Do Customs Union Members Engage In More Bilateral Trade Than Free Trade Agreement Members?

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Abstract

This paper provides the first empirical analysis directly comparing the effects of customs unions (CUs) and free trade agreements (FTAs) on members' bilateral trade, while addressing the biases arising from log-linearization of the gravity model and crucial time-invariant unobservables. Since Fiorentino et al. (2007) question the popularity of CUs relative to FTAs, considering the latter to be more practical in the current trading climate, such a comparison seems especially relevant. While Baier and Bergstrand (2007) find an FTA to approximately double members' bilateral trade after 10 years, it is actually a CU, and not an FTA, which doubles bilateral trade.

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1 Introduction

In today's trading climate, the relevance of analyzing preferential trade agreements (PTAs) cannot be overemphasized. The effective number of such agreements exceed two hundred, with Mongolia being the only World Trade Organization (WTO) member not party to one. The notification of more than fifty PTAs to the WTO between January 2005 and December 2006, coupled with the ongoing negotiations of numerous agreements, indicate their recent proliferation and unabated rise in years to come. If all the PTAs currently under negotiation and proposal are implemented, then one would be looking at over four hundred PTAs by 2010 (Fiorentino et al. 2007). Hence, policy issues associated with trade agreements are relevant for some time to come.

Any PTA is essentially an arrangement among countries whereby members engage in trade at reduced tariff rates. Such benefits are typically not extended to non-members and are usually accompanied by a dismantling of quantitative restrictions as well (Krueger 1999). The arrangements may be partial or total with respect to the extent of duty reduction or commodity coverage.[1] However, partial scope agreements, which involve a reduction or elimination of duties on a limited number of goods, are not explicitly considered in this paper.[2]

Non-partial or total agreements can be further classified into two categories. If the members eliminate tariffs internally while maintaining their individual external tariffs, a free trade area or free trade agreement (FTA) is formed. In case they *also* unify their external tariffs, the arrangement is termed a customs union (CU). It is this common external tariff (CET) which separates a CU from an FTA. Another important distinction between the two, which follows from the CET, is the extent of the role of rules of origin (ROO). In either preferential regime, the ROO are restrictions on the preferential treatment of goods which are not produced or significantly transformed by a member country.[3] However, they have greater relevance, in the context of FTAs, due to an additional implication.[4] In case of an FTA, a CET is absent. This potentially allows a good to enter the free

[1] While there is no exact rule for classifying trade agreements as partial or total, Frankel (1997, p. 3) considers the latter to be characterized by liberalization across "most major sectors" and covering a "high percentage of total trade."

[2] Fiorentino et al. (2007, p. 7) consider them to be characterized by "poor implementation record" and "scarce visibility."

[3] Bhagwati et al. (1999, p. 543) provide an account of the alternative criteria used in defining ROO. Krishna (2005) is also an excellent survey.

[4] Krueger (1997, p. 177) considers that ROO "can act as additional trade barriers under an FTA in ways that

trade zone as an export to the member with the minimum duty for it. The ROO, in an FTA, prevent tariff concessions on the *subsequent* exports of *these* goods to the other members. Prominent FTAs include the North American Free Trade Agreement (NAFTA), whereas the Mercosur comprises an example of a CU.[5]

The literature on preferential agreements, dating back to at least as early as Viner (1950), has addressed a host of associated policy issues. These issues include, but are not limited to, the building and stumbling bloc effects of PTAs with respect to multilateral liberalization, their impact on trade volumes and prices, and their trade creation and trade diversion effects. The contributions, both theoretical and empirical, have usually relied on one particular type of PTA in order to draw relevant conclusions. Some studies have also analyzed these issues while focussing on specific trade agreements or trade agreements with respect to a particular country.

Unfortunately, analyses pertaining to a comparison of the types of PTAs have received relatively less attention. Perhaps Krueger (1997, p. 171) best expresses this, stating: "Surprisingly ... there has been little analysis of different types of preferential arrangements, and in particular, of free trade agreements in contrast to customs unions." Clausing (2000), the only contribution to the author's knowledge after Krueger (1997) in terms of directly comparing FTAs and CUs, also alludes to this lack of attention. However, both Krueger (1997) and Clausing (2000) are theoretical contributions. While Krueger (1997) finds a CU to be Pareto-superior to an FTA, Clausing (2000, p. 418) "generates specific conditions that determine when customs unions are preferred to free trade areas." Accordingly, the empirical literature seems to be even more lacking in this respect.[6] This paper fills the gap by analyzing a straightforward question: do countries belonging to a CU engage in more bilateral trade (in goods) on average than countries belonging to an FTA?

Such a comparison of FTAs and CUs is of great relevance. With their greater recent proliferation relative to CUs, FTAs account for 84% of all the PTAs notified and in force (Fiorentino et al.

they cannot do under a customs union." Krishna (2005) is of a similar opinion as well.

[5] One may also go further up the scale of integration and consider a common market, which allows for free movement of factors of production as well. However, a common market is essentially an arrangement where countries form a CU before permitting any increased mobility of the factors (Krueger 1997). Accordingly, such regimes of further integration (e.g. the European Union) are treated as CUs in this paper.

[6] Ghosh and Yamarik (2004) and Magee (2008) are empirical contributions, which allow for differential effects of the degree of integration, but both analyses primarily allude to the trade creation and trade diversion issue.

2007).[7] The proportion of FTAs to CUs is even higher if one considers the PTAs currently under negotiation. Accordingly, Fiorentino et al. (2007, p. 5) question the popularity of CUs and consider them to be "out of tune with today's trading climate." The more restrictive nature of CUs in terms of the members' trade relations with countries outside the union, requirement of a greater degree of harmonization among members, and longer implementation periods are offered as possible explanations. In light of this, the findings of this paper are especially significant.

Using the gravity model and data from Baier and Bergstrand (2007), this paper compares the effects of FTAs and CUs on members' volume of bilateral trade. Once the biases arising from crucial time-invariant unobservables, or log-linearization of the gravity model are addressed, the results are striking. Baier and Bergstrand (2007, p. 72) find that "on average, an FTA approximately doubles two members' bilateral trade after 10 years." However, using the same data, the results of this paper indicate that it is a CU, and not an FTA, which is responsible for this. Hence, analyses which do not allow for the effects of FTAs and CUs to differ, fail to capture this crucial aspect of trade policy decisions.

More generally, members of a CU are found to engage in significantly greater volumes of bilateral trade than FTA members. Strikingly, the ranking remains unaltered when membership to the European Union (EU) is additionally controlled for, or an interesting split of the sample is considered. Although the initial success of CUs can be partly attributed to the EU, the latter's prominence disappears following the emergence of more recent CUs.

The remainder of the paper is organized as follows. Section 2 describes the empirical methodology. Section 3 discusses the data. Section 4 presents the results, while Section 5 concludes.

2 Empirical Methodology

2.1 Cross Section Analysis

Gravity models are estimated in levels and logs to compare the effects of FTAs and CUs. The level specification is given by

$$T_{ij}=\beta_0 D_{ij}^{\beta_1} \exp(\beta_2 lang_{ij} + \beta_3 adj_{ij} + \beta_4 FTA_{ij} + \beta_5 CU_{ij} + \theta_i + \theta_j)\eta_{ij}. \quad (1)$$

[7] CUs and partial scope agreements constitute 8% each.

Here, T_{ij} is the *nominal* value of exports from country i to country j; D_{ij} is the distance between i and j; $lang_{ij}$ is a dummy variable taking the value one if i and j share a common language (zero otherwise); adj_{ij} is a binary variable assuming the value unity if i and j share a land border (zero otherwise); FTA_{ij} (CU_{ij}) is a dummy variable taking the value one if i and j are part of an FTA (CU) and zero otherwise; and θ_i and θ_j are country-specific dummies.[8] Santos Silva and Tenreyro (2006) show that (1) may be estimated using an estimator that is numerically equivalent to the Poisson pseudo-maximum likelihood (PPML) estimator, provided

$$E\left[\eta_{ij}|D_{ij}, lang_{ij}, adj_{ij}, FTA_{ij}, CU_{ij}, \theta_i, \theta_j\right] = 1. \tag{2}$$

The log specification is instead given by

$$\begin{aligned} \ln\left(T_{ij}\right) &= \ln\beta_0 + \beta_1 \ln D_{ij} + \beta_2 lang_{ij} + \beta_3 adj_{ij} \\ &\quad + \beta_4 FTA_{ij} + \beta_5 CU_{ij} + \theta_i + \theta_j + \ln\eta_{ij}. \end{aligned} \tag{3}$$

Consistent estimation of (3) requires

$$E\left[\ln\left(\eta_{ij}\right)|D_{ij}, lang_{ij}, adj_{ij}, FTA_{ij}, CU_{ij}, \theta_i, \theta_j\right] = 0. \tag{4}$$

However, as noted by Santos Silva and Tenreyro (2006), (2) does not imply (4) (invoking Jensen's inequality); in fact, the elasticity estimates from the log-linearized model may be biased if the level specification suffers from heteroskedasticity. Henderson and Millimet (2008) find this concern relevant and recommend estimating the gravity model in levels. This also avoids the omission of observations with zero trade flows or the use of other ad hoc measures to address it.

2.2 Panel Analysis

The cross-section estimates are likely to be biased due to endogenous trade agreements. An excellent account of the endogeneity issue, and the failure of previous cross-section studies to address it, can be found in Baier and Bergstrand (2007, p. 78), who consider an omitted variable or selection bias to be "the major source" of the endogeneity. Although Magee (2003) attempts to address it by relying on instrumental variables (IV), the quality of the instruments used is clearly suspect. It is

[8] The country dummies are usually used to control for country-specific unobservables that do not vary across trading partners as well as the multilateral resistance terms (Anderson and van Wincoop 2003). In this case, they also capture the impact of GDP.

unlikely that variables like GDP similarities or differences in relative factor endowments between two countries are uncorrelated with unobservables affecting the volume of trade between them. For any two countries, the difficulty of coming up with an instrument which is correlated with their likelihood of forming a trade agreement, but uncorrelated with such pairwise unobservables compels Baier and Bergstrand (2007, p. 83) to conclude that "IV estimation is not a reliable method for addressing the endogeneity bias." The Heckman control function approach also suffers from the lack of a suitable exclusion restriction.

The panel fixed effects approach, with pairs of countries as the basic unit of observation, addresses the endogeneity issue to a certain extent. It allows one to control for pairwise time-invariant unobservables which affect the volume of trade between two countries, and are also correlated with their decision to form an agreement. For example, as discussed in Baier and Bergstrand (2007), trade between a country-pair depends on their domestic policies. A strict domestic policy in the form of internal shipping regulations may reduce the volume of goods traded. However, it may also encourage the countries to form a trade agreement and realize potential welfare gains, provided the tariff liberalization renders the domestic policy less restrictive. The panel fixed effects estimates do not suffer from bias due to the presence of *such* unobservables as long as they are time-invariant, and hence are a definite improvement over the cross-section estimates.[9]

However, the bias arising from the log specification is a separate issue. Panel estimates from the log-linearized model may still be biased and lead to "misleading conclusions" in the presence of heteroskedasticity in the levels model (Santos Silva and Tenreyro 2006, p. 641). In keeping with this recommendation and the one in Henderson and Millimet (2008), the panel analysis is mainly conducted using the level specification which is given by

$$T_{ijt} = \beta_0 \exp(\beta_1 FTA_{ijt} + \beta_2 CU_{ijt} + \theta_{it} + \theta_{jt}) \upsilon_{ijt} \epsilon_{ij}. \tag{5}$$

In this case, T_{ijt} is the *real* value of exports from country i to country j at time t. While distance, language, and adjacency drop out of (5), being captured by the panel fixed effects, the other variables have an additional t subscript. Accordingly, FTA_{ijt} (CU_{ijt}) takes the value one if i and j are part of an FTA (CU) at time t and zero otherwise; and θ_{it} and θ_{jt} are the country-by-time dummies. The unobservable term is decomposed into time-varying and time-invariant components such that $\eta_{ijt} = \upsilon_{ijt}\epsilon_{ij}$. The panel fixed effects method provides consistent estimates even in the presence of

[9] The method also addresses the issue of measurement error in the time-invariant regressors, such as distance.

any correlation between the time-invariant unobservables ϵ_{ij} and the trade agreement dummies.

While trade agreements usually have a phase-in period, some of the effects may actually precede the date of the agreement. Hence, some of the panel specifications include lag and lead terms of the trade agreement dummies to capture any lagged or anticipatory effects. Baier and Bergstrand (2007, p. 90) also recommend the inclusion of lag terms since trade agreements involve changes in countries' terms of trade, which "tend to have lagged effects on trade volumes." In other words, some panel specifications include variables like $FTA_{ij,t-k}$ and $CU_{ij,t-k}$ or, $FTA_{ij,t+k}$ and $CU_{ij,t+k}$. The variable $FTA_{ij,t-k}$ $(CU_{ij,t-k})$ is simply the k^{th} lag of FTA_{ijt} (CU_{ijt}) and captures the lagged effects of the FTA (CU). Similarly, the variable $FTA_{ij,t+k}$ $(CU_{ij,t+k})$ is the k^{th} lead of FTA_{ijt} (CU_{ijt}) and captures any anticipatory effect.[10]

3 Data

The data come from Baier and Bergstrand (2007); thus, only limited details are provided. The nominal bilateral trade flows are from the International Monetary Fund's Direction of Trade Statistics for the years 1960 to 2000, at five year intervals. For the panel analysis, exporter GDP deflators are used to generate the real trade flows. The bilateral distances and the language and adjacency dummies are calculated from the CIA Factbook. Although the trade agreement dummies continue to be defined by an agreement's year of entry, they involve a crucial modification. While Baier and Bergstrand (2007) considered a single dummy variable, which pooled the "full (no partial) FTAs and customs unions" together, here their effects are allowed to differ (p. 84). The summary statistics appear in the appendix, Table A1.

In keeping with the original data, the classification of trade agreements into the two PTA types is based on the sources listed in Table 3 in Baier and Bergstrand (2007). For further clarity, Table A2, in the appendix, lists the FTAs and CUs considered along with the relevant years. In addition, the trade agreement dummy in the original data involved errors, which have been corrected.[11] All such corrections, and the exact sources on which they are based, find mention in the table footnotes.

[10] Note, in this context, the inclusion of lags and leads should not be viewed as a test of strict exogeneity. Instead, these variables are included in the model to capture the dynamics associated with the implementation of FTAs and CUs.

[11] The author would like to thank Scott Baier and Jeffrey Bergstrand for their help in this.

4 Results

4.1 Main Results

Tables 1, 2 and 3 correspond to the cross-section results for the years 1960, 1970, ..., 2000. While Table 1 reports results from the log model excluding observations with zero bilateral trade, Table 2 reports the log results after replacing the zeros by ones. The issue of dealing with the zero trade values does not arise in the level specification, whose results are presented in Table 3. For all the cross-section results, columns (a) and (b) do not consider separate dummies for FTAs and CUs, where (a) uses the original trade agreement dummy from Baier and Bergstrand (2007) and (b) reports results after incorporating the corrections to it.[12] The coefficient estimates and their statistical significance hardly differ across (a) and (b) in any of the cross-section tables. Thus, the results of the paper are not sensitive to the corrections.

Column (c) considers the differential effects of FTAs and CUs. Results from the log specifications (Tables 1 and 2) indicate mostly negative coefficients on the FTA and CU dummies. This is similar to the cross-section findings in Baier and Bergstrand (2007), who only offer omitted variables bias as an explanation. In Table 1, the null hypothesis of equality between the FTA and CU coefficients is rejected, at the 5% level, for all years except 1970. Table 2 reports a similar rejection for all years except 1960 and 1970. Hence, the log-linearized cross-section findings suggest that, *post-1970*, FTA and CU members engage in significantly different volumes of bilateral trade. For all instances of rejection of the null, in Tables 1 and 2, the coefficient on CU is more negative than the FTA coefficient.

Results from the level specification are strikingly different. The statistically significant coefficients on FTA and CU are all positive. The p-values, in Table 3, signify a rejection of the null of equality for 1960 and 1970 only. Hence, the levels results imply that the volume of bilateral trade is significantly different among FTA and CU members *upto 1970*. It will be interesting to see what the panel results have to offer. Santos Silva and Tenreyro (2006) also find striking differences in their Monte Carlo simulations, across the two cross-section specifications. They further claim that (p. 641) log-linearization "yields significantly larger effects for geographical distance." The results

[12] Baier and Bergstrand (2007) use the log-linearized model and omit observations with zero trade. Accordingly, the column (a) estimates of Table 1 are very similar to their cross-section estimates. Very slight differences arise due to their imposition of unit income elasticities.

in Tables 1, 2 and 3 are consistent with this too. Thus, regardless of the endogeneity due to omitted variables, the potential endogeneity arising from log-linearization of the gravity model seems to be of significant relevance by itself. The cross-section findings further support estimation in levels. Accordingly, the level specification is adopted for the panel fixed effects method.[13]

Unlike the cross-section estimates, the panel results, reported in Table 4, allow for an unambiguous ranking of FTAs and CUs with respect to their effect on members' volume of bilateral trade. Column (a) does not consider any lagged or anticipatory effects of the trade agreements; (b) allows for single lags of FTA and CU; (c) considers two lags of each; and (d) allows for two lags and one lead.[14] Across all specifications, the coefficients on CU are positive and significantly greater than the FTA coefficients. Individual and joint tests reject the equality of the coefficients on FTA and CU, and on their lag and lead terms, at the 1% level.

Column (a) indicates that an FTA increases members' bilateral trade by less than 17%, on average, relative to countries not belonging to a CU or an FTA.[15] However, a CU increases the same by about 77%. The difference seems to be even more stark once the lagged and anticipatory effects in columns (b), (c) and (d) come into play. For each of these specifications, the cumulative effect of an FTA or a CU is obtained by adding the statistically significant lag, lead and contemporaneous coefficients. The coefficients in (b) imply that while an FTA increases members' trade by about 25%, a CU brings about an increase of more than 90%, after 5 years.[16] Similarly, the results in (c) find FTA and CU members to engage in 26% and 110% more bilateral trade, respectively, after a decade. This is reminiscent of the principal result in Baier and Bergstrand (2007, p. 72), who find that "on average, an FTA approximately doubles two members' bilateral trade after 10 years." However, the results here hold only CUs responsible for this. Thus, pooling all FTAs and CUs into a single trade agreement dummy masks this crucial information, which is extremely relevant for policy decisions pertaining to PTAs in today's trading climate.

Specification (d) continues to find CU members to engage in more bilateral trade while allowing

[13]Panel estimates of the log-linearized model are relegated to the appendix, Tables A3, A4, A5 and A6. The findings provide further support for estimation in levels, and are discussed in the next subsection.

[14]Baier and Bergstrand (2007, p. 90) argue that trade agreements typically have a phase-in period of ten years and since the observations are at five year intervals, "it is reasonable to include one or two lagged levels" of the trade agreement dummy. Accordingly, the lags and leads used in this paper are similar to the ones used by them.

[15]exp(0.154)=1.166

[16]Note that each lag in the data corresponds to a period of five years. exp(0.223)=1.25; exp(0.647)=1.91.

for anticipatory effects of trade agreements. Unlike the findings in Baier and Bergstrand (2007), but similar to those in Magee (2008), these effects turn out to be significant.

A closer look at the cross-section and panel level specification results, Tables 3 and 4, suggests that concern over possible selection bias is well-founded. The significant contemporaneous trade agreement coefficients are similar in sign across both. However, the same cannot be said of their magnitudes as the cross-section FTA coefficients are clearly more positive. This suggests a positive selection bias, for FTA members, on the basis of time-invariant unobservables. Hence, the use of panel fixed effects *and* avoidance of log-linearization are a prerequisite for drawing reliable conclusions.

Table 5 reexamines the findings in Table 4 by using the same lag and lead specifications, but after splitting the sample. While columns (a), (b), (c) and (d) report results using data from 1960 to 1985, results in (e), (f), (g) and (h) correspond to the years 1990 to 2000. The split addresses any tension between the time dimension of the data and the assumption of time-invariant unobservables. Accordingly, the results in Table 5 are less sensitive to the possibility of crucial unobservables varying over time.[17] The results further strengthen the findings in Table 4. In both samples the contemporaneous and cumulative effects of a CU are significantly greater than those of an FTA. For the years 1960 to 1985, CUs more than double the volume of members' bilateral trade across all the specifications except (a), where the increase is by about 85%. The differences in the FTA and CU coefficients are smaller when only the years 1990 to 2000 are considered.[18] However, the ranking of the two PTA regimes, in terms of members' bilateral trade, remains unaltered.

For *both* samples in Table 5, individual and joint tests continue to reject the equality of the coefficients on the trade agreement dummies, and on their lag and lead terms. This finding for the 1990 to 2000 sample is especially interesting when compared to the cross-section test of equality results. Although cross-section results from the log specification suggest significant differences in the FTA and CU coefficients after 1970, the Table 3 results suggest the same, but upto 1970. However, once crucial unobservables are *also* controlled for, FTA and CU members are found to engage in significantly different volumes of bilateral trade, in more recent times as well.

[17] This split is also interesting since Bhagwati et al. (1999, p. 10) consider the US-Israel FTA of 1985 (year of entry into force) as the start of the "Second Regionalism" and "the main driving force for regionalism today." Hitherto, the United States abstained from forming FTAs.

[18] The findings discussed in the next subsection suggest the European Union's success to be partly responsible for the greater differences in the 1960 to 1985 sample.

4.2 Additional Results

Before concluding, some additional results deserve mention. Despite the results being noteworthy, the tables have been relegated to the appendix.

Tables A3 and A4 present panel results using the full sample, a log specification, and lags and leads similar to the ones previously considered. While the Table A3 results involve dropping observations with zero bilateral trade, Table A4 presents the results after replacing them by ones. Although, in both cases, joint tests reject the equality of the FTA and CU coefficients, results from tests on the individual coefficients are sensitive to the treatment of zeros. In addition, the signs on the FTA and CU coefficients and their significance also differ across the two tables. Since the level specification circumvents the issue of handling the zeros and avoids a potential sample selection bias due to their omission, the case for estimation in levels is further strengthened.

Tables A5 and A6 are also devoted to panel results from the log model, but after splitting the sample, as in Table 5. The results continue to be sensitive to the treatment of zeros and hence are not discussed in detail.

According to Krueger (1999, p. 106), upto the late 1970s, the EU "was by far the most successful customs union." Hence, whether the EU's success is primarily responsible for this paper's findings, remains a relevant concern. Tables A7 and A8 aim to address this issue by considering a separate dummy variable for the EU. In other words, the EU variable takes the value one for a pair of EU countries, and zero otherwise. The CU dummy is assigned a value of one *only* to country pairs belonging to CUs other than the EU. However, the FTA variable remains unchanged. Given the previous findings, only the level specification using the panel fixed effects method is relied on. Lags and leads, characteristic of the other panel tables, are also included. While Table A7 utilizes the entire sample, Table A8 considers a split similar to the one in Table 5.

The results are striking. Across all specifications using the full sample (Table A7), the cumulative effects are greatest for countries belonging to CUs other than the EU. Individual and joint tests continue to reject the null of equality, at the 1% level, for each pair of the trade agreement dummies. Hence, even the CU members, which do not belong to the EU, continue to engage in significantly greater volumes of bilateral trade than FTA members. The cumulative effects also find bilateral trade to be significantly greater for EU members relative to the FTA members. Most interestingly, EU members engage in *significantly less* bilateral trade than countries belonging to the other CUs.

Thus, the EU does not influence the ranking of FTAs and CUs, previously obtained.

Now, Baier and Bergstrand (2008) also consider the strongest impact of the EU to have been around 1970. The results in Table A8 seem to be consistent with this finding. For the 1960 to 1985 sample, the volume of bilateral trade is significantly greater among the EU members, than countries belonging to FTAs or other CUs. Also, the cumulative effects in columns (a), (b), (c) and (d) fail to unambiguously rank members belonging to FTAs and other CUs. However, following a revival of the Central American Common Market (CACM) and the emergence of more recent CUs such as the Mercosur, the prominence of the EU disappears in the 1990 to 2000 sample.[19]

5 Conclusion

Analyses pertaining to FTAs and CUs is significant for trade policy decisions. The policy issue seems to be of even greater relevance today, when Fiorentino et al. (2007) consider CUs to be characterized by declining popularity. This paper is the first empirical contribution to directly compare the two PTA regimes while addressing biases due to crucial time-invariant unobservables *and* log-linearization of the gravity model. While Baier and Bergstrand (2007) address the former, the latter is found to be of significant relevance as well. Once both biases are addressed, the results are striking. Baier and Bergstrand (2007, p. 72) find that "on average, an FTA approximately doubles two members' bilateral trade after 10 years." However, this paper uses the same data in concluding that it is actually a CU, and not an FTA, which is responsible for this.

In general, members of a CU are found to engage in significantly greater volumes of bilateral trade than FTA members. Strikingly, the finding remains unaltered on controlling for a separate EU effect, or on splitting the sample. Although some of the initial success of CUs can be attributed to the EU, the latter's prominence disappears in more recent years.

[19] Baier and Bergstrand (2008) consider the CACM to be marked by intital success in the 1960s, followed by political instability between 1970 and 1990, and a successful revival post-1990.

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Table 1. Cross-section estimates of the log specification excluding observations with zero trade

	1960 (a)	1960 (b)	1960 (c)	1970 (a)	1970 (b)	1970 (c)	1980 (a)	1980 (b)	1980 (c)
ln(Distance)	-0.741 *	-0.739 *	-0.739 *	-0.898 *	-0.897 *	-0.897 *	-1.269 *	-1.278 *	-1.282 *
	(0.039)	(0.039)	(0.039)	(0.038)	(0.038)	(0.038)	(0.04)	(0.04)	(0.04)
Language	0.376 *	0.375 *	0.38 *	0.909 *	0.909 *	0.902 *	0.773 *	0.769 *	0.766 *
	(0.104)	(0.104)	(0.104)	(0.107)	(0.107)	(0.107)	(0.104)	(0.104)	(0.105)
Adjacency	0.251 *	0.249 *	0.287 *	0.298 *	0.297 *	0.278	0.455 *	0.44 *	0.449 *
	(0.123)	(0.123)	(0.124)	(0.151)	(0.151)	(0.153)	(0.148)	(0.148)	(0.148)
FTA	-0.081	-0.055	0.191	0.516 *	0.537 *	0.307	-1.374 *	-1.398 *	-1.145 *
	(0.118)	(0.117)	(0.136)	(0.183)	(0.185)	(0.184)	(0.137)	(0.137)	(0.14)
CU			-0.404 *			0.831 *			-1.861 *
			(0.182)			(0.345)			(0.213)
Test FTA = CU			[p = 0.007]			[p = 0.175]			[p < 0.001]
N	**3232**	**3232**	**3232**	**4818**	**4818**	**4818**	**5551**	**5551**	**5551**

	1990 (a)	1990 (b)	1990 (c)	2000 (a)	2000 (b)	2000 (c)
ln(Distance)	-1.308 *	-1.313 *	-1.316 *	-1.469 *	-1.472 *	-1.479 *
	(0.042)	(0.042)	(0.042)	(0.039)	(0.04)	(0.04)
Language	0.961 *	0.959 *	0.951 *	0.957 *	0.953 *	0.958 *
	(0.099)	(0.099)	(0.099)	(0.093)	(0.093)	(0.093)
Adjacency	0.57 *	0.562 *	0.559 *	0.589 *	0.585 *	0.613 *
	(0.146)	(0.146)	(0.145)	(0.168)	(0.168)	(0.168)
FTA	-1.095 *	-1.101 *	-0.848 *	-0.144	-0.15 *	0.016
	(0.117)	(0.118)	(0.131)	(0.09)	(0.085)	(0.096)
CU			-1.425 *			-0.395 *
			(0.158)			(0.12)
Test FTA = CU			[p < 0.001]			[p = 0.002]
N	**6474**	**6474**	**6474**	**7302**	**7302**	**7302**

Notes: For all years (a) uses the Baier and Bergstrand (2007) FTA dummy; (b) uses the corrected trade agreement dummy with FTAs and CUs pooled together; (c) uses separate dummies for FTAs and CUs based on the correction in (b). Standard errors in parentheses are robust. The p-values are reported for the test of equality between the coefficients on FTA and CU. Each regression also includes country dummies. * denotes statistical significance at the 5% level.

Table 2. Cross-section estimates of the log specification including observations with zero trade

	1960 (a)	1960 (b)	1960 (c)	1970 (a)	1970 (b)	1970 (c)	1980 (a)	1980 (b)	1980 (c)
ln(Distance)	-1.091 *	-1.092 *	-1.093 *	-1.455 *	-1.455 *	-1.454 *	-1.89 *	-1.913 *	-1.918 *
	(0.056)	(0.056)	(0.056)	(0.052)	(0.052)	(0.052)	(0.056)	(0.056)	(0.056)
Language	1.065 *	1.063 *	1.069 *	1.394 *	1.393 *	1.391 *	1.477 *	1.464 *	1.46 *
	(0.15)	(0.15)	(0.15)	(0.135)	(0.135)	(0.135)	(0.137)	(0.137)	(0.137)
Adjacency	0.841 *	0.837 *	0.868 *	0.303	0.301	0.296	0.448	0.421	0.432
	(0.244)	(0.244)	(0.245)	(0.237)	(0.237)	(0.239)	(0.26)	(0.26)	(0.259)
FTA	-1.112 *	-1.021 *	-0.767 *	-0.941 *	-0.915 *	-0.993 *	-3.894 *	-4.025 *	-3.554 *
	(0.318)	(0.304)	(0.358)	(0.315)	(0.322)	(0.329)	(0.229)	(0.225)	(0.243)
CU			-1.493 *			-0.813			-4.903 *
			(0.514)			(0.595)			(0.348)
Test FTA = CU			[p = 0.234]			[p = 0.788]			[p < 0.001]
N	**7173**	**7173**	**7173**	**7895**	**7895**	**7895**	**7829**	**7829**	**7829**

	1990 (a)	1990 (b)	1990 (c)	2000 (a)	2000 (b)	2000 (c)
ln(Distance)	-1.794 *	-1.802 *	-1.806 *	-1.681 *	-1.679 *	-1.698 *
	(0.051)	(0.051)	(0.051)	(0.051)	(0.052)	(0.052)
Language	1.637 *	1.632 *	1.623 *	1.68 *	1.672 *	1.684 *
	(0.127)	(0.127)	(0.128)	(0.119)	(0.119)	(0.12)
Adjacency	0.699 *	0.679 *	0.672 *	0.66 *	0.646 *	0.734 *
	(0.215)	(0.215)	(0.215)	(0.219)	(0.219)	(0.22)
FTA	-3.358 *	-3.351 *	-3.028 *	-0.348 *	-0.298 *	0.215
	(0.16)	(0.165)	(0.195)	(0.126)	(0.116)	(0.134)
CU			-3.772 *			-1.087 *
			(0.22)			(0.163)
Test FTA = CU			[p = 0.003]			[p < 0.001]
N	**8703**	**8703**	**8703**	**8875**	**8875**	**8875**

Notes: For all years (a) uses the Baier and Bergstrand (2007) FTA dummy; (b) uses the corrected trade agreement dummy with FTAs and CUs pooled together; (c) uses separate dummies for FTAs and CUs based on the correction in (b). Standard errors in parentheses are robust. The p-values are reported for the test of equality between the coefficients on FTA and CU. Each regression also includes country dummies. * denotes statistical significance at the 5% level.

Table 3. Cross-section estimates of the level specification (including observations with zero trade)

	1960 (a)	1960 (b)	1960 (c)	1970 (a)	1970 (b)	1970 (c)	1980 (a)	1980 (b)	1980 (c)
ln(Distance)	-0.563 *	-0.563 *	-0.555 *	-0.761 *	-0.761 *	-0.759 *	-0.868 *	-0.862 *	-0.867 *
	(0.075)	(0.076)	(0.076)	(0.047)	(0.047)	(0.047)	(0.042)	(0.043)	(0.043)
Language	0.531 *	0.531 *	0.555 *	0.554 *	0.554 *	0.571 *	0.371 *	0.373 *	0.35 *
	(0.126)	(0.126)	(0.122)	(0.088)	(0.088)	(0.085)	(0.072)	(0.072)	(0.074)
Adjacency	0.458 *	0.458 *	0.51 *	0.255 *	0.255 *	0.284 *	0.267 *	0.269 *	0.283 *
	(0.141)	(0.141)	(0.141)	(0.084)	(0.084)	(0.088)	(0.077)	(0.077)	(0.079)
FTA	-0.008	-0.007	0.314	0.502 *	0.503 *	0.751 *	0.065	0.092	0.225
	(0.112)	(0.112)	(0.175)	(0.068)	(0.068)	(0.106)	(0.099)	(0.106)	(0.12)
CU			-0.217			0.345 *			0.021
			(0.161)			(0.109)			(0.117)
Test FTA = CU			[p = 0.039]			[p = 0.017]			[p = 0.051]
N	**7173**	**7173**	**7173**	**7895**	**7895**	**7895**	**7829**	**7829**	**7829**

	1990 (a)	1990 (b)	1990 (c)	2000 (a)	2000 (b)	2000 (c)
ln(Distance)	-0.746 *	-0.738 *	-0.739 *	-0.748 *	-0.72 *	-0.717 *
	(0.044)	(0.043)	(0.045)	(0.045)	(0.045)	(0.046)
Language	0.446 *	0.448 *	0.445 *	0.33 *	0.332 *	0.338 *
	(0.084)	(0.084)	(0.086)	(0.075)	(0.075)	(0.076)
Adjacency	0.304 *	0.312 *	0.313 *	0.32 *	0.319 *	0.321 *
	(0.079)	(0.078)	(0.078)	(0.081)	(0.081)	(0.082)
FTA	0.427 *	0.451 *	0.459 *	0.518 *	0.619 *	0.594 *
	(0.089)	(0.085)	(0.085)	(0.083)	(0.083)	(0.082)
CU			0.439 *			0.648 *
			(0.11)			(0.108)
Test FTA = CU			[p = 0.828]			[p = 0.568]
N	**8703**	**8703**	**8703**	**8875**	**8875**	**8875**

Notes: For all years (a) uses the Baier and Bergstrand (2007) FTA dummy; (b) uses the corrected trade agreement dummy with FTAs and CUs pooled together; (c) uses separate dummies for FTAs and CUs based on the correction in (b). Standard errors in parentheses are robust. The p-values are reported for the test of equality between the coefficients on FTA and CU. Each regression also includes country dummies. * denotes statistical significance at the 5% level.

Table 4. Panel estimates of the level specification (including observations with zero trade)

	(a)	(b)	(c)	(d)
FTA	0.154 *	0.074 *	0.08 *	0.121 *
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lag FTA		0.149 *	0.131 *	0.026 *
		(0.0001)	(0.0001)	(0.0001)
Lag2 FTA			0.022 *	0.081 *
			(0.0001)	(0.0001)
Lead FTA				0.039 *
				(0.0001)
Cumulative FTA	**0.154**	**0.223**	**0.233**	**0.267**
CU	0.571 *	0.32 *	0.342 *	0.357 *
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lag CU		0.327 *	0.205 *	0.276 *
		(0.0001)	(0.0001)	(0.0001)
Lag2 CU			0.198 *	0.157 *
			(0.0001)	(0.0001)
Lead CU				0.069 *
				(0.0001)
Cumulative CU	**0.571**	**0.647**	**0.745**	**0.859**
Test FTA = CU	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag FTA = Lag CU		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag2 FTA = Lag2 CU			[p < 0.001]	[p < 0.001]
Test Lead FTA = Lead FTA				[p < 0.001]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]
N	67058	60531	53707	44014

Notes: Due to the panel fixed effects approach, coefficients on the time-invariant regressors are not reported. (a) does not include any lags or leads of FTA or CU; (b) includes one lag of FTA and CU; (c) includes two lags of FTA and CU; (d) includes two lags and one lead of FTA and CU. The cumulative effects are obtained by adding the significant contemporaneous, lag and lead coefficients. The standard errors are reported in parentheses. The p-values are reported for the test of equality between the coefficients on - FTA and CU, their corresponding lag and lead terms. The p-values for the joint test of equality between these coefficients are also reported. Each regression also includes country-by-time dummies. * denotes statistical significance at the 5% level.

Table 5. Panel estimates of the level specification (including observations with zero trade), after splitting the sample

	1960 - 1985				1990 - 2000			
	(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h)**
FTA	-0.029 *	-0.025 *	0.048 *	0.039 *	0.106 *	0.107 *	0.111 *	0.185 *
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Lag FTA		0.099 *	0.093 *	0.097 *		0.113 *	0.094 *	0.096 *
		(0.0001)	(0.0001)	(0.0001)		(0.0001)	(0.0001)	(0.0002)
Lag2 FTA			0.027 *	0.031 *			0.045 *	0.023 *
			(0.0001)	(0.0001)			(0.0001)	(0.0004)
Lead FTA				0.123 *				-0.15 *
				(0.0001)				(0.0002)
Cumulative FTA	**-0.029**	**0.074**	**0.168**	**0.29**	**0.106**	**0.22**	**0.25**	**0.154**
CU	0.619 *	0.345 *	0.359 *	0.353 *	0.259 *	0.217 *	0.229 *	0.272 *
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Lag CU		0.387 *	0.302 *	0.303 *		0.156 *	0.122 *	0.14 *
		(0.0001)	(0.0002)	(0.0002)		(0.0001)	(0.0001)	(0.0002)
Lag2 CU			0.143 *	0.14 *			0.106 *	0.025 *
			(0.0002)	(0.0002)			(0.0002)	(0.001)
Lead CU				0.083 *				0.114 *
				(0.0002)				(0.001)
Cumulative CU	**0.619**	**0.732**	**0.804**	**0.879**	**0.259**	**0.373**	**0.457**	**0.551**
Test FTA = CU	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag FTA = Lag CU		[p < 0.001]	[p < 0.001]	[p < 0.001]		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag2 FTA = Lag2 CU			[p < 0.001]	[p < 0.001]			[p < 0.001]	[p < 0.001]
Test Lead FTA = Lead FTA				[p < 0.001]				[p < 0.001]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]		[p < 0.001]	[p < 0.001]	[p < 0.001]
N	37467	31615	25361	25361	23489	23489	23489	14618

Notes: The results pertain to analyses similar to that in Table 4, where the full sample from 1960 to 2000 was considered. Here (a), (b), (c) and (d) correspond to the years 1960 to 1985; (e), (f), (g) and (h) correspond to the years 1990 to 2000. For the years 1960 to 1985, there are 520 observations with FTA=1 and 322 with CU=1. For the years 1990 to 2000 there are 592 observations with FTA=1 and 624 with CU=1.

Table A1. Summary Statistics

Variable	Mean	SD	N
Bilateral Trade (nominal)	234970.9	2487905	73228
Bilateral Trade (real)	344774.1	2893388	72136
Distance	4812.206	2707.089	82080
Common Language (1=Yes)	0.059	0.236	82080
Adjacent (1=Bordering Countries)	0.025	0.156	82080
Free Trade Agreement	0.014	0.116	82080
Customs Union	0.012	0.107	82080

Notes: Data come from Baier and Bergstrand (2007) and include observations from 1960 to 2000, at five year intervals. While the original trade agreement dummy pooled FTAs and CUs together, here they are considered separately.

Table A2. List of Trade Agreements

Customs Unions
European Union, or EU (1958): Belgium-Luxembourg, France, Italy, Germany, Netherlands, Denmark (1973), Ireland (1973), United Kingdom (1973), Greece (1981), Portugal (1986), Spain (1986), Austria (1995), Finland (1995), Sweden (1995).
Central American Common Market (1959 * - 1975, 1993): El Salvador, Guatemala, Honduras, Nicaragua, Costa Rica (1965).
Economic and Customs Union of the Central African States (1991 **): Cameroon, Congo, Gabon.
Caribbean Community, or Caricom (1973 ***): Jamaica, Trinidad and Tobago, Guyana (1995).
Mercosur (1991): Argentina, Brazil, Paraguay, Uruguay.
Andean Community (1993): Bolivia, Colombia, Ecuador, Venezuela, Peru (1997).
EU-Turkey (1996 †)
Free Trade Agreements
Customs Union of West African States (1959-1966 ††): Burkina Faso, Mali, Mauritania, Niger, Senegal, C te d ′Ivorie.
European Free Trade Association, or EFTA (1960): Austria (until 1994), Denmark (until 1973), Finland (1986 - 1994), Norway, Portugal (until 1986), Sweden (until 1994), Switzerland, United Kingdom (until 1973).
Economic and Customs Union of the Central African States (1966-1990 **): Cameroon, Congo, Gabon.
Caribbean Community, or Caricom (1968 - 1973 ***): Jamaica, Trinidad and Tobago.
EU-EFTA / European Economic Area (1973 / 1994)
Australia-New Zealand Closer Economic Relations (1983)
US-Israel (1985)
US-Canada (1989)
EFTA-Turkey (1992) †
EFTA-Israel (1993)
Central Europe Free Trade Agreement, or CEFTA (1993): Hungary, Poland, Romania (1997), Bulgaria (1998).
EFTA-Bulgaria (1993)
EFTA-Hungary (1993)
EFTA-Poland (1993)
EFTA-Romania (1993)
North American Free Trade Agreement, or NAFTA (1994): Canada, Mexico, United States.
Bolivia-Mexico (1995)
Costa Rica-Mexico (1995)
Group of Three (1995): Colombia, Mexico, Venezuela.
Mercosur-Chile (1996)
Mercosur-Bolivia (1996)
Canada-Chile (1997)
Canada-Israel (1997)
Association of South East Asian Nations, or ASEAN (1998): Indonesia, Philippines, Singapore, Thailand.
Caricom-Dominican Republic (1998)
Hungary-Turkey (1998)
Israel-Turkey (1998)
India-Sri Lanka (1998)
Hungary-Israel (1998)

Notes: The parentheses contain an agreement's year of entry, except where noted otherwise.

* Frankel (1997, p. 262) considers the formation year to be 1959.

** Frankel (1997, p. 274) considers the union to have been functioning as little more than an FTA upto 1991.

*** According to Frankel (1997, p. 261), initially an FTA (Carifta) was formed in 1968 followed by a CU in 1973.

† http://www.wto.org/english/tratop_e/region_e/summary_e.xls

†† Frankel (1997, p. 275) suggests the existence of an FTA till 1966 followed by little success.

Table A2 (cont.). List of Trade Agreements

Free Trade Agreements (cont.)
Mexico-Nicaragua (1998)
Poland-Israel (1998)
Romania-Turkey (1998)
EU-Tunisia (1998) ‡
EFTA-Morocco (1999) ‡
Mexico-Chile (1999)
Common Market for Eastern and Southern Africa, or Comesa (2000 ‡): Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zimbabwe, Zambia.
EU-Israel (2000)
EU-Mexico (2000)
Poland-Turkey (2000)
Mexico-Guatemala (2000)
Mexico-Honduras (2000)
Mexico-Israel (2000)
Mexico-El Salvador (2000)
New Zealand-Singapore (2000)
EU-Morocco (2000) ‡

Notes: ‡ http://www.wto.org/english/tratop_e/region_e/summary_e.xls

Although EU-Hungary, EU-Bulgaria, EU-Poland, EU-Romania are listed in Baier and Bergstrand (2007), they aren't considered to be total agreements in their data. Jeffrey Bergstrand verifies this, and they aren't listed in http://www.wto.org/english/tratop_e/region_e/summary_e.xls as well.

Frankel (1997, p. 259) suggests that the Latin American Free Trade Association (LAFTA) met with little success. Also, its succesor, the Latin American Integration Association (LAIA) is considered to be partial scope. Hence they have not been listed here.

Owing to its very limited success, the African Common Market is also not coded as an FTA or a CU.

Table A3. Panel estimates of the log specification excluding observations with zero trade

	(a)	(b)	(c)	(d)
FTA	0.215 *	0.157 *	0.146 *	0.112 *
	(0.045)	(0.049)	(0.05)	(0.053)
Lag FTA		0.152 *	0.113 *	0.073
		(0.053)	(0.055)	(0.061)
Lag2 FTA			0.071	0.039
			(0.069)	(0.08)
Lead FTA				-0.024
				(0.057)
Cumulative FTA	**0.215**	**0.309**	**0.259**	**0.112**
CU	0.544 *	0.299 *	0.313 *	0.355 *
	(0.054)	(0.054)	(0.054)	(0.056)
Lag CU		0.362 *	0.314 *	0.168 *
		(0.055)	(0.059)	(0.074)
Lag2 CU			0.076	0.076
			(0.072)	(0.073)
Lead CU				0.03
				(0.06)
Cumulative CU	**0.544**	**0.661**	**0.627**	**0.523**
Test FTA = CU	[p < 0.001]	[p = 0.014]	[p = 0.003]	[p < 0.001]
Test Lag FTA = Lag CU		[p < 0.001]	[p < 0.001]	[p = 0.186]
Test Lag2 FTA = Lag2 CU			[p = 0.943]	[p = 0.696]
Test Lead FTA = Lead FTA				[p = 0.406]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]
N	48235	45262	41656	34354

Notes: See Table 4. Standard errors in parentheses are robust (clustering by country-pairs).

Table A4. Panel estimates of the log specification including observations with zero trade

	(a)	(b)	(c)	(d)
FTA	-0.266 *	-0.124	-0.084	0.059
	(0.086)	(0.085)	(0.085)	(0.09)
Lag FTA		-0.016	0.012	0.146
		(0.113)	(0.113)	(0.164)
Lag2 FTA			0.048	-0.31
			(0.14)	(0.19)
Lead FTA				-0.295 *
				(0.09)
Cumulative FTA	**-0.266**			**-0.295**
CU	0.035	0.006	0.068	0.369 *
	(0.088)	(0.111)	(0.104)	(0.092)
Lag CU		0.377 *	0.43 *	0.033
		(0.147)	(0.143)	(0.199)
Lag2 CU			-0.032	-0.188
			(0.16)	(0.146)
Lead CU				-0.328 *
				(0.113)
Cumulative CU		**0.377**	**0.43**	**0.041**
Test FTA = CU	[p = 0.003]	[p = 0.269]	[p = 0.168]	[p < 0.001]
Test Lag FTA = Lag CU		[p = 0.008]	[p < 0.001]	[p = 0.539]
Test Lag2 FTA = Lag2 CU			[p = 0.643]	[p = 0.554]
Test Lead FTA = Lead FTA				[p = 0.782]
Joint test		[p < 0.001]	[p < 0.001]	[p = 0.012]
N	72136	65222	57978	49103

Notes: See Table 4. Standard errors in parentheses are robust (clustering by country-pairs).

Table A5. Panel estimates of the log specification excluding observations with zero trade, after splitting the sample

	1960 - 1985				1990 - 2000			
	(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h)**
FTA	0.131 *	0.048	0.008	0.018	0.154 *	0.156 *	0.155 *	0.123
	(0.066)	(0.074)	(0.071)	(0.069)	(0.057)	(0.057)	(0.057)	(0.097)
Lag FTA		0.1	0.052	0.045		0.139 *	0.139 *	0.066
		(0.079)	(0.081)	(0.081)		(0.064)	(0.065)	(0.093)
Lag2 FTA			0.039	0.028			-0.018	0.018
			(0.092)	(0.094)			(0.078)	(0.116)
Lead FTA				-0.091				-0.035
				(0.08)				(0.09)
Cumulative FTA	**0.131**				**0.154**	**0.295**	**0.294**	
CU	0.379 *	0.093	0.205 *	0.212 *	0.414 *	0.312 *	0.316 *	0.355 *
	(0.085)	(0.082)	(0.079)	(0.076)	(0.071)	(0.067)	(0.068)	(0.096)
Lag CU		0.46 *	0.414 *	0.413 *		0.292 *	0.288 *	0.024
		(0.091)	(0.106)	(0.106)		(0.064)	(0.067)	(0.088)
Lag2 CU			-0.132	-0.138			0.048	0.113
			(0.087)	(0.088)			(0.079)	(0.142)
Lead CU				-0.024				-0.043
				(0.089)				(0.13)
Cumulative CU	**0.379**	**0.46**	**0.619**	**0.625**	**0.414**	**0.604**	**0.604**	**0.355**
Test FTA = CU	[p = 0.009]	[p = 0.641]	[p = 0.027]	[p = 0.032]	[p < 0.001]	[p = 0.016]	[p = 0.014]	[p = 0.002]
Test Lag FTA = Lag CU		[p < 0.001]	[p = 0.002]	[p = 0.002]		[p = 0.015]	[p = 0.02]	[p = 0.619]
Test Lag2 FTA = Lag2 CU			[p = 0.128]	[p = 0.146]			[p = 0.371]	[p = 0.471]
Test Lead FTA = Lead FTA				[p = 0.461]				[p = 0.961]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]		[p = 0.004]	[p = 0.012]	[p = 0.016]
N	27529	24556	20950	20950	20706	20706	20706	13404

Notes: See Table 5. Standard errors in parentheses are robust (clustering by country-pairs).

Table A6. Panel estimates of the log specification including observations with zero trade, after splitting the sample

	1960 - 1985				1990 - 2000			
	(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h)**
FTA	-0.75 *	-0.392 *	-0.218	-0.156	0.041	0.068	0.068	-0.014
	(0.193)	(0.177)	(0.146)	(0.145)	(0.097)	(0.097)	(0.097)	(0.152)
Lag FTA		-0.081	0.235	0.208		-0.172	-0.176	0.143
		(0.207)	(0.281)	(0.281)		(0.126)	(0.125)	(0.125)
Lag2 FTA			-0.554 *	-0.56 *			-0.012	-0.889
			(0.253)	(0.256)			(0.165)	(0.799)
Lead FTA				-0.386 *				-0.134
				(0.129)				(0.149)
Cumulative FTA	**-0.75**	**-0.392**	**-0.554**	**-0.946**				
CU	-0.165	-0.031	-0.028	0.111	0.37 *	0.231 *	0.247 *	0.264 *
	(0.143)	(0.119)	(0.108)	(0.107)	(0.106)	(0.106)	(0.106)	(0.126)
Lag CU		0.064	0.105	0.094		0.39 *	0.362 *	0.341 *
		(0.187)	(0.265)	(0.267)		(0.127)	(0.146)	(0.141)
Lag2 CU			-0.058	-0.17			0.234	0.144
			(0.166)	(0.171)			(0.136)	(0.203)
Lead CU				-0.448 *				-0.658 *
				(0.129)				(0.193)
Cumulative CU				**-0.448**	**0.37**	**0.621**	**0.609**	**-0.053**
Test FTA = CU	[p = 0.007]	[p = 0.061]	[p = 0.219]	[p = 0.084]	[p = 0.003]	[p = 0.147]	[p = 0.107]	[p = 0.041]
Test Lag FTA = Lag CU		[p = 0.569]	[p = 0.708]	[p = 0.743]		[p < 0.001]	[p = 0.002]	[p = 0.101]
Test Lag2 FTA = Lag2 CU			[p = 0.07]	[p = 0.167]			[p = 0.041]	[p = 0.206]
Test Lead FTA = Lead FTA				[p = 0.658]				[p = 0.028]
Joint test		[p = 0.049]	[p = 0.086]	[p = 0.126]		[p < 0.001]	[p = 0.001]	[p < 0.001]
N	45726	38812	31568	31568	26410	26410	26410	17535

Notes: See Table 5. Standard errors in parentheses are robust (clustering by country-pairs).

Table A7. Panel estimates of the level specification (including observations with zero trade)

	(a)	(b)	(c)	(d)
FTA	0.15 *	0.064 *	0.069 *	0.117 *
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lag FTA		0.154 *	0.129 *	0.033 *
		(0.0001)	(0.0001)	(0.0001)
Lag2 FTA			0.029 *	0.087 *
			(0.0001)	(0.0001)
Lead FTA				0.019 *
				(0.0001)
Cumulative FTA	**0.15**	**0.218**	**0.227**	**0.256**
CU	0.777 *	0.592 *	0.597 *	0.652 *
	(0.0002)	(0.0002)	(0.0002)	(0.0004)
Lag CU		0.4 *	0.367 *	-0.191 *
		(0.0003)	(0.0003)	(0.001)
Lag2 CU			0.337 *	0.722 *
			(0.001)	(0.001)
Lead CU				0.355 *
				(0.0003)
Cumulative CU	**0.777**	**0.992**	**1.301**	**1.538**
EU	0.546 *	0.267 *	0.287 *	0.347 *
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lag EU		0.347 *	0.209 *	0.295 *
		(0.0001)	(0.0001)	(0.0001)
Lag2 EU			0.207 *	0.142 *
			(0.0001)	(0.0001)
Lead EU				-0.008 *
				(0.0001)
Cumulative EU	**0.546**	**0.614**	**0.703**	**0.776**
Test FTA = CU	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag FTA = Lag CU		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag2 FTA = Lag2 CU			[p < 0.001]	[p < 0.001]
Test Lead FTA = Lead CU				[p < 0.001]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test FTA = EU	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag FTA = Lag EU		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag2 FTA = Lag2 EU			[p < 0.001]	[p < 0.001]
Test Lead FTA = Lead EU				[p < 0.001]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test CU = EU	[p < 0.001]	[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag CU = Lag EU		[p < 0.001]	[p < 0.001]	[p < 0.001]
Test Lag2 CU = Lag2 EU			[p < 0.001]	[p < 0.001]
Test Lead CU = Lead EU				[p < 0.001]
Joint test		[p < 0.001]	[p < 0.001]	[p < 0.001]
N	67058	60531	53707	44014

Notes: See Table 4. The EU variables correspond to the European Union. CU refers to all other customs unions.

Table A8. Panel estimates of the level specification (including observations with zero trade), after splitting the sample

	1960 - 1985				1990 - 2000	
	(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**
FTA	-0.03 *	-0.026 *	0.046 *	0.038 *	0.073 *	0.071 *
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
Lag FTA		0.099 *	0.093 *	0.097 *		0.111 *
		(0.0001)	(0.0001)	(0.0001)		(0.0001)
Lag2 FTA			0.027 *	0.031 *		
			(0.0001)	(0.0001)		
Lead FTA				0.123 *		
				(0.0001)		
Cumulative FTA	**-0.03**	**0.073**	**0.166**	**0.289**	**0.073**	**0.182**
CU	-0.223 *	-0.373 *	-0.244 *	-0.383 *	0.389 *	0.36 *
	(0.0001)	(0.001)	(0.001)	(0.001)	(0.0003)	(0.0003)
Lag CU		0.446 *	0.273 *	0.272 *		0.151 *
		(0.001)	(0.002)	(0.002)		(0.0004)
Lag2 CU			-0.057 *	0.255 *		
			(0.002)	(0.002)		
Lead CU				0.515 *		
				(0.002)		
Cumulative CU	**-0.223**	**0.073**	**-0.028**	**0.659**	**0.389**	**0.511**
EU	0.63 *	0.36 *	0.373 *	0.367 *	0.176 *	0.121 *
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Lag EU		0.381 *	0.3 *	0.302 *		0.167 *
		(0.0001)	(0.0002)	(0.0002)		(0.0001)
Lag2 EU			0.14 *	0.137 *		
			(0.0002)	(0.0002)		
Lead EU				0.083 *		
				(0.0002)		
Cumulative EU	**0.63**	**0.741**	**0.813**	**0.889**	**0.176**	**0.288**
N	37467	31615	25361	25361	23489	23489

Notes: See Table A7. Tests of equality for each pair of trade agreement dummies, as in Table A7, were conducted for both splits of the sample. In each case, the null of equality for each individual and joint test is rejected at the 1% level. For the years 1960 to 1985, there are 520 observations with FTA=1, 244 with EU=1 and 78 with (other) CU=1. For the years 1990 to 2000 there are 592 observations with FTA=1, 474 with EU=1 and 150 with (other) CU=1. For the 1990 - 2000 case, additional lags or lead resulted in some of the variables of interest being dropped.