Pure Trade Diversion (Intra-bloc trade increases but extra-bloc trade decreases over time)

The other possible scenarios need to be relatively defined depending on sign and the magnitudes of $\delta_1,\ \delta_2,\ \delta_3$. For example, given all the other factors being equal, if $(\delta_1 + \delta_2) > 0,\ (\delta_1 + \delta_2 + \delta_3) < 0$ it suggests that RTB has created trade for members but has diverted trade from the ROW more than they created thus on average NTC for the world is negative.

3.2. Sources of Data

Nominal values of bilateral export in US dollar are from the United Nations Commodity Trade Statistics (UN comtrade) database. This data series were converted to PPP values to be comparable across country pairs multiplying by nominal exchange rates over PPP exchange rate.[12] As this transformation replaces domestic inflationary effect with USA inflationary effect, the series was deflated by USA inflation rate to be comparable over time. The data series for nominal exchange rates, the implied PPP exchange rates and the inflation rates required for the adjustment were taken from the

[12] Both Nominal and PPP exchange rates were expressed in indirect method, i.e., the domestic currency units per one unit of US dollar.

IMF-World Economic Outlook database for April 2006.[13] PPP converted annual GDP series taken from the IMF-World Economic Outlook database for April 2006 was re-adjusted to remove USA inflationary effect embodied. We use CIA World Fact Book to obtain total land area of each country to compute the radius of a country and the geographical coordinates (of capital cities) to compute Great Circle Distance between the two countries in a pair. Information to establish FTA dummy was directly taken from the WTO official website. Tariff data is primarily based on UNCTAD TRAINS database and then used WTO IDB data for filling gaps for missing observations. We also used Penn World Tables to fill up some set of missing data in PPP and GDP series (not more than 10 to 20 observations) for small island countries not appearing in above mentioned data sources.

The dataset used in this study comprises of one-way trade flows (exports) among 184 countries over 9 years from 1997-2005. Though the number of maximum possible country pairs should be 16,110, not all the country pairs are potential for trade. For example, we cannot expect Barbados to trade with all other 183 countries whereas USA does. When zero trade flows are excluded and the discontinued series were dropped in balancing the data panel, we have ended up with 9,832 country pairs,[14] perhaps, the largest number of cross-sections used in a balanced panel approach in a gravity model. Accordingly, our panel dimension is 9,832 times 9, which is equal to 88,488.[15]

4. RESULTS AND DISCUSSION

In estimating equation (2) we will employ neither fixed effect nor random

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[13] Nominal exchange rate is not explicitly available in the database. Instead, we calculated it using two available series as follows. Nominal exchange rate = gross domestic product per capital current prices national currency/gross domestic product per capital current prices US dollars.

[14] No other major trading country has been dropped except for Taiwan, Saudi Arabia and United Arab Emirates.

[15] Carrere, C. (2006) uses 14,387 country pairs but it is an unbalanced panel where many pair observations discontinued.

effect because Cross-sectional Fixed Effect (known as Demean or within method) totally loose the ground in this case for the reason that it wipes out all the time-invariant dummy variables (Common currency, language, border, island, landlocked, colony) as well as much needed distance variable in gravity model. As panel cross-section random effect uses quasi-demean data (subtracting only a fraction of time average from each observation) it helps gravity model to retain time invariant variables intact. Yet cross-section random effect method is possible only if the unobserved effect λ is uncorrelated with explanatory variables (both time varying and time invariant) in all time periods.

Symbolically,

$$\text{Cov}(x_{itj},\ \lambda_i) = 0,\ t = 1,\ 2,\ ...,\ T,\ j = 1,\ 2,\ ...,\ k. \tag{3}$$

More precisely the underlining assumption is that there is an unobserved cross-section specific factor (technically known as individual heterogeneity) that affects bilateral exports but uncorrelated with the right-hand side variables such as country GDPs, distance, prices, taxes etc, which is less plausible in a highly integrated macroeconomic setting.

The pooled OLS fails to serve the purpose as heteroskedasticity problem naturally arises when the country sample is very large including the smallest country to the biggest. Therefore, it was decided to take cross-sectional weights to yield Feasible Generalized Least Square (FGLS) estimator. White heteroskedasticity test roughly concludes the presence of heteroskedasticity of which the functional form is not detected. The efficiency of the FGLS over OLS necessarily depends on the assumption we make regarding the correct functional form of the heteroskedasticity that we never know exactly. To overcome this problem we first performed preliminary (OLS) estimations to obtain cross-section specific residual vectors (for 9 different periods), and then used these residuals to form estimates of the cross-specific variances. The estimates for cross-sectional error variances were then used in a WLS rocedure to yield the FGLS estimates, which is now free from user-defined

functional form of the heteroskedasticity.

The table 2 shows the estimated results for equation (4) where the columns provide two period panel data estimates seven RTBs namely EU, NAFTA, ASEAN, EFTA, DCAFTA, SAARC, CARICOM and finally WTO in the last column though it cannot be regarded as an RTB.

While it is enough the current period error term to be uncorrelated with the current explanatory variables for the OLS to be consistent, EGLS requires current error term to be uncorrelated with not only the current but also the lags and leads of the explanatory variables (Wooldrige, 2006, p. 428).

Symbolically,

$$\begin{aligned} &\mathrm{Cov}(x_t,\ u_t) = 0 \text{ for OLS,} \\ &\mathrm{Cov}(x_t,\ u_t) = 0 \text{ and } \mathrm{Cov}(x_{t-1} + x_{t+1},\ u_t) = 0 \text{ for FGLS.} \end{aligned} \tag{4}$$

In the light of above argument, our EGLS estimates were also corrected for serial autocorrelation[16] (see $DW \cong 2.0$ in all models in table 2).

Table 2 shows the estimated results for equation (2). All the gravity variables are of expected sign and highly significant. As the model is in double-log form, each coefficient measures the elasticity. Nevertheless, for brevity, we do not interpret the variables related to the augmented gravity model, which is not our main interest in this paper. Let μ denote the "natural level of trade expected from any country pair for the base year (1997)" as given by augmented gravity model. Then the tail end dummy variables will show how the RTB, FTA and their interactive forces cause the actual trade to shift up / down the natural level. The sum of the exponential values of the coefficients for the relevant dummy variables (only if they are significant) will show the percentage by which the actual trade differs from the natural level, μ in each case.

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[16] For this correction, we used period SUR (Seemingly Unrelated Regression) option available with E-views 7 (this is usually known as Park estimator). This corrects both period heteroskedasticity (if any) and serial correlation within a given cross-section.

Figure 3 FTA Configuration for Selected Regional Blocs

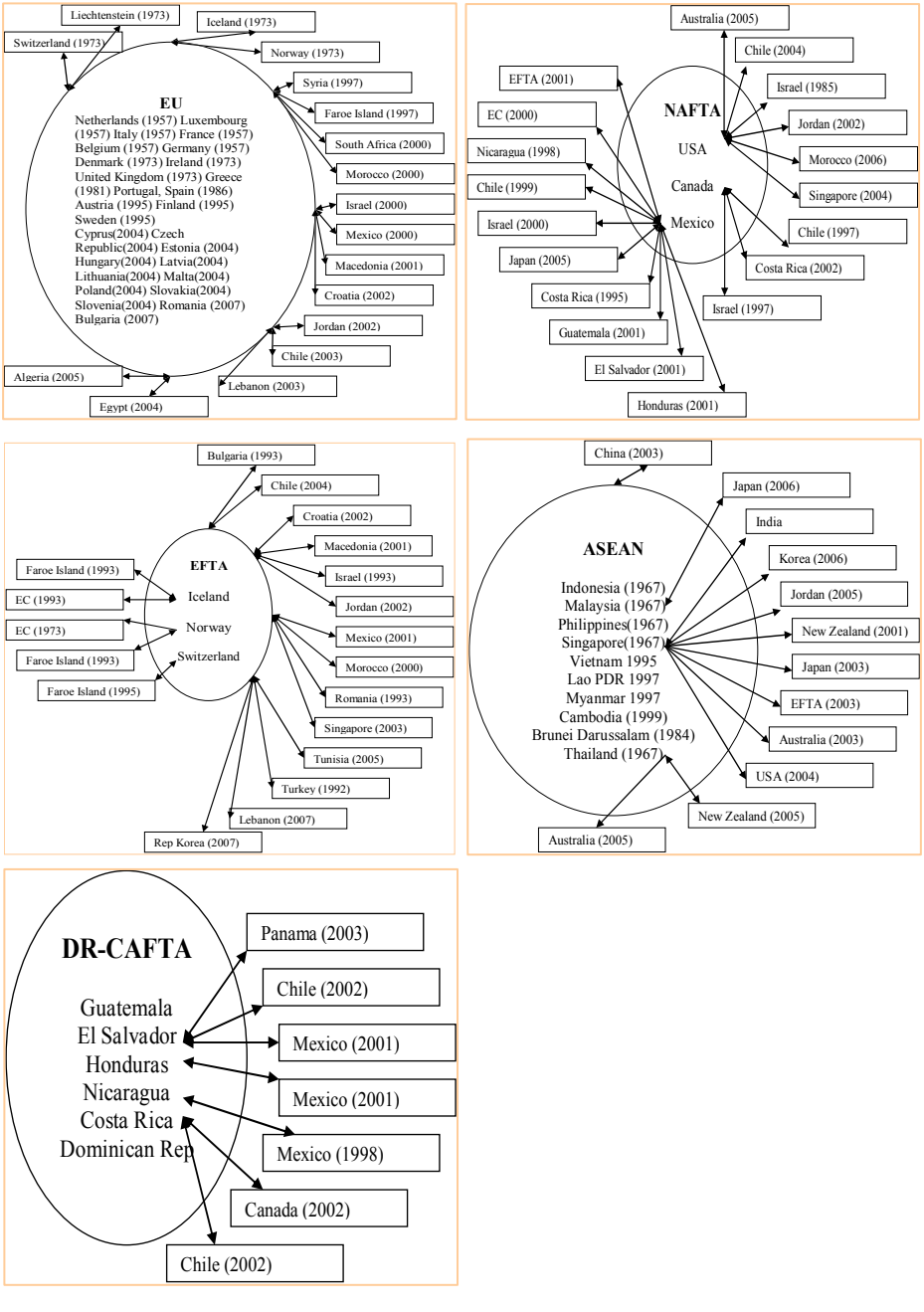

Table 2 FGLS Estimations of Augmented Gravity Model for RTB and FTA Interactive Effect

Dependent Variable: W*LOG(X)
Method: Panel EGLS (Period SUR)
Periods included: 9 (1997-2005)
Cross-sections included: 9832
Total panel (balanced) observations: 88488
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

	EC	T-stat	NAFTA	T-stat	ASEAN	T-stat	EFTA	T-stat
W	-3.793667 ***	-22.94286	-3.055763 ***	-18.58838	-3.57244 ***	-22.63992	-2.583815 ***	-15.93494
LOG(GDPGDP)	0.669787 ***	158.7721	0.685668 ***	162.5976	0.693347 ***	170.7834	0.683027 ***	163.7909
LOG(GDPGDP)*YD05	0.000909	1.618823	-0.000732	-1.331131	0.000905 *	1.66121	0.000327	0.584293
LOG(DISRAD)	-0.810089 ***	-47.05121	-0.931426 ***	-57.33113	-0.925368 ***	-58.15173	-0.979204 ***	-60.83955
LOG(DISRAD)*YD05	0.026321 ***	12.9564	0.039126 ***	23.02078	0.036536 ***	21.50663	0.040253 ***	23.47122
LOG(PRICEi)	-0.852719 ***	-144.2771	-0.838463 ***	-143.088	-0.826534 ***	-141.5746	-0.832348 ***	-141.8644
LOG(PRICEi)*YD05	-0.060695 ***	-21.9898	-0.067875 ***	-26.78208	-0.061774 ***	-25.07075	-0.075978 ***	-29.6921
LOG(PRICEj)	0.311216 ***	57.62971	0.311497 ***	58.33609	0.318726 ***	59.86489	0.310135 ***	58.17456
LOG(PRICEj)*YD05	-0.012889 ***	-5.48557	-0.01494 ***	-6.558534	-0.013566 ***	-5.76375	-0.014704 ***	-6.312993
TAXj	-0.007862 ***	-25.41314	-0.008196 ***	-26.69718	-0.008023 ***	-26.18727	-0.008455 ***	-27.38986
TAXj*YD05	-0.00253 ***	-7.780505	-0.001763 ***	-5.514587	-0.00187 ***	-5.938867	-0.00211 ***	-6.540432
LOG(REMOi)	-0.101723 ***	-16.74289	-0.137803 ***	-22.78373	-0.233381 ***	-34.52549	-0.141296 ***	-23.57383
LOG(REMOi)*YD05	0.0000385	0.041928	0.001267	1.354762	-0.005942 ***	-5.640192	-0.000108	-0.11806
LOG(REMOj)	-0.049807 ***	-7.434751	-0.047904 ***	-7.118586	-0.03337 ***	-4.899775	-0.052186 ***	-7.827195
LOG(REMOj)*YD05	-0.000969	-0.984713	-0.0017 *	-1.713347	0.001674	1.633461	-0.000392	-0.391963
BORDERij	1.02784 ***	20.11635	0.984437 ***	19.07681	0.997262 ***	20.01626	0.981611 ***	19.01289
BORDERij*YD05	0.070665 ***	13.58649	0.064093 ***	12.31342	0.065449 ***	12.68432	0.072727 ***	13.68517
COLONYij	0.363965 ***	9.665	0.420853 ***	11.01206	0.53981 ***	14.58058	0.391301 ***	10.28488
COLONYij*YD05	-0.054728 ***	-14.27622	-0.052176 ***	-13.60317	-0.048211 ***	-12.60048	-0.059282 ***	-15.21791
LBi	-1.051657 ***	-20.94491	-1.028097 ***	-20.44553	-1.131315 ***	-23.18071	-1.04333 ***	-20.57744
LBi*YD05	0.026412 ***	5.01351	0.017069 ***	3.253531	0.006409	1.2195	0.018678 ***	3.472777
LBj	-1.019271 ***	-17.19266	-1.091037 ***	-18.3064	-1.018249 ***	-17.64917	-1.149337 ***	-19.25546
LBj*YD05	-0.021041 ***	-3.468219	-0.015243 **	-2.507458	-0.007775	-1.28692	-0.014618 **	-2.360368
ILANDi	0.854803 ***	21.48248	0.832219 ***	20.68333	0.574154 ***	14.05731	0.830456 ***	20.82291
ILANDi*YD05	-0.095565 ***	-21.69264	-0.082965 ***	-19.88981	-0.090979 ***	-21.33267	-0.092838 ***	-22.06835
ILANDj	0.24289 ***	6.585107	0.201153 ***	5.437068	0.102549 ***	2.770539	0.223783 ***	6.070471
ILANDj*YD05	0.010682 ***	2.750294	0.017032 ***	4.535853	0.019169 ***	4.975954	0.020574 ***	5.38856
FTAij	0.331151 ***	8.378879	0.241222 ***	12.85903	0.268514 ***	14.07407	0.328364 ***	15.47116
FTAij*YD05	-0.070945 ***	-3.659259	-0.002949	-0.240383	-0.02495 **	-2.233563	0.007789	0.485282
D1	0.426804 ***	18.48464	1.643107 ***	8.48605	1.283414 ***	15.98583	-0.882098 ***	-9.003285
D1*YD05	-0.054687 ***	-12.71048	0.003246	0.166317	0.016714 *	1.865372	-0.022758 **	-2.230653
D2	0.099762 ***	8.049433	-0.103872 *	-1.872637	1.255013 ***	26.86613	-0.083235	-1.103167
D2*YD05	-0.017182 ***	-4.204098	-0.001234	-0.211498	0.069623 ***	13.00757	0.011939	1.422636
D3	-0.086268 ***	-7.751385	-0.462121 ***	-6.802387	0.737932 ***	9.0937	-1.227637 ***	-7.866291
D3*YD05	0.003276	0.691757	-0.007724	-1.12238	-0.052588 ***	-6.059374	-0.005564	-0.279886
D2*FTA	-0.135924 ***	-2.906849	0.291573 **	2.094942	-0.090918	-1.013248	-0.268547 ***	-4.816422
D2*FTA*YD05	0.127522 ***	4.759061	-0.071984 **	-2.202179	0.08886	0.992802	-0.132435 ***	-4.973705
D3*FTA	-0.166345 ***	-2.718227	0.139709 *	1.688451	-0.077619	-0.693827	-0.157749 ***	-2.925591
D3*FTA*YD05	-0.048763 *	-1.733742	0.041054	0.69821	0.160256	1.424609	0.037491	1.024107
R-squared	0.867655		0.856406		0.861247		0.856397	
Adjusted R-squared	0.867588		0.856333		0.861176		0.856324	
Durbin-Watson stat	2.009567		2.017457		2.007459		2.005941	

	DCAFTA	T-stat	SAARC	T-stat	CARICOM	T-stat	WTO	T-stat
W	-3.069918 ***	-19.03356	-3.047376 ***	-18.84522	-2.466752 ***	-14.92085	-2.860165 ***	-17.82971
LOG(GDPGDP)	0.68628 ***	164.6538	0.686316 ***	164.6778	0.672694 ***	159.7871	0.682327 ***	162.9614
LOG(GDPGDP)*YD05	-0.000995 *	-1.829718	-0.001757 ***	-3.200642	-0.001496 ***	-2.664622	-0.000892 *	-1.648696
LOG(DISRAD)	-0.936851 ***	-58.55381	-0.931746 ***	-57.51209	-0.964212 ***	-59.42466	-0.951252 ***	-59.59485
LOG(DISRAD)*YD05	0.038658 ***	23.0814	0.039721 ***	23.69493	0.037857 ***	21.99518	0.037652 ***	22.78906
LOG(PRICEi)	-0.841663 ***	-143.4211	-0.846801 ***	-144.2114	-0.839377 ***	-141.7642	-0.842391 ***	-143.4331
LOG(PRICEi)*YD05	-0.065392 ***	-26.00453	-0.071001 ***	-26.72456	-0.071712 ***	-28.70858	-0.063483 ***	-25.65805
LOG(PRICEj)	0.314449 ***	58.83229	0.310354 ***	58.03468	0.31985 ***	58.95594	0.312048 ***	58.19705
LOG(PRICEj)*YD05	-0.015883 ***	-6.950539	-0.007785 ***	-3.320903	-0.01394 ***	-6.059004	-0.013162 ***	-5.817268
TAXj	-0.007978 ***	-25.96624	-0.008065 ***	-25.9645	-0.008376 ***	-27.09296	-0.008016 ***	-25.82193
TAXj*YD05	-0.001586 ***	-4.872963	-0.002542 ***	-7.918469	-0.001411 ***	-4.440435	-0.001442 ***	-4.352465
LOG(REMOi)	-0.140123 ***	-22.95774	-0.121107 ***	-19.43443	-0.14057 ***	-23.56474	-0.136599 ***	-22.84404
LOG(REMOi)*YD05	0.002774 ***	2.942041	0.0003	0.331139	0.001002	1.097414	0.002546 ***	2.84019
LOG(REMOj)	-0.048889 ***	-7.31709	-0.052538 ***	-7.772694	-0.046406 ***	-6.93721	-0.046283 ***	-6.919849
LOG(REMOj)*YD05	-0.001037	-1.028152	-0.002143 **	-2.185906	-0.001546	-1.569625	-0.001952 **	-1.993943
BORDERij	1.018793 ***	19.70937	0.991431 ***	19.1999	0.953142 ***	18.58241	1.007451 ***	19.48865
BORDERij*YD05	0.063012 ***	12.1503	0.066975 ***	12.92051	0.066058 ***	12.62219	0.066157 ***	12.79051
COLONYij	0.430223 ***	11.12199	0.433169 ***	11.36978	0.515796 ***	13.32941	0.39842 ***	10.45957
COLONYij*YD05	-0.050844 ***	-13.13077	-0.054223 ***	-14.18194	-0.051273 ***	-12.69643	-0.045624 ***	-12.01247
LBi	-1.017216 ***	-20.1787	-1.008228 ***	-19.98986	-1.051467 ***	-21.01344	-1.016492 ***	-20.12518
LBi*YD05	0.018643 ***	3.556083	0.016515 ***	3.163612	0.017811 ***	3.391091	0.016493 ***	3.116925
LBj	-1.060906 ***	-17.75855	-1.076987 ***	-18.03474	-1.147513 ***	-19.35374	-1.09585 ***	-18.3081
LBj*YD05	-0.01791 ***	-2.952095	-0.01006 *	-1.657075	-0.013552 **	-2.214321	-0.006005	-0.991426
ILANDi	0.84223 ***	20.93679	0.841629 ***	21.09726	0.996981 ***	24.01882	0.811896 ***	20.29522
ILANDi*YD05	-0.088198 ***	-21.21676	-0.086485 ***	-21.09034	-0.078034 ***	-18.05546	-0.077289 ***	-18.88687
ILANDj	0.231471 ***	6.263259	0.19383 ***	5.158716	0.216851 ***	5.867717	0.209355 ***	5.66063
ILANDj*YD05	0.015542 ***	4.143412	0.009309 **	2.451388	0.023558 ***	6.200031	0.013957 ***	3.748601
FTAij	0.24739 ***	13.50604	0.268795 ***	14.92129	0.263338 ***	14.48104	0.260621 ***	14.36904
FTAij*YD05	0.000864	0.070415	-0.015011	-1.355002	-0.012052	-1.084982	-0.01695	-1.536874
D1	0.882275 ***	9.30907	-1.159918	-1.366585	0.281225	1.112303	0.048108 ***	3.237161
D1*YD05	-0.082148 ***	-8.466407	0.037839	0.447561	-0.179324 ***	-6.514817	0.101092 ***	3.881838
D2	-0.035736	-0.485579	-0.489987 ***	-8.148269	-1.868323 ***	-13.95505	0.059939 ***	4.610316
D2*YD05	-0.030398 ***	-3.837162	0.012354 *	1.871081	0.030224 **	2.19968	0.089249 ***	3.378111
D3	-0.018975	-0.870377	-0.08027	-1.230609	0.022128 **	2.144071	-0.036527 **	-2.301838
D3*YD05	-0.007957	-1.070254	0.089373 ***	12.51441	-0.021089 **	-2.589414	0.086376 ***	2.994546
D2*FTA	0.841912 ***	3.683035						
D2*FTA*YD05	-0.081944 **	-2.40212						
D3*FTA	0.052102	0.287055						
D3*FTA*YD05	-0.017902	-0.386326						
R-squared	0.857092		0.855208		0.86269		0.858923	
Adjusted R-squared	0.857019		0.85514		0.862626		0.858857	
Durbin-Watson stat	2.022176		2.011753		2.017953		2.010432	

Notes: All the variables are weighted by cross-sectional weightes; time variances of OLS residuals for each Cross-unit taken from 9 period specific OLS regressions. Time dummies included in regression but not reported for brevity. *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

European Union (EU)

The European Union (EU) is a union of twenty-seven independent European Communities formerly known as European Community (EC) or European Economic Community (EEC), which was originally formed in 1957 and grew up to the current status after five enlargements. The available statistics show higher degree of economic integration within EU. For instance, for the period 1999-2005 on average EU intra exports are 67% of their total exports while EU intra imports are 66% of their total imports.[17] Can we infer the observed higher integration as EU impact as an RTB? Not! Statistics are misleading about EU impact unless we isolate EU effect controlling the other factors influencing the EU intra and extra trade. In this analysis, we have taken into account 17 outsider countries having FTA with 27 EU countries in multilateral form.[18]

In table 3 we have reproduced the aggregated values for the dummy coefficients taken from the column 2 of table 2 in a more precise way. Controlled for all other factors (such as income, distance, common currency, common border ...etc) a pair of EU countries (X, Y) presently (most recently in 2005) trades among themselves around 46% above the natural level of trade (μ) expected from any country pair indicating a higher degree of integration. However, The EU exports to the outsider countries (X, B1) are just 8% above μ while the EU imports from the outsider countries (B2, X) are noticeably below by 9% from μ when the pair of countries is not tied up by an FTA.

More interestingly, when the pair of countries is bound by an FTA, EU exports to the outsider countries are 39% above μ and the EU imports from the outsider countries are only 5% below μ showing that FTAs are beneficial for both parties in principle. However, the FTA benefits are not equally distributed. It can be shown that the non-member countries have been able to reverse their relative adverse position just by 4% (from –9 % to –5 %)

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[17] Calculated with WTO statistics.
[18] EU being a custom union possibility of bilateral FTA is ruled out.

Table 3 Deviation of EU Trade from Natural Level of Trade 1997-2005

	1997	2005	Change
Intra-bloc	$\mu + 0.43 = \mu + 53\%$	$\mu + 0.43 - 0.05 = \mu + 46\%$	–7 %
Extra-bloc Export without FTA	$\mu + 0.1 = \mu + 10\%$	$\mu + 0.1 - 0.02 = \mu + 8\%$	–2%
Extra-bloc Export with FTA	$\mu + 0.1 + 0.33 - 0.14 = \mu + 33\%$	$\mu + 0.1 + 0.33 - 0.14 - 0.2$ $-0.07 + 0.13 = \mu + 39\%$	+6%
Extra-bloc Import without FTA	$\mu - 0.09 = \mu - 9\%$	$\mu - 0.09 = \mu - 9\%$	0%
Extra-bloc Import with FTA	$\mu - 0.09 + 0.33 - 0.17 = \mu + 7\%$	$\mu - 0.09 + 0.33 - 0.17$ $-0.07 - 0.05 = \mu - 5\%$	–12%

Note: Exponential values (Base 'e') have been used to convert dummy coefficients to percentage values, μ=natural level of trade predicted by augmented gravity model.

as a result of FTAs whereas the FTAs have remarkably improved the favorable position of the EU exports towards the non-members (from 8 % to 39 %).

Next question is whether this boost can be known as NTC to the world. To answer the question we now look into the TC and TD effects of EU over the study period. On the one hand our findings show that EU intra-export intensity fell by 7% (from 53% to 46% against the natural level) and the insider-outsider (X, B1) export intensity also fell by 2% (from 10% to 8% against the base line average level) while the insider-outsider (X, B2) import intensity remained unchanged over the period from 1997-2005. Then, overall 9% decline without FTA impact.

On the other hand, it shows that the insider-outsider export intensity under FTA (X, A1) improved by 6% (from 33% to 39%) while the insider-outsider import intensity under FTA (X, A2) declined by 12% (from +7% to –5%). Then, overall 6% decline under FTA.

Considering all above, we conclude that during 1997-2005 FTA has provided enough incentives for the EU countries to divert their exports from the members to the non-members without NTC for the world. Furthermore, the EU has deprived the outsider countries off their favorable position they maintained in 1997 in terms of the insider-outsider imports under FTA resulting a negative net trade creation to the world.

NAFTA

In January 1994, USA, Mexico Canada, formed the world's largest free trade area known as the North American Free Trade Agreement (NAFTA). These three countries alone dominate over 18-20% of the world trade. The degree of integration is so high that the intra-block exports are about 56% of the total exports while the intra-block imports are 38% of the total imports on average for the period 1999-2005.[19] In this study, 18 outsider countries having FTAs bilaterally with the NFTA countries were taken into account. Table 4 reproduces the aggregated values for the dummy coefficients copied from the column 3 of table 2 assuming all insignificant estimates to be zero.

As the largest RTB in the world, it is not surprising to see the NAFTA intra-trade intensity is 415% above μ or four times above the level of trade, any random country pair does, controlled for all other factors affecting trade. The number remains unchanged for the corresponding two years because we have removed the Canada-USA FTA (1998) effect from the NAFTA intra-trade, as we need to isolate NAFTA impact.

Following the higher level of the NAFTA intra-trade integration, its Export to and the imports from the ROW is well below μ unless trade takes place under an FTA. Our findings show that the NAFTA exports to the ROW is 10% below the average in absence of an FTA but around 48% above in presence of an FTA between the trading pair. Similarly, the NAFTA imports from the ROW unsecured by an FTA are 58% below μ but only 8% below in presence of an FTA. This follows the idea that having an FTA with a

[19] Calculated with WTO statistics.

Table 4 Deviation of NAFTA Trade from Natural Level of Trade 1997-2005

	1997	2005	Change
Intra-bloc	$\mu + 1.64 = \mu + 415\%$	$\mu + 1.64 = \mu + 415\%$	0%
Extra-bloc Export without FTA	$\mu - 0.1 = \mu - 10\%$	$\mu - 0.1 = \mu - 10\%$	0%
Extra-bloc Export with FTA	$\mu - 0.1 + 0.24 + 0.29 = \mu + 53\%$	$\mu - 0.1 + 0.24 + 0.29 - 0.07 = \mu + 43\%$	–10%
Extra-bloc Import without FTA	$\mu - 0.46 = \mu - 58\%$	$\mu - 0.46 = \mu - 58\%$	0%
Extra-bloc Import with FTA	$\mu - 0.46 + 0.24 + 0.14 = \mu - 8\%$	$\mu - 0.46 + 0.24 + 0.14 = \mu - 8\%$	0%

Note: Exponential values (Base 'e') have been used to convert dummy coefficients to percentage values, μ=natural level of trade predicted by augmented gravity model.

NAFTA country tremendously and almost equally improves trade for both the insiders and the outsiders.

Analogous to the computation of TC and TD effect of EU, we find evidences for marginally negative net trade creation by NAFTA during 1997-2005. That conclusion is valid for the scenario where we have removed USA-Canada FTA effect. Once USA-Canada FTA effect is in place we would find that NAFTA has been a trade-creating RTB for the period concerned.

ASEAN

The Association of South East Asian Nations (ASEAN) comprises of ten member countries. For the period of 1999-2005, the ASEAN intra-block exports are 24% of their total exports while the ASEAN intra block imports

Table 5 Deviation of ASEAN Trade from Natural Level of Trade 1997-2005

	1997	2005	Change
Intra-bloc	$\mu+1.28=\mu+259\%$	$\mu+1.28+0.02=\mu+266\%$	+7%
Extra-bloc Export without FTA	$\mu+1.26=\mu+252\%$	$\mu+1.26+0.07=\mu+278\%$	+26%
Extra-bloc Export with FTA	$\mu+1.26+0.27=\mu+361\%$	$\mu+1.26+0.27+0.07-0.02=\mu+385\%$	+24%
Extra-bloc Import without FTA	$\mu+0.74=\mu+100\%$	$\mu+0.74-0.05=\mu+99\%$	–1%
Extra-bloc Import with FTA	$\mu+0.74+0.27-0.08=\mu+153\%$	$\mu+0.74+0.27-0.08-0.05-0.02+0.16=\mu+177\%$	+24%

Note: Exponential values (Base 'e') have been used to convert dummy coefficients to percentage values, μ=natural level of trade predicted by augmented gravity model.

are 23% of their total imports.[20] This study covers 09 bilateral FTA[21] with 3 ASEAN countries namely; Malaysia, Singapore and Thailand.

Again, table 5 is an abstract from the column 4 of table 2 summing up the significant estimates for tail end dummies.

According to our findings, every other factor being equal, the ASEAN intra-block exports are on average 2.6 times above μ and the ASEAN exports to the ROW undefended by FTA is also 2.6 times above the expected level of bilateral exports between any random county pair. In other words, the ASEAN countries do trade among members exactly as the same way they do with the non-members. This follows the idea that ASEAN regional trade integration has not so far been materialized.

[20] Calculated with WTO statistics.
[21] There are more than 9 FTAs presently in progress but fall beyond the study period.

The ASEAN export to the ROW without an FTA is almost 2.6 above μ whereas it is 3.7 times above μ under FTA. Similarly, the ASEAN imports from the ROW without an FTA are approximately double the natural level. However, the figure is nearly1.7 times above the natural level under an FTA. This suggests that trading with ASEAN countries secured by an FTA is beneficial for both the insider and the outsider. Nevertheless, the FTA interactive effect cannot be generalized to all 10 ASEAN members because Indonesia, Philippines, Brunei Darussalam, Vietnam, Lao PDR, Myanmar and Cambodia do not have a single FTA while Singapore alone deals with 7 FTAs (in progress during study period). Therefore, this finding could be specific to Singapore rather than being generalized to ASEAN.

It can be seen that almost all the trade flows have been improving during 1997-2005 and there is no evidence of any offsetting effect. We can reasonably conclude that ASEAN has been a trade-creating RTB.

EFTA

The European Free Trade Association (EFTA)[22] was established in 1960 originally with six-member states but presently it is a four-member RTB having Iceland, Liechtenstein, Norway and Switzerland inside. Though the RTB seems to be small in terms of the number of states, it is relevant to us because they have 19 FTAs out of which 16 going into our study. The FTA configuration of EFTA is quite similar to that of EU because outsider countries maintain FTAs with the whole block instead of individual countries.

Analogues to the previous work, we reproduce below in table 6 the results coming from column 5 of table 2 According to our findings, the EFTA intra-block exports were around 140% below μ and in 1997 and it has been further declining during the study period. On face of it is unbelievable! However, it should be reminded that we talk about the bilateral exports arising

[22] There should not be any confusion with similar abbreviation EFTA standing for the European Fair Trade Association, which is a joint body of eleven Fair Trade importers in nine European countries namely Austria, Italy, Switzerland, The Netherlands, France, Spain, Belgium, Germany, and the UK.

Table 6 Deviation of EFTA Trade from Natural Level of Trade 1997-2005

	1997	2005	Change
Intra-bloc	$\mu - 0.88 = \mu - 140\%$	$\mu - 0.88 - 0.02 = \mu - 145\%$	–5%
Extra-bloc Export without FTA	$\mu = \mu$	$\mu = \mu$	0%
Extra-bloc Export with FTA	$\mu + 0.33 - 0.27 = \mu + 6\%$	$\mu + 0.33 - 0.27 - 0.13 = \mu - 7\%$	–13%
Extra-bloc Import without FTA	$\mu - 1.23 = \mu - 242\%$	$\mu - 1.23 = \mu - 242\%$	0%
Extra-bloc Import with FTA	$\mu - 1.23 + 0.33 - 0.16 = \mu - 188\%$	$\mu - 1.23 + 0.33 - 0.16 = \mu - 188\%$	0%

Note: Exponential values (Base '*e*') have been used to convert dummy coefficients to percentage values, μ=natural level of trade predicted by augmented gravity model.

owing to EFTA membership. We have already controlled for the exports arising from all the other factors in gravity model (Income, distance, prices, tariff. etc).

The EFTA imports from the ROW undefended by FTA are around 242% below μ and the imports defended by FTA too are 188% below μ. The EFTA exports to the ROW without FTAs do not show any significant difference from the level of export maintained by any other country pair whereas the EFTA exports covered by FTAs is also very closer to the natural level on average. These findings suggest FTA has been helpful only for the outsider countries to overcome their adverse position they would have had otherwise. For now, EFTA shows significant evidence for neither TC nor TD. However, it is noteworthy the 16 FTA we considered are not matured enough to see the full TC/TD effects, and therefore these results, perhaps, might not be robust for the future when FTAs become matured.

DR-CAFTA

DRCAFTA, sometimes know as doctor cafta, is the agreement under which the Dominican Republic joined the Central American Free Trade Agreement (CAFTA) that USA signed earlier with El Salvador, Costa Rica, Honduras, Nicaragua, and Guatemala. Upon entry into force, they agreed to eliminate 80% of the tariffs immediately creating the second-largest free trade zone in Latin America.

All else being equal, DRCAFTA intra-block trade is approximately 140% above μ in 1997 and 122% above μ in 2005. It can be shown that the DRCAFTA exports to or the imports from the ROW in absence of FTAs are not significantly different from the average level of trade maintained by any other random country pair.

Table 7 Deviation of DR-CAFTA Trade from Natural Level of Trade 1997-2005

	1997	2005	Change
Intra-bloc	$\mu + 0.88 = \mu + 140\%$	$\mu + 0.88 - 0.08 = \mu + 122\%$	–18%
Extra-bloc Export without FTA	$\mu = \mu$	$\mu - 0.03 = \mu - 3\%$	–3%
Extra-bloc Export with FTA	$\mu + 0.25 + 0.84 = \mu + 197\%$	$\mu + 0.25 + 0.84 - 0.03 - 0.08 = \mu + 166\%$	–31%
Extra-bloc Import without FTA	$\mu = \mu$	$\mu = \mu$	0%
Extra-bloc Import with FTA	$\mu + 0.25 = \mu + 28\%$	$\mu + 0.25 = \mu + 28\%$	0%

Note: Exponential values (Base '*e*') have been used to convert dummy coefficients to percentage values, μ=natural level of trade predicted by augmented gravity model.

More interestingly, the DRCAFTA imports from the ROW are 28% above μ and the exports to the ROW is in the region of 166% to 197% above the average level in presence of FTAs. This suggests that FTAs are beneficial in principle to the both the insider and the outsider but has been more beneficial to the RTB members in expanding their export market beyond the RTB. However, during the period 1997-2005 figures suggest the NTC effect of DRCAPTA is negative because TD effect for the member countries are high (56%) though there is no noticeable TD effect to the ROW.

SAARC

The South Asian Association for Regional Cooperation (SAARC) was established in December 8, 1985 by the States of Pakistan, Bangladesh, Bhutan, Nepal, Maldives, India and Sri Lanka. The South Asian Preferential Agreement (SAPTA) was envisaged in 1995 as the first step towards trade liberalization. Despite the poor achievements in SAPTA the agreement for the South Asian Free Trade Area (SAFTA) was signed in January 2004 under which regional trade is projected to be fully liberalized by year 2016.

In our study we attempt to capture the degree of regional integration of SAARC but left out FTA interactive effect because SAARC does not have adequate number of FTAs with the ROW except for the 3 FTAs India having with Singapore (2005), Thailand (2003) and Chile (2005) which we feel inadequate for studying FTA interactive effect.

The results from the column 7 of table 2 suggest, all other factors being equal, controlled for Sri Lanka-India FTA(1998) as well, the SAARC intra-block trade is not significantly different from the average level of the trade expected from any other pair of countries. The SAARC imports from the ROW were not different from the natural level in 1997 but show a slight improvement (9% above the natural level) in 1995. In addition, we found SAARC exports to the ROW are at least 60% below the natural level. The results are not surprising because, except for India, all six other nations are naturally small players in the world market and SAARC has not so far taken

any collective effort to improve their competitive edge. Estimating a Gravity model using 1996-1997 data Hassan (2001) also shows the insignificancy of SAARC as a RTB.

CARICOM

The Caribbean Community (CARICOM) was established by the Treaty of Chaguaramas that came into effect on August 1, 1973 transforming the Caribbean Free Trade Association (CARIFTA) into a Common Market. Barbados, Jamaica, Guyana and Trinidad & Tobago were the initial signatories and the other eight Caribbean territories joined CARICOM subsequently. The Bahamas (1983) the British Virgin Islands and the Turks and Caicos (1991) Anguilla (1999) The Cayman Islands (2002) Bermuda (2003) Suriname (1995) Haiti (2002) are also among CARICOM member states now.

CARICOM common Market is intended to benefit the region by providing more and better opportunities to attract investment and trade in a more liberalized environment. According to WTO sources, no FTAs are reported between CARICOM and the ROW. Therefore, our analysis is limited to effect of CARICOM as an RTB. From the findings reported in column 8 of table 2, The CARICOM intra-block trade is not significantly different from the natural level of trade throughout the eight years concerned. However, the CARICOM exports to the ROW unexplained by other variables, are around 60% below the expected level from any other random country pair while the imports are more or less equivalent to the average level predicted by gravity model.

Trade Creation, Trade Diversion Effect of WTO

Now that we have discussed the RTB effect with the help of six selected RTBs. Our main contribution was to differentiate RTB and FTA effect and quantify the RTB-FTA interactive effect. Having done that, finally we will

have a glance into WTO effect though it is not an RTB, rather a global FTA. In fact, we all agree that WTO has been behind FTA formation encouraging trade liberalization for a long time. Unfortunately, that kind of indirect influence is hardly measurable and often been neglected in quantitative researches.

According to our findings reported in column 9 of table 2, controlled for all other factors, trade between two WTO members was only 5% above compared to the natural level of trade between any random two non-members in 1997. For the corresponding year, the WTO members' exports to non-members were only 6% above the average but the WTO members' imports from non-members are 4% below the natural level predicted by the model. Nevertheless, there is a progress in trade intensity in 2005 after eight years from the first result. WTO intra trade was found to be 16% above the average while WTO exports to non-members were 15% above the average and WTO imports from non-members were 5% above the average. Following the definition we used for other RTBs, WTO seems to be net trade creating. These findings contradict with Rose (2004) who concluded, "We do not have strong empirical evidence supporting the idea that GATT/WTO has systematically played a role in encouraging trade."

However, our results as well as interpretations are not free from errors. Firstly, The WTO membership increased to 149 by 2005 as against 132 in 1997. Transferring 17 countries from non-member group to member group make the two groups to defer from each other by 34 memberships. To be more concrete in our sample of 184 countries WTO member/non-member ratio was 132/52 in 1997 and 149/35 in 2005. So, interpreting results without proper adjustment for membership changes is misleading. Secondly, the question whether WTO member countries do trade significantly above the non-member countries do itself is a meaningless question once we realize 151 countries in the world are now WTO members. Alternatively, it would be meaningful to ask whether WTO countries have improved trade after having WTO status. In fact, WTO impact is a by-product of our estimates, which is not our target.

5. SUMMARY AND CONCLUSION

Using the Augmented Gravity Model in Panel context covering 9,832 country pairs (184 countries) over 9 years, the present study examined the impact of FTA, trade creation and trade diversion effects of Regional Trading Blocs and the FTA and RTB interactive effects in promoting trade for member and non-member countries with the help of seven selected RTBs namely; ASEAN, NAFTA, EFTA, DR-CAFTA, EU, CARICOM and SAARC networked with 79 FTAs. The main research question was whether an FTA between an outsider and insider country of an RTB creates trade for both parties equally, unequally or if it at least helps the outsider countries to overcome any trade diversionary effect resulted from RTB.

In connection to TC and TD effects of RTB, we find mixed results where the intra-bloc trade of NAFTA and ASEAN is overwhelming while that of EU and DR-CAFTA is moderate. On the other hand, the intra-bloc trade of EFTA is negative whereas the effects are insignificant for SAARC and CARICOM. Although these findings suggest most of RTBs are gross trade-creating in general, only NAFTA and ASEAN was found to be net-trade-creating for the world. All the other evaluated blocs show hardly any evidence for either TC or TD with only exception that EU is marginally trade diverting.

As the first empirical study in trade literature ascertaining RTB and FTA interactive effects, our findings suggest that outsider-countries trading with an RTB are adversely exploited by the RTB insider-countries for their own benefits, rather than mutual, in absence of an FTA. More interestingly, it was found that the countries being exploited could effectively reverse their adverse position by forming an FTA with the RTB concerned. The bottom line is that trading "with an FTA" is always more beneficial for both parties than trading "without an FTA," though the benefits are unequal.

This study defined welfare effect of RTB and FTA in a narrow sense that welfare gain for a country should be reflected in terms of an increase in export volumes. We have not taken into account the changes in government

tax revenue, changes in domestic consumer's surplus and domestic supplier's surplus caused by the tariff reduction under FTA or RTB negotiation. Moreover, we have given equal weight to all FTAs regardless of level of maturity and the depth of trade negotiation involved. These would be potential topics for future studies.

APPENDIX

Table A1 FREE TRADING AGREEMENTS (FTA) Notified to the GATT/WTO and in Force as at 1 March 2007 and Considered in this Study

S.N	Agreement	Date of entry into force	Date notified to WTO	Related Provisions	Type of Agreement	S.N	Agreement	Date of entry into force	Date notified to WTO	Related Provisions	Type of Agreement
1	EFTA (Stockholm Convention)	3-May-60	14-Nov-59	GATT Art. XXIV	FTA	41	El Salvador - Mexico	15-Mar-01	23-May-06	GATT Art. XXIV	FTA
2	EC — Switzerland and Liechtenstein	1-Jan-73	27-Oct-72	GATT Art. XXIV	FTA	42	Honduras - Mexico	1-Jun-01	10-Jul-06	GATT Art. XXIV	FTA
3	EC — Iceland	1-Apr-73	24-Nov-72	GATT Art. XXIV	FTA	43	EC — FYROM	1-Jun-01	23-Oct-01	GATT Art. XXIV	FTA
4	EC — Norway	1-Jul-73	13-Jul-73	GATT Art. XXIV	FTA	44	EFTA - Mexico	1-Jul-01	25-Jul-01	GATT Art. XXIV	FTA
5	EC — Syria	1-Jul-77	15-Jul-77	GATT Art. XXIV	FTA	45	India — Sri Lanka	15-Dec-01	17-Jun-02	Enabling Clause	FTA
6	United States — Israel	19-Aug-85	13-Sep-85	GATT Art. XXIV	FTA	46	United States — Jordan	17-Dec-01	15-Feb-02	GATT Art. XXIV	FTA
7	EFTA — Turkey	1-Apr-92	6-Mar-92	GATT Art. XXIV	FTA	47	EFTA — Jordan	1-Jan-02	17-Jan-02	GATT Art. XXIV	FTA
8	EFTA — Israel	1-Jan-93	30-Nov-92	GATT Art. XXIV	FTA	48	EFTA — Croatia	1-Jan-02	14-Jan-02	GATT Art. XXIV	FTA
9	Armenia - Russian Federation	25-Mar-93	17-Jun-04	GATT Art. XXIV	FTA	49	Chile — Costa Rica	15-Feb-02	16-Apr-02	GATT Art. XXIV	FTA
10	Faroe Islands — Norway	1-Jul-93	12-Feb-96	GATT Art. XXIV	FTA	50	EC — Croatia	1-Mar-02	17-Dec-02	GATT Art. XXIV	FTA
11	Faroe Islands — Iceland	1-Jul-93	14-Dec-95	GATT Art. XXIV	FTA	51	EC — Jordan	1-May-02	17-Dec-02	GATT Art. XXIV	FTA
12	NAFTA	1-Jan-94	29-Jan-93	GATT Art. XXIV	FTA	52	Chile - El Salvador	1-Jun-02	29-Jan-04	GATT Art. XXIV	FTA
13	Georgia — Russian Federation	10-May-94	8-Feb-01	GATT Art. XXIV	FTA	53	Albania - FYROM	1-Jul-02	9-Dec-04	GATT Art. XXIV	FTA
14	Costa Rica - Mexico	1-Jan-95	17-Jul-06	GATT Art. XXIV	FTA	54	FYROM - Bosnia and Herzegovina	15-Jul-02	24-Feb-05	GATT Art. XXIV	FTA
15	Faroe Islands — Switzerland	1-Mar-95	12-Feb-96	GATT Art. XXIV	FTA	55	Canada — Costa Rica	1-Nov-02	13-Jan-03	GATT Art. XXIV	FTA
16	Kyrgyz Republic — Armenia	27-Oct-95	12-Dec-00	GATT Art. XXIV	FTA	56	Japan - Singapore	30-Nov-02	8-Nov-02	GATT Art. XXIV	FTA
17	Georgia — Ukraine	4-Jun-96	8-Feb-01	GATT Art. XXIV	FTA	57	EFTA - Singapore	1-Jan-03	14-Jan-03	GATT Art. XXIV	FTA
18	Georgia — Azerbaijan	10-Jul-96	8-Feb-01	GATT Art. XXIV	FTA	58	EC - Chile	1-Feb-03	3-Feb-04	GATT Art. XXIV	FTA
19	Armenia - Ukraine	18-Dec-96	17-Jun-04	GATT Art. XXIV	FTA	59	EC - Lebanon	1-Mar-03	26-May-03	GATT Art. XXIV	FTA
20	EC — Faroe Islands	1-Jan-97	17-Feb-97	GATT Art. XXIV	FTA	60	Panama - El Salvador	11-Apr-03	24-Feb-05	GATT Art. XXIV	FTA
21	Canada — Israel	1-Jan-97	15-Jan-97	GATT Art. XXIV	FTA	61	Croatia - Albania	1-Jun-03	8-Mar-04	GATT Art. XXIV	FTA
22	Turkey - Israel	1-May-97	16-Apr-98	GATT Art. XXIV	FTA	62	Turkey - Bosnia and Herzegovina	1-Jul-03	29-Aug-03	GATT Art. XXIV	FTA
23	Canada — Chile	5-Jul-97	30-Jul-97	GATT Art. XXIV	FTA	63	Turkey - Croatia	1-Jul-03	2-Sep-03	GATT Art. XXIV	FTA
24	Croatia - FYROM	30-Oct-97	23-Mar-05	GATT Art. XXIV	FTA	64	Singapore - Australia	28-Jul-03	25-Sep-03	GATT Art. XXIV	FTA
25	EC — Tunisia	1-Mar-98	15-Jan-99	GATT Art. XXIV	FTA	65	China - Hong Kong, China	1-Jan-04	27-Dec-03	GATT Art. XXIV	FTA
26	Mexico - Nicaragua	1-Jul-98	17-Oct-05	GATT Art. XXIV	FTA	66	United States - Singapore	1-Jan-04	17-Dec-03	GATT Art. XXIV	FTA
27	Georgia — Armenia	11-Nov-98	8-Feb-01	GATT Art. XXIV	FTA	67	United States — Chile	1-Jan-04	16-Dec-03	GATT Art. XXIV	FTA
28	India - Sri Lanka	28-Dec-98			FTA	68	Republic of Korea - Chile	1-Apr-04	8-Apr-04	GATT Art. XXIV	FTA
29	Georgia — Kazakhstan	16-Jul-99	8-Feb-01	GATT Art. XXIV	FTA	69	EC - Egypt	1-Jun-04	3-Sep-04	GATT Art. XXIV	FTA
30	Chile — Mexico	1-Aug-99	27-Feb-01	GATT Art. XXIV	FTA	70	EFTA - Chile	1-Dec-04	3-Dec-04	GATT Art. XXIV	FTA
31	EFTA — Morocco	1-Dec-99	20-Jan-00	GATT Art. XXIV	FTA	71	Thailand - Australia	1-Jan-05	27-Dec-04	GATT Art. XXIV	FTA
32	EC — Morocco	1-Mar-00	13-Oct-00	GATT Art. XXIV	FTA	72	United States - Australia	1-Jan-05	22-Dec-04	GATT Art. XXIV	FTA
33	EC — Israel	1-Jun-00	20-Sep-00	GATT Art. XXIV	FTA	73	Japan - Mexico	1-Apr-05	31-Mar-05	GATT Art. XXIV	FTA
34	Israel - Mexico	1-Jul-00	22-Feb-01	GATT Art. XXIV	FTA	74	EFTA - Tunisia	1-Jun-05	3-Jun-05	GATT Art. XXIV	FTA
35	EC — Mexico	1-Jul-00	25-Jul-00	GATT Art. XXIV	FTA	75	Thailand - New Zealand	1-Jul-05	1-Dec-05	GATT Art. XXIV	FTA
36	Turkey — Former Yugoslav Republic of Macedonia	1-Sep-00	5-Jan-01	GATT Art. XXIV	FTA	76	Turkey - Tunisia	1-Jul-05	1-Sep-05	GATT Art. XXIV	FTA
37	Croatia - Bosnia and Herzegovina	1-Jan-01	25-Sep-03	GATT Art. XXIV	FTA	77	Jordan - Singapore	22-Aug-05	7-Jul-06	GATT Art. XXIV	FTA
38	New Zealand - Singapore	1-Jan-01	4-Sep-01	GATT Art. XXIV	FTA	78	EC-Algeria	1-Sep-05	24-Jul-06	GATT Art. XXIV	FTA
39	EFTA — Former Yugoslav Republic of Macedonia	1-Jan-01	11-Dec-00	GATT Art. XXIV	FTA	79	India — Thailand	25-Jun-05			FTA
40	Guatemala - Mexico	15-Mar-01	3-Jul-06	GATT Art. XXIV	FTA		Singapore - Korea	27-Jun-05			FTA

Source : World Trade Organization.

Table A2 Country Sample used in the Study

1	Afghanistan	32	Central African Rep.	63	FS Micronesia	94	Lao People's Dem. Rep.	125	Pakistan	156	Sri Lanka
2	Albania	33	Chad	64	Gabon	95	Latvia	126	Palau	157	Sudan
3	Algeria	34	Chile	65	Gambia	96	Lebanon	127	Panama	158	Suriname
4	Angola	35	China	66	Georgia	97	Liberia	128	Papua New Guinea	159	Sweden
5	Antigua and Barbuda	36	China, Hong Kong SAR	67	Germany	98	Libya	129	Paraguay	160	Switzerland
6	Argentina	37	Colombia	68	Ghana	99	Lithuania	130	Peru	161	Syria
7	Armenia	38	Comoros	69	Greece	100	Luxembourg	131	Philippines	162	Tajikistan
8	Australia	39	Congo	70	Grenada	101	Madagascar	132	Poland	163	TFYR of Macedonia
9	Austria	40	Costa Rica	71	Guatemala	102	Malawi	133	Portugal	164	Thailand
10	Azerbaijan	41	Côte d'Ivoire	72	Guinea	103	Malaysia	134	Qatar	165	Togo
11	Bahamas	42	Croatia	73	Guinea-Bissau	104	Maldives	135	Rep. of Korea	166	Tonga
12	Bahrain	43	Cuba	74	Guyana	105	Mali	136	Rep. of Moldova	167	Trinidad and Tobago
13	Bangladesh	44	Cyprus	75	Haiti	106	Malta	137	Romania	168	Tunisia
14	Barbados	45	Czech Rep.	76	Honduras	107	Marshall Isds	138	Russian Federation	169	Turkey
15	Belarus	46	Dem. People's Rep. of Korea	77	Hungary	108	Mauritania	139	Rwanda	170	Turkmenistan
16	Belgium	47	Dem. Rep. of the Congo	78	Iceland	109	Mauritius	140	Saint Kitts and Nevis	171	Uganda
17	Belize	48	Denmark	79	India	110	Mexico	141	Saint Lucia	172	Ukraine
18	Benin	49	Djibouti	80	Indonesia	111	Mongolia	142	St Vincent & the Grenadines	173	United Arab Emirates
19	Bermuda	50	Dominica	81	Iran	112	Morocco	143	Samoa	174	United Kingdom
20	Bhutan	51	Dominican Rep.	82	Iraq	113	Mozambique	144	Sao Tome and Principe	175	United Rep. of Tanzania
21	Bolivia	52	Ecuador	83	Ireland	114	Myanmar	145	Saudi Arabia	176	Uruguay
22	Bosnia Herzegovina	53	Egypt	84	Israel	115	Nepal	146	Senegal	177	USA
23	Brazil	54	El Salvador	85	Italy	116	Neth. Antilles	147	Serbia and Montenegro	178	Uzbekistan
24	Brunei Darussalam	55	Equatorial Guinea	86	Jamaica	117	Netherlands	148	Seychelles	179	Vanuatu
25	Bulgaria	56	Eritrea	87	Japan	118	New Caledonia	149	Sierra Leone	180	Venezuela
26	Burkina Faso	57	Estonia	88	Jordan	119	New Zealand	150	Singapore	181	Viet Nam
27	Burundi	58	Ethiopia	89	Kazakhstan	120	Nicaragua	151	Slovakia	182	Yemen
28	Cambodia	59	Fiji	90	Kenya	121	Niger	152	Slovenia	183	Zambia
29	Cameroon	60	Finland	91	Kiribati	122	Nigeria	153	Solomon Isds	184	Zimbabwe
30	Canada	61	France	92	Kuwait	123	Norway	154	Somalia		
31	Cape Verde	62	French Polynesia	93	Kyrgyzstan	124	Oman	155	Spain		

REFERENCES

Aitken, N. D., "The Effect of EEC and EFTA on European Trade: A Temporal Cross-sectional Analysis," *American Economic Review*, 63, 1973, pp. 881-892.

Bagwell, K. and R. Staiger, "Regionalism and Multilateral Tariff Cooperation," in J. Piggott and A. Woodland, eds., *International Trade Policy and The Pacific Rim*, London: Macmillan, 1999.

Balassa, B., "Trade Creation and Trade Diversion in European Common Market," *Economic Journal*, 77, 1967, pp. 1-21.

Benjamin, A. R., "A Gravity Study of the Proposed China-ASEAN Free Trade Area," *The International Trade Journal*, 18(4), 2004, pp. 335-353.

Cadot, O., J. Melo, and M. de Olarreaga, "Regional Integration and Lobbying for Tariffs Against Non-members," *International Economic Review*, 40, 1999, pp. 635-657.

Carrere, C., "Revisiting the Effects of Regional Trade Agreements on Trade Flows with Proper Specification of Gravity Model," *European Economic Review*, 50, 2006, pp. 223-247.

Emanuel, O., "Endogenous Free Trade Agreements and the Multilateral Trading System," *Journal of International Economics*, 67, 2005, pp. 471-497.

Frankel, J. A., "Is Japan Creating a Yen Bloc in East Asia and the Pacific?," NBER Working Paper, No. 4050, 1992.

_____, "Regional Trading Blocs in the World Economic System," *Institute for International Economics*, Washington, DC, 1997.

Frankel, J. and S. J. Wei, "Trading Blocs and Currency Blocs," NBER Working Paper, No. 4335, 1993.

_____, "Open Regionalism in a World of Continental Trading Blocs," NBER Working Paper, No. 5272, 1995.

_____, "ASEAN in a Regional Perspective," Pacific Basin Working Paper, No. PB96-02, 1996.

Ghosh, S. and Y. Steven, "Are Regional Trading Arrangements Trade Creating? An Application of Extreme Bounds Analysis," *Journal of International Economics*, 63, 2004, pp. 369-395.

Hassan, K. M., "Is SAARC a Viable Economic Block? Evidence from Gravity Model," *Journal of Asian Economics*, 12, 2001, pp. 263-290.

Kennan, J. and R. Riezman, "Optimal Tariff Equilibria with Customs Unions," *Canadian Journal of Economics*, 23, 1990, pp. 70-83.

Masahiro, E., "Trade Creation and Trade Diversion in EEC, the LAFTA and CMEA 1960-1994," *Applied Economics,* 31, 1999, pp. 207-216.

Naya, S. and G. Michael, "A Quantitative Survey of the Economics of ASEAN–U.S. Free Trade Agreements," *ASEAN Economic Bulletin*, 23(2), 2006, pp. 230-252.

Pelzman, J., "Trade Creation and Trade Diversion in the Council of Mutual Economic Assistance 1954-70," *American Economic Review*, 67, 1977, pp. 713-722.

Richardson, M., "Endogenous Protection and Trade Diversion," *Journal of International Economics*, 34, 1993, pp. 309-324.

Roberto V. Fiorentino, V. Luis, and T. Christelle, "The Changing Landscape of Regional Trade Agreements," Discussion Paper 12, WTO Publications, Geneva: Switzerland, 2007.

Rose, A. K., "Do We Really Know that the WTO Increases Trade," *American Economic review*, 94(1), 2004, pp. 98-114.

Sucharita, G. and Y. Steven, "Does Trade Creation Measure Up? A Reexamination of the Effects of Regional Trading Arrangements," *Economics Letters*, 82, 2004, pp. 213-219.

Tang, D., "Effects of the Regional Trading Arrangements on Trade: Evidence from the NAETA, ANZCER and ASEAN Countries 1989-2000," *Journal of International Trade & Economic Development*, 14(2), 2005, pp. 241-265.

Volker, N., "Does the G7/G8 Promote Trade?," *Economics Letters*, 94, 2007, pp. 136-140.

Wooldridge, J. M., *Introductory Econometrics: A modern Approach*, 3ed., USA: Thomson South Western, 2006.