THE LATEST WAVE OF REGIONALISM: DOES OUTSIDER STATUS AFFECT THE COMPETITIVENESS OF U.S. AND CANADIAN AGRICULTURAL EXPORTS?

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Abstract

The degree to which countries are pursuing regional trade agreements (RTAs) has been nothing short of extraordinary. The latest wave of regional integration, however, is "breeding concern" among academics and policymakers as to the extra-regional effects of these agreements and their impact on North American agricultural exporters who are party to relatively few RTAs in world trade. This study constructs and uses an updated database of agricultural trade flows from 1992-2008 to shed light on the degree to which outsiders status affects U.S. and Canadian agricultural exports and its competing suppliers. Regarding outsider status, the existing dummy-variable approach is modified by incorporating region-specific extra-bloc trade flow variables to examine the degree to which RTAs divert trade from specific regions of the world, including Canadian agricultural exports. The results are quite illuminating. While RTAs may not be trade diverting on net, all RTAs considered exhibit trade diversion with respect to at least some regions. The results have important policy implications for nations that are not actively participating in the latest wave of regionalism.

I. Introduction

Regional Trade Agreements (RTAs) have become an increasingly prominent feature of the world economy in recent years. Crawford and Fiorentino (2005) noted that the world has entered into one of the most prolific periods of RTA formations in recorded history and the post-1990 wave of RTA formation shows no sign of abating. The latest numbers just released from the World Trade Organization (WTO) show that it is monitoring 271 agreements as of February, 2010. This is up from 180 agreements in 2003, less than 100 agreements in 1995, and just 40 agreements in 1990. Since the advent of the WTO in 1995, the WTO has received an average of 11 notifications per year - almost one per month - and many WTO members are participating in multiple RTAs. If we count the number of planned, intended or agreements in the negotiation phase, the WTO estimates that it will oversee some 462 RTAs in the coming years.[1]

In many respects, RTAs are an attractive policy instrument to promote market integration and increase trade. First, Article XXIV of the General Agreement on Tariffs and Trade (GATT) commits WTO Members to eliminate restrictions on "substantially" all trade within an RTA. Second, compared to its multilateral counterpart, RTAs can facilitate deeper integration by liberalizing non-tariff barriers including technical standards, food safety concerns, and domestic regulations, areas where the WTO has made very little progress. Third, RTAs are easier to conclude because they involve fewer negotiating parties.

The issue of whether RTAs are welfare improving has motivated an explosion in the number of *ex post* empirical econometric studies using the gravity equation (e.g., Aitken, 1973; Frankel, 1997; Wei and Frankel, 19978; Krueger 2000; Rose and van Wincoop, 2001; and Sapir, 2001). It is not surprising, given the latest wave of regionalism in world trade, that RTAs are once again receiving a considerable amount of attention from international trade economists (Baier and Bergstrand, 2007; Baier *et al*., 2008; Grant and Lambert, 2008; Vollrath *et al.,* 2009). The effect of RTAs on members' agricultural trade has, until recently, received very little attention. Grant and Lambert (2008) addressed this issue and found that the use of aggregate merchandise trade often masks important RTA effects across different sectors. Comparing members' agricultural and nonagricultural trade flows inside RTAs, they found large and

[1] See http://www.wto.org/english/tratop_e/region_e/region_e.htm

statistically significant effects of RTAs for members' agricultural trade. Similarly, Vollrath *et al.* (2006) investigated the socio- and geo-political forces influencing land-based and processed food trade. The authors controlled for regional similarities within the EU, NAFTA, and Mercosur and found some evidence that these agreements increased members' agricultural trade.

To date, however, relatively few empirical studies have attempted to quantify the extent to which RTAs may discriminate against non-member suppliers by curtailing their exports to RTA members. Yet, *outsider status as a competitor* in world markets is an important issue because the formation of an RTA likely affects a non-member exporter's ability to supply goods to countries that belong to RTAs. Outsider status is an issue of particular concern to countries like Canada and the United States who are participating in relatively few RTAs in world trade. In his 2010 State of the Union Address, President Obama declared a national export initiative that calls for a doubling of exports within the next five years. Bergsten (2010) points out that attainment of this ambitious goal could generate 2 million high-paying American jobs, more than has been created by the domestic stimulus package. Canada has similarly expressed interest in negotiating free trade agreements with countries such as Korea, the European Union, Ukraine, Morocco, the Andean and Caribbean Communities, Singapore, and the Dominican Republic.[2] The creation of these envisioned agreements has a lot of promise for U.S. and Canadian agricultural exports, including opening many windows agricultural goods. On the other hand, should the negotiation of these agreements become protracted over sensitive issues such as agriculture, it is likely that further regional integration in other parts of the world will put Canada and U.S. agricultural exports at a competitive disadvantage.

The purpose of this study is to examine empirically the latest wave of regionalism, characterized by the growing prominence of RTAs shaping world trade, and to identify its implications for Canada and U.S. agricultural exports. Several questions are addressed:

1) Do RTAs involving the Canada or the U.S. increase members' agricultural trade?

2) How do Canada- and U.S.-based RTAs measure up against other regional and bilateral agreements in world agricultural trade?

[2] See: http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/index.aspx

3) Do RTAs to which Canada and the U.S. do not participate reduce their agricultural exports?

4) How does outsider status affect agricultural exports by other countries?

To address these questions use is made of a new bilateral trade database and different versions of econometric gravity equations to provide insight into how RTA insider and outsider status affect competitiveness in agricultural trade. Insider trade (i.e., intra-bloc trade) depicts trade between RTA member countries, whereas outsider trade (i.e., extra-bloc trade) refers to trade between an RTA and a non-member country.

II. Intra and Extra Regional Trade Shares

Regional Trade Agreements are now a ubiquitous feature of global trade. Both the number of RTAs and the share of global trade occurring within RTAs have increased steadily since the latest wave of regionalism began in the 1990's. To see this, Figure 1 plots the share of international trade occurring within RTAs for agricultural products and total merchandise trade as well as under bilateral RTAs (agreements involving two members). In 1992, 39 percent of world agricultural trade took place under RTAs. By 2007, 60 percent, or more than half, of world agricultural trade now occurs within RTAs. Trade occurring within RTAs appears to be more important for agricultural trade compared to total merchandise trade. The RTA shares for agricultural trade lie everywhere above the RTA shares for total merchandise trade. Moreover, bilateral RTAs, defined as those agreements involving just two members, are also on the rise. In 1992, bilateral RTAs accounted for less than one percent of world agricultural trade. In 2007, however, regional agricultural trade accounted for over four percent. For comparison purposes, membership in the WTO is by far the largest international agreement in force. For example, in 2005, 82 percent of total merchandise trade took place between WTO members (Grant and Parmeter 2009).

The use of bilateral and regional trade agreements as a viable trade policy instrument is not concentrated on a small group of countries. Using a much longer timeframe (1960-2005), Figure 2 plots the share of countries in the sample that are engaged in at least one RTA (All Countries - At least 1), at least two RTAs (All Countries - At least 2), and the share of WTO Members (WTO Members - At Least 1) that are engaged in at least one RTA. In 2005, almost every country participated in at least one RTA. More than 60 percent of all countries are in at least two RTAs, and almost every WTO Member

participates in at least one RTA. Thus, RTAs appear to be an attractive policy instrument, especially for WTO Members, who are finding it increasingly difficult to negotiate substantial reductions in trade policy in a multilateral setting.

Another issue concerning the growth in regional integration is the fact that there are numerous RTAs in world trade that have not been notified to the WTO (Grant and Parmeter 2009). To gain insight into the sheer number of notified and non-notified RTAs, Figure 3 tabulates the number of RTAs by notification status and year using the comprehensive RTA database developed by Grant and Parmeter (2009). The recent proliferation in the number of RTAs is clearly evident. In 1960, only three RTAs existed, two of which, the European Free Trade Agreement (EFTA) and the original European Union (EU), were notified to the GATT/WTO. The only non-notified RTA in existence in 1960 was the partial scope (bilateral) agreement between Canada and Australia.[3] By 1990, 50 regional trade agreements were in existence. However, only 21 of these agreements were actually notified to the GATT/WTO. In 2005, the last year for which data was collected on notified and non-notified RTAs, there were 158 notified RTAs in force and 126 non-notified RTAs, for a total of 284 agreements in world trade. Remarkably however, the number of notified RTAs increased by a factor of almost eight, while non-notified agreements increased roughly four-fold.

What is also evident in Figure 3 is the surge in the number of bilateral RTAs. In 1990, there were 25 bilateral RTAs in force, equal to 50 percent of the total number of RTAs in force (25/50). Remarkably however, only four out of 25 bilateral RTAs were notified to the WTO (Figure 3). By 2005, the number of bilateral RTAs increased seven-fold from 25 to178 agreements with approximately the same number of notified (88) and non-notified (90) bilateral RTAs. Bilateral RTAs now make up the largest share -- 63 % (178/284) -- of the total number of notified and non-notified RTAs in world trade.

Finally, Figure 4 illustrates the composition of notified RTAs by year and type of agreement (customs unions (CU), free trade agreements (FTA), and partial scope agreements (PSA). A few important trends are worth noting. First, very few CUs have been signed and entered into force since 1960, possibly reflecting the fact the CUs are far more difficult to negotiate both politically and

[3] Details on the Canada-Australia trade agreement can be found on the Australian Customs Service website: http://www.customs.gov.au/site/page.cfm?u=4401

economically. In 2005, a total of ten CUs were notified to the WTO.[4] Second, the majority of WTO-notified agreements in world trade are FTAs. In 2005 for example, 138 out of a total of 159 notified RTAs (or roughly 87 percent) were FTAs compared to just ten CUs and 11 notified PSAs (Figure 4). Thus, FTAs appear to be the agreement of choice among trading nations.

One of the most widely studied topics of regional integration is the degree to which RTAs stimulate intra-bloc trade. In the remaining figures, focus is shifted from summarizing the number and types of RTAs in world trade to the topic of intra- and extra-regional trade shares of some noteworthy RTA blocs. First, conventional regional trade shares are presented for six selected regional trade blocs with respect to their agricultural trade patterns. We then turn our attention to extra-regional trade shares of the six selected RTAs with respect to their imports of Canada and the U.S. agricultural exports.

Figure 5 reports the average intra-regional trade shares of six RTAs over the period 1995-2007 (NAFTA, Mercosur, Andean, CAFTADR, ASEAN and the accession of China in 2003 and Japan in 2008 (ASEAN PLUS) and the EU/EC) (see table 1 for details on these RTAs). The denominator in the intra-regional trade share calculation is country *j's* imports from all of its partners, while the numerator is country *j's* imports from its RTA members. This yields an average intra-regional trade share for each RTA country and year in the database. Averaging across all members (*j*) for each RTA and year, we arrive at the intra-regional trade shares reported in Figure 5. Figure 5 shows clearly that the EU/EC agreement has the highest intra-regional trade share hovering around 60 percent over the sample period. NAFTA's intra-regional agricultural trade share started at less than 20 percent in 1995 before climbing to almost 30 percent by 2007, reflecting the fact that many of NAFTA's trade policy commitments were phased-in over time (see Grant and Lambert 2008 for an empirical estimate of NAFTA's phase-in period). Mercosur is the only RTA whose intra-regional agricultural trade share has been falling over time.

Conventional intra-regional trade shares, however, do not paint a particularly accurate picture of the extent of regional integration. For example, does the large EU/EC intra-regional trade share in Figure 5 imply that European integration is actually stimulating more intra-regional trade compared to

[4] In 2005 there was one non-notified CU - the South African Customs Union (SACU). However, the SACU agreement has been subsequently notified to the WTO as of June 25th, 2007 (see http://rtais.wto.org/UI/PublicAllRTAList.aspx)

other RTAs considered? Or, is the large EU/EC intra-regional trade share simply due to the fact that European integration encompasses a much larger set of countries in the RTA bloc? This is a fundamental problem with reporting simple trade shares because they do not adjust for the agreement's share in world trade (Frankel 1997).

To paint a more accurate picture of intra-regional trade taking place within the selected RTAs, Figure 6 adjusts each share by country *j's* share in world trade for that year - sometimes referred to as a concentration index (Frankel 1997). A very different trend emerges. Conditional on size as measured by their share in world trade, the Andean agreement appears to have stimulated the largest increase in members' intra-regional trade with a concentration index rising to nearly 45 points before tailing off slightly. Mercosur's downward intra-regional trend is still apparent. However, Mercosur's intra-regional concentration index ranks second, whereas the EU/EC has the lowest intra-regional agricultural concentration index.

Finally, Figure 7 reports extra-regional RTA shares with respect to Canada and U.S. agricultural exports. Six trade blocs, to which Canada and the U.S. do not participate, are considered. For the U.S., Figure 7 highlights the fact that outsider status has affected the magnitude of U.S. exports to RTA markets. In 4 out of 5 RTAs to which the U.S. does not participate (EU/EC, Andean, Mercosur, and the SAARC) U.S. export shares are eroding. The decrease in U.S. agricultural exports is particularly noteworthy after the formation of the SAARC in 1996 where U.S. agricultural export presence was cut in half from a high of 22 percent in 1995 to a low of almost five percent in 2006. U.S. agricultural exports to EU/EC markets also fell over the sample period from a high of 18 percent in 1995 to a low of 9.7 percent in 2007. However, some of this export erosion can be explained by the continued enlargement of the EU/EC to include many eastern European countries where U.S. export presence is not nearly as large as it is in the original EU/EC members.

Canada's agricultural exports, while much smaller in magnitude compared to the U.S., have remained relatively constant in most RTA markets to which it does not participate. In some cases, Canada's extra-regional export share has increased. In contrast to the U.S., extra-regional imports from Canada by the SAARC have actually increased since 2005. This could reflect a substitution effect away from U.S. agricultural products towards Canadian products in markets where the U.S. and Canada compete for market share in the SAARC. Or, it could reflect Canada's interest in forming trade pacts with

Asian nations more recently. However, a more disaggregated analysis is needed to provide further insight. Canada's extra-regional exports to the U.S.-Dominican Republic-Central American Free Trade Agreement (CAFTADR) is the only RTA bloc where we see a recent decline in agricultural exports after peaking in 2001. Again since this agreement includes the U.S. and to the extent that the U.S. and Canada export similar products to CAFTADR members, the declining Canadian export share could suggest a reorientation of CAFTADR imports from the U.S. at the expense of Canadian agricultural exports.

III. Gravity Econometrics

However instructive intra-regional trade shares and concentration indices are, they do not control for a host of other factors affecting trade flows. For example, intra-regional trade shares do not control for trade barriers, linguistic ties, geographic location, trade costs, multilateral resistance or cultural affinities. To formally control for these factors we need an empirical model which is developed in this section.

This study exploits information in an updated global agricultural database that contains partner trade flows from 1992-2008 and it uses gravity equations to identify the extent to which RTAs affect intra- and extra-bloc trade. Gravity models continue to provide the framework for analysis of partner trade flows not only due to their ability to generate consistent results, but also because of their relatively compact specification which makes it appealing to diagnose regional integration issues.

The basic gravity model predicts that trade flows are proportional to the economic size of the importing and exporting nations and the distance between them. The gravity model applied to panel data is formalized as follows:

$$(1) \qquad T_{ijt} = \beta_0 Y_{it}^{\beta_1} Y_{jt}^{\beta_2} D_{ij}^{\beta_3} \varepsilon_{ijt}$$

where T_{ijt} denotes trade flows from country *i* to *j* in year *t*; Y_{it} and Y_{jt} represent yearly GDP of country *i* and *j*, respectively; , and D_{ij} measures the distance between the two countries. β_0, β_1, β_2, and β_3 are unknown parameters, and ε_{ij} is a multiplicative, stochastic error term.

Researchers often augment the traditional gravity equation in (1) to control for other factors believed to promote or impede trade. After taking the natural logarithm of equation (1) and

augmenting the basic model to include additional factors hypothesized to influence bilateral trade flows, our reference gravity model can be expressed as follows:

$$(2)\quad \ln T_{ijt} = \beta_t + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_4 Border_{ij} + \beta_5 Lang_{ij} + \beta_6 LL_i + \beta_7 LL_j + \varepsilon_{ijt}$$

where, β_t is a comprehensive set of year fixed effects, $Border_{ij}$ ($Lang_{ij}$) is a dummy variable equal to one if *i* and *j* share (speak) a common land border (language), LL_i (LL_j) is a dummy variable equal to one if the exporter *i* (importer *j*) is a landlocked country, and all other variables are as defined previously.

We begin by investigating whether and to what extent RTAs expand agricultural trade between member countries and/or lower trade with non-member countries via estimation of the following model:

$$(3)\quad \ln T_{ijt} = \beta_t + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_4 Border_{ij} + \beta_5 Lang_{ij} + \beta_6 LL_i + \beta_7 LL_j + \theta_1 Intra - RTA_{ijt} + \theta_2 Extra - RTA_{ijt} + \varepsilon_{ijt}$$

where, $Intra\text{-}RTA_{ijt}$ is a generic dummy variable equal to one whenever *i* and *j* are part of the same trade agreement in year *t*, and zero otherwise, and $Extra\text{-}RTA_{ijt}$ is a another dummy variable that equals one whenever a RTA-member imports from an exporter not affiliated with the RTA to which the importer belongs. [5] $Intra\text{-}RTA_{ijt}$ is designed to capture how RTAs in general stimulate trade among member nations. $Extra\text{-}RTA_{ijt}$ is a similarly constructed variable that identifies possible trade diversion effects resulting from the dismantling of trade barriers inside RTAs. If trade is created due to the formation of an RTA then we expect θ_1 to be positive. Conversely, if trade is re-orientated towards member nations at the expense of trade with non-members, then we would expect θ_2 to be less than zero.

While instructive, equation (3) is quite restrictive since θ_1 and θ_2 measure the *average* treatment effect of intra- and extra-bloc agricultural trade across the ten RTAs evaluated in this study. Because different RTAs exhibit varying degrees of agricultural trade liberalization, it is likely that the impacts on

[5] Eleven regional blocs, listed in Table 1, are considered in the construction of Intra-RTAijt and Extra-RTAijt. Note, the various EU expansions from 12 members in 1992 to 27 members in 2007 as well as the enlargement of the free-trade agreement between Canada and the United States to include Mexico in 1994 are coded dynamically in the construction of these two variables.

trade vary considerably across individual agreements. Further, equation (3) does not consider Canadian- or US-based RTAs. Collapsing the standard gravity variables (β_ι, GDP, distance, borders, language and landlocked countries) into $\boldsymbol{X\beta}$ our second estimating equation is:

$$(4) \qquad \ln T_{ijt} = \mathbf{X\beta} + \sum_{r=1}^{10} \theta^r Intra - RTA_{ijt}^r + \sum_n \gamma^n US - RTA_{ijt}^n + \sum_m \eta^m CAN - RTA_{ijt}^m + \varepsilon_{ijt}$$

where, $US - RTA_{ijt}^n$ and $CAN - RTA_{ijt}^m$ are a set of n = 7 and m = 3 bilateral RTAs (involving 2 countries) Canada and the U.S. have implemented over the period 1992-2008, and *r* is the set of ten regional blocs considered (table 1) which provide points of reference from which to gauge the performance of Canadian- and US-based bilateral RTAs.

Next attention is turned to potential adverse effects on Canadian and U.S. agricultural exports as a result of the increasing number of RTAs in world trade to which Canada and the U.S. does not participate. This is an issue of particular concern to policymakers given the relatively few agreements involving Canada and the U.S. and the proliferation of RTAs throughout the world in recent years. There are, for example, numerous regional and bilateral economic integration agreements involving Asian nations that have entered into force since the original ASEAN agreement was ratified in 1992 (see table 1). While Canadian and U.S. policymakers have expressed interest in participating in bilateral and plurilateral talks with Asian countries, only the Canada-Korea, Canada-Singapore and U.S.-Korea and Trans-Pacific Partnership are on the radar screen.

While many studies have evaluated the overall economic payoffs from RTAs (Grant & Lambert 2008 and Baier & Bergstrand 2007), few studies have considered the possible trade diverting effects of RTAs on non-member agricultural exports.[6] Even fewer studies have focused attention on the role that RTAs exert on the ability of an *individual* non-member country not belonging to these agreements to compete in the foreign market place.[7]

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[6] Notable exceptions are Koo *et al,* 2006; Vollrath *et al*, 2009; and Lambert and McKoy, 2009. However, these authors did not consider U.S. or Canadian agricultural exports explicitly.

[7] Zahniser *et al.,* (2004) is an exception concerning U.S. agricultural exports. However, the authors did not consider Canadian agricultural exports and the recent proliferation of RTAs in the Asia-Pacific.

Subsequent modeling efforts aim to begin bridging gaps in knowledge about trade diversion. First, a more general specification of equation (4), one which allows for extra-bloc-trade effects in the form of both import and export diversion, is estimated:

$$\ln T_{ijt} = \mathbf{X\beta} + \sum_r \theta^r Intra - RTA_{ijt}^r + \sum_r \delta^r ExtraRTA - IMP_{ijt}^r + \sum_r \lambda^r ExtraRTA - EXP_{ijt}^r + \varepsilon_{ijt} \quad (5)$$

where *r* indexes the set of ten RTA blocs considered, $ExtraRTA - IMP_{ijt}^r$ is a dummy variable equal to one if country *j* of RTA *r* imports from a non-member exporting country *i* ($i \notin r$). $ExtraRTA - EXP_{ijt}^r$ is a dummy variable equal to one if country *i* of RTA *r* exports to a non-member importing country *j* ($j \notin r$). it is posited that if intra-bloc trade for RTA *r* is reoriented towards member countries after its formation at the expense of trade with non-members, then not only is $\theta^r > 0$ but either $\delta^r < 0$ and/or $\lambda^r < 0$.

Should the coefficients pertaining to the extra-bloc RTA variables in equation (5) exhibit trade diversion, then the question arises as to what countries or regions are adversely affected? To address this issue, equation (5) is modified to reflect *region–specific*, extra-bloc trade diversion:

$$\ln T_{ijt} = \mathbf{X\beta} + \sum_r \theta^r Intra - RTA_{ijt}^r + \sum_r \sum_c \delta_{ijt}^{rc} ExtraRTA - IMP_{ijt}^{rc} + \varepsilon_{ijt} \quad (6)$$

where, *r* denotes the ten regional trade blocs considered (table 1), and *c* is introduced to index the set of six continental areas in world trade: Africa, Asia, North America, Other Americas, Europe, and Oceania. In other words, each of the extra-bloc import diversion variables pertaining to the r^{th} RTA is disaggregated into *c* region-specific import diversion variables. For instance, if *r* = European Union, then there are *c* = 6 EU extra-bloc import diversion variables, one each for EU-Africa, EU-Asia, EU-Europe, EU-North America, EU-Other Americas, and EU-Oceania. This type of framework is appealing for two reasons. First it allows us to determine whether RTAs are in fact trade diverting, and secondly, it allows us to determine which regions are being impacted by trade diversion.

Finally, we modify equation (6) even further to investigate possible trade diversion adversely affecting Canadian and U.S. agricultural exports:

$$(7) \qquad \ln T_{ijt} = \mathbf{X\beta} + \sum_r \theta^r Intra - RTA_{ijt}^r + \sum_r \delta^r ExtraRTA - EXP - US_{ijt}^r$$

$$+ \sum_r \chi^r ExtraRTA - EXP - CAN_{ijt}^r + \sum_r \zeta^r ExtraRTA - EXP - OTH_{ijt}^r + \varepsilon_{ijt}$$

where, $ExtraRTA - EXP - US_{ijt}^r$ is a dummy variable equal to one if the United States, as an exporter, supplies importer *j*'s market, where *j* is a member of RTA *r* but the United States is not ($US \notin r;\ j \in r$). Similarly, $ExtraRTA - EXP - CAN_{ijt}^r$ is a dummy variable equal to one if Canada, as an exporter, supplies importer *j*'s market, where *j* is a member of RTA *r* but Canada is not ($CAN \notin r;\ j \in r$). Finally, $ExtraRTA - EXP - OTH_{ijt}^r$ is a "catch-all" dummy equal to one if exporter *i* is any other country (other than the US or Canada) who exports to importer *j*'s market, where *j* is a member of RTA *r* but *i* is not ($OTH \notin r;\ j \in r$).

IV. Data

This study constructs an updated bilateral trade dataset based on the WTO's definition of agricultural products to the most recent year for which data are available (2008). This allows us to consider a number of newly formed RTAs which have not been considered previously due to data limitations (e.g., ASEAN trade agreement with accession of China and Japan, a number of bilateral agreements involving the Canada and the U.S., and the proliferation of several Asian bilateral RTAs). Agricultural bilateral trade values over the period 1992-2008 are retrieved from the United Nations Commodity Trade Statistics Database (Comtrade)[8]. We pay close attention to the WTO's definition of agricultural products which are based on 10 multilateral trade negotiation (MTN) categories (see Table 2).

Agricultural trade data are gathered for 206 countries, which produces an extensive matrix of bilateral trade flows and ensures a considerable amount of variation between countries that initiated RTAs (the treatment group) and non-member nations (the control group). For each country-pair and

[8] Available (with subscription) at: http://comtrade.un.org/db/default.aspx

year, we summed the value of trade over the 10 MTN agricultural categories to arrive at total agricultural trade for the sector.

Reporting country's import statistics are used whenever they are available. However, mirrored trade flows based on the exporter's reported exports are used if the reporting country's imports are recorded as zero or missing.[9] The use of mirrored trade flows is advantageous for two reasons. First, it allows us to complete the bilateral trade database for many low-income countries. This is because low-income countries often lack the technical or financial capabilities to record import statistics at disaggregated levels of the HS classification. Second, although the harmonized system was introduced in 1992, it was not adopted by many low-income countries until the late 1990's, whereas many industrialized countries were able to convert to the HS system almost immediately. Thus developed countries' reported exports to lower-income import markets were often used to fill in many of the earlier years in the database. Our agricultural panel dataset spans the 1992-2008 period and contains 241,989 observations.[10]

Country size is proxied by Gross Domestic Product (GDP) data (in US dollars) obtained from the World Bank's *World Development Indicators* and the United Nations' *National Accounts*. GDP data are relatively complete and are available for almost all countries and time periods.[11] Data for the standard gravity equation covariates - distance, contiguity, common language, and landlocked countries - are taken from the *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII) geo-distance dataset (Mayer and Zignago 2006).[12]

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[9] Feenstra *et al*. (2005) also employ mirrored trade flows when trade flow statistics of the reporting country are incomplete or missing.

[10] This database is unbalanced because zero trade flow records do not exist. In this paper we do not address the issue of zero or missing trade even though such records have shown to be important in the estimation of bilateral trade flows (Helpman, Melitz, and Rubinstein 2008).

[11] In some cases (i.e., Taiwan), we use GDP data from the Penn World Tables (6.3) to supplement WB and UN data when it is incomplete or missing. WB Development Indicators Data can be accessed (with subscription) at: http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers&userid=1&queryId=135, and UN GDP data can be retrieved at: http://unstats.un.org/unsd/snaama/dnllist.asp. Penn World Tables can be accessed at the Center for International Comparisons at the University of Pennsylvania's website: http://pwt.econ.upenn.edu/

[12] CEPII is an independent European research institute on the international economy stationed in Paris, France. CEPII's research program and datasets can be accessed at www.cepii.com. CEPII uses the great circle formula to

Eleven regional trade blocs along with seven U.S. bilateral agreements and three Canadian bilateral RTAs are considered in the analysis. See Table 1 for a listing of all RTAs considered in this study, including their date of entry into force and country membership through time.

V. Results

The econometric results are organized in four sections. In section one, the benchmark results are presented utilizing a single intra- and extra-regional RTA dummy variable to estimate the extent of regional trade creation and trade diversion. Section two presents the results from estimating a more flexible specification of the gravity equation in which each of the ten regional blocs is allowed to have its own coefficient. Canadian and U.S. bilateral RTAs are also added to the picture. Section three shifts attention to the trade diverting effects of each of the ten regional blocs. Here, use is made of a generic export and import diversion variable to gauge the overall impact of RTA trade on nonmember countries. Finally, section four presents a more detailed analysis of the extra-bloc RTA effects by focusing on specific geographic regions of non-member countries as well as on Canada and U.S. agricultural exports.

Benchmark Results

Table 3 presents the econometric results based upon equation 3, with the associated *p-values* of the parameter estimates in parentheses. The gravity model continues to fit the data well. Larger countries trade more on average as the coefficients on GDP suggest whereas distance nearly halves agricultural trade. Sharing a land border (*Border*) and speaking a common language (*Language*) stimulates bilateral trade whereas landlocked countries trade less.

Intra-bloc parameter estimates (RTA - Trade Creation) indicate that the formation of an RTA increases trade (table 3). However, the negative extra-bloc coefficients (RTA - Trade Diversion) suggest that RTAs divert trade against exports from non-members. Column (1) presents the basic gravity model with no time or country fixed effects. The coefficient on intra-bloc trade (0.81) suggests that the formation of an RTA increased members' trade by 124 percent ((exp(0.81)-1)*100). That is, RTAs more than double members' agricultural trade, on average. However, trade with non-members decreased by

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calculate the geographic distance between countries, referenced by latitudes and longitudes of the largest urban agglomerations in terms of population.

34 percent ((exp(-0.41)-1)*100) suggesting that some of the increase in intra-bloc trade has come at the expense of non-member exports (RTA imports from non-members).

Columns (2) through (5) present different variants of the benchmark model. Column (2) adds year fixed effects. The intra-bloc RTA impact is similar in magnitude to column (1). However, the trade diverting impact of RTAs is less pronounced and suggests a 24 percent decrease in trade with non-members. Column (3) adds bilateral pair fixed effects (26,747 fixed effects) that absorb all time-invariant extraneous factors that are specific to each country pair and column (4) includes time-varying country-specific fixed effects (Anderson and van Wincoop 2003; Baier and Bergstrand; Grant and Lambert). The results are consistent across all models in terms of the sign and statistical significance of the generic RTA indexes, although the intra- and extra-bloc effects are smaller in magnitude in columns (3) and (4). As a final robustness check, column (5) includes both country-pair and time-varying country-specific fixed effects as suggested by Baier and Bergstrand (2007). Here the RTA effect is to double members' agricultural trade which is remarkably similar to the results found in Baier and Bergstrand (2007) using total merchandise trade.

Regional Blocs and U.S. and Canada Bilateral RTAs

The previous results suggest that RTAs more than double members' agricultural trade using columns (1) or (2) in table 4. It is likely, however, that the trade flow effect of RTAs varies considerably over individual agreements. Moreover, the previous scenario omitted Canadian and U.S. bilateral RTAs. This section allows each regional bloc to have its own coefficient and adds Canadian and U.S. bilateral RTAs to the picture. Because this specification is more general in that each RTA has its own coefficient and some RTA dummy variables do not vary over the sample period (1992-2008) (i.e. Andean (CAN), Mercosur (MERC)) or have very little variation such as NAFTA (due to the original CUSTA agreement in 1989) we adopt the baseline gravity equation with year fixed effects, leaving out country-pair and time-varying country-specific fixed effects.[13] Consequently our results should be interpreted as an upper bound of the potential effects of RTAs since Egger (1997) and Mátyás (2000) have shown that policy

[13] For example, a model that includes country-pair fixed effects would absorb all time-invariant variables including those RTA dummy variables that do not vary over the sample period.

variables tend to be inflated in the gravity equation that does not include fixed effects for unobserved country-pair specific heterogeneity.

The results are impressive (table 4). Agricultural trade is boosted by regional integration in all eleven regional blocs considered. CAFTDR and the CACM are particularly noteworthy. Two CAFTADR (CACM) members traded almost 14 times [exp(2.63)] (7.5) times [exp(2.02)] more with each other relative to trade between non-RTA members.[14] Similarly, NAFTA, the various EU expansions, Mercosur, Andean (CAN), SADC, COMESA, ASEAN plus China and Japan (ASEAN+), Asian Bilaterals and the SAARC all stimulate members' agricultural trade (column 1, table 4).

Column (2) adds a generic US and Canadian bilateral RTA dummy which captures the average trade flow effect of seven and three free trade agreements the U.S. and Canada have with their trade partners, respectively. The results suggest that Canadian-based (U.S.-based) bilateral free trade agreements have increased members' agricultural trade by 447 (343) percent! Column (3) adds a dummy variable for the recent Canada-EFTA agreement. Although this agreement entered into force in 2009, RTAs can have significant anticipatory effects as suggested by Frankel (1997). The coefficient on the Canada-EFTA dummy, however, is positive but statistically insignificant. Finally, column (4) adds each Canadian-based bilateral RTA as a separate variable in the estimation. This sheds light on the question whether all Canadian-based bilateral RTAs increase members' agricultural trade? With the exception of the Canada-Israel agreement in 1997, Canadian bilateral free trade agreements with Costa Rica and Chile have provided a significant boost to members' agricultural trade.

RTA Effects on Non-Member Countries

An equally important policy question is not whether RTAs have expanded members' trade, but rather, whether non-participation in the recent wave of regionalism has negatively impacted the competitiveness of North American agricultural exports. The starting point is estimation of equation 5 that contains generic trade diversion effects of the eleven regional blocs considered in table 1. included for each regional bloc are the intra-bloc trade creation variable and two asymmetric extra-bloc trade diversion variables, one reflecting import diversion and the other export diversion. The results are

[14] Recall that CAFTADR (which includes the U.S.) and CACM (which does not include the U.S.) are coded mutually exclusive from one another (CACM until 2006, and CAFTADR from 2006-2008) (see footnote to table 1).

presented in table 5, where the standard gravity equation coefficients have been suppressed for ease of exposition.

The formation of each of the eleven regional blocs listed in the columns of table 5 has not adversely impacted RTA member *exports* to non-member countries. In fact, the results indicate that countries belonging to these RTAs have increased their exports to non-member countries, though not as much as their exports have risen to member countries. This finding suggests RTA formation generates economies of scale and productivity increases that increase members' competitiveness in world markets. Conversely, however, RTA members appear to discriminate against imports coming from non-member countries (i.e., non-member agricultural exports to RTA member markets). This is shown by the negative import diversion coefficients in almost all of the regional blocs considered (the exceptions being the EU/EC and the ASEAN+ agreements). For example the results suggest that the formation of NAFTA has reduced extra-bloc imports by 45 percent ((exp(-0.59)-1)*100), on average. Mercosur and the Andean Pact seem to be the least open to imports from non-member countries following ratification of their respective agreements, followed by CAFTADR and the CACM.

RTA Effects on Non-Member Countries by Region

The results in table 5 suggest that trade diversion is present in RTAs but only in the form of import diversion. In this final section we ask: which non-member exporters are being impacted by import diversion? Two regressions are reported. First, non-member exporters are disaggregated into region specific exporters and a separate extra-bloc import trade diversion dummy variable is introduced for each region (equation 6). Six regions are considered: (i) Africa; (ii) North America; (iii) Other Americas; (iv) Asia; (v) Europe; and (vi) Oceania. In the second regression, we focus more specifically on the potential impact of trade diversion on Canadian and U.S. agricultural exports as compared to all other non-member exporters (equation 7). The results of both regressions are tabulated in table 6.

Several interesting findings emerge with respect to the region specific trade diversion results. First, Mercosur and the Andean Pact, both of which were found to exhibit relatively strong import diversion in the previous scenario (table 5), continue to produce large trade diversion effects. The region-specific exporters most impacted by Mercosur include Africa and Other American exporters. Asia and Europe suffered the most trade diversion induced by the Andean Pact. The fact that the magnitude

of import trade diversion in Mercosur is relatively strong against Other American countries is particularly noteworthy because these exporters are located in Central and South America and are in close proximity to Mercosur countries. A similar result is obtained when examining the import diversion coefficients for the Asian bilateral agreements. Although Asian bilateral agreements appear to exhibit very little trade diversion overall (on average), import diversion is the largest against other Asian countries not party to the Asian bilateral RTAs considered in this study. The NAFTA import diversion variables continue to produce negative and significant results for most regions, particularly Asia and Africa, but not for Oceania.

The second noteworthy finding is that most agreements (with the exception of SADC) appear to be relatively open to extra-bloc trade with North America. Mercosur import trade diversion with respect to North American and Oceania exporters was insignificant whereas both exporting regions saw their agricultural exports increase significantly to Andean Pact RTA members. Similarly, North American exports appear to be little affected by the formation of the ASEAN (plus China and Japan) (ASEAN+) and the 12 Asian bilateral RTAs. The positive extra-bloc coefficients for the Andean agreement and the ASEAN+ and Asian bilaterals could be the result of the strong seasonal trading relationship that exists in many fruit and vegetable product trade between northern and southern hemispheric nations in the Americas in the former case, and a relative openness to North American agricultural exports in the latter. The formation of CAFTADR in 2006 exhibits strong import diversion against Africa, Asia, and Europe whereas the CACM (1992-2006) exhibits relatively strong import diversion towards Asia. However, both agreements are relatively open to North American agricultural exports although the effect for CAFTADR is not significant.[15]

The third interesting result concerns the EU/EC and ASEAN+ agreements. In the previous scenario (table 5) these two agreements were found to be open to extra-bloc imports on average, in contrast to the nine other agreements. However, the results in Table 6 underscore an important finding in this study: RTAs may not exhibit *net* import trade diversion when considering all non-member

[15] The CAFTADR import diversion variable for North America deserves further explanation. CAFTADR (or the U.S.-Dominican Republic-Central American Free Trade Agreement) includes the U.S. as one of its members. Thus the CAFTADR import diversion coefficient specific to North America includes imports from Canada and Mexico since 2006.

countries, but this is not to say that the RTA is not *gross* import diverting with respect to some regions. The EU/EC and ASEAN+ agreements illustrate this point rather convincingly. Net import diversion for both RTAs is positive, on average, as suggested by the results in table 5. However, both RTAs are gross trade diverting (in the form of import diversion) against other Asia and European nations. The results for EU/EC and ASEAN+ are interesting for another reason. The countries most impacted by the expansion of the EU/EC and the formation of the ASEAN+ are those which are relatively close in geographical proximity (other Europe and other Asia) – a result that first emerged when we discussed the import diversion effects of Mercosur and Asian bilateral RTAs.

The final noteworthy result in table 6 concerns the import diversion effects against Canada and the U.S. (see, lower half of table 6). U.S. and Canadian agricultural exports appear to be unscathed from the latest wave of regionalism that began in the 1990's, especially when compared to the import diversion effects of all other countries except the U.S. and Canada. The only RTA that appears to have a statistically significant negative effect on U.S. and Canadian agricultural exports is member nations of the South African Development Community (SADC). Here, U.S. and Canadian agricultural exports decreased by 48 and 68 percent on average. Many of the remaining RTAs show positive and statistically significant import diversion coefficients with respect to U.S. and Canadian agricultural exports with noteworthy trade flow effects in the Andean Pact, ASEAN+, and Asian bilateral RTAs.

VI. Conclusion/Summary

Bilateral and regional trade agreements have, indeed, become an increasingly prominent feature in the global marketplace. The rise in the number of RTAs is due, in part, to the frustration of negotiators attempting to achieve multilateral free trade. This is particularly true in agriculture where WTO members (particularly the developing countries) have made it clear that they are unwilling to negotiate on other topics until a suitable agreement on agriculture exists. Asia has been particularly aggressive in its pursuit of regionalism since the new millennium began and policymakers in Canada and the U.S. are now concerned with the prospect of an Asian bloc creating a barrier down the center of the pacific.

This study examined the latest wave of regionalism, characterized by the growing prominence of RTAs shaping world trade patterns, and identifies its implications for Canadian and U.S. agricultural

exports. The recent proliferation of RTAs raises questions about their impact on the pattern of world agricultural trade and the ability of exporters to compete in foreign markets. The majority of applied studies found in the literature have focused attention on total merchandise trade and insider status or the degree to which mutual RTA membership expands trade among partner countries. Relatively few studies have examined how these agreements have affected agricultural trade and even fewer studies have focused attention on outsider status, namely how RTAs may have discriminated against non-member suppliers by curtailing their exports to RTA members. This paper attempts to begin bridging this gap.

The results show that the formation of RTAs significantly increases members' agricultural trade, including the formation of most Canadian- and U.S.-based bilateral RTAs in the past decade and a half. However, it appears that much of this increase has come at the expense of decreased trade with outsiders. That is, the results suggest that RTAs are generally trade diverting in nature. This study addressed the issue of trade diversion more closely because policy-makers are likely interested in not only whether an RTA is trade diverting, but which countries are impacted by trade diversion. This is an issue of particular concern to Canadian and U.S. policymakers given the relatively few agreements to which these countries belong. The results show that each of the 11 regional blocs did not adversely affect RTA member exports to non-member countries. Conversely, the results do, however, suggest that most RTAs discriminate against imports coming from non-member countries. All 11 RTAs exhibit import diversion with respect to at least one group of non-member exporting countries. Furthermore, for some RTAs, trade diversion was found to have displaced exports from neighboring countries. Trade diversion resulting from the formation of Mercosur, the EU/EC, and several Asian RTAs impacted countries within close geographical proximity as opposed to other, more distant, geographical regions of the world. The EU/EC and ASEAN+, the two RTAs found not have discriminated against non-member suppliers on average were found to have diverted trade in two of the five regions with which they traded, namely in other Asia with respect to ASEAN+ and in other Europe with respect to the EU/EC. Other Europe and other Asia countries are in relatively close proximity to the EU/EC and ASEAN+, respectively.

Finally, this study examined import diversion affecting Canadian and U.S. agricultural exports. Preliminary results suggest that Canada and the United States, unlike most other non-RTA-specific

suppliers, have not been adversely affected by the latest wave of regionalism which began in the 1990's. The only RTA exhibiting a decline in Canadian and U.S. agricultural exports is the South African Development Community (SADC). Many of the other RTAs, by contrast, show not only positive but statistically significant import diversion coefficients pertaining to Canadian and U.S. agricultural exports.

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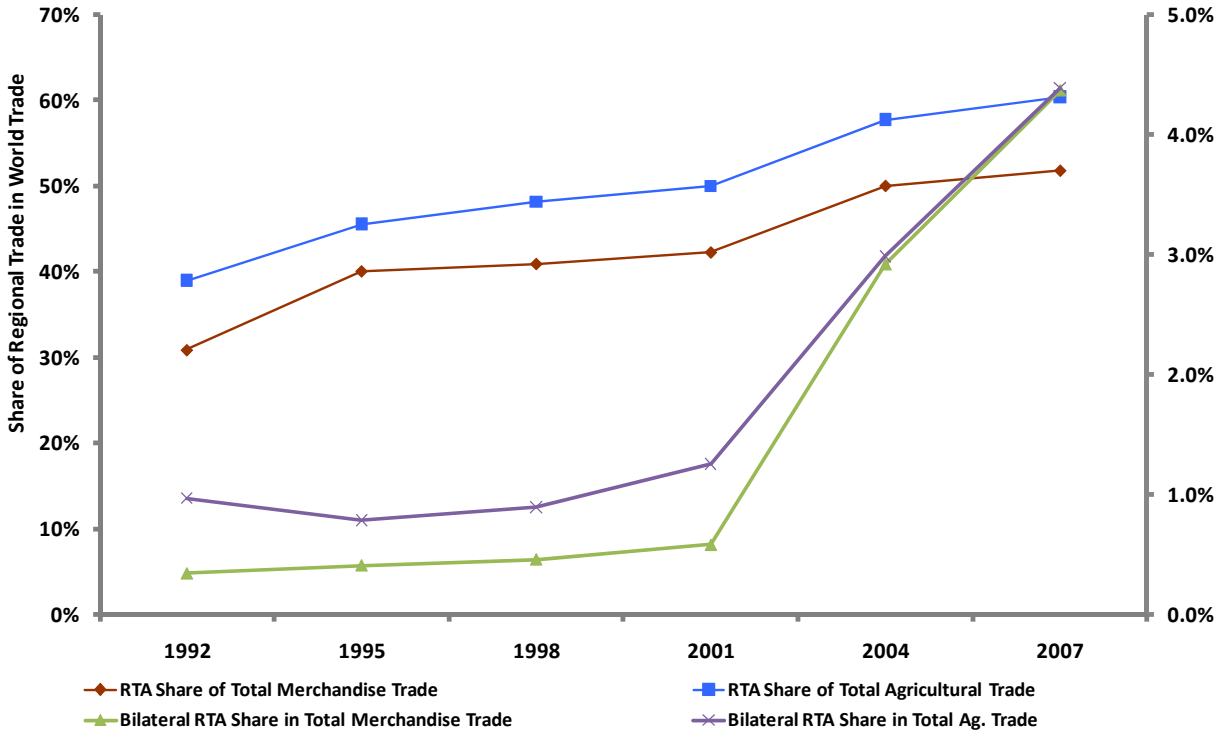
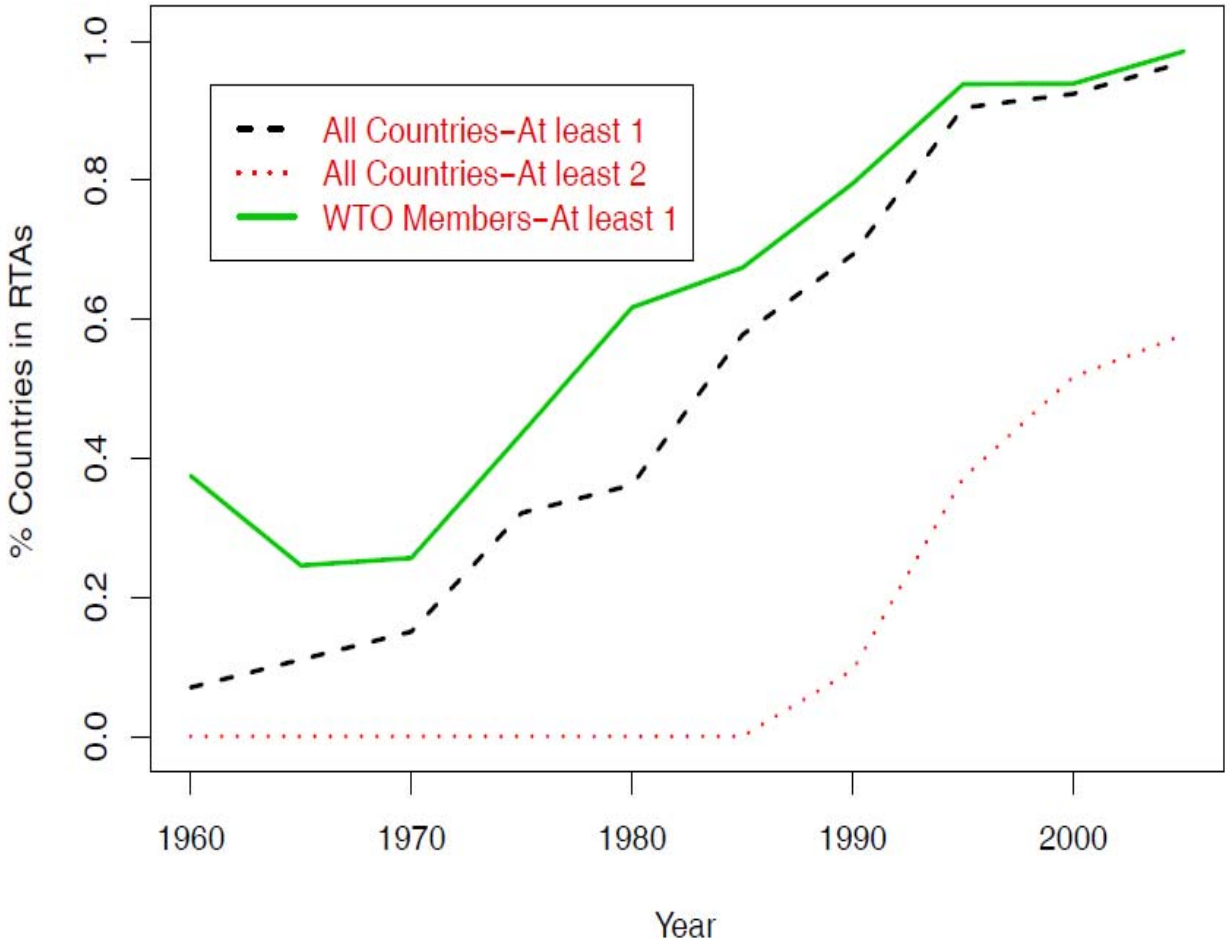
Figure 1. RTA Trade Shares in Total Agricultural and Merchandise Trade



Note: Bilateral RTA share and RTA share in total merchandise or agricultural trade are not mutually exclusive

Source: Author's calculations

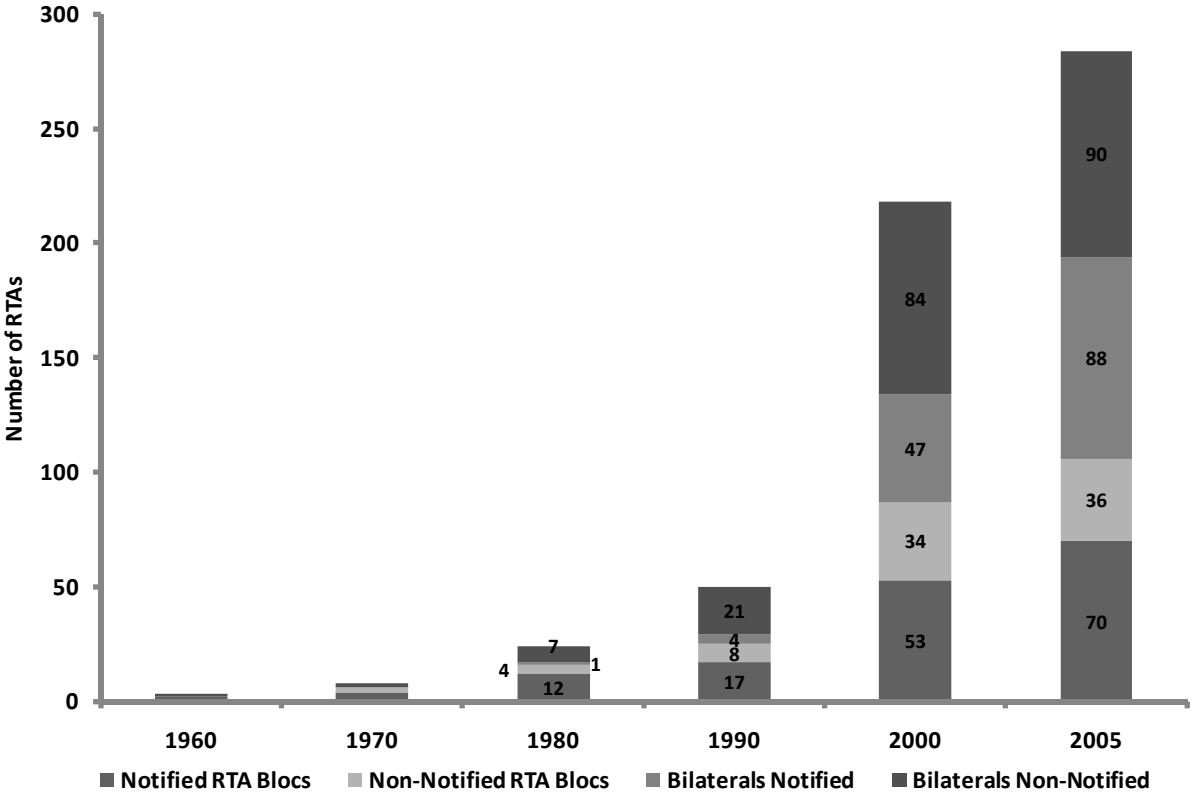
Figure 2. Participation in RTAs



Note: All Countries – At Least 1 denotes the percentage of countries in the database that participate in at least one RTA; All Countries – At Least 2 denotes the percentage of countries in the database that participate in at least 2 RTAs; and WTO Members – At Least 1 denotes the percentage of WTO members that participate in at least one RTA

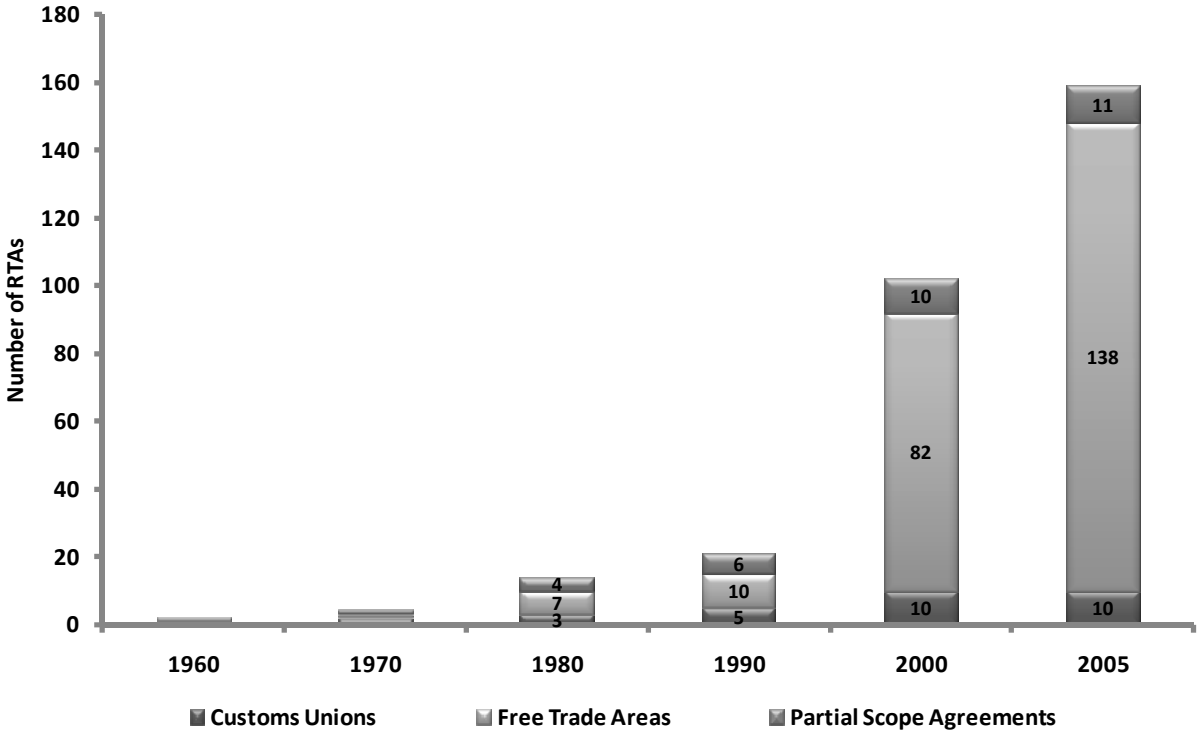
Source: Grant and Parmeter (2009)

Figure 3. Notified and Non-Notified RTAs Entered Into Force



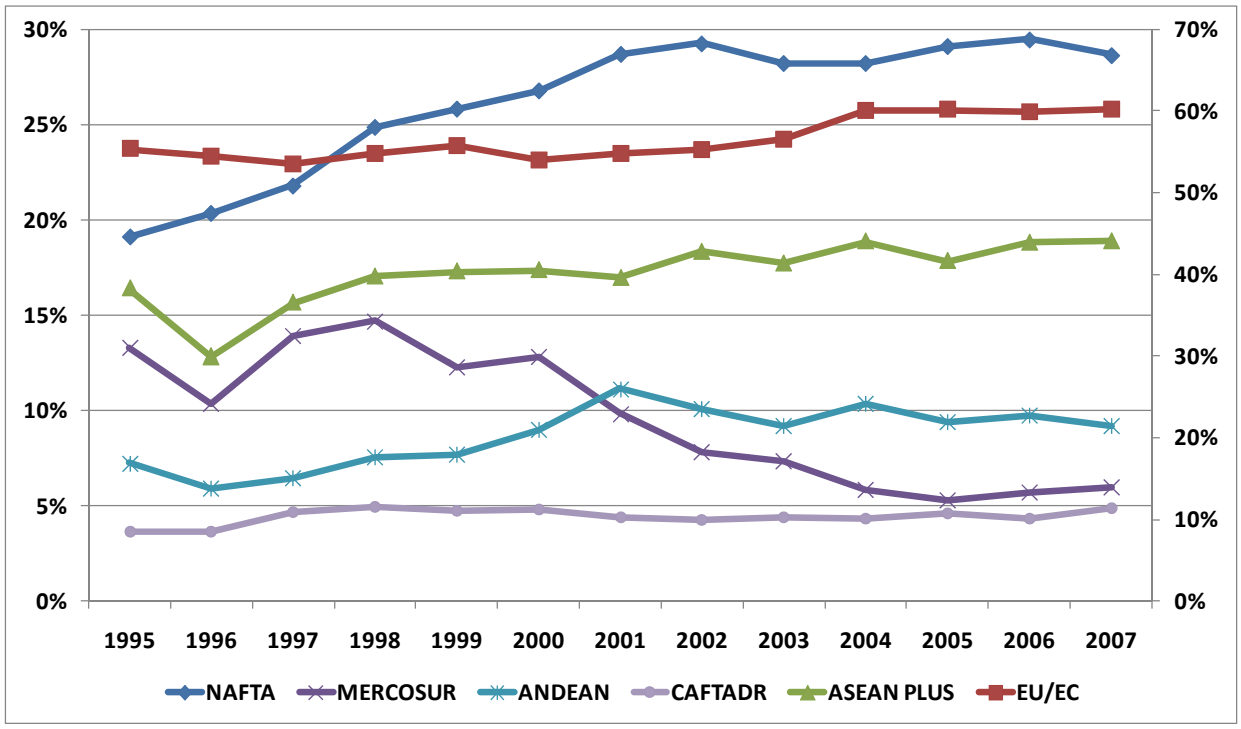
Source: Grant and Parmeter (2009)

Figure 4. RTAs Entered Into Force by Type of Agreement



Source: Grant and Parmeter (2009)

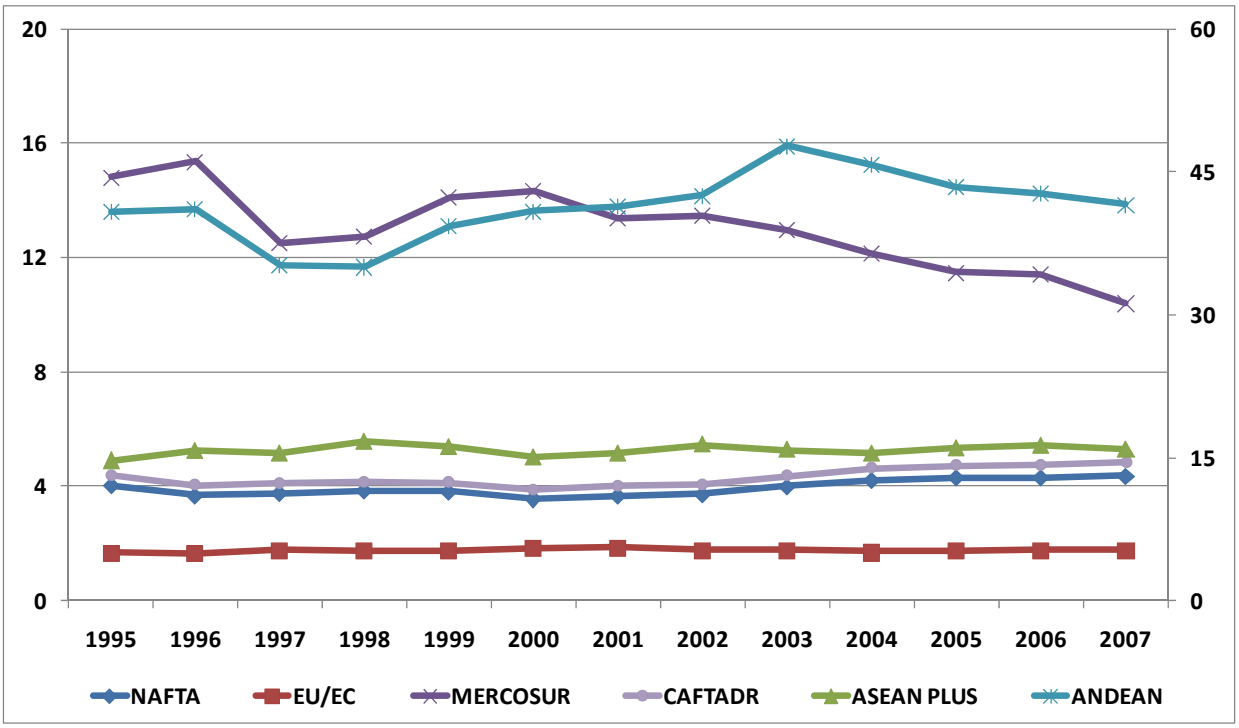
Figure 5. Intra-Regional Trade Shares, Select Regional Blocs, 1995-2007



Note: EU/EC RTA share depicted on right vertical axis

Source: Author's calculations

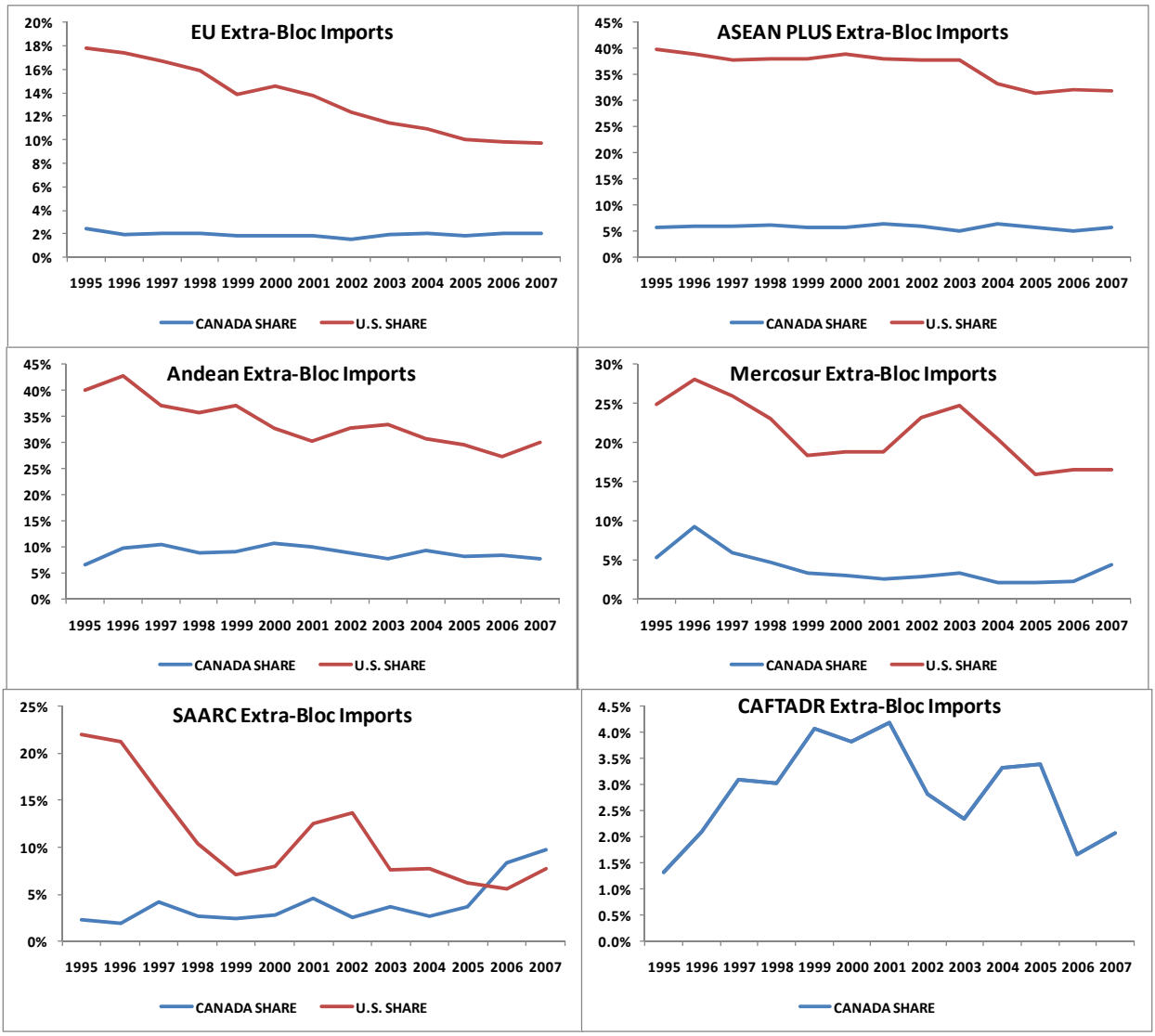
Figure 6. Intra-Regional Concentration Indices, Select RTAs, 1995-2007



Note: Andean RTA depicted on the right vertical axis

Source: Author's calculations

Figure 7. Extra-Bloc Trade Shares, U.S. and Canadian Agricultural Exports, 1995-2007



Note: Canada's share of CAFTADR extra-bloc trade is computed by excluding U.S. from CAFTADR

Source: Author's calculations

Table 1. RTAs Considered in the Analysis, Date of Entry into force, and Membership

AFRICA		
Common Market for Eastern and Southern Africa	COMESA (1994)	Angola, Burundi, Comoros, Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe
South African Development Community	SADC (2000)	Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe
AMERICAS & CARIBBEAN		
Andean Community	CAN (1996)	Bolivia, Columbia, Ecuador, Peru, Venezuela
Central American Common Market*	CACM (1961-2006)	Costa Rica, Guatemala, Honduras, Nicaragua, El Salvador
North American Free Trade Agreement	NAFTA (1989/1994)	United States (1989), Canada (1989), Mexico (1994)
Mercosur	MERC (1991)	Argentina, Brazil, Paraguay, Uruguay
U.S.-Dominican Republic-Central American Free Trade Agreement	CAFTADR (2006)	Guatemala, Honduras, Nicaragua, El Salvador, United States, Costa Rica (2008), Dominican Republic (2007)
ASIA AND PACIFIC		
Association of Southeast Asian Nations (including accession of China & Japan)	ASEAN PLUS (1993)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam, China (2003), Japan (2008)
South Asian Association for Regional Cooperation (originally, the South Asian Preferential Trade Agreement (SAPTA) and the progression to South Asian Free Trade Association (SAFTA)	SAARC (1995)	Bhutan, Bangladesh, India, Sri Lanka, Moldova, Nepal, Pakistan, Afghanistan (2008)
Asian Bilateral RTAs	Asian Bilaterals (various years)	China-New Zealand (2008), India-Singapore (2005), Japan-Singapore (2002), New Zealand-Singapore (2001), Pakistan-China (2001), Pakistan-Malaysia (2008), Singapore-Australia (2003), Thailand-New Zealand (2005), Thailand-Australia (2005), China-Macau (2004), China-Hong Kong (2004), South Korea-

		Singapore (2006)
EUROPE		
European Communities (Union)	EU/EC (various years)	Austria (1995), Belgium, Bulgaria (2007), Cyprus (2004), Czech Republic (2004), Denmark, Estonia (2004), Finland (1995), France, Germany, Greece, Hungary (2004), Ireland, Italy, Latvia (2004), Lithuania (2004), Luxembourg, Malta (2004), Netherlands, Poland (2004), Portugal, Romania (2007), Slovakia (2004), Slovenia (2004), Spain, Sweden (1995), United Kingdom
UNITED STATES BILATERAL RTAS		
US-Israel	USA-ISR (1985)	United States, Israel
US-Jordan	USA-JOR (2002)	United States, Jordan
US-Chile	USA-CHL (2004)	United States, Chile
US-Singapore	USA-SGP (2004)	United States, Singapore
US-Australia	USA-AUS (2005)	United States, Australia
US-Morocco	USA-MAR (2006)	United States, Morocco
US-Bahrain	USA-BHR (2006)	United States, Bahrain
CANADIAN RTAS		
Canada-Israel	CAN-ISR (1997)	Canada, Israel
Canada-Chile	CAN-CHL (1997)	Canada, Chile
Canada-Costa Rica	CAN-CRI (2002)	Canada, Costa Rica
Canada-EFTA	CAN-EFTA (2009)	Canada, Iceland, Liechtenstein, Switzerland

* Because the Central American Common Market (CACM) contains essentially the same members as the U.S.-Dominican Republic-Central American Free Trade Agreement (CAFTADR) in 2006, the former is coded into the database from 1992-2005 and the latter from 2006-2008 such that they are defined mutually exclusive

Table 2. World Trade Organization Definition of Agricultural Products

MTN Category	HS-2007 Code or Chapter
Animal Products	01, 02, 1601-1602
Dairy Products	0401 - 0406
Fruits, Vegetables, and Plants	07, 08, 1105-1106, 2001-2008, 0601-0603, 1211, 13, 14
Coffee & Tea	0901-0903, 18 (except 1802), 2101
Cereals & Preparations	0407-0410, 1101-1104, 1107-1109, 19, 2102-2106, 2209, 10
Oilseeds, Fats, & Oils	1201-1208, 15 (except 1504), 2304-2306, 3823
Sugars & Confectionary	17
Beverages & Tobacco	2009, 2201-2208, 24
Cotton	5201-5203
Other Agricultural Goods	05, 0604, 1209-1210, 1212-1214, 1802, 230110, 2302-2303, 2307-2309, 290543-290545, 3301, 3501-2505, 380910, 382460, 4101-4103, 4301, 5001-5003, 5301-5302

Source: http://www.wto.org/english/res_e/booksp_e/tariff_profiles06_e.pdf (pg 24-25)

Table 3. Trade Flow Effects of Regional Trade Agreements

	(1)	(2)	(3)	(4)	(5)
	No fixed Effects	Year Fixed Effects	Year & Country-Pair Fixed Effects	Country-by-Time Fixed Effects	Country-Pair and Country-by-Time Fixed Effects
GDPit	0.80***	0.81***	0.20***		
	(0.00)	(0.00)	(0.00)		
GDPjt	0.68***	0.69***	0.57***		
	(0.00)	(0.00)	(0.00)		
Distance	-0.91***	-0.91***		-1.33***	
	(0.00)	(0.00)		(0.00)	
Border	1.38***	1.35***		1.10***	
	(0.00)	(0.00)		(0.00)	
Language	1.00***	1.02***		0.90***	
	(0.00)	(0.00)		(0.00)	
LL Exporter	-0.08***	-0.04***			
	(0.00)	(0.01)			
LL Importer	-0.53***	-0.50***			
	(0.00)	(0.00)			
RTA	0.81***	0.97***	0.41***	0.26***	0.72***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RTA-Import Diversion	-0.41***	-0.27***	-0.08***	-0.13***	-0.09***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	241,989	241,989	241,989	241,989	241,989
R^2	0.434	0.446	0.854	0.538	0.860
RMSE	2.563	2.535	1.381	2.321	1.354

Note: the dependent variable is the natural logarithm of bilateral agricultural trade. RTA is a generic dummy variable representing 11 regional blocs presented in Table 1. RTA-Import Diversion is a dummy variable denoting extra-bloc imports from non-members. P-values are in parentheses. Asterisks *, **, and *** denote statistical significance at the ten, five, and one percent levels, respectively

Table 4. RTA Blocs Compared to Canada and U.S. Bilaterals, 1992-2008

	(1)	(2)	(3)	(4)
	Regional Blocs	Regional Blocs + US/Canadian Bilaterals	Regional Blocs + US/Canada Bilaterals & CAN-EFTA	Regional Blocs + US Bilaterals & Canada-Based RTAs
GDPit	0.82***	0.82***	0.82***	0.82***
	(0.00)	(0.00)	(0.00)	(0.00)
GDPjt	0.67***	0.67***	0.67***	0.67***
	(0.00)	(0.00)	(0.00)	(0.00)
Distance	-0.94***	-0.94***	-0.94***	-0.94***
	(0.00)	(0.00)	(0.00)	(0.00)
Border	1.30***	1.30***	1.30***	1.30***
	(0.00)	(0.00)	(0.00)	(0.00)
Language	1.00***	0.99***	0.99***	1.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Exporter Landlocked	-0.03**	-0.03**	-0.03**	-0.03**
	(0.03)	(0.03)	(0.03)	(0.03)
Importer Landlocked	-0.49***	-0.49***	-0.49***	-0.49***
	(0.00)	(0.00)	(0.00)	(0.00)
EU/EC	0.88***	0.88***	0.88***	0.88***
	(0.00)	(0.00)	(0.00)	(0.00)
NAFTA	0.97***	0.98***	0.98***	0.98***
	(0.00)	(0.00)	(0.00)	(0.00)
CAFTADR	2.63***	2.63***	2.63***	2.63***
	(0.00)	(0.00)	(0.00)	(0.00)
MERC	1.83***	1.83***	1.83***	1.83***
	(0.00)	(0.00)	(0.00)	(0.00)
CAN	0.82***	0.82***	0.82***	0.82***
	(0.00)	(0.00)	(0.00)	(0.00)
SADC	1.46***	1.46***	1.46***	1.46***
	(0.00)	(0.00)	(0.00)	(0.00)
COMESA	0.75***	0.75***	0.75***	0.75***
	(0.00)	(0.00)	(0.00)	(0.00)
ASEAN+	1.63***	1.63***	1.63***	1.63***
	(0.00)	(0.00)	(0.00)	(0.00)
SAARC	0.83***	0.83***	0.83***	0.83***
	(0.00)	(0.00)	(0.00)	(0.00)
ASIAN Bilaterals	2.05***	2.06***	2.06***	2.06***
	(0.00)	(0.00)	(0.00)	(0.00)
CACM	2.02***	2.02***	2.02***	2.02***
	(0.00)	(0.00)	(0.00)	(0.00)
U.S. Bilaterals		1.49***	1.49***	1.48***
		(0.00)	(0.00)	(0.00)
Canada Bilaterals		1.70***	1.70***	

		(0.00)	(0.00)	
Canada-EFTA			0.56	0.56
			(0.45)	(0.45)
Canada-Israel				-0.14
				(0.79)
Canada-Chile				3.04***
				(0.00)
Canada-Costa Rica				2.58***
				(0.00)
Observations	241,989	241,989	241,989	241,989
R-squared	0.45	0.45	0.45	0.45
RMSE	2.53	2.53	2.53	2.53

Note: the dependent variable is the natural logarithm of bilateral agricultural trade. U.S. Bilaterals is a generic dummy variable representing seven U.S.-based bilateral RTAs that have entered into force over the sample period (see Table 1). Canadian Bilaterals is a generic dummy variable representing three bilateral RTAs that entered into force over the sample period. P-values are in parentheses. Asterisks *, **, and *** denote statistical significance at the ten, five, and one percent levels, respectively

Table 5. RTA Bloc Import and Export Diversion Estimates, 1992-2008

	EU/EC	NAFTA	CAFTADR	MERC	ANDEAN	SADC	COMESA	ASEAN+	SAARC	ASIAN Bilaterals	CACM
Trade Creation	1.22***	1.39***	2.85***	2.04***	0.99***	1.51***	0.87***	1.92***	1.13***	2.54***	2.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Import Diversion	0.15***	-0.59***	-0.83***	-0.90***	-0.88***	-0.44***	-0.19***	0.16***	-0.17***	-0.07*	-0.81***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
Export Diversion	0.79***	0.81***	0.77***	2.39***	0.56***	0.74***	0.50***	1.71***	0.46***	0.76***	1.15***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations = 241,989											
R^2 = 0.48											
RMSE = 2.46											

Note: the dependent variable is the natural logarithm of bilateral agricultural trade. Standard gravity coefficients for distance, language, borders and landlocked countries are omitted for brevity. Import Diversion is a dummy variable denoting regional bloc imports from non-member countries. Export Diversion is a dummy variable denoting regional bloc exports to non-member countries. P-values are in parentheses. Asterisks *, **, and *** denote statistical significance at the ten, five, and one percent levels, respectively.

Table 6. Region-Specific Import Diversion, Selected RTAs, 1992-2008, Year Fixed Effects

	IMPORTING RTA BLOC										
Exporting Non-RTA Region	**EU/EC**	**NAFTA**	**CAFTADR**	**MERC**	**ANDEAN**	**SADC**	**COMESA**	**ASEAN+**	**SAARC**	**ASIAN Bilaterals**	**CACM**
Africa	0.54***	-0.92***	-1.08***	-1.20***	-0.83***	-0.37***	0.03	0.90***	0.96***	-0.28***	-0.35***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.71)	(0.00)	(0.00)	(0.00)	(0.00)
North America	0.06	----	0.93	-0.10	0.85***	-1.19***	-0.23	0.86***	-0.08	1.60***	0.75***
	(0.50)	----	(0.13)	(0.56)	(0.00)	(0.00)	(0.16)	(0.00)	(0.64)	(0.00)	(0.00)
Other Americas	1.14***	-0.21***	-0.41***	-1.73***	-0.64***	0.12	0.49***	0.23***	-0.23**	0.49***	-0.92***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.15)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Asia	-0.70***	-0.91***	-1.25***	-0.78***	-1.45***	-0.45***	-0.45***	-0.60***	-0.33***	-0.57***	-1.48***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Europe	-1.01***	-0.29***	-1.03***	-0.80***	-0.97***	-0.83***	-0.40***	-0.49***	-1.07***	-0.20**	-0.87***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Oceania	1.30***	0.01	2.05***	0.10	1.00***	0.63***	0.60***	1.61***	1.78***	0.75***	1.22***
	(0.00)	(0.95)	(0.00)	(0.60)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations = 241,989											
R^2 = 0.47											
RMSE = 2.49											
USA[a]	0.50***	----	----	0.49	1.49***	-0.65***	0.74***	1.43***	0.05	1.91***	1.97***
	(0.00)	----	----	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.85)	(0.00)	(0.00)
Canada[a]	0.12	----	1.11*	0.30	2.05***	-1.15***	-0.32	1.24***	0.91***	2.24***	0.63**
	(0.42)	----	(0.10)	(0.32)	(0.00)	(0.00)	(0.23)	(0.00)	(0.00)	(0.00)	(0.04)
All Non-RTA Exporters except US & Canada[a]	0.10***	-0.66***	-0.88***	-1.09***	-0.97***	-0.50***	-0.22***	-0.03	-0.21***	-0.20***	-0.93***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.26)	(0.00)	(0.00)	(0.00)
Observations = 241,989											
R^2 = 0.45											
RMSE = 2.52											

Note: the dependent variable is the natural logarithm of bilateral agricultural trade. Standard gravity coefficients for distance, language, borders and landlocked countries are omitted for brevity. *P-values* are in parentheses. Asterisks *, **, and *** denote statistical significance at the ten, five, and one percent levels, respectively

[a/] Estimated in a separate regression. Standard gravity coefficients not reported for ease of exposition