REGIONALISM WITHOUT REGIONS: THE ECONOMIC IMPACTS OF CROSS-REGIONAL TRADE AGREEMENTS

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Abstract

The unprecedented spread of regional trade agreements (RTAs) has motivated a significant number of *ex post* empirical studies investigating their trade impacts. Estimates from this growing literature suggest that RTAs can double members' agricultural trade after implementation and phase-in periods are complete. However, as countries reach further around the globe to sign new trade deals, we show that there are significant costs associated with 'unnatural' or cross-regional RTAs because of a non-trivial distance decay in members' intra-regional trade. Adding explicit controls for cross-regional RTAs in a theoretically motivated gravity equation and additional specifications that include interactions with geographical distance and members' proximity to market produces an important result: the trade creating benefit of RTAs declines significantly as members become more geographically isolated and vanishes once a certain threshold is reached. The results have important policy implications in light of the numerous trans-oceanic agreements that have or are currently being negotiated.

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I. Introduction

The proliferation of RTAs is perhaps the single most important international economic development in the world economy since the post-war era. While RTAs have been at the forefront of the trade policy agenda for over 50 years, beginning with the Treaty of Rome which kick-started European integration in 1958, as of December 2015, the latest World Trade Organization (WTO) notifications show that the Committee on Regional Trade Agreements is monitoring over 600 RTAs with 265 agreements in operation. This is up from 180 agreements in 2003, less than 100 agreements in 1995, and just 23 agreements in 1990. Since the advent of the WTO in 1995, the WTO has received an average of 24 notifications of new RTAs per year – an average of two per month – and many countries participate in multiple RTAs.[1]

The term regional trade agreement, as the WTO defines it, is often used to describe any type of reciprocal trade arrangement that grants preferential market access beyond what has been negotiated at the multilateral level. However, the geographical connotation of the word 'regional' is somewhat of a misnomer because the once prevalent idea of 'natural trading blocs' (Krugman 1991) where nations assimilate based on regional proximity, similar economic development levels, or shared cultural, linguistic and political ties, now seems outdated as countries crisscross the globe to sign new trade pacts (Mansfield and Milner 1999). While the European Union (and its many expansions from six to now 28 members), the European Free Trade Agreement (EFTA 1961), The Central American Common Market (CACM, 1960), the North American Free Trade Agreement (NAFTA 1994), the Closer Economic Relations between Australia and New Zealand (ANZERTA) (1983), the Andean Pact (1988), Mercosur (1991), and the Association of South east Asian nations

[1] Over the course of just four months ending in September 2009, the WTO's chairperson of the Council for Trade in Goods announced that 10 new notifications of RTAs had been received.

(ASEAN 1988) dominated the landscape of 'regional' integration, beginning in the 1990s, a new phenomenon - termed cross-regionalism (WTO), transoceanic agreements, or regionalism without regions – reflects a growing trend of trade liberalization outside of traditional boundaries.

For example, since NAFTA the U.S. has pursued free trade agreements with 12 other countries, including countries such as Australia where nearly 10,000 miles separate the two countries. EU members have negotiated extra-regional trade agreements with over 30 other countries, including with neighborly countries such as Switzerland and Norway but also with remote partners such as Canada, Mexico and South Africa. When the original signatories of the General Agreement on Tariffs and Trade (GATT) ratified Article XXIV (Customs Unions and Free Trade Agreements) in 1947 as an exception to the rule of non-discrimination, they likely did not foresee the incredible propensity with which Member countries would seek out RTAs beginning some 40 years later.

Recent advances in the specification of the gravity equation has shed new light on the trade creating benefits of regionalism (Baltagi, Egger, and Pfaffermayr 2003; Santos-Silva and Tenreyro 2006; Baier and Bergstrand (B&B) 2007, Grant and Lambert 2008; Sun and Reed 2010; Grant 2013). B&B (2007) demonstrated that RTAs approximately double members' trade. Focusing on agriculture, Grant and Lambert (2008) find even larger intra-regional trade effects: *"The cumulative effect of RTAs is to increase members' agricultural trade by 149% after 12 years of phase-in"* (p.779). Koo, Kenedy, and Skripnitchenko (2006) find that the average RTA increases members' agricultural trade by 95 percent. Lambert and McKoy (2009) report a 153 and 101 percent increase in agriculture and food-based trade, respectively. Equally impressive RTA effects have been documented in Vollrath and Hallahan (2011), Sun and Reed (2010), Karemera and Koo (2007), Vollrath, Hallahan and Gelhar (2009), Jayasinghe and Sarker (2008), and Sarker and Jayasinghe (2007).

While these studies have certainly advanced our understanding of the trade creating potential of RTAs, an important policy question is: what factors are responsible for the impressive agricultural trade increases RTAs seem to generate? One important, although largely untested, factor is whether the success of economic integration is conditional on the formation of 'natural' agreements along continental lines (Krugman 1991). Since the pioneering work of Viner (1950), Meade (1955) and Balassa (1961), economists have placed RTAs along a continuum extending from autarky to a perfectly integrated zone with member countries reaping greater benefits the further they move along this hierarchy (Do and Watson 2006). However as pointed out initially by Wonnacott and Lutz (1989), and further expanded by Krugman (1991), this continuum breaks down if 'unnatural' or non-neighborly trade agreements are pursued because at some point members will face prohibitive trade and policy coordination costs to serve more distant markets.

Conventional trade theory continues to emphasize geographical proximity to market as a key ingredient for the establishment of international trade agreements not only because of lower transportation and policy coordination costs but also the greater likelihood of sharing cultural, linguistic, and political ties by which greater trade concentration can be achieved. Thus, although cross-regional trade agreements (henceforth CRTAs) are on the rise, to our knowledge, whether the benefits of regionalism for agricultural trade are increasing in the geographical proximity of membership remains an open empirical question.

This article revisits the effects of RTAs on members' agricultural trade conditional on the degree of regionalization embodied in the agreement. First, the WTO's comprehensive database of RTA notifications tracks statistics on the type of agreement notified which permits us to separate agreements into regional and cross-regional types. We then match these agreements to a newly developed global dataset of agricultural trade flows covering 185 countries and 46 years of data (1965-2010) and estimate a more flexible specification of the gravity equation with explicit controls for natural and unnatural RTAs. Second, because there is no formal definition of what constitutes a region other than the WTO's definition of continental boundaries, we perform several robustness checks augmenting the model using interaction effects with geographical distance and proximity to market. Differentiating this interaction equation with respect to RTA and setting it equal to zero permits us to solve for a set of RTA "distance thresholds" beyond which the positive and significant RTA trade effect vanishes.

To preview the results, we find strong evidence in support of Krugman's (1991) natural trading blocs' hypothesis. Regional agreements that fall along continental lines are largely responsible for the impressive agricultural trade flow increases reported in the literature, whereas non-neighborly trade blocs are largely inconsequential, despite the fact that the latter now account for nearly 50 percent of RTAs in global trade. With relatively modest, and oftentimes insignificant agricultural trade effects of cross-regional RTAs, the results cast doubt on the significance of these trade blocs and their discriminatory threat to the multilateral system.

II. The Growth of Regional and Cross-Regional RTAs

With 265 regional trade agreements as of December 2015 and well over two-thirds of these agreements entering into force since the advent of the WTO in 1995, the world economy has experienced a very rapid period of regionalization.[2] A simple method to illustrate this growth – as popularized by the WTO – is to count RTA notifications. Figure 1 plots the cumulative number of

[2] Bhagwati (1993) is an important opponent of this trend. However, Estevadeordal, Freund and Ornelas (2008) show empirically that some agreements not only lower their tariffs with their RTA partners, but also reduce tariffs on imports from countries outside the agreement.

RTAs notified to the WTO, broken down by the type of agreement entered into force over the period 1960-2010.[3] Plotted are the number of regional and cross-regional agreements entered into force over the sample period. The WTO defines cross-regional RTAs as agreements comprising signatories that belong to at least two of the following eleven continental regions: North America, Caribbean, Central America, South America, Europe, The Commonwealth of Independent States (CIS), Africa, the Middle East, East Asia, West Asia, and Oceania. Also plotted in Figure 1 are the number of bilateral arrangements, defined as agreements comprising only two countries.

At first glance, the growth of regionalism is striking. In 1960, only two RTAs existed - the original EU and the European Free Trade Agreement (EFTA) - and both agreements were regionally concentrated. By 1990, 24 RTAs were in force of which one-third (8) were cross-regional agreements as defined by the WTO. In 2000, just ten years later, the total number of regional and cross-regional RTAs increased roughly four-fold to 59 and 27 agreements, respectively. Notable examples of cross-regional RTAs include East-West agreements such as EU-Mexico (2000), and North-South deals such as Canada-Chile (1997) and EU-South Africa (2000). By 2010, the WTO recognized a total of 206 RTAs in force, almost three times the level just ten years earlier.[4] The increasing popularity of cross-regional RTAs is clear, as these agreements – totaling 98 - account for almost 50 percent of RTAs in the world economy (98/206 = 48%). While some cross-regional agreements are between countries whose WTO regions neighbor one another such as the Dominican Republic-Central America free trade agreement (CAFTA-DR) which encompasses three

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[3] For a list of all countries and RTAs considered in this article, see Appendices A and B.

[4] Note that the 206 RTAs in force in 2010 (Figure 1) is less than what the WTO reports in their database. As explained in the data section, this is because the WTO double-counts RTAs when they are notified under Article XXIV covering trade in goods and again if the agreement is also notified under Article V of the General Agreement on Trade in Services (GATS). We eliminate duplicate agreements covering trade in goods and services leaving a total of 206 RTAs in force in 2010.

regions (North America, Central America and the Caribbean), other agreements stretch over 9,000 miles such as U.S.-Australia (2005), USA-Singapore (2004), Chile-Korea (2004), Peru-Singapore (2009), and many others. At the extreme, the Chile-China (2006) RTA spans over 12,000 miles between the two countries.

Also of interest are the types of economic integration agreements countries are pursuing. First, an important feature of the growth of regionalism is that over half of the 206 RTAs that were in force in 2010 are bilateral agreements (105/206) (Figure 1). Second, over 80 percent of the total number of RTAs in 2010 are notified as free trade agreements (170/206 FTAs), whereas customs unions/common markets (CUs) and partial scope arrangements (PSAs) account for just ten (21/206) and seven percent (15/206), respectively. The increasing popularity of free trade agreements is also evident in cross-regional RTAs. Of the 98 cross-regional RTAs currently in force, over 90 percent (89/98) are FTAs with only eight PSAs and one CU. Thus, the spread of regionalism is characterized by: (i) declining geographic proximity as countries reach across the globe to sign new trade deals, (ii) fewer countries per agreement (i.e., bilateral arrangements), and (iii) negotiations that stop short of deeper integration (FTAs).

Simply adding up agreements to illustrate the growth of regionalism, however, is not innocuous because when trade agreements are counted equally but differ widely in terms of their size, depth, and geographic composition, it is difficult to judge their economic significance (Pomfret 2006; Grant 2013). An alternative is to calculate the intra-regional share of world trade taking place within RTAs (Frankel, 1997). Using our newly developed agricultural trade dataset from 1965-2010 and the 206 RTAs that have entered into force throughout the sample period the share of world agricultural trade occurring within RTAs reached 55 percent in 2010, inclusive of intra-EU trade or 43 percent excluding intra-EU trade. Regional agreements account for a larger share of agricultural trade inside RTAs at 24 percent of world agricultural trade in 2010, compared to a small but growing share of 19 percent in 2010 for cross-regional RTAs. However, does this mean that regionally-based agreements with neighborly partners stimulate more intra-regional trade? Or, do regional RTAs include a much larger set of agreements comprised of predominantly developed economies (i.e., EU, NAFTA) compared to their cross-regional counterparts?[5] This is the fundamental problem with trade shares – they do not control for the agreement's size in world trade. By definition, adding more members to an agreement will always increase the intra-regional trade share.

To overcome this limitation a trade intensity, or concentration index, can be used (Frankel 1997; Frankel and Rose 1998). The bilateral trade intensity index (BTTI) identifies destination countries for which the reporting country's exports are concentrated. Let *i* (*j*) denote the exporting (importing) country. The numerator in the BTTI is the share of *i's* exports sent to *j*. The denominator is the share of world (*w*) export's sent to *j*. Thus, the BTTI weights the share of *i's* exports to *j* by the relative importance of the world's exports to *j*. Because both numerator and denominator are shares – one in terms of the partner country (numerator) and one in terms of the world market (denominator) – the BTTI ranges from zero to infinity. The symmetric BTTI (SBTTI), which has a more intuitive appeal, normalizes the BTTI on the domain {-1,+1}, indicating a more intense trade relationship as the SBTTI approaches plus one and a relatively weak trade relationship when the SBTTI approaches minus one.[6]

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[5] Another criticism of regional trade share calculations is that they assume agreements cover all agricultural products which is often not the case (Grant and Lambert 2008; Fulponi, Shearer, and Almeida 2011).

[6] Formally, and letting *X* denote exports, the BTTI = $\frac{X_{ij} / X_{iw}}{X_{wj} / X_{ww}}$ ranges between zero and infinity. The symmetric version (SBTTI) normalizes the BTTI on the (-1,+1) interval as: $-1 < SBTTI = \frac{BTTI - 1}{BTTI + 1} < 1$

Figure 2 traces out the average SBTTI for regional and cross-regional RTAs and provides a first look at what appears to be very stark difference in trade intensities between regional and cross-regional RTAs. The SBTTI for regional RTAs are everywhere positive, reflecting a more concentrated trade relationship, and larger than those for cross-regional RTAs for which the SBTTI is often negative or close to zero. Even within the more recent wave of regionalism from 1995-2010, the SBTTI for regional RTAs ranged from a high of 0.37 in 2000, to a low of 0.24 in 1995. This compares to a high of 0.08 in 2000 and a low of -0.11 for the cross-regional trade agreements.

To get a sense of the differences in geographic proximity between countries, Figure 3 plots the frequency and Kernel density distribution of country-pairs in our sample against the logarithm (log) of geographical distance between country-pairs belonging to regional, cross-regional and those with no RTAs. For each distribution plot, the same horizontal distance scale is used to facilitate comparison. For regional RTAs, the distribution of country-pairs is centered on a log distance of 7.15, compared to cross-regional RTAs which are more widely dispersed (heavier left tail) and centered on a log distance of 8.5. In levels, the mean distance differential between country-pairs in regional and cross-regional RTAs is quite striking at 5,558 kilometers (7,160 km – 1602 km) and a simple difference in means *T-test* between regional and cross-regional country-pairs is easily rejected (*t = 122.7; p-value = 0.00*).[7]

The forgoing analysis appears to support the case for regionally concentrated RTAs – or what Krugman (1991) and Wannocott and Lutz (1989) refer to as 'natural' trade agreements. That is, if policy coordination and trade costs become prohibitive with distance, bilateral trade will have a tendency to remain along continental lines suggesting that cross-regional trade agreements may

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[7] Interestingly, while the test statistic is smaller we also obtain a statistically significant difference in the log distance between country-pairs participating in cross-regional RTAs (mean log distance = 8.46) and those country-pairs not belonging to any RTA (mean log distance = 8.65) (*t = 31.7; p-value = 0.00*).

not deliver the intended trade flow benefits policy-makers often envision when seeking out additional trade agreements. However, there are many other factors influencing bilateral trade along regional and cross-regional lines that are not controlled for when calculating trade shares or intensity indices. To provide a more formal test of the potential trade flow benefits of regional integration, we need a formal model which we develop in the next section.

III. Gravity and Regional Integration

The gravity equation continues to be the workhorse model to evaluate the trade flow impacts of international economic integration (see Cipollina and Salvatici (2010) for a comprehensive survey). Its continued popularity is not only due to its consistent results, but also because of its relatively compact specification which makes it appealing for multilateral and regional integration topics. A popular class of trade models derives economic welfare from the constant elasticity of substitution (CES) framework. While the theoretical development of the gravity equation is explained thoroughly in Anderson and van Wincoop (2003) and Baldwin and Taglioni (2006) (see also Feenstra 2004; Arkolakis, Costinot, and Rodriguez-Clare 2010) below we describe a few differences for sector level analyses such as agriculture.

Denoting x_{ij}^{k} as the nominal value of exports from country *i* to country *j* in goods associated with agricultural industry *k*, consumers in country *j* allocate expenditure E_{j}^{k} on industry *k* goods and consumer preferences over these goods is described by a preference-weighted standard CES utility function. The elasticity of substitution σ^k is specific to industry *k* and assumed to exceed unity such that $\sigma^k > 1$. In addition, producer prices (p_{i}^{k}) in the origin region and landed prices in the destination market (p_{ij}^{k}) are linked via the price linkage equation inclusive of trade costs ($t_{ij}^{k} \geq 1$), whether they are natural as in the case of distance or policy induced ($p_{i}^{k} = t_{ij}^{k} p_{ij}^{k}$).

Assuming all markets clear for industry *k*, then the quantity produced in region *i* will equal the quantity demanded across destination regions *j*, including domestic consumers in country *i*. This implies that the total sales produced in region *o* (Y_{ok}) will equal the sum of consumer expenditures (evaluated at the producer price in region *o*) across demand regions. Imposing market-clearing and solving this equilibrium yields an extended version of Baldwin and Taglioni's (2006, equation (7)) gravity equation that incorporates an explicit industry dimension:

(1) $$x_{ijk} = \frac{\beta_{ijk} Y_{ik} E_{jk} t_{ijk}^{1-\sigma_k}}{\Omega_{ik} \left(P_{jk}\right)^{1-\sigma_k}}$$

where, β_{ijk} is a preference parameter for industry *k* goods supplied by *i* and consumed in *j*, Y_{ik} denotes total sales of goods produced in region *i*, E_{jk} is expenditure on industry *k* goods in region *j*, P_{jk} is the standard inward CES price index measuring nation *j*'s propensity to import from the rest of the world and Ω_{ik} is the outward multilateral resistance term capturing *i's* market potential with respect to its exports to the rest of the world. All other variables are as defined above.

Note that because the CES sub-utility function is homothetic, an increase in E_{jk} will yield a proportional increase in x_{ijk}, all else constant. Furthermore, E_{jk} is not directly observable.[8] Similarly, an increase in the value of production in region *i* (Y_{ik}) will lead to a proportional increase in x_{ijk}, all else constant. However, because data on the value of production (Y_{ik}) for the 185 countries in our sample contain a large number of missing values (due to unobserved producer prices), we follow two alternative approaches. First, we assume that E_{jk} is a function

[8] While in general, E_{dk} is a function of the price indices for each partition in the weakly separable utility function and income, the price indices for each commodity are also not observable which we discuss further below.

of total income (*GDP*) in region *j* such that $E_{jk} = GDP^{\alpha_1}$. Because the overall utility function for the representative consumer in region *j* need not be homothetic, α_1 need not equal one. Similarly we assume that GDP is a useful proxy for the value of industry production[9] and assume $Y_{ik} = GDP^{\alpha_2}$, where the parameter α_2 need not equal one. Second, we can absorb the time-varying influence of both industry expenditure and production as well as each countries inward (P_{jk}) and outward (Ω_{ik}) multilateral resistance terms, which are also likely to be time-varying over the sample period, through the use of country-and-sector specific fixed effects (*ik*, *jk*).

The formation of an RTA affects Ω_{ik} and P_{jt} through the *ad-valorem* trade cost component (t_{ijt}) which we assume depends on the regional or cross-regional nature of the agreement.[10] Adding additional geographic and cultural controls multiplicatively yields the following trade cost function:

$$(2) \qquad t_{ijk} = D_{ij}^{\delta_1} e^{-(\delta_2 AD_{ij} + \delta_3 LA_{ij} + \delta_4 CO_{ij} + \rho^r RTA_{ij}^r)}$$

where, the variable of interest, RTA_{ij}^r, is a dummy variable equal to one if *i* and *j* belong to a regional trade agreement, and zero otherwise. Note here that the parameter ρ and the RTA dummy variable are further indexed by the superscript *r* which we use to denote regional (*re*) and cross-regional (*cr*) trade blocs (i.e., $r \in \{re, cr\}$) as defined by the WTO. That is, although we expect the *ad valorem* trade cost component to fall with the formation of an RTA as evidenced by the negative sign preceding the bracketed term in equation (2), we anticipate that the extent by which t_{ijk} falls

[9] Where data are available, the correlation between the value of agricultural production from the Food and Agricultural Organization (FAO) and GDP is 0.78 in our data.

[10] Because we focus on agricultural trade, we remain in a partial equilibrium industry framework. However, while the general equilibrium case, particularly the non-linear estimation in Anderson and van Wincoop (2003) is appealing, it raises a number of complexities that are beyond the scope of this article. In particular, expenditure (E_{jt}) is assumed to remain constant after the formation of an RTA whereas the general equilibrium case would bring about changes in aggregate expenditure and production through changes in tariffs, wages, product variety, and tariff revenues.

depends critically on whether countries form natural or unnatural RTAs. The remaining variables in equation (2) represent additional controls for geographic and cultural proximity. D_{ij} is the geographical distance between *i* and *j*, and AD_{ij}, LA_{ij}, and CO_{ij} are indicator variables equal to one if *i* and *j* share an adjacent land border (*AD*), speak the same language (*LA*) or whether they have enjoyed a previous colonial link (*CO*), respectively, and zero otherwise.

Suppressing the industry *k* subscript denoting agriculture to ease notation and combining the trade cost specification in (2) with the theoretically motivated, sector-based gravity equation in (1) and taking logs we obtain:

(3) $$\ln x_{ij} = \ln \beta_{ij} + \alpha_1 \ln GDP_j + \alpha_2 \ln GDP_i - (1-\sigma)\ln P_j - \ln \Omega_i$$
$$+ (\sigma - 1)\left(\delta_1 \ln D_{ij} + \delta_2 \ln AD_{ij} + \delta_3 \ln LA_{ij} + \delta_4 \ln CO_{ij} + \rho^{re} RTA_{ij}^{re} + \rho^{cr} RTA_{ij}^{cr}\right).$$

The traditional gravity equation (3) requires several additional refinements for theoretical consistency. First, as noted above, P_j and Ω_i are not directly observable and failure to control for each countries' multilateral indices leads to omitted variable bias (Subramanian and Wei 2007; Feenstra 2004; Baldwin and Taglioni 2006). Second, in the cross-sectional setting, equation (3) cannot control for "natural trading partner" biases when country-pairs are more likely to select into RTAs for trade cost reasons other than those observed on the right-hand side of equation (3) (Baier and Bergstrand 2007; Magee 2008; Grant and Lambert 2008; Grant 2013).[11] For example, the U.S. and Canada are often considered "natural trading partners", even in the absence of the Canada-U.S. (CUSTA) or North American Free Trade Agreement (NAFTA), because both countries share a land border, speak the same language and enjoy a similar set of tastes and preferences. If there are

[11] A host of factors could potentially influence countries' decision to enter into an RTA that do not appear in the right-hand side of equation (8) such as domestic policy issues behind a nation's border, non-tariff measures, shipping regulations, and product standards, to name a few.

trade costs factors influencing countries' decision to select into an RTA but these factors do not change a lot over time, Baldwin and Taglioni (2006) and Baier and Bergstrand (2007) suggest the use of panel data and country-pair (*ij*) fixed effects which allow for a time-invariant U.S.-Canada (and Canada-U.S.) specific intercept to control for "naturally" higher (and lower in the case of other country-pairs) levels of trade, irrespective of whether an RTA is signed.[12] Third, one of the distinguishing features of most RTAs is the fact that they are phased-in over time, particularly for agriculture, as members complete their schedule of trade liberalization commitments (Grant and Lambert 2008; Sun and Reed 2010). As Frankel (1997) notes:, "… the year an agreement is negotiated is different from the year it is ratified, which is in turn different from the year it goes into effect, which is in turn different from the year that the transition period of trade liberalization is completed" (p.78).

To address these concerns, we estimate a more flexible specification of the gravity equation using panel data that control for countries' industry-level expenditure, output and multilateral resistance levels (*it*, *jt*), natural trading partners and other time-invariant trade cost factors (*ij*), explicit controls for regional and cross-regional trade agreements their phase-in periods:

(4) $$\ln x_{ijt} = \alpha_{ij} + \alpha_{it} + \alpha_{jt} + \sum_{r=1}^{2}\sum_{n=0}^{3} \lambda_n^r RTA_{ijt-n}^r + \varepsilon_{ijt},$$

where x_{ijt} is the nominal value of *i's* agricultural exports to *j* in year *t*, α_{it} and α_{jt} are time-varying exporter and importer fixed effects, respectively, α_{ij} is a comprehensive set of dyadic (country-pair) fixed effects ($ij \neq ji$) and ε_{ijt} is a log-normal error term. The double summation in (4) reflects the fact that there is now a concurrent and three-period lagged structure for each of two regional (*re*) and

[12] Importer-exporter fixed effects (i.e., country-pair dummies or the "within" estimator) would soak up all the degrees of freedom in the cross-section. Baldwin and Taglioni (2006) refer to the omission of country-pair fixed effects as part of the "Gold Medal Error" in gravity equation estimation (along with country-specific fixed effects).

cross-regional (*cr*) RTA types (*r*). That is, *n = 0* corresponds to the date the agreement enters into force (*t-0*); *n = 1* is the first period lag (*t-1*); *n = 2* is the second period lag (*t-2*); and *n = 3* is the final period lag (*t-3*). As described in the next section, we use a five-year panel of bilateral trade flows from 1965-2010. Thus, one, two, and three lags represent five, ten and 15 years of RTA implementation and phase-in, respectively. The policy parameters of interest, λ^{re} *and* λ^{cr}, yield the extent to which the average regional (*re*) and cross-regional (*cr*) RTA increases members' agricultural trade.

Krugman's (1991) idea of "natural trading blocs" motivates our core hypothesis (H_1):

(5) $$H_1: \sum_{n=0}^{3} \lambda_n^{re} > \sum_{n=0}^{3} \lambda_n^{cr}$$

The ranking of regional trade agreements in terms of their effect on members' agricultural trade is increasing in the geographical proximity of membership.

As a robustness check, we address two potential shortcomings with equation (4). First, while our initial estimations with explicit regional and cross-regional RTA variables shed considerable light on the trade flow effects of economic integration, the classification is based on the WTO's definition of eleven geographic regions. The choice of continental regions – or where one "draws the line" - could be a point of contention because countries such as Mexico share a land border in close proximity to regional partners in the North (NAFTA) and South (Mexico-Honduras). While the WTO classifies Mexico's membership in NAFTA as a regional agreement (within North America), its bilateral trade agreements with Guatemala, Honduras, Nicaragua and El Salvador on its southern border are cross-regional despite the fact that the geographical distance separating

Mexico and Canada is greater than the distance separating Mexico and its Central American partners.[13]

Thus, although the idea of continental 'regions' in the WTO's terminology is a useful starting place, an important contribution of this paper is to go beyond continental groupings to understand a more fundamental question: to what extent does distance erode the trade flow benefits of preferential trade agreements? While the persistence of the 'distance effect' is well established in international trade (see Disdier and Head 2008) the literature has been virtually silent on the extent to which the distance effect manifests itself inside reciprocal trading arrangements. To gain further insight, equation (4) is augmented by interacting the RTA indicator variable with geographical distance:

$$(6) \qquad \ln x_{ijt} = \alpha_{it} + \alpha_{jt} + \delta_1 \ln D_{ij} + \delta_2 \ln AD_{ij} + \delta_3 \ln LA_{ij} + \delta_4 \ln CO_{ij} + \lambda_1 RTA_{ijt} + \lambda_2 RTA_{ijt} * \ln D_{ij} + \varepsilon_{ijt}$$

where, RTA_{ijt} is now an indicator variable for all RTAs (regional and cross-regional) and all other variables are as defined previously. Note that we continue to retain the important country-by-time fixed effects in equation (4). However, in order to include distance (D_{ij}) and its interaction with RTAs explicitly, country-pair fixed effects (*ij*) have been removed and replaced with distance and standard gravity-like trade cost factors (adjacency (AD_{ij}), common language (LA_{ij}) and prior colonial links (CO_{ij}).

Differentiation of equation (6) with respect to RTA_{ijt} and setting this equal to zero permits us to solve for a predicted distance cutoff or threshold level (D_{ij}^{C}) as follows:

[13] As discussed in the data section, we use Mayer and Zignago's (2006) weighted distance variable which takes into account the most import cities and agglomerations within the country as opposed to the more commonly used distance between the capital cities of two countries.

(7) $$\frac{\partial \ln x_{ijt}}{\partial RTA_{ijt}} = \hat{\lambda}_1 + \hat{\lambda}_2 \ln D_{ij}^C = 0 \Leftrightarrow D_{ij}^C = \exp\left(\frac{\hat{\lambda}_1}{\hat{\lambda}_2}\right)$$

where, D_{ij}^C denotes the geographical distance cutoff level whereby the positive predicted trade flow effect of regional integration ($\hat{\lambda}_1$) is offset by the negative distance effect ($\hat{\lambda}_2$) of implementing trade agreements with more distant and perhaps culturally diverse trading partners.

Finally, because the log of zero is undefined, the dependent variable, ln(x_{ijt}), is limited to country-pairs where trade is strictly positive (Santos-Silva and Tenreyro (SST) 2006; Helpman, Melitz and Rubinstein (HMR) 2008). However, if there are unobservable trade barriers that are correlated with the variables in $z_{ij(t)}^m$, then countries may not select into exporting, even in the presence of an RTA. This explains why zeros may exist in the trade data, but not for random reasons. Santos Silva and Tenreyro (SST 2006) present the Poisson Pseudo-Maximum Likelihood (PPML) model as an appealing solution to deal with the bias associated with omitting zero trade flows. The PPML method estimates the gravity equation multiplicatively without taking the logarithm of x_{ijt} along with the additional assumption that the conditional variance is proportional to the conditional mean. According to SST (2006), the PPML model is robust to different patterns of heteroskedasticity and provides a natural way to address the "zeros" issue. The PPML model is estimated by solving the following first order conditions:

(8) $$\sum_{ij}\left(X^{ij} - \exp(Z^{ij}\hat{\beta})\right) = 0$$

where, *ij* denotes country-pairs, X^{ij} is the levels value of unidirectional exports, Z^{ij} is the full vector of gravity equation covariates, including the RTA variables, and *E* (exp) is the expected value (exponentiation) function. The variables in Z^{ij} can be in logarithms and the estimated coefficients can be interpreted as elasticities even though the dependent variable is in levels. Importantly, the

PPML model produces consistent estimates provided, $E(X^{ij} \mid Z^{ij}) = \exp(Z^{ij}\hat{\beta})$ is satisfied even if the data are not count variables (see Wooldridge 2002, p. 676).

IV. Data

We develop a new dataset of total agri-food trade flows covering 46 years (1965-2010), 185 countries, and 206 bilateral and regional trade agreements (see Appendix Tables A and B, respectively). The trade data are based on countries' reported import statistics to the United Nation's Commodity Trade Statistics (Comtrade) using 4-digit Standard Industrial Trade Classification (SITC, revision 1) product codes. Reported import statistics are used whenever they are available. Following Feenstra et al. (2005), mirrored trade flows, defined as the exporters' reported exports, are employed if the reporting countries' imports are missing and the exporter's statistics are non-zero. The WTO's Multilateral Trade Negotiation (MTN) categories are used to classify agricultural goods.[14]

Distance, common borders and language, and colonial linkages are taken from the *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII) geo-distance dataset developed by Mayer and Zignago (2006).[15] GDP data are taken from two sources: the World Bank's (WB) World Development Indicators (WDI) and the United Nation's National Accounts Main Aggregates Database.[16] Information on regional trade agreements is taken from the WTO's enhanced Regional

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[14] The WTO's MTN categories for agriculture are: (1) animal and meat products; (2) dairy; (3) fruits, vegetables and plants; (4) coffee, tea, and spices; (5) cereals and preparations; (6) oilseeds, fats and oils; (7) sugar; (8) beverages and tobacco; (9) cotton; and (10) other agriculture (confectionary products, hides and skins, etc.). See http://www.wto.org/english/res_e/booksp_e/tariff_profiles06_e.pdf (pgs. 24-25) for more details.

[15] 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.

[16] 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 can be accessed at: http://databank.worldbank.org/data/home.aspx, and UN GDP data can be retrieved at:

Trade Agreements Information System (RTA-IS).[17] In 2010, the WTO reports that 286 RTAs were in force. However, because RTAs covering trade in services are also required to be notified, many agreements are double counted – once when the RTA is notified under Article XXIV covering trade in goods and again if the same RTA is notified under Article V covering trade in services. The US-Morocco FTA, all seven EU enlargements (6 members in 1958, 9 members in 1973, 10 members in 1981, 12 members in 1986, 15 members in 1995, 25 members in 2004, and 27 members in 2007), and many others appear twice for this reason.[18] Removing 80 duplicate agreements leaves a total of 206 agreements (286 – 80 = 206) as shown in Appendix Table A.

The completed (unbalanced) dataset spans the period 1965-2010 at five year intervals (1965, 1970, 1975, . . . , 2010) and contains a total of 303,457 observations. Of this total, 27 (73) percent, or 81,475 (221,982) are zero (positive) trade flows. Nearly ten percent (25,215) of bilateral trade occurs between RTA partners. The number of observations for regional and cross-regional RTAs corresponds to 12,578 and 12,637 observations, respectively, as we might expect given the roughly equal number of regional and cross-regional RTAs currently in force (108 vs. 98, respectively) (Figure 1).

5. Results

The econometric results are organized in three sections. Section one (*Regionalism vs. Cross-Regionalism*) contrasts the results using a single RTA dummy variable versus a more flexible specification that controls for regional and cross-regional RTAs. Section two (Regional vs. Cross-

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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/

[17] Available at: http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx

[18] One could also make the case that the various EU expansions from six to 27 members should be treated as a single agreement with accessions. However, in Appendix Table A we follow the WTO and count each EU enlargement as a separate RTA. In the empirical analysis, the EU is dynamically coded to reflect its changing membership over time.

Regional *with Phase-ins*) controls for the transitional period of trade liberalization for each RTA type through the use of five, ten and 15 year lags. Finally, section three (*Robustness Checks*) proceeds to a set of robustness checks including zero trade flows and distance thresholds.

5.1 Regionalism vs. Cross-Regionalism

We begin by investigating potential differences in the trade flow effects of regional and cross-regional trade agreements. Table 1 presents the econometric results along with cluster robust (by country-pairs) standard errors in parentheses. Two regressions are reported in each column: *All RTAs* and *Regional* & *Cross-Regional*. The *All RTAs* scenario restricts the RTA trade effect to be equal across all agreements, whereas the *Regional & Cross-Regional* scenario allows the RTA coefficient to vary depending on the geographical proximity of partner countries.

The gravity equation applied to agricultural trade produces consistent estimates. Economic size (GDP) is positive and statistically significant in all scenarios. Doubling the economic distance between countries roughly halves trade whereas sharing (speaking) a common border (language) and colonial linkages facilitate trade, as expected. Consistent with previous studies the results reveal that RTAs provide a significant boost to members' agricultural trade (Grant and Lambert 2008; Vollrath and Hallahan 2011, Lambert and McKoy 2009). The results in column (1) with time dummies suggest that RTAs increase members' agricultural trade by 125 percent ((exp(0.81)-1)*100), on average, compared to trade between two nonmembers. With separate importer, exporter and year fixed effects (column 2, *All RTAs*), RTAs stimulate intra-regional trade by 70 percent ((exp(0.53)-1)*100). Adding country-by-time (*it*, *jt*) fixed effects to control for multilateral prices and industry output and expenditure (column 3) changes the results very little. Column (4) addresses both multilateral prices and "natural trading partner" effects by incorporating country-and-time (*it*, *jt*) and bilateral-pair (*ij*) fixed effects (equation (4)). The results are robust. Membership in an RTA increases trade by 52 percent, compared nonmembers.[19]

However, are significant RTA trade increases conditional on whether they are formed between natural or unnatural trading partners? And if so, what are the costs of crossing continental divides to establish new trade deals? The adjacent *Regional & Cross-Regional* scenarios reported in Table 1 shed considerable light and provide new insight on the role of geographical proximity to market to explain the success of regional integration. For example, using our preferred specification (column 4), the results suggests that natural (i.e., regional) trade blocs increase members' trade by an impressive 80 ((exp(0.60)-1)*100) percent. Put differently, the formation of trade agreements with regionally concentrated partners nearly doubles members' agricultural trade. By comparison, cross-regional RTAs increased members' trade by just 14 percent – a result that is at odds with conventional empirical estimate of RTAs employing the gravity equation. Further, testing the equality of regional and cross-regional coefficients is rejected in every specification in Table 1, providing further support of the benefits of natural trading blocs. In short, it appears that the wave of cross-regional trade agreements beginning in the 1990s may not deliver the intended trade flow benefits that policy-makers were likely expecting.

5.2 Regionals and Cross-Regionals with Phase-Ins

While illuminating, the results in the previous section may not reflect the cumulative effect of economic integration since almost all RTAs are phased-in over a 10-15 year time horizon. If cross-regionals are more difficult to negotiate and coordinate on members' trade policy it could be that their trade effects are picked up over the longer run as the transitional periods of trade

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[19] As expected, failing to control for natural trading partner effects through the use of country-pair fixed effects in columns (1) through (3) results in somewhat larger RTA coefficients compared to our preferred specification in column (4) (see also Baldwin and Taglioni 2006).

liberalization are completed. Table 2 considers five, ten, and 15 years of phase-in using one (*t-5*), two (*t-10*), and three (*t-15*) RTA lags, respectively. All regressions reported in Table 2 are estimated on positive trade flows with a comprehensive set of time-varying country specific (*it*, *jt*) and bilateral-pair (*ij*) fixed effects.

Two important results stand out. First, regional integration agreements have persistent and long-lasting effects on trade that are significant up to 15 years compared to cross-regional agreements where lagged effects are often small and statistically insignificant. For example, the cumulative effect of regional RTAs is to increase members' trade by 110 percent ((exp(0.38+0.36)-1)*100) after five years (Scenario 1), increasing to 127 percent ((exp(0.38+0.30+0.14)-1)*100) after ten years (Scenario 2) and an impressive 148 percent ((exp(0.43+0.28+0.20)-1)*100) after 15 years (Scenario 3). This compares to trade increases of ten, nine, and seven percent for cross-regional RTAs after five, ten, and 15 years of phase-in, respectively. Second, hypothesis tests of the ranking of regional and cross-regional RTAs continues to underscore the importance of natural trading blocs. All tests of equality of regional and cross-regional RTAs inclusive of up to three lagged coefficients are easily rejected, both economically and statistically. Thus, despite the fact that cross-regional trade agreements represent almost half of all RTAs notified to the WTO (Figure 1), the results suggest that previous studies have likely underestimated (overstated) the trade flow impacts of regional (cross-regional) integration along continental boundaries.

5.3 Robustness Checks

The forgoing results provide a lot of clarity regarding the proliferation of RTAs and the apparent effectiveness of trading blocs when partners are neighbors compared to when they are distant. However, it is possible that other factors are at play and this section performs several checks. First, the relatively large trade increases of regional agreements could be the result of an

"EU effect". Because the formation and expansion of the EU and its common agricultural policy (CAP) over time is widely considered one of the largest regional RTAs in world agricultural trade, it is important to see if the ranking of economic integration still holds purged of this effect. Second, there are structural differences between regional and cross-regional RTAs in that the former encompass a larger share of developed economies relative to developing countries that are more active in the latter. Third, the previous results may be plagued by specification issues, namely the omission of zero trade flows (SST, 2006).[20] Finally, we revisit the WTO's definition of cross-regional trade agreements. One might wonder whether economically significant differences in the trade creating ability of neighborly and non-neighborly trading blocs holds more generally without having to group countries into predefined regions. Thus, our goal here is to answer a more conventional question: what is the marginal effect of additional kilometers separating RTA member countries? Moreover, if the distance effect does manifest itself inside RTAs, at what level of geographical distance is the positive trade creating benefit of RTAs offset by the negative distance-to-market effect? As numerous industrialized and developing countries consider, or are in the stages of implementing various trans-oceanic agreements (i.e., Canada-EU, US-EU, TPP, etc.), policy-makers are likely to be quite interested in the rate at which the "distance effect" erodes the trade flow benefits of preferential trading arrangements. This final section examines these issues. The results are presented in Table 3.

Column (1) presents the results after removing the EU from the regional RTA variable. The results confirm the fact that the EU has been one of the strongest trade creating natural RTA

[20] If two cross-regional partners did not trade (or traded sporadically) prior to the formation of a cross-regional agreement and the formation of an RTA between them increases trade, the trade effect will tend to be underestimated when omitting zero trade flows. However, the converse situation could bias the results the other way whereby two countries that do not trade with each other prior and subsequent to the formation of an RTA then the true RTA effect is zero and the RTA trade effect will tend to be upwardly biased.

formations in world agricultural trade, increasing members' trade by an additional 180 percent (exp((1.03)-1)*100), on average, relative to two non-member countries. Further support of this can be found by testing the equality of the EU trade effect with that of all other regional agreements which is easily rejected (H_2). More importantly, however, the trade flow differences between regional and cross-regional RTAs remains, even after purging the "EU effect. The effect of regional RTAs (exclusive of the EU) is to increase members' trade by an average of 48 percent, which is more than two-times the modest 14 percent increase for cross-regional RTAs, and testing the ranking of regional compared to cross-regional integration remains unchanged (H_1).

Column (2) considers the development status of country-pairs in regional and cross-regional RTAs. Since regional agreements comprise more developed countries compared to corss-regional agreements, an "industrial country" effect could be operating in the data, although arguments on these grounds are tenuous because country-pair fixed effects controls for naturally higher and lower levels of trade irrespective of whether regional or cross-regional trade agreements exist. Nevertheless, to test this potential bias, three separate regional and cross-regional dummy variables are created: (i) regional and cross-regional high income country trade (HIC^R-HIC^R, HIC^{CR}-HIC^{CR}), (ii) regional and cross-regional HIC with low income (LIC) country trade (HIC^R-LIC^R, HIC^{CR}-LIC^{CR}), and (iii) regional and cross-regional low income country trade (LIC^R-LIC^R, LIC^{CR}-LIC^{CR}).

Interestingly, even with three separate controls for economic development in regional and cross-regional RTAs, natural trading blocs continue to outperform their unnatural counterparts by a significant margin in each development status. For example, regional RTAs between LICs stimulate members' agricultural trade by 84 percent compared to a modest 16 percent effect for LICs in cross-regional agreements. Moreover, all pairwise tests comparing regional and cross-regional RTA effects are rejected (H_3-H_5).

Columns (3) through (6) consider alternative econometric specifications. Column (4) excludes trade less than $0.5 million since low import values are noisy and may be subject to large measurement error. Again, however, the results are little changed (H_1). The effect of regional RTAs is to doubles members' trade ((exp(0.71) – 1)*100 = 103%). Column (5) incorporates country-pair random effects.[21] The results continue to be robust (H_1). Columns (6) and (7) consider nonlinear PPML and Negative Binomial models to address potential selection issues associated with the omission of zero trade flows.[22] The results are remarkably robust, and in fact, do not differ much from our preferred OLS panel-data models. The PPML fixed effects estimator suggests that regional RTAs increase members' trade by 105 percent compared to 17 percent for cross-regional trade agreements (column 5). The fixed-effects negative binomial model changes the results very little, with the exception of a significant and larger cross-regional coefficient. Here, the results suggest that regional RTAs more than double members' trade (127 percent or (exp(0.82)-1)*100), whereas cross-regional agreements increase trade by 41 percent ((exp(0.34)-1)*100).

In columns (7) to (9) we employ a single RTA dummy variable inclusive of regional and cross-regional agreements along with an interaction terms with the log of geographical distance using OLS (column 7), PPML (column 8) and Negative Binomial (column 9) specifications.[23] The results are

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[21] The use of fixed effects is well supported in the empirical trade literature since a random effects specification assumes all unobserved country-pair factors are uncorrelated with the explanatory variables (Egger 2000; Egger and Pfaffermayr 2003). The Hausman Test of fixed versus random effects is easily rejected in column (4) of Table 3, thus supporting the use of fixed effects.

[22] The PPML model has been criticized because it assumes equal dispersion between the conditional mean and variance (Cameron and Trivedi 1990). The negative binomial estimator allows for the second conditional moment to differ from the first and therefore can accommodate problems of over or under dispersion in the data. However, Santos Silva and Tenreyro (2011) also provide simulation evidence that the PPML estimator is well behaved even when the conditional variance is far from being proportional to the conditional mean. Unlike the Poisson model, the Negative Binomial is scale dependent with respect to how the dep. var. is measured (i.e., thousands, millions, etc.). Because we do not take a stand on suitability of either model, we report results for both.

[23] Distance is time-invariant across country-pairs and thus was absorbed previously by the country-pair fixed effects. In order to identify the pure distance effect and its interaction with RTAs, we removed the country-pair (*ij*) fixed effects from columns 7-9 but retain importer and exporter country-by-time dummies (*it*, *jt*) to account for the multilateral price terms.

illuminating and underscore the value of proximity to market in the formation of successful trade agreements. First, for the OLS panel data model, the interaction term of log distance and RTA is negative and statistically significant indicating that doubling the economic distance between RTA partner markets nearly halves trade (-0.58 + - 0.41 = -0.99). Second, differentiation of this equation with respect to RTA and setting it equal to zero permits us to solve for a predicted cutoff value (equation (7)). The RTA distance cutoff is defined as the point at which the additional trade flow increases enjoyed by partners belonging to an RTA is no different than not being in an RTA at all! For the OLS model this threshold is estimated at 9,848 kilometers (exp(3.77/0.41)) or roughly the same distance as nations trading in the ASEAN-Australia-New Zealand (ASEAN-CER), Japan-Switzerland, USA-Israel, EU-Chile, EU-Mexico and many other notable free trade agreements. The estimated distance cutoff in the Poisson model is higher, at 13,360 kilometers, whereas the Negative Binomial model predicts a 9,114 kilometer threshold.

Further evidence of the distance decay in members RTA trade at each distance level is presented in Figure 4. Plotted are the marginal effects on bilateral agricultural trade and the corresponding 95 percent confidence intervals of participation (RTA = 1) and non-participation (RTA = 0) in preferential trade agreement at each level of log distance between country-pairs ranging from a low of 4.1 (approximately 60 km) to a high of 9.9 (approximately 19,950 km). The relationship between predicted bilateral trade margins and logarithmic distance in the three charts in figure 4 is based on the corresponding distance-RTA interaction model estimated in columns 7-9 of table 3.

Several important trends are evident in figure 4. First, all models illustrate a clear distance decay impacting members' agricultural trade inside RTAs. Second, the predicted distance decay in members' trade on average declines more rapidly than country-pairs not participating in RTAs up to the estimated distance threshold, or the point at which the two lines intersect. Third, the predicted trade premiums - defined as the difference in predicted value of agricultural and food trade between country-pairs with and without RTAs – further supports the fact that economic integration with regional partners clearly has its privileges. Fourth, the nonlinear models inclusive of zero trade flows predict a much larger trade premium for regional partners separated by smaller distances compared to the OLS, Panel Data model.

For example, the additional trade flow gain for regional RTA partners at a log distance of six (roughly 400 km) is an impressive $84.9 million worth of agri-food product trade ($108.8 million - $23.9 million) in the PPML model.[24] Under the Negative Binomial model the estimated trade premium is even larger at $150 million, or almost two times the sample mean RTA trade flow of $90 million in 2010. However, as established in column 1 of table 3, the significant trade premium enjoyed at log distances between four and six (roughly 60km to 400 km) is driven to some extent by the EU effect. Thus, it is more instructive to evaluate predicted trade flow margins at log distance values between six and eight (roughly 500km to 3000km) which encompasses a much more diverse set of countries and agreements.[25]

Regional RTA partners continue to enjoy a significant predicted agricultural trade premium. For example, the additional trade flow gain for RTA country-pairs separated by a distance of 1,100 km (log distance of seven) is nearly $21 million worth of agricultural and food trade ($36.6 - $15.6) under the Poisson model and $23 million ($44.2 - $21.2) predicted by the Negative Binomial model.

[24] Note the $43.8 million figure is for the average country-pair in an RTA separated by a log distance of six. For multilateral agreements involving more country-pairs sharing similar geographical separation, the aggregate trade flow gains for the agreement as a whole would be larger.

[25] For context, there are 1,308 country-pair observations with RTAs between the log distance interval of four and six. When we consider log distances between six and eight the number of RTA country-pair observations increases by an order of magnitude to 14,492 observations.

This premium decreases to a predicted premium of nearly $9 ($7) million under the PPML (Negative Binomial) model for RTA partners separated by an average log distance of eight (roughly 3,000 km; i.e., NAFTA trade between Canada and Mexico, CAFTA-DR, EU-Morocco, ASEAN-India) before reaching a log distance of 9.2 (9,848 km) where the trade flow benefit of being part of an RTA is offset by the distance decay in members' trade between partners that are further removed. Notable agreements on or near this predicted threshold include the EU-Mexico, ASEAN-CER, Japan-Switzerland, Canada-Chile, and many others). Because the predicted additional trade flow gains at each value of logarithmic distance up to the distance cutoff are statistically different the results underscore the importance of proximity to market in the formation of regional trade agreements.

6. Conclusions

The proliferation of regional trade agreements is not only viewed as one of the most important international economic developments since the post-war era but it has also intensified the debate on the desirability of these agreements vis-á-vis the multilateral system (Panagariya 2002; Baldwin and Thorton 2008). Counting RTAs, as has been popularized by the WTO, reveals that most countries, and all WTO Members, are party to at least one RTA and many belong to multiple alliances. Further, their impressive impact on members' agricultural and food trade has been well documented in the empirical literature with the majority of studies suggesting that RTAs can double members' trade, on average. Despite this success, less is known about a number of factors contributing to the trade flow gains RTAs seem to stimulate. The once prevalent idea that geographical proximity was a necessary condition to promote and make viable economic integration now seems obsolete as countries reach outside of traditional boundaries to sign new trade deals. However, the extent to which the effectiveness of economic integration depends on the geographical proximity of its membership is an important policy question that, to our knowledge, has remained unexplored in agri-food trade.

This article offered a first look at the trade creating potential of regional and cross-regional trade agreements. First, despite the increased prevalence of cross-regionalism, the results reveal that while economic integration along continental lines is clearly beneficial for members' agricultural trade, cross-regional integration is largely inconsequential. Regional agreements formed along continental lines increase members' agricultural trade by 80 percent compared to just 14 percent for cross-regionals (table 1, column 4). Moving beyond the traditional logarithmic gravity equation to address possible selection issues associated with zero trade flows, we find that the trade effect of regional trading blocs is even stronger, increasing members' agricultural trade by 105 percent compared to a modest 17 percent for cross-regional trading blocs. Moreover, statistical tests of equality of regional and cross-regional trade effects were rejected in every model estimated, even across developing countries who have become more active in signing RTAs and have a vested interest in opening agricultural markets. Thus, the notion of natural trading blocs advocated by Krugman (1991) some 25 years ago appears to be a fundamental condition for the success of economic integration.

Second, pushing this analysis further if we look at the value of non-RTA developing country agricultural trade in the world economy which averaged $9.7 million over the 2000-2010 sample period, the formation of a natural RTA would boost LIC trade by an additional $8.0 million, on average, whereas the formation of unnatural RTAs stimulates an additional $1.6 million. The difference is $6.4 million which we suggest represents the economic costs of cross-regionalism in terms of forgone developing country trade.

MARY – WE MAY NEED A PARAGRAPH ABOUT A FEW CAVEATS OR CAUTIONARY NOTES TO LET REVIEWERS KNOW WE RECOGNIZE SOME OF THE LIMITATIONS OF OUR STUDY

- FIRST, RESULTS DO NOT NECESSARILY IMPLY THAT ALL CROSS-REGIONAL RTAS ARE INCONSEQUENTIAL FOR TRADE. HOWEVER, ON AVERAGE AND CONSIDERING ALL RTAS NOTIFIED TO THE WTO TO DATE OUR RESULTS SEEM TO POINT TO A SIGNIFICANT DECAY IN MEMBERS' CROSS-REGIONAL TRADE. DIGGING FURTHER INTO THE DETAILS TO DETERMINE WHETHER CROSS-REGIONAL RTAS ARE SYSTEMATICALLY ASSOCIATED WITH WEAKER TRADE LIBERALIZATION AS AN EXPLANATION FOR OUR RESULTS IS LIKELY A FRUITFUL AREA FOR FURTHER RESEARCH
- SECOND (AND SIMILARLY) – DISTANCE CUTOFFS WHERE THE RTA TRADE BENEFITS ARE OFFSET BY DISTANCE DECAY AMONG MEMBERS IS A MODEL PREDICTED RESULT THAT MAY NOT BE REPRESENTATIVE OF SOME CROSS-REGIONAL RTAS THAT MAY EXCEED THE PREDICTED CUTOFF AND STILL BENEFIT MEMBERS' AG TRADE. IT MAY ALSO BE INTERESTING TO EXAMINE WHETHER THE DISTANCE CUTOFFS HOLD UP FOR US AND EU CROSS-REGIONAL AGREEMENTS (US-AUSTRALIA; EU-MEXICO, ETC)
- THIRD, OUR RESULTS DO NOT SAY HOW TRADE CONTRACTS WITH CROSS-REGIONALISM. IS IT BECAUSE TRADE PER PRODUCT DECLINES (INTENSIVE MARGIN) OR IS IT THAT CROSS-REGIONALISM LEADS TO A "COMPRESSION EFFECT" WHEREBY EXPORTERS ARE SHIPPING FEWER PRODUCTS TO CROSS-REGIONAL PARTNER MARKETS (EXTENSIVE MARGIN EFFECT). AGAIN WE VIEW THIS AS AN INTERESTING ARE OF FUTURE RESEARCH (AND ONE WE INTEND TO WRITE).

The results should be prefaced with a few caveats. First, the results do not necessarily imply that all cross-regional or trans-oceanic agreements are inconsequential for members' agricultural trade and the new mega-regional trade deals being negotiated may suggest otherwise. However, on average and considering the universe of RTAs notified to the WTO over the last 60 years, our results seem to point to a significant trade decay when coutnries pursue trade agreements with more geographically remote partners. Second, the estimated distance cutoffs where the RTA trade flow benefits are offset by the distance effect on intra-regional trade is a model predicted result that may not be representative of all cross-regional trade deals. Third, our results do not say how trade declines with more geographically remote partners. Is it because average sales per product fall along the intensive margin, or does cross-regionalism lead to a compression effect whereby RTA corss-regional RTA exporters ship fewer products to more distant markets along the extensive margin. Subsequent versions of this paper will attempt to identify these effects.

Notwithstanding these caveats, the implication is clear: regardless of a country's development status, policymakers wishing to expand agricultural trade through free trade agreements would do well to reflect on the significant trade flow gains associated with establishing new or deepening existing regional economic integration agreements. Regional integration generates sizable trade flow gains and establishes an atmosphere conducive to commercial exchange when countries are more familiar with each other's markets and are more likely to share cultural, linguistic and institutional ties. Thus, as the U.S. and EU look East and West to sign major trade deals in T-TIP and the TPP, it is hard to escape the conclusion that the anticipated trade benefits may not be as big as the headlines suggest, and policymakers and trade negotiators would be well served to contemplate the tradeoffs between signing more cross-regional deals versus reinvigorating and deepening existing agreements on the regional front.

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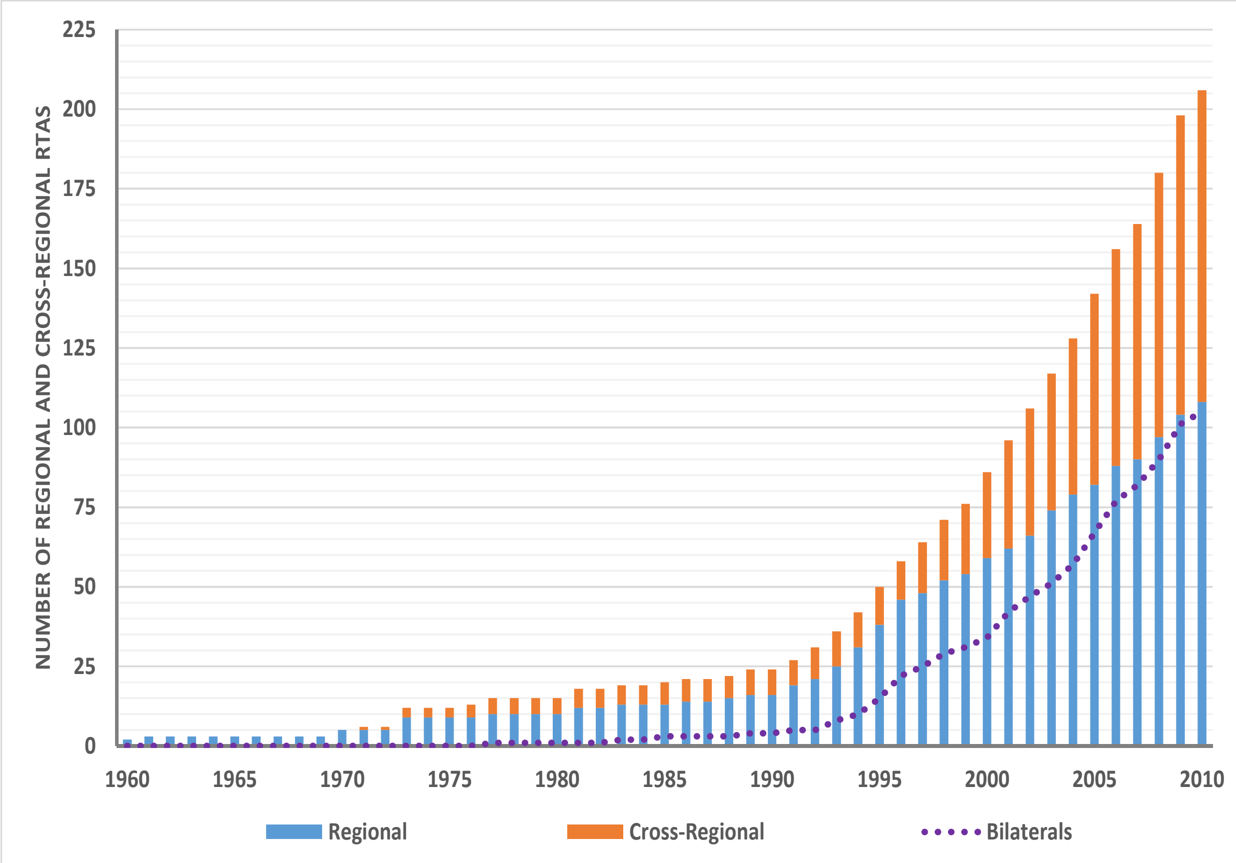
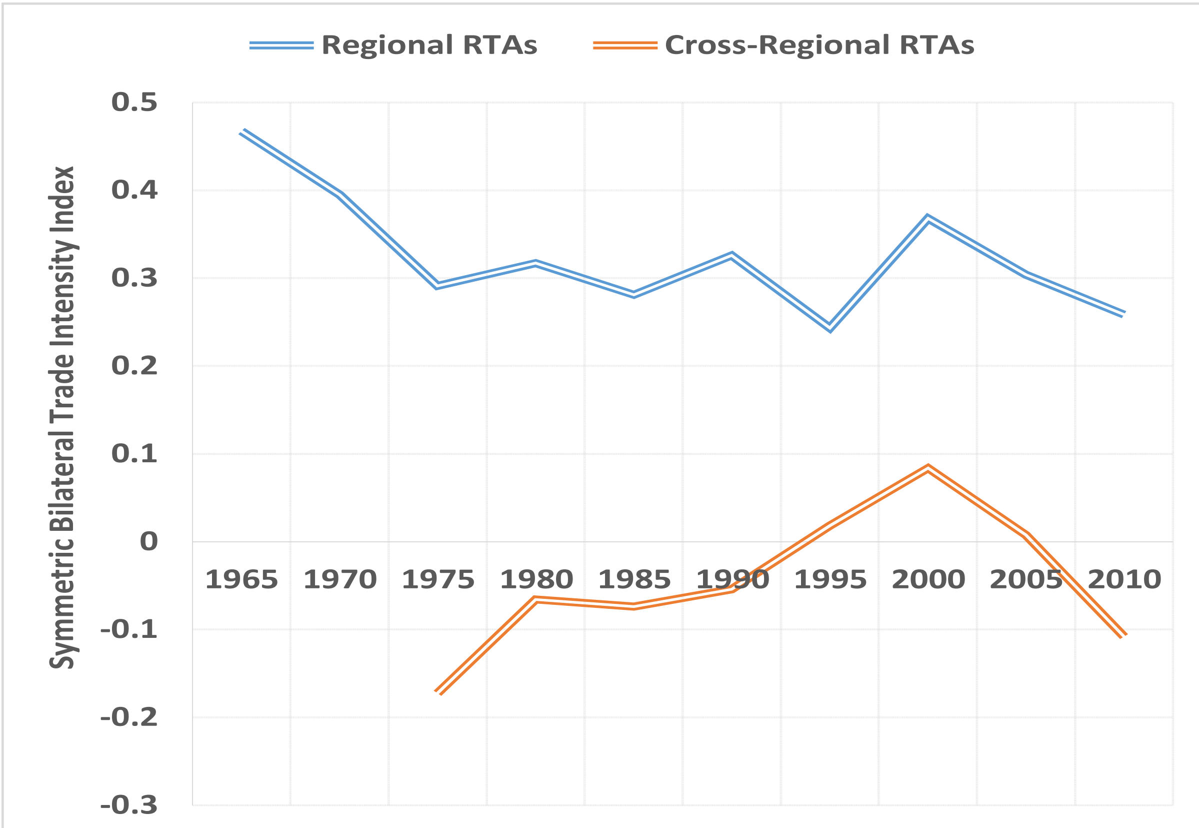
Figure 1. Regional Trade Agreement Notifications by Type of Agreement, 1965-2010



Notes: The figure depicts cumulative RTAs entered into force by year and type of agreement notified to the WTO. Cross-regionals are defined as agreements between two or more countries that are not part of the same continental region (i.e., EU-Canada (CETA), Chile-Australia, etc.). Bilaterals are agreements that encompass only two countries and the totals for this category are not in addition to the totals depicted in the bars.
Source: http://www.wto.org/english/tratop_e/region_e/region_e.htm

Figure 2. Symmetric Bilateral Trade Intensity Indices for Regional and Cross-Regional RTAs



Source: Authors' calculation based on a new bilateral dataset of agricultural trade from 1965-2010, collected from the United Nation's Commodity Trade Statistics Database (Comtrade) using the Standard Industrial Trade Classification (SITC, revision 1)

Figure 3. Frequency Distribution of Country-pairs with Regional, Cross-Regional and no RTAs

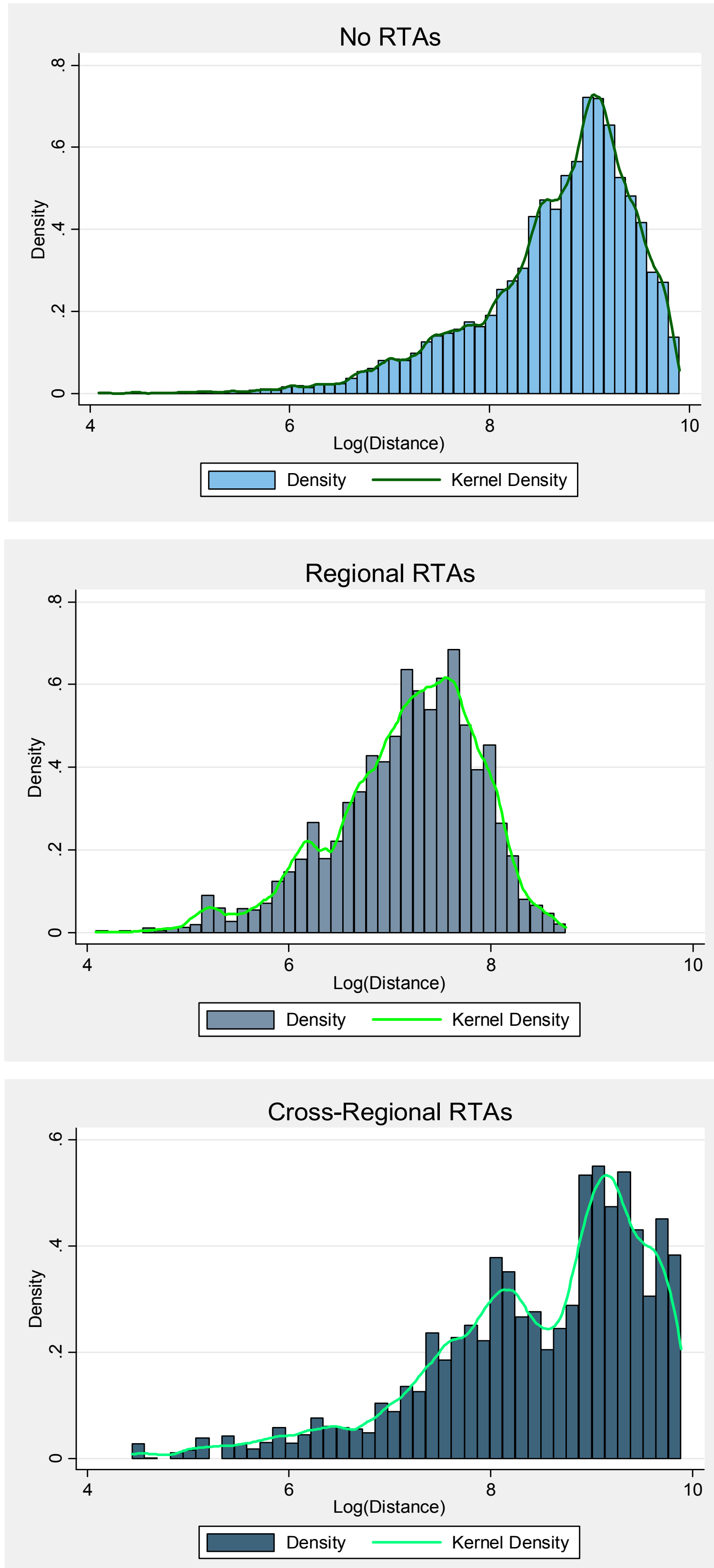


Table 1. Trade Flow Effects of Regional & Cross-Regional RTAs, Panel Data 1965-2010

Estimation	**1**		**2**		**3**		**4**	
Method	**OLS**		**OLS**		**OLS**		**OLS**	
Fixed Effects	**Year**		**Importer, Exporter, Year**		**Importer-year; Exporter-year**		**Importer-year, Exporter-year, Country-pair**	
Scenario	***All RTAs***	***Regional & Cross-regional***	***All RTAs***	***Regional & Cross-regional***	***All RTAs***	***Regional & Cross-regional***	***All RTAs***	***Regional & Cross-regional***
Log. GDP (it)	0.66***	0.66***	0.34***	0.34***				
	(0.01)	(0.01)	(0.02)	(0.02)				
Log. GDP (jt)	0.70***	0.70***	0.25***	0.26***				
	(0.01)	(0.01)	(0.02)	(0.02)				
Log. Distance (ij)	-0.77***	-0.77***	-1.20***	-1.21***	-1.24***	-1.23***		
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)		
Contiguity (ij)	0.89***	0.85***	0.74***	0.75***	0.74***	0.73***		
	(0.08)	(0.08)	(0.07)	(0.07)	(0.10)	(0.09)		
Language (ij)	0.63***	0.66***	0.67***	0.69***	0.73***	0.74***		
	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)		
Colony (ij)	1.31***	1.30***	1.23***	1.21***	1.24***	1.24***		
	(0.10)	(0.10)	(0.08)	(0.08)	(0.09)	(0.09)		
RTA (ijt)	0.81***		0.53***		0.51***		0.42***	
	(0.04)		(0.03)		(0.03)		(0.03)	
Regional RTA (ijt)		1.08***		0.61***		0.58***		0.59***
		(0.05)		(0.05)		(0.02)		(0.04)
Cross-Regional RTA (ijt)		0.42***		0.42***		0.44***		0.13***
		(0.04)		(0.02)		(0.02)		(0.04)
regional = cross-regional		*127.43****		*12.37****		*75.42****		*88.76****
Prob. > F		*(0.00)*		*(0.00)*		*(0.00)*		*(0.00)*
N	214,429	214,429	214,429	214,429	221,750	221,750	221,982	221,982
Adj. R^2	0.39	0.39	0.59	0.60	0.64	0.64	0.71	0.71
RMSE	2.54	2.54	2.08	2.08	2.36	2.36	1.85	1.86

Notes: the dependent variable is the natural log of bilateral imports. Robust standard errors clustered on country-pairs are in parentheses except for hypotheses tests which report *p-values*. One, two, and three asterisks denote significance at the ten, five and one percent levels, respectively. Two regressions are reported in each of the four scenarios. The *All RTAs* scenarios present the average treatment effect of all RTAs and the *Regional & Cross-Regional* scenarios allow the trade flow effect of RTAs to differ depending on whether the RTA is a regional or cross-regional agreement with respect to the geographical location of member countries.

Table 2. Trade Flow Effects of Regional and Cross-Regional RTAs with Phase-ins, Panel Data, 1965-2010

	Concurrent (t-0)	One Lag (t-5)	Two Lags (t-10)	Three Lags (t-15)	Cumulative Trade Increase (%)	Regional = Cross Regional	N	R^2	RMSE
Scenario 1: One Lag									
All RTAs	0.26***	0.29***			73%		205,185	0.70	1.88
	(0.03)	(0.03)							
Regional RTAs	0.38***	0.36***			110%	98.59***	205,185	0.70	1.88
	(0.04)	(0.04)				(0.00)			
Cross-Regional RTAs	0.10***	0.00			10%				
	(0.03)	(0.04)							
Scenario 2: Two Lags									
All RTAs	0.25***	0.24***	0.13***		86%		184,626	0.71	1.87
	(0.03)	(0.03)	(0.03)						
Regional RTAs	0.38***	0.30***	0.14***		127%	84.52***	184,626	0.71	1.87
	(0.04)	(0.04)	(0.04)			(0.00)			
Cross-Regional RTAs	0.09***	0.03	-0.05		9%				
	(0.03)	(0.04)	(0.04)						
Scenario 3: Three Lags									
All RTAs	0.25***	0.26***	0.10***	0.12***	108%		160,966	0.72	1.86
	(0.03)	(0.03)	(0.04)	(0.04)					
Regional RTAs	0.43***	0.28***	0.06	0.20***	148%	94.28***	160,966	0.72	1.86
	(0.04)	(0.04)	(0.05)	(0.04)		(0.00)			
Cross-Regional RTAs	0.07**	0.03	-0.01	-0.06	7%				
	(0.03)	(0.04)	(0.04)	(0.04)					

Notes: the dependent variable is the natural logarithm of bilateral trade. All regressions include time-varying country-specific (*it*, *jt*) and bilateral-pair (*ij*) fixed effects. Cluster robust standard errors are in parentheses except for the hypotheses tests which report *p-values*. One, two, and three asterisks denote significance at the ten, five and one percent levels, respectively. The Cumulative Trade Increase is calculated by exponentiation of the sum of the concurrent, five (*t-5*), ten (*t-10*) and 15 (*t-15*) year lagged coefficients. Standard errors for this non-linear transformation are estimated using the Delta Method. Rows labeled RTA refer to separate regressions of the generic trade flow effects of all regional trade agreements (i.e., no differentiation according to cross-regions).

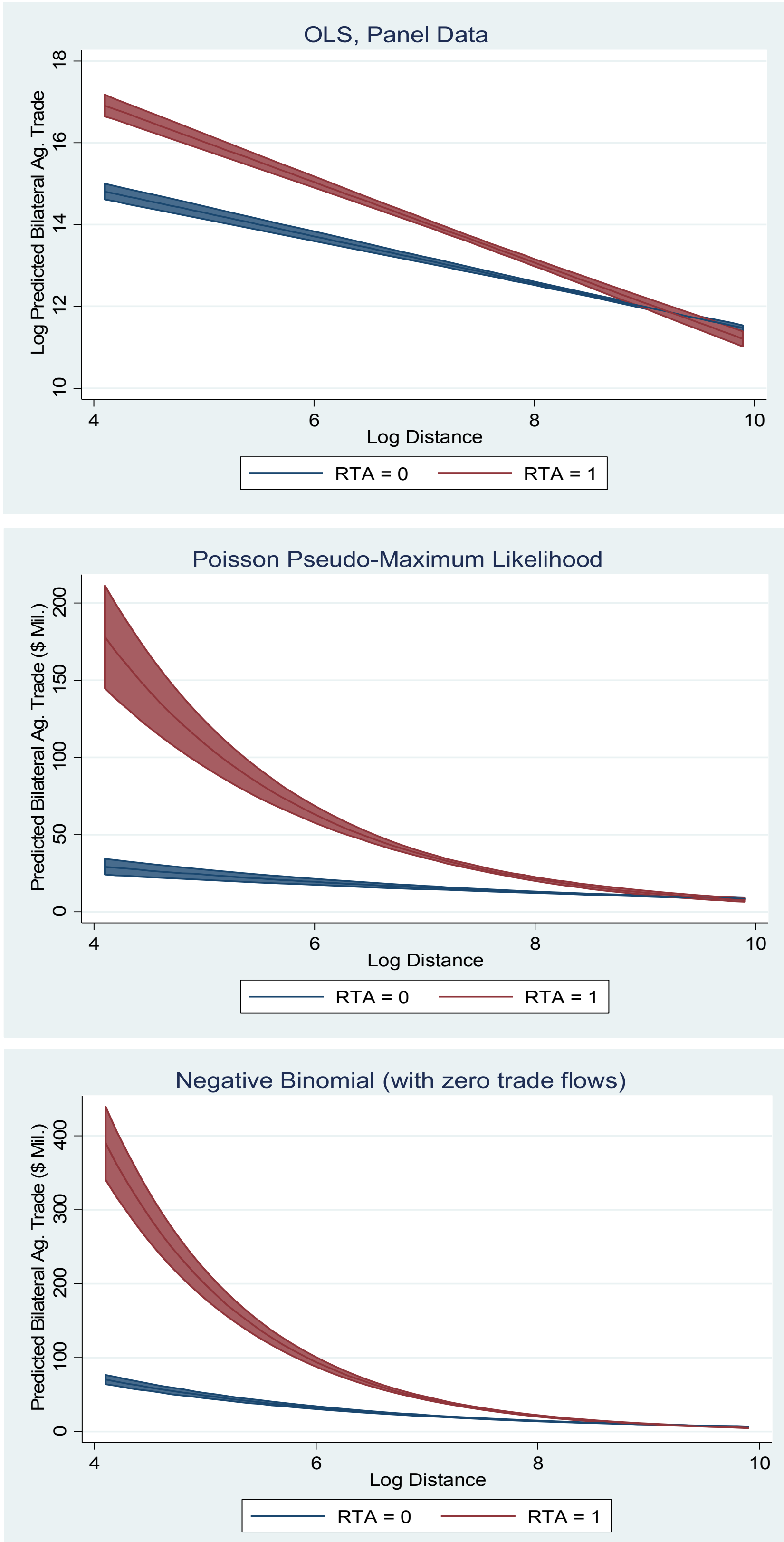
Table 3. Robustness Checks: Zero Trade Flows and Regional Characteristics

	(1) EU Effect	(2) Income Status	(3) Trade > $0.5 Mil.	(4) Country Pair Random Effects	(5) PQML	(6) Neg. Binomial	(7) Log Gravity, importer-year, exporter-year	(8) PQML Model	(9) Negative Binomial
Regional RTAs	0.39***		0.71***	0.65***	0.72***	0.81***			
	(0.05)		(0.03)	(0.04)	(0.07)	(0.07)			
Cross-Regional RTAs	0.12***		0.16***	0.31***	0.16**	0.08***			
	(0.04)		(0.03)	(0.03)	(0.07)	(0.05)			
EU	1.03***								
	(0.05)								
Regional (HIC^{RE}-HIC^{RE})		0.69***							
		(0.05)							
Regional (HIC^{RE}-LIC^{RE})		0.39***							
		(0.07)							
Regional (LIC^{RE}-LIC^{RE})		0.61***							
		(0.08)							
Cross-Regional (HIC^{CR}-HIC^{CR})		-0.01							
		(0.09)							
Cross-Regional (HIC^{CR}-LIC^{CR})		0.12**							
		(0.05)							
Cross-Regional (LIC^{CR}-LIC^{CR})		0.15**							
		(0.06)							
RTA (Reg. & Cross-Reg.)							3.77***	3.04***	3.10***
							(0.30)	(0.34)	(0.15)
Log Dist.							-0.58***	-0.27***	-0.41***
							(0.02)	(0.03)	(0.01)
Log Dist.*RTA							-0.41***	-0.32***	-0.34***
							(0.04)	(0.04)	(0.02)
Level Distance Threshold							9,897 km	13,360 km	9,114 km
Test Log Dist. = Log Dist.*RTA							10.76***	4.02**	9.14***
							(0.00)	(0.04)	(0.00)
H_1: Regional = Cross-Regional	19.0**		219.5***	50.1***	30.23***	480***			
Prob. > F	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)			

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
H_2: EU = Regional RTA (Col. 5)	103.7***						
Prob. > F	(0.00)						
H_3: HIC^{RE}-HIC^{RE} = HIC^{CR}-HIC^{CR}		47.5***					
Prob. > F		(0.00)					
H_4: HIC^{RE}-LIC^{RE} = HIC^{CR}-LIC^{CR}		12.4***					
Prob. > F		(0.00)					
H_5: LIC^{RE}-LIC^{RE} = LIC^{CR}-LIC^{CR}		27.4***					
Prob. > F		(0.00)					
N	221,982	221,982	214,429	214,429	285,264	285,264	
Adj. R^2	0.70	0.71	0.74	0.51	----	----	----
RMSE	1.88	1.87	1.64	1.64	----	----	----

Notes: the dependent variable is the natural logarithm of bilateral trade. Robust standard errors are in parentheses except for the hypothesis tests which report p-values. One, two, and three asterisks denote significance at the ten, five and one percent levels, respectively. Except for columns 6 and 7 which include bilateral-pair fixed effects, all regressions include time-varying country-specific and bilateral-pair fixed effects.

Figure 4. Predicted RTA and Non-RTA Agricultural Trade and Geographical Distance



Appendix Table A. RTA Database (sorted by date of entry into force; Total = 206)

Cross-Regional RTAs (98)

EC – Overseas Territories(1971)	EC - South Africa(2000)	EC - Chile(2005)	EC - CARIFORUM States (2008)
Protocol on Trade Negotiations(1973)	Israel - Mexico(2000)	EFTA - Tunisia(2005)	EFTA - SACU(2008)
Caribbean Common Market (1973)	EFTA - Mexico(2001)	India - Singapore(2005)	Honduras – Taiwan (2008)
Asia Pacific Trade Agreement(1976)	Mexico - El Salvador(2001)	Japan - Mexico(2005)	El Salvador – Taiwan (2008)
EC - Syria(1977)	Mexico – Guatemala(2001)	Jordan - Singapore(2005)	Nicaragua Taiwan (2008)
Latin American Integration Assoc.(1981)	Mexico - Honduras(2001)	Thailand - Australia(2005)	Pakistan – Malaysia(2008)
US - Israel(1985)	New Zealand - Singapore(2001)	Thailand - New Zealand(2005)	Panama - Chile(2008)
Global System of Trade Pref. (1989)	Ukraine - Macedonia (2001)	Turkey - Palestinian Authority(2005)	Turkey - Georgia(2008)
Central Europe Free Trade Assoc.(1992)	US - Jordan (2001)	Turkey - Tunisia(2005)	Australia - Chile(2009)
Econ. Cooperation Organization (1992)	Asia Pacific Agreement-China(2002)	US - Australia(2005)	Canada - EFTA(2009)
EFTA - Israel(1993)	Canada - Costa Rica(2002)	Chile - China(2006)	Canada - Peru(2009)
Costa Rica - Mexico(1995)	Chile - Costa Rica(2002)	Dominican Rep.-Central America-USA(2006)	EC - Cameroon(2009)
Canada - Chile(1997)	Chile - El Salvador (2002)	EFTA - Korea, Republic of(2006)	EC - Côte d'Ivoire(2009)
Canada - Israel(1997)	EC - Jordan(2002)	Panama - Singapore(2006)	Japan - Switzerland (2009)
EC - Palestinian Authority(1997)	EFTA - Jordan (2002)	Trans-Pacific Ec. Partnership(2006)	Mercosur - India(2009)
Turkey - Israel(1997)	EC - Lebanon(2003)	Turkey - Morocco(2006)	Pakistan - China(2009)
EC - Tunisia(1998)	EFTA - Singapore(2003)	US - Bahrain(2006)	Peru - Singapore(2009)
Mexico - Nicaragua(1998)	Singapore - Australia(2003)	US - Morocco(2006)	US - Oman(2009)
Pan-Arab Free Trade Area(1998)	EC - Egypt(2004)	Chile - India(2007)	US - Peru(2009)
Chile - Mexico(1999)	EFTA - Chile(2004)	Chile - Japan(2007)	ASEAN-Australia-New Zealand(2010)
EFTA - Morocco(1999)	Korea, Republic of - Chile(2004)	EFTA - Egypt(2007)	ASEAN - India(2010)
EFTA - Palestinian Authority(1999)	Panama Taiwan (2004)	EFTA - Lebanon(2007)	Korea, Republic of - India(2010)
EC - Israel(2000)	US - Chile(2004)	Egypt - Turkey(2007)	Peru - China(2010)
EC - Mexico(2000)	US - Singapore(2004)	Turkey - Syria(2007)	
EC - Morocco(2000)	EC - Algeria(2005)	China - New Zealand(2008)	

Regional RTAs (108)

EC Treaty(1958)	Georgia - Russian Federation(1994)	East African Community(2000)	Ukraine - Moldova(2005)
European Free Trade Assoc.(EFTA)(1960)	N. Amer. Free Trade Agreement(1994)	Georgia - Turkmenistan(2000)	Iceland - Faroe Islands(2006)
Central Amer. Common Market(1961)	Ukraine - Russian Federation(1994)	South African Dev. Community(2000)	India - Bhutan(2006)
EFTA - Iceland(1970)	Melanesian Spearhead Group(1994)	West Africa Economic/Monetary Union(2000)	Japan - Malaysia(2006)
Southern African Customs Union(1970)	Armenia - Moldova(1995)	Turkey - Macedonia(2000)	Korea, Republic of - Singapore(2006)
EC - Iceland(1973)	Faroe Islands - Switzerland(1995)	Armenia - Kazakhstan(2001)	South Asian Free Trade Agreement(2006)
EC - Norway(1973)	Kyrgyz Republic - Armenia(1995)	EFTA - Macedonia(2001)	Ukraine - Belarus(2006)
EC - Switzerland - Liechtenstein(1973)	Kyrgyz Republic - Kazakhstan(1995)	India - Sri Lanka(2001)	EC (27) Enlargement(2007)
EC (9) Enlargement(1973)	Ukraine -Turkmenistan(1995)	EU - San Marino(2002)	Japan - Thailand(2007)
Australia - Papua New Guinea(1977)	EC (15) Enlargement(1995)	EFTA - Croatia (2002)	ASEAN - Japan(2008)
EC (10) Enlargement(1981)	S. Asian Pref. Trade Arrangement(1995)	Japan - Singapore(2002)	Brunei Darussalam - Japan(2008)
South Pacific Coop. Agreement(1981)	EC - Turkey(1996)	Ukraine - Tajikistan(2002)	EC – Bosnia/Herzegovina(2008)
Australia - New Zealand(1983)	Armenia - Turkmenistan(1996)	CEFTA – Croatia (2003)	Japan – Indonesia (2008)
EC (12) Enlargement(1986)	Armenia - Ukraine(1996)	Pacific Island Trade Agreement(2003)	Japan - Philippines(2008)
Andean Community(1988)	Georgia - Azerbaijan (1996)	Panama - El Salvador(2003)	Panama - Costa Rica(2008)
Canada-US Free Trade Agreement(1989)	Georgia - Ukraine (1996)	Turkey – Bosnia/Herzegovina(2003)	Turkey - Albania(2008)
South Common Market (Mercosur)(1991)	Kyrgyz Republic - Moldova(1996)	Turkey - Croatia(2003)	Chile - Colombia(2009)
EC - Andorra(1991)	Ukraine - Azerbaijan(1996)	Gulf Cooperation Council(2003)	China - Singapore(2009)
Laos-Thailand(1991)	Ukraine - Uzbekistan(1996)	India - Afghanistan(2003)	India - Nepal(2009)
ASEAN Free Trade Area(1992)	Eurasian Economic Community(1997)	ASEAN - China(2003)	EC - Albania(2009)
EFTA - Turkey(1992)	EC - Faroe Islands(1997)	China - Hong Kong, China(2004)	Japan - Viet Nam (2009)
Ec. Community of West Africa (1993)	Georgia - Armenia (1998)	China - Macao, China(2004)	Korea, Republic of - ASEAN(2009)
Armenia - Russian Federation(1993)	Kyrgyz Republic - Ukraine(1998)	Common Economic Zone(2004)	Panama - Honduras(2009)
Faroe Islands - Norway(1993)	Kyrgyz Republic - Uzbekistan(1998)	EC - Macedonia (2004)	EC - Montenegro(2010)
Kyrgyz Rep. - Russian Federation(1993)	Ukraine - Kazakhstan(1998)	EC (25) Enlargement (2004)	EU - Serbia(2010)
Common Mkt. East/South Africa(1994)	Ec./Monetary Comm. of Central Africa(1999)	EC - Croatia(2005)	Turkey - Montenegro(2010)
Commonwealth of Indep. States (1994)	Georgia - Kazakhstan(1999)	Pakistan - Sri Lanka(2005)	Turkey - Serbia(2010)

Appendix Table B. List of Countries by Region (number of countries in parentheses)

North America (3)				
Canada	Mexico	United States		
Other Americas (including Caribbean) (45)				
Anguilla	Antigua and Barbuda	Argentina	Aruba	Bahamas
Barbados	Belize	Bermuda	Bolivia	Brazil
British Virgin islands	Cayman Islands	Chile	Colombia	Costa Rica
Cuba	Dominica	Dominican Republic	Ecuador	El Salvador
Greenland	Grenada	Guadeloupe	Guatemala	Guyana
Haiti	Honduras	Jamaica	Mauritania	Montserrat
Netherlands Antilles	Nicaragua	Panama	Paraguay	Peru
Saint Kitts and Nevis	Saint Lucia	Saint Pierre & Miquelon	Saint Vincent & Grenadines	Suriname
Trinidad and Tobago	Turks and Caicos Islands	Uruguay	Venezuela	U.S. Virgin Islands
Asia (50)				
Afghanistan	Armenia	Azerbaijan	Bahrain	Bangladesh
Bhutan	Brunei Darussalam	Cambodia	China	China, Hong Kong SAR
China, Macau	Cyprus	Georgia	India	Indonesia
Iran	Iraq	Israel	Japan	Jordan
North Korea	South Korea	Kuwait	Kyrgyzstan	Laos
Kazakhstan	Latvia	Malaysia	Maldives	Mongolia
Myanmar	Nepal	Oman	Pakistan	Palestinian Territory
Philippines	Qatar	Saudi Arabia	Singapore	Sri Lanka
Syrian Arab Republic	Taiwan	Tajikistan	Thailand	Turkey
Turkmenistan	United Arab Emirates	Uzbekistan	Vietnam	Yemen
Africa (54)				
Algeria	Angola	Benin	Botswana	Burkina Faso
Burundi	Côte d'Ivoire	Cameroon	Cape Verde	Central African Republic
Chad	Comoros	Congo	Congo, DMR	Djibouti
Egypt	Equatorial Guinea	Eritrea	Ethiopia	Gabon
Gambia	Ghana	Guinea	Guinea-Bissau	Kenya
Lesotho	Liberia	Libya	Madagascar	Malawi
Mali	Mauritius	Mayotte	Morocco	Mozambique
Namibia	Niger	Nigeria	Rwanda	Saint Helena
Sao Tome and Principe	Senegal	Seychelles	Sierra Leone	Somalia
South Africa	Sudan	Swaziland	Tanzania	Togo
Tunisia	Uganda	Zambia	Zimbabwe	
Europe (39)				
Andorra	Austria	Belgium-Luxembourg	Belarus	Bosnia and Herzegovina
Bulgaria	Croatia	Czech Republic	Denmark	Estonia
Finland	France	Germany	Greece	Hungary
Iceland	Ireland	Italy	Lebanon	Lithuania
Macedonia	Malta	Moldova, Republic of	Netherlands	Norway
Poland	Portugal	Romania	Russian Federation	Serbia and Montenegro
Slovakia	Slovenia	Malta	Spain	Sweden
Switzerland	Ukraine	United Kingdom	Former Yugoslavia	
Oceania (15)				
American Samoa	Australia	Cook Islands	Fiji	French Polynesia
Guam	Martinique	New Caledonia	New Zealand	Palau
Papua New Guinea	Samoa	Solomon Islands	Tonga	Vanuatu