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THE NEW WAVE OF REGIONALISM: DOES OUTSIDER/INSIDER STATUS AFFECT THE COMPETITIVENESS OF U.S. AGRICULTURAL EXPORTS?[1]

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Abstract

The degree to which countries are pursuing regional trade agreements (RTAs) has been nothing short of extraordinary. The topic of regional integration is "breeding concern" among academics and policymakers as to the intra- and extra-regional effects of these agreements. This study constructs and uses an updated database of agricultural trade flows from 1992-2008 to shed light on the degree to which insider and outsiders status affects U.S. agricultural exporters and its competing suppliers. Regarding outsider status, we modify the existing approach by incorporating region-specific extra-bloc trade flow variables to examine the degree to which RTAs divert trade from specific regions of the world. 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.

Introduction

President Obama declared a National Export Initiative in his 2010 State of the Union address. This initiative calls for a doubling of U.S. 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.

The establishment of U.S. free trade agreements with South Korea, Columbia, and Panama, on hold until ratified by Congress, would likely expand U.S. exports, facilitating achievement of the Administration's goal. Moreover, the creation of the envisioned Trans-Pacific Partnership (TPP) promises to increase U.S. exports, including many goods from the agricultural sector, by deepening integration of the U.S. economy with the fast-growing Asia-Pacific region.

Recently, U.S. policymakers within USDA have expressed concern that the large number of bilateral/regional trade agreements (RTAs) to which the United States does not belong may erode U.S. presence in foreign markets. Concern about the loss of U.S. markets has been heightened due to the emergence of many new agreements in recent years (e.g., Mexico-EU, 2000; ASEAN-China, 2003; ASEAN-Japan, 2008; Canada-EFTA, 2008; ASEAN-Australia-New Zealand, 2009). Currently, negotiations are underway that could lead to the establishment of yet more trade agreements that exclude the United States. Talks about forming such RTAs are taking place between Australia and China, EU-South-Korea, EU-Colombia, and EU-Canada, and among the 10-member ASEAN countries who are also negotiating with South Korea, Japan, and China to create an Asian bloc, known as the "ASEAN + 3".

RTAs have clearly become an increasingly prominent feature in the global marketplace in recent years. In an article published in 2005, Crawford and Fiorentino (2005) noted that the world has entered into one of the most prolific periods of RTA formations in recorded history. 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 will oversee 462 RTAs in the coming years.

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 a RTA. Second, RTAs can facilitate deep 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 a large number of *ex post* econometric analyses using gravity equations (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 new 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 majority of applied studies found in the literature have focused on the degree to which mutual RTA membership expands trade among partner countries using total merchandise trade. The effect of RTAs on members' agricultural trade has, until recently, received very little attention. Grant and Lambert 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 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.

Todate, relatively few empirical studies have attempted to quantify the extent to which RTAs may have discriminated against non-member suppliers by curtailing their exports to RTA members. Yet, *outsider status as a competitor* in world markets is an important issue. Outsider status refers to an exporter's ability to supply goods to countries that belong to RTAs to which it is not affiliated. Together, outsider status as well as insider status is an issue of particular concern to countries like the United States, who is a member of relatively few RTAs. The trade implications of RTA outsider and insider status form the basis of this study.

The purpose of this study is to examine the new wave of regionalism, characterized by the growing prominence of RTAs shaping world trade, and to identify

its implications for U.S. and competitor agricultural exporters. Several questions arise: 1) To what extent do RTAs involving the *United States* expand agricultural trade to member countries? 2) How do these U.S.-based RTAs measure up against other regional and bilateral agreements in world agricultural trade? 3) Do RTAs to which the United States does not participate reduce U.S. agricultural exports? 4) How does outsider status affect agricultural exports by other countries? To address these questions use is made of a new trade database and different versions of econometric gravity equations that 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. Outsider trade (i.e., extra-bloc trade) refers to trade between RTA member countries with non-member countries. Parameter estimates from the various models that quantify RTA impacts on partner trade in agriculture are compared and analyzed.

Methodology

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

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)

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

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

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. [2] $Intra\text{-}RTA_{ijt}$ 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 trade vary considerably across individual agreements. Further, equation (3) does not consider US-based RTAs. Collapsing the standard gravity variables (β_t, GDP, distance, borders, language and landlocked countries) into $\boldsymbol{XB}$ our second estimating equation is:

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

where, $US - RTA_{ijt}^n$ is a set of n = 7 bilateral RTAs (involving 2 countries) the US has 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 US-based RTAs.

[2] Ten regional blocs, listed in Table 1, are considered in the construction of $Intra\text{-}RTA_{ijt}$ and $Extra\text{-}RTA_{ijt}$. 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.

Next we turn attention to potential adverse effects on U.S. agricultural exports as a result of the increasing number of RTAs in world trade to which the United States does not participate. This is an issue of particular concern to U.S. policymakers given the relatively few agreements involving the United States 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. While U.S. policymakers have expressed interest in participating in bilateral and plurilateral talks with Asian countries, only the U.S.-Korea and Trans-Pacific Partnership are on the U.S. radar screen.

While many studies have evaluated the overall economic payoffs from RTAs (Grant & Lambert and Baier & Bergstrand), few studies have considered the possible trade diverting effects of RTAs on non-member agricultural exports.[3] 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.[4]

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

$$(5) \qquad \ln T_{ijt} = \mathbf{X}\boldsymbol{\beta} + \sum_r \theta^r \, Intra - RTA_{ijt}^r + \sum_r \delta^r \, ExtraRTA - IMP_{ijt}^r$$

[3] Notable exceptions are Koo *et al,* 2006; Vollrath *et al*, 2009; and Lambert and McKoy, 2009. However, these authors did not consider US agricultural exports explicitly.
[4] Zahniser *et al.,* (2004) is an exception.

$$+\sum_r \lambda^r ExtraRTA-EXP_{ijt}^r+\varepsilon_{ijt}$$

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 ($j \notin r$). We posit 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, we modify equation (5) to reflect *region–specific*, extra-bloc trade diversion:

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

where, r denotes the ten regional trade blocs considered (table 1), and m is introduced to denote a 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 m region-specific import diversion variables. For instance, if r = European Union, then there are m = 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 U.S. agricultural exports as well as all other agricultural suppliers:

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

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, $ExtraRTA - EXP - OTH_{ijt}^r$ is a dummy variable equal to one if exporter *i* is any other country (other than the US) who exports to importer *j*'s market, where *j* is a member of RTA *r* but *i* is not ($OTH \notin r;\ j \in r$).

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 and a number of bilateral agreements involving the U.S.). Agricultural bilateral trade values over the period 1992-2008 are retrieved from the United Nations Commodity Trade Statistics Database (Comtrade)[5]. 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).

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

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 year, we summed the value of trade over the 10 MTN agricultural categories to arrive at total 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.[6] 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.[7]

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

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

[7] 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 help define equilibrium (Helpman, Melitz, and Rubinstein 2008).

countries and time periods.[8] 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).[9]

Ten regional trade blocs along with seven U.S. bilateral agreements have entered into force over the sample period. 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.

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. In section two, we present the results from estimating a more flexible specification of the gravity model in which each of the ten regional blocs is allowed to have its own coefficient. We also add U.S. bilateral RTAs to the picture. Section three shifts attention to the trade diverting effects of each of the ten regional blocs. In section 3, we make use of generic export and import diversion variables to gauge the overall impact of RTA trade on nonmember countries. Finally, in section four, we present a more detailed analysis of the extra-bloc

[8] 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/

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

RTA effects by focusing on specific geographic regions of non-member countries as well as on the United States alone.

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 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, some of this increase in intra-bloc trade has come at the expense of non-member exports (RTA imports from non-members). Trade with non-members decreased by 34 percent ((exp(-0.41)-1)*100).

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. Here the RTA effect is to double members' agricultural trade which is remarkably similar to the results found in Baier and Bergstrand using total merchandise trade.

Regional Blocs and U.S. 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 RTAs. Moreover, the previous scenario omitted U.S. bilateral RTAs. This section shows the empirical results of equation 4 which allows each regional bloc to have its own coefficient and adds 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.[10] Because gravity equations do not include control for unobserved heterogeneity, they tend to inflate the policy variable of interest (RTA dummy variable) (see Egger, 1997; Mátyás, 2000). Consequently our results should be interpreted as an upper bound of the potential effects of RTAs.

The results are impressive (table 4). Agricultural trade is boosted by the formation of regional blocs in all RTAs 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.[11] Similarly, NAFTA, the various EU expansions, Mercosur, Andean (CAN), SADC, COMESA, ASEAN plus China and Japan (ASEAN+), and the SAARC all stimulate members' agricultural trade (column 1, table 4).

Column (2) adds a generic US bilateral RTA dummy which captures the average trade flow effect of the seven free trade agreements the U.S. has with its partners. The results suggest that US-based bilateral free trade agreements have increased members' agricultural trade by 339 percent! Column (3) separates new and old US-based bilateral RTAs. New agreements are those that entered into force after 2004 (U.S.-Australia, U.S.-Bahrain, and U.S.-Morocco) whereas old agreements are those that entered into force before 2004 (U.S.-Israel, U.S.-Jordon, and U.S.-Singapore). The results for new and old free trade agreements are similar and statistically speaking, there is no significant difference between new and old U.S.-based RTAs. To answer the question whether all U.S.-based bilateral increase members' agricultural trade, column (4) adds each U.S.-

[10] 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.
[11] 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).

based bilateral RTA as an individual variable. With the exception of the U.S.-Bahrain agreement, U.S. free trade agreements have provided a significant boost to members' agricultural trade.

RTA Effects on Non-Member Countries

An equally important policy question facing U.S. agriculture is not whether RTAs have expanded members' trade, but rather, whether U.S. non-participation in the recent wave of regionalism has negatively impacted the competitiveness of its agricultural exports. We begin by estimating equation 5 that contains the generic trade diversion effects of the ten regional blocs considered in this study. For each regional bloc we include the intra-bloc trade creation variable and also add two asymmetric extra-bloc trade diversion variables, one reflecting import diversion and the other export diversion. The results are presented in table 5, where the standard gravity equation coefficients have been suppressed for ease of exposition.

The results continue to support the fact that regionalism has significantly boosted the trade flows of its member nations. Moreover, the formation of each of the ten 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 plus China and Japan (ASEAN+)). 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, 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 compared: (i) Africa; (ii) North America; (iii) Other Americas; (iv) Asia; (v) Europe; and (vi) Oceania. Second, we focus more specifically on the potential impact of trade diversion on 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), not surprisingly, continue to produce large trade diversion effects. The region-specific exporters most impacted adversely by Mercosur include Africa and Other American exporters. Asia and Europe suffered the most trade diversion induced by the Andean

Pact. The fact that import trade diversion in Mercosur is strongest against Other American countries is particularly noteworthy because these exporters are located in central and south America and are neighbors to the Mercosur countries. On the other hand, North American and Oceania exporters actually saw their agricultural exports rise to Andean Pact RTA members. By contrast, import diversion against North America and Oceania was not significant in the case of Mercosur.

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 appear to be relatively open to North American agricultural exports although the effect for CAFTADR is not significant.[12] 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 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, in contrast to the 8 other agreements. However, one of the fundamental results produced in this paper is that RTA import diversion can produce a positive coefficient resulting in no *net* import diversion when considering all non-member countries, but this is not to say that the RTA is not *gross* import diverting with respect to some regions. This is exactly what is happening in the case of the EU/EC and ASEAN+. Net import diversion for both RTAs is positive as suggested by the results in table 5. However, both RTAs are gross trade diverting (in the form of import diversion) against Asia and Europe.

[12] 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.

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.

The final noteworthy result in table 6 concerns the import diversion effects against the U.S. compared to all other countries (see, lower half of table 6). U.S. 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. The only RTA exhibiting a decline in U.S. agricultural exports is member nations of the South African Development Community (SADC). Here, U.S. agricultural exports decreased by 48 percent on average. Many of the remaining RTAs show positive and statistically significant import diversion coefficients pertaining to U.S. agricultural exports with noteworthy positive impacts in the Andean Pact, ASEAN+, and the CACM.

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 the United

States are now concerned with the prospect of an Asian bloc creating a barrier down the center of the pacific.

This study examines the new wave of regionalism, characterized by the growing prominence of RTAs shaping world trade patterns, and identifies its implications for U.S. agricultural exporters and its competing suppliers. 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. 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 begins to bridge these gaps.

The results show that the formation of RTAs provides a significant boost to members' agricultural trade. This result was found using both aggregate and specific RTA coefficients. 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. Further, the parameter estimates show that agricultural trade is boosted by many of the U.S. bilateral RTAs it has signed over the past decade and a half. With the exception of the U.S.-Bahrain agreement, U.S.-based RTAs have increased members' trade by a remarkable 339 percent relative to trade between two non-member countries.

Next, we addressed the issue of trade diversion more closely because we believe policy-makers are interested in not only whether a RTA is trade diverting, but which countries are impacted by trade diversion. This is an issue of particular concern to U.S. policymakers given the relatively few agreements to which the United States belongs. The results show that each of the 10 regional blocs did not adversely affect RTA member exports to non-member countries. This finding suggests that RTAs may generate economies of scale and productivity increases that increase members' competitiveness in world markets. The results do, however, suggest that most RTAs discriminate against imports coming from non-member countries on average (i.e., non-member agricultural exports to RTA member markets), the exceptions being the EU/EC and ASEAN+ agreements.

We then developed a framework from which to identify which geographical regions has been adversely affected due to RTA import diversion. Several interesting results emerged from this analysis. First, all 10 RTAs exhibit import diversion with respect to at least one group of non-member exporting countries. Secondly, for some RTAs, trade diversion was found to have displaced exports from neighboring countries. Trade diversion resulting from the formation of Mercosur impacted Central and South America to a greater degree than in 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, we examined import diversion affecting U.S. agricultural exports. This analysis provided empirical evidence that the United States, unlike most other non-RTA-specific suppliers, has not been adversely affected by the latest wave of regionalism which began in the 1990's. The only RTA exhibiting a decline in U.S. agricultural exports is the South African Development Community (SADC). The average SADC country decreased its agricultural exports from the United States by 48 percent. Many of the other RTAs, by contrast, show not only positive but statistically significant import diversion coefficients pertaining to U.S. agricultural exports.

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Table 1. Regional Trade Agreements Included in Sample

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)
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

* Because the Central American Common Market (CACM) merged with 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 from one another

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, 1992-2008

	(1) No fixed Effects	(2) Year Fixed Effects	(3) Year & Country-Pair Fixed Effects	(4) Country-by-Time Fixed Effects	(5) 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-Trade Creation	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 10 regional blocs noted 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. Regional Blocs and US-Based Bilateral RTAs, 1992-2008, Year Fixed Effects

	(1) Regional Blocs	(2) Regional Blocs & U.S. Bilaterals	(3) Regional Blocs & U.S. Bilaterals (new/old)	(4) Regional Blocs & U.S. Individual Bilaterals
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	-0.93***	-0.94***	-0.94***	-0.94***
	(0.00)	(0.00)	(0.00)	(0.00)
Border	1.31***	1.31***	1.31***	1.31***
	(0.00)	(0.00)	(0.00)	(0.00)
Language	1.00***	1.00***	1.00***	1.00***
	(0.00)	(0.00)	(0.00)	(0.00)
LL Exporter	-0.03**	-0.03**	-0.03**	-0.03**
	(0.03)	(0.03)	(0.03)	(0.03)
LL Importer	-0.50***	-0.50***	-0.50***	-0.50***
	(0.00)	(0.00)	(0.00)	(0.00)
EU/EC	0.87***	0.88***	0.88***	0.88***
	(0.00)	(0.00)	(0.00)	(0.00)
NAFTA	0.96***	0.97***	0.97***	0.97***
	(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	1.82***	1.82***	1.82***	1.82***
	(0.00)	(0.00)	(0.00)	(0.00)
CAN	0.81***	0.81***	0.81***	0.81***
	(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)
CACM	2.02***	2.02***	2.02***	2.02***
	(0.00)	(0.00)	(0.00)	(0.00)
U.S. Bilaterals		1.48***		
		(0.00)		
U.S. Bilaterals (old < 2005)			1.51***	
			(0.00)	
U.S. Bilaterals (new > 2004)			1.38**	
			(0.02)	
U.S. – Israel				1.13***
				(0.01)
U.S. - Jordan				1.31*
				(0.05)
U.S. - Chile				3.09***
				(0.00)
U.S. – Singapore				1.48*
				(0.06)

U.S. – Australia				2.07**
				(0.02)
U.S. – Bahrain				-0.60
				(0.60)
U.S. - Morocco				2.10**
				(0.04)
Observations	241989	241989	241989	241989
R^2	0.447	0.447	0.447	0.447
RMSE	2.534	2.534	2.534	2.534

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). *U.S. Bilaterals (old < 2005)* is a dummy variable representing U.S.-based bilateral RTAs that entered into force prior to 2005. *U.S. Bilaterals (new > 2004)* is a dummy variable representing U.S.-based bilateral RTAs that entered into force after to 2004. (see Table 1). *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	CACM
	---------- Regression 1 ----------									
Trade Creation	1.18***	1.32***	2.82***	2.01***	0.96***	1.50***	0.86***	1.89***	1.10***	2.00***
	(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***	-0.91***	-0.88***	-0.45***	-0.19***	0.16***	-0.17***	-0.82***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Export Diversion	0.73***	0.72***	0.71***	2.33***	0.51***	0.70***	0.46***	1.64***	0.41***	1.12***
	(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 import 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									
Exporting Non-RTA Region	**EU/EC**	**NAFTA**	**CAFTADR**	**MERC**	**ANDEAN**	**SADC**	**COMESA**	**ASEAN+**	**SAARC**	**CACM**
Africa	0.54***	-0.92***	-1.07***	-1.20***	-0.83***	-0.37***	0.02	0.90***	0.97***	-0.35***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.74)	(0.00)	(0.00)	(0.00)
North America	0.06	----	0.94	-0.10	0.85***	-1.19***	-0.23	0.86***	-0.08	0.75***
	(0.48)	----	(0.13)	(0.57)	(0.00)	(0.00)	(0.15)	(0.00)	(0.65)	(0.00)
Other Americas	1.14***	-0.21***	-0.41***	-1.73***	-0.64***	0.12	0.49***	0.23***	-0.23**	-0.93***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.15)	(0.00)	(0.00)	(0.01)	(0.00)
Asia	-0.70***	-0.91***	-1.25***	-0.78***	-1.45***	-0.45***	-0.45***	-0.60***	-0.33***	-1.48***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Europe	-1.01***	-0.28***	-1.03***	-0.80***	-0.97***	-0.82***	-0.39***	-0.49***	-1.07***	-0.87***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Oceania	1.30***	0.01	2.06***	0.10	1.00***	0.63***	0.60***	1.60***	1.78***	1.22***
	(0.00)	(0.96)	(0.00)	(0.60)	(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***	----	----	0.48	1.48***	-0.65***	0.74***	1.43***	0.05	1.95***
	(0.00)	----	----	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)	(0.86)	(0.00)
All Non-RTA Exporters except USA[a]	0.11***	-0.64***	-0.84***	-1.06***	-0.92***	-0.51***	-0.22***	-0.00	-0.19***	-0.90***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.88)	(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