The Impact of Historical and Regional Linkages on Free Trade in the Americas: A Gravity Model Analysis Across Sectors

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Abstract:

This paper estimates the impact of regional linkages (i.e. regional trading agreements) and historical linkages (i.e. neo-colonial trade ties) on trade pattern in the Western Hemisphere using the gravity model of international trade. The estimation is made at the aggregate trade level as well as on the disaggregated level by using trade data corresponding to food products and manufactured goods respectively. The evidence suggests that significant distortions of trade patterns due to regional and historical linkages exist. It seems that smaller economies are more receptive to the effects of regionalism than larger ones and that the food sector is more affected by distortions than the manufactured goods sector.

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1. Introduction and Background

The Free Trade Area of the Americas (FTAA) is currently being negotiated among 34 countries in North America, Latin America, and the Caribbean.[1] The goal is a free trade area spanning the entire Western Hemisphere. While the negotiations are scheduled to be complete by the end of 2005, the FTAA's implementation continues to be a sensitive issue. As such, it is important that the discussion is based on empirical facts and not political propaganda. Obviously, the issues surrounding the FTAA are too vast and too complex to be addressed in any single work. However, a good starting point for analyzing the FTAA is to develop a clear understanding of the underlying pattern of trade in the Western Hemisphere.

It can be postulated that the trade patterns in the Western Hemisphere are influenced by trade relationships resulting from different types of linkages. For instance, there are often strong trade relationships between countries on a regional basis. There are currently seven major regional trading agreements in the Western Hemisphere. They are presented with their respective members and years of enactment in Table 1. As the table suggests, almost every economy in the hemisphere is participating in a regional trading agreement of some sort. As these agreements essentially follow geographical regions, they divide the hemisphere into different sub-regions. An economic integration scheme can be considered a regional linkage affecting trade patterns.

Other linkages are the consequence of historical legacies. Most FTAA economies are former European colonies. As pointed out by Grier, establishing trade linkages was often one of the major motivations behind imperialism. As a lingering effect, there are

often neo-colonial trade ties present with large volumes of trade between the former colony and the former metropolitan ruler in Western Europe.

Trade data reveal some support for the above hypothesized trade relationships. Table 2 presents the intra-regional trade shares for the regional groupings in Table 1 over the past decade.[2] The intra-regional trade shares in the table are defined as the percentage of total merchandise exports of a particular grouping that is destined for other member countries. The Caribbean Community (Caricom), Mercado Comun del Sur (Mercosur), and the North American Free Trade Agreement (NAFTA) have experienced an increase in intra-regional trade over the past decade. Intra-regional trade among the Andean Group increased initially during the nineties, but seems to have reach its peak of almost 13 percent in 1998 with a sharp decrease in subsequent years. The Central American Common Market (Cacm) exhibits a similar trend, but the peak was reached earlier followed by a sharper decrease.[3]

Similarly, a useful way of detecting neo-colonial trade ties is to observe the percentage of a former colony's total exports destined for the former colonial ruler. Using export data from the United Nations COMSTAT Database, this trade share for the Caribbean economies, most of which are former British dependencies, ranges between 8 to 15 percent of total exports over the past decades. Interestingly, no analogous relationship exists for most former Spanish and Portuguese dependencies as the corresponding export-shares linger in the lower single.[4]

While particular trade relationships exist, they may simply be part of the 'natural' trade pattern that would prevail if regional and historical linkages had no significant impact on trade behavior. That is, they would naturally result due to the economic and

geographic circumstance of trading partners, i.e. countries within a particular region may exhibit higher trade level internally vis-à-vis other trading partners due to cultural similarities within a region and geographic proximity, and the presumed neo-colonial trade bias might just be in response to the relative market size of Western Europe. Hence, these trade relationships may not represent any true distortions of trade patterns. Given this context, it becomes interesting to address the extent to which these linkages truly influence trade behavior.

The purpose of this paper is to empirically investigate the determinants of trade patterns in the Western Hemisphere using the gravity model of international trade. In particular, this paper focuses on the extent to which regional linkages, i.e. regional trading agreements, and historical linkages, i.e. colonial legacies, influence trade behavior after the gravity model accounts for the hemisphere's 'natural' trade pattern. The model is applied to a data set encompassing the nine-year period 1992-2000. To capture any sectoral differences, the estimation is implemented using both aggregated and disaggregated trade data.

The remainder of this paper is organized as follows. Section two presents a brief review of the literature. Section three follows with an introduction to the gravity model. The next section addresses the empirical specification and discusses the data. Section five presents the empirical results. The final section concludes.

2. Brief Literature Review

There is a plethora of works analyzing integration in the Western Hemisphere with widely varying conclusions and hypotheses (i.e. Bouzas; Lee; Nicholls et al.;

Panagariya; Salazar-Xirinachs and Tavares de Araujo Jr; Smith). Thorough investigations of trade patterns are less plentiful. Much recent work on the economic impact associated with trade liberalization and economic integration in the hemisphere have been based on Computable General Equilibrium (CGE) models (i.e. Diao and Somwaru; Rutherford and Martinez). However, CGE models generally result in the smaller economies in the Caribbean basin and Central America to be subsumed into regional aggregates such a 'Central America and the Caribbean' or 'Latin America and the Caribbean'. As such, much information about the individual economies is lost. Consequently, the usefulness of such models in analyzing the impact of Western Hemispheric integration may be limited due to the inherent diversity of the FTAA economies, both in terms of economics and in terms of sheer physical size.

An alternative framework for analyzing trade patterns is the use of gravity models. The gravity methodology provides an intuitive and convenient framework for analyzing trade flows. Gravity models also have the ability to incorporate the characteristics of each country as an individual unit regardless of its size. The methodology has been widely used in the investigation of trade patterns in varying contexts over the past four decades. Some have applied the model to assess the influence of regionalism, as well as other factors, in the Western Hemisphere (i.e. Egoume-Bossogo and Mendis; Endoh; Frankel, Stein, and Wei 1995, 1997; Garman, Peterson and Gilliard; Sandberg, Taylor, and Seale; Soloaga and Winters; Thoumi 1989a, b). They all find differing degrees of significant regional influences on trade patterns. However, the literature commonly fails to include the majority of the hemisphere's economies or to extend the analysis to the overall pattern of trade. Furthermore, Rauch and Sandberg,

Taylor, and Seale detect significant colonial linkages using the gravity model, however, the former employed a more general worldwide model and the latter focused exclusively on the Caribbean.

3. The Gravity Model

The basic idea behind the gravity model is that bilateral trade from one country to another can be explained by factors that capture the potential of a country to export goods and services, factors that capture the propensity of a country to import goods and services, and any other forces that either attract or inhibit bilateral trade. Sandberg provides a thorough review of the model's evolution and alternate uses over time.

The origin of gravity model analysis in international trade is generally attributed to Tinbergen and Pöyhönen (1963a,b) who independently and concurrently explored similar models. While there are several variations on the theme, a typical gravity model of international trade takes the following form

$$(1) \qquad X_{ijt} = e^{\beta_0} Y_{it}^{\beta_1} N_{it}^{\beta_2} Y_{jt}^{\beta_3} N_{jt}^{\beta_4} D_{ij}^{\beta_5} e^{\mathbf{W}\gamma} e^{u_{ijt}},$$

where X_{ijt} is the bilateral exports from country i to country j in period t; Y_{it}, Y_{jt} are the GDPs of countries i and j in time t, respectively; N_{it}, N_{jt} are the trading partners' respective populations in time t; D_{ij} is the bilateral distance between the two countries; and the model is commonly augmented with $\boldsymbol{W}$, a vector of variables capturing any resistance or enhancement factors to trade.[5] Following convention, u is a normally distributed error component capturing any random influences.

The income, population, and distance variables represent the so-called the 'gravity variables.' These variables establish what can be thought of as a 'normal' pattern of trade

prevailing given the economic and geographic characteristics of trading partners in the absence of any systematic distortions. An appealing feature of the model is its ability to identify any systematic distortions or deviations vis-à-vis these presumably 'normal' trade flows. This is commonly accomplished by including binary variables in $\boldsymbol{W}$.[6] Using binary variables to capture the effects of qualitative factors enables one to assess by what factor trade flows under such influence differ from the undistorted trade pattern.

As an illustration, assume that a regional trading agreement is postulated to affect trade patterns. Let a binary variable be introduced controlling for participation in this agreement. When both country *i* and country *j* participate in the particular agreement, the variable is assigned a value of 1, 0 otherwise. Thus, the distortion due to the regional trading agreement, or the deviation from the 'normal' trade pattern, would be a factor equal to the exponential of the estimated coefficient of this variable times the 'undistorted' trade. The case where the binary variable is zero would thus represent the 'undistorted' trade pattern.[7]

4. Econometric Specification and Data

The gravity model used in this paper is a slightly modified version of the model presented above. The GDP terms in (1) are interchanged for their respective GDP per capita as to better capture the trading capacity of the particular countries.[8] The use of per capita income rather than absolute income also alleviates the inherent problem of comparing economies of widely varying sizes. For the purposes of this study, the effects of historical and regional linkages will be introduced by the inclusion of binary variables in $\boldsymbol{W}$. After taking the natural logarithm the econometric model becomes

(2) $$\ln X^{*}_{ijt} = \beta_0 + \beta_1 \ln\left(\frac{Y_{it}}{N_{it}}\right) + \beta_2 \ln N_{it} + \beta_3 \ln\left(\frac{Y_{it}}{N_{jt}}\right) + \beta_4 \ln N_{jt} + \beta_5 \ln D_{ij} +$$

$$\beta_6 \ln Remoteness_{it} + \beta_7 \ln Remoteness_{jt} + \beta_8 Border_{ij} + \beta_9 Language_{ij} + \beta_{10} UK\ Colony +$$

$$\beta_{11} Spain\ Colony + \beta_{12} Portugal\ Colony + \beta_{13} NAFTA + \beta_{14} Caricom_{ij} + \beta_{15} Mercosur +$$

$$\beta_{16} Andean\ Pact + \beta_{17} Cacm + \beta_{18} EU\ Importer + u_{ijt},$$

where

$X^{*}_{ijt} = (X_{ijt} + 1)$ and X_{ijt} is the nominal dollar value of exports from country *i* to country *j* in time *t* (this procedure eliminates the problem of 'zero observations', i.e. the instances where bilateral exports are zero);

Y_t is the nominal dollar value of a particular country's GDP in time *t*;

N_t is the population of a particular country in time *t*;

D_{ij} is the bilateral distance in kilometers between the capitals of country *i* and country *j*;

$Remoteness_t$ is the 'relative distance' of a particular country to its trading partners as measured by the average distance to its trading partners in the sample as weighted by their respective share in world GDP in time *t*;

$Border_{ij}$ is a binary variable measuring the effect of adjacency, defined to equal 1 if country *i* and country *j* share a common border, 0 otherwise;

$Language_{ij}$ is binary variable measuring the cultural effect of sharing a common language, defined to equal 1 if both trading partners share a common commercial language, 0 otherwise;

UK Colony is a binary variable capturing any British neo-colonial ties, defined to equal 1 if one of the trading partners is the UK and the other a former British dependency in the Western Hemisphere, 0 otherwise;[9]

Spain Colony is a binary variable capturing any Spanish neo-colonial ties, defined to equal 1 if one of the trading partners is Spain and the other a former Spanish dependency in the Western Hemisphere, 0 otherwise;

Portugal Colony is a binary variable capturing any Portuguese neo-colonial ties, defined to equal 1 if one of the trading partners is Portugal and the other a former Portuguese dependency in the Western Hemisphere, 0 otherwise;

NAFTA, Caricom, Mercosur, Andean Pact, and *Cacm* are binary variables capturing the effects of any linkages resulting from participating in a particular regional trading agreement (i.e. NAFTA, Caricom, Mercosur, Andean Pact, and Cacm respetively), defined to equal 1 if both country *i* and country *j* are both members of a particular grouping, 0 otherwise;[10]

EU Importer is a binary variable measuring the effect of the often generous preferential treatment given by the EU, defined to equal 1 if the importing country (i.e. country *j*) is the a member of the EU, 0 otherwise.

The above model is fitted to trade data obtained from the Inter-American Development Bank's DATA Intal CD-rom. The data consists of annual observations over the time period 1992 through 2000. GDP and population data are obtained from the United Nations COMSTAT database. The distance data, language, border, and colonial information are obtained from Gaulier, Mayer and Zignago. Information regarding

participation in regional trading agreements is obtained from Frankel, Stein, and Wei (1997).

There are a total of 64 countries in the sample. In addition to the FTAA economies, the majority of the OCED countries, India, Indonesia, Israel, the Philippines, Singapore, and South Africa are included in the sample.[11] Each bilateral export flow in a given year represents one observation. The data set used in this paper is somewhat unique vis-à-vis other gravity model applications in that the data set is hemispheric centered. What that implies is that in each observation, at least one of the trading partners, i.e. either the exporting country, the importing country or both, are located in the Western Hemisphere. Thus, the data set encompasses the bilateral trade among the FTAA countries and the bilateral trade between the FTAA countries and their 'external' trading partners, but not the bilateral trade between the 'external' non-FTAA economies. As a consequence, the results in this paper are directly applicable to the trade pattern of the Western Hemisphere, whereas most other gravity estimations result in a world-model of trade

5. Empirical Results and Discussion

There is no reason to believe that trade patterns are the same across all sectors of an economy (i.e. the impact of regionalism on agricultural trade may very well differ from the impact on manufactured goods trade). As such, the model will be estimated using three different trade data sets. First, the model is estimated using aggregated trade data. Second, the model is re-estimated using disaggregated trade data. The dataset in disaggregated by the United Nations Conference on Trade and Development (UNCTAD)

system. Two particular desegregations are of interest, the trade in 'all food products' (UNCTAD category 1) and the trade in 'manufactured goods' (UNCTAD category 5). The model is estimated for each of the nine years (1992-2000) for each data set. Due to data availability the number of observations in each year for each data set varies. The estimation is accomplished by using GAUSS programming language. The estimated parameters are presented in Table 3 (aggregated trade), Table 4 (UNCTAD category 1) and Table 5 (UNCTAD category 5). To avoid the inherent problem of heteroskedasticity in cross-sectional data sets encompassing units of vastly varying sizes, the estimated standard errors are White's robust standard errors. The reader should note that parameter estimates for the *UK colonial* and *Caricom* variables are unavailable for 1992 and 1993 due to missing observations and the *NAFTA* variable is unavailable since the NAFTA agreement was not effective until 1994. These three variables had to be dropped from the two years to avoid perfect collinearity.

According to the r-squares and the overall F-tests, the model fits the data sets well and exhibits statistically significant explanatory power. As expected, the basic gravity variables perform well empirically. The magnitude of the parameter estimates is higher for aggregated trade than when the data is disaggregated. Rather consistently, the effect of the exporter's variables outweigh the effect of the importer's, although the difference is lessened once the data is disaggregated. For trade in food products, the difference is only marginal. It seems that the trade patterns in the Western Hemisphere are relatively more determined by exporting country's trading capacity than the trading capacity of the importer. As an interesting note, the estimated distance parameter for the aggregated data set is close to negative 2, thus resembling Newton's original gravitational formula.

The remoteness of the exporter exerts a positive influence on manufactures trade, but a negative effect on food products. When relatively remotely located, a country will engage in more merchandise trade with partners within a particular distance to a greater extent than otherwise. For food products, however, the trade increasing effect seems to be outweighed by the higher transportation cost required for goods to reach the importer as food products tend to be bulky relative to their value. As a consequence of these opposite effects, the impact on aggregate trade is ambiguous. The remoteness of the importing country seem not to matter significantly for manufactured goods trade, whereas the impact on food products and aggregated trade is positive. A relatively remote country tends to import more food products from a particular trading partner and potential exporters seemingly search for the closest importer. In general, the parameter estimates stand in sharp contrast with the results of Frankel, Stein, and Wei (1997).

For all three data sets, statistically significant neo-colonial linkages are detected. The results suggest that the UK and Spain in particular exert a strong influence on the trade behavior of their former dependencies. Obviously, this is due to a combination of preferential treatment and historical ties. The effect of the British linkage is greater in magnitude for food products than for manufactures. Manufactured goods trade seemingly follows a normal pattern to a greater extent than trade in food products, although a neo-colonial distortion is still present. The neo-colonial bias for food products can thus be thought of as being induced through overly generous preferences. The upward neo-colonial distortion for food products is roughly 12 (the exponential of 2.5) times what trade would be been in the absence of this linkage. The corresponding figure for manufactured goods is roughly 2.7 (the exponential of unity) times the undistorted

trade in the absence of the neo-colonial linkage. This magnitude is slightly larger for aggregated trade indicating that even stronger neo-colonial distortions are present in other UNCTAD product groups, such as raw materials, ores and metals, or fuels. The parameter estimates for aggregate trade are similar to Sandberg, Taylor, and Seale who also look at British linkages.

The Spanish neo-colonial distortion follow a similar trend, however, the magnitude of the distortion is significantly smaller than the British (ranging from roughly 1.5 to 2.2 times the undistorted trade). In contrast, it does not seem to be the case that other product groups are subject to graver distortions, as the aggregate parameters fall in between those for UNCTAD category 1 and UNCTAD category 5. In general, the results for the colonial linkage between Brazil and Portugal are ambiguous.

For the British case, the existence of a significant colonial linkage confirms what can be suspected from looking at trade data. In the Spanish case, however, the existence of a distortion reinforces the strength of the gravity model. Even though the causal observation of trade data does not reveal a clear distortion (neo-colonial trade shares in the lower single digits), there is indeed a statistically significant linkage present after controlling for the natural trade patterns resulting from economics and geography. The influence that Portugal may exert might already be captured by the *EU importer* and *Language* variables. It seems that preferential treatment from the EU has exerted an upward bias on food trade in particular, but in terms of manufactured goods (a negative effect) the natural trade pattern suggest that the Western Hemisphere would trade more with EU than they actually do. This notion is reinforced by the ambiguous result when the model is fitted to aggregated trade data.

Regional linkages are also significant in determining hemispheric trade patterns. The estimated parameters for the NAFTA linkage are at first puzzling with the estimates being negative and significant for aggregate trade but insignificant for food and manufactured goods trade. Do the estimated parameters indicate that NAFTA has been a failure as a regional grouping? Not at all. Given the economic characteristics and the geography of the NAFTA countries vis-à-vis the other countries in the hemisphere, the gravity model predicts that they would trade rather extensively with each other. Following such reasoning, it can be concluded that the trade in food and manufacturers among the NAFTA countries largely follow the undistorted trade pattern and the influence of trade in other UNCTAD categories, i.e. raw materials, ores and metals, and fuels carry over into the aggregate estimates. Frankel, Stein, and Wei (1995, 1997) also find ambiguous results regarding the NAFTA parameter.

An interesting story unfolds when looking at the parameter estimates for the *Caricom*, *Andean Pact*, and *Cacm* variables. These regional groupings have exerted a strong positive effect on trade patterns. The estimated parameters are comparable to those of Sandberg, Taylor, and Seale, Egoume-Bossogo and Mendis, and Soloaga and Winters, but the Andean Pact parameters stand in contrast with Frankel, Stein, and Wei (1995, 1997) and Garman, Petersen, and Gilliard. The linkage among the Caricom and Cacm countries outweighs that of the Andean Pact regardless of data set. It is intriguing that both the Caricom and the Cacm consists of smaller economies and are located in Central American and the Caribbean Basin. Thus, it seems that smaller economies are more receptive to the changes in trade patterns resulting from regionalism.

The effect of the Caricom is strongest for aggregated trade and weakest for manufactured goods trade. The Central American Common Market and the Andean Pact regional linkages exert most influence over trade in food products and the least over manufactured goods trade. Similar to the neo-colonial distortions, the manufacturing sector seems less affected by linkages. Yet, the distortions of manufactured goods trade are still large, roughly a factor of 20 times the undistorted trade in the absence of regionalism for Caricom, 11 times the undistorted trade for Cacm, and a factor of double the undistorted trade for the Andean Pact. In the Caricom case, the influence of other UNCTAD product groups may contribute to the larger effect for aggregated trade. Intriguingly, most the Caricom economies are former British colonies and the influence of other UNCTAD product groups was also postulated to be large for the colonial distortion. There may be a relation between these findings. Finally, Mercosur only distorts food trade, whereas manufactured goods trade seem to follow an undistorted pattern.

6. Conclusions

This paper finds that both regional and historical linkages significantly influence the trade pattern of the economies in the Western Hemisphere. The evidence suggests that the trade pattern of the smaller economies in the hemisphere is distorted to a greater extent by these linkages than the trade pattern of their larger counterparts. These effects are often quite large. In particular, regional linkages are significant among the countries in the Caribbean Community, the Central American Common Market, and to a somewhat lesser extent also the countries of the Andean Pact. NAFTA and Mercosur, on the other

hand, do not seem to alter trade patterns to the same extent after controlling for the economic and geographic characteristics of trading partners.

The key becomes to enact policies aiming at engaging the already strongly integrated groupings in the central region of the hemisphere, i.e. Caricom and Cacm, with the northern and southern groupings, i.e. NAFTA and Mercosur. Similarly, it is important to link those economies with each other, forming a North-South nexus, especially as NAFTA and Mercosur represent potential opposite forces during the implementation.

Furthermore, the results indicate that Britain and Spain do exert a neo-colonial influence distorting the trade pattern of their former dependencies. Since these linkages affect trade patterns, they need to be taken into account when analyzing the FTAA as they may interfere with the integration process. There is also evidence that the trade of the former British colonies in the Caribbean Basin in product groups other than food products and manufactures are even more receptive to the effects of these linkages. Overall, it seems that trade in food products is more receptive to distortions from regional and historical linkages than trade in manufactured goods.

Being that the results different depending on product group, it raises an interesting empirical issue. Unless it can be statistically shown that the data set can be pooled across categories, estimation should be made at a disaggregated level whenever data availability allows, as conclusions would differ based on what sector is being studied. Thus, it adds a dimension to the issue of pooling the data for panel estimation. Not only must one consider whether or not the data can be pooled over cross-sectional units (i.e. country pairs) and time periods (i.e. years), but one must also consider if pooling across product

groups is appropriate. Perhaps the gravity model should not be pooled across products categories. The appropriate estimation of this model as a panel definitely represents a fruitful extension for future research.

[1] These countries include Antigua and Barbuda, Argentina, the Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Columbia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States, Uruguay, and Venezuela (Free Trade Area of the Americas Administrative Secretariat). Note that Antigua and Cuba are not part of the list.

[2] Note that the data refers to merchandise trade only.

[3] As a comparison, intra-regional trade in the European Union (EU) has been remarkably stable over the past decade.

[4] Grier suggests that Britain has maintained a closer relationship with its former dependencies after independence than for example Spain and France. These closer relationships would results in stronger trade ties, i.e. higher trade levels, between Britain and its former colonies after their independence.

[5] For simplicity, it is assumed here that these variables enter the model exponentially

[6] In previous research, such variables have included different measures of the price level in each country, the exchange rate, trade policy proxies, binary variables for assessing the impact of qualitative factors such as participation in regional trading agreements, of sharing a common commercial language (the sharing a common language is often used as a proxy for cultural similarities), of sharing a common border, and of historical colonial ties.

[7] This would follow since the binary variables in this case enter the model as a factor of unity (the exponential of zero is equal to one).

[8] Due to the multiplicative specification of the model, interchanging absolute GDP for per capita GDP does not alter the model significantly. The original model can still be recovered by manipulation of the parameters.

[9] The United States is not counted as a former British colony for the purposes of this paper.

[10] Since the purposes of this paper is to capture the effects of regional linkages, The Group of Three and LAFTA are not accounted for here due to their pan-regional nature and overlapping memberships.

[11] The countries included in the sample are Argentina, Australia, Austria, the Bahamas, Barbados, Belgium-Luxembourg, Belize, Bolivia, Brazil, Canada, Chile, China, Columbia, Costa Rica, Denmark, Dominica, Dominican Republic, Ecuador, El Salvador, Finland, France, Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Mexico, the Netherlands, New Zealand, Nicaragua, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Russia, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Singapore, South Africa, South Korea, Spain, Suriname, Sweden, Switzerland, Trinidad and Tobago, Turkey, United Kingdom, United States, Uruguay, and Venezuela.

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Table 1: Current Regional Agreements in the Western Hemisphere

Name of Agreement	**Year Enacted**	**Current Members**
North American Free Trade Agreement	1994	Canada, Mexico, the United States
Latin American Free Trade Association/Latin American Integration Association	1960/1980	Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela
Mercado Comun del Sur	1991	Argentina, Brazil, Paraguay, and Uruguay
Andean Community	1969	Bolivia, Columbia, Ecuador, Peru, and Venezuela
Caribbean Community and Common Market	1973	Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago
Central American Common Market	1959	Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua
Group of Three	1995	Columbia, Mexico, and Venezuela

Source: Frankel, Stein, and Wei (1997) and the Caribbean Community Secretariat (2001)

Table 2: Intra-Regional Export Shares (as % of Total Merchandise Exports)

	1990	1993	1994	1995	1996	1997	1998	1999	2000
Andean Group	3.8	9.8	10.5	12	9.7	10.8	12.8	8.8	8.4
CACM	15.3	16.9	16.7	21.7	22	18.1	16.1	12.8	13.7
CARICOM	8.1	8.8	8.7	12.1	13	14.4	17.3	16.9	14.6
MERCOSUR	8.9	18.5	19.2	20.2	22.8	24.8	25	20.6	20.9
NAFTA	41.4	45.8	47.9	46.2	47.5	49.1	51.7	54.6	55.7
For comparison purposes:									
European Union	65.9	61.7	62.1	62.4	61.5	55.5	57	63.3	62.1

Source: World Bank (various years). Data refers to merchandise trade only.
CACM: Central American Common Market, CARICOM: Caribbean Community and Common Market (also referred to as Caribbean Community), MERCOSUR: Mercado Comun del Sur, NAFTA: North American Free Trade Agreement. Please refer to Table 1 for membership information.

Table 3: Aggregate Trade

Dependent Variable: ln(exports from country *i* to country *j* in U.S. dollars in a given year)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	Period Average
Constant	-55.099***	-46.949***	-56.838***	-58.040***	-58.914***	-60.092***	-57.846***	-53.689***	-59.040***	-56.278
	(6.251)	(6.335)	(4.487)	(5.057)	(5.081)	(4.665)	(4.359)	(4.730)	(4.246)	
GDP per capita Exporter	2.241***	2.167***	1.975***	2.038***	1.987***	1.999***	1.873***	1.840***	1.846***	1.996
	(0.088)	(0.085)	(0.067)	(0.066)	(0.066)	(0.063)	(0.064)	(0.063)	(0.060)	
GDP per capita Importer	1.309***	1.243***	1.203***	1.136***	1.133***	1.191***	1.269***	1.103***	1.109***	1.188
	(0.099)	(0.095)	(0.068)	(0.074)	(0.072)	(0.067)	(0.069)	(0.068)	(0.066)	
Population Exporter	1.619***	1.676***	1.879***	1.864***	1.843***	1.893***	1.833***	1.845***	1.884***	1.815
	(0.061)	(0.058)	(0.040)	(0.041)	(0.043)	(0.037)	(0.039)	(0.043)	(0.040)	
Population Importer	0.897***	0.930***	0.999***	1.015***	1.017***	1.067***	1.091***	1.016***	0.993***	1.003
	(0.072)	(0.066)	(0.029)	(0.030)	(0.032)	(0.028)	(0.033)	(0.029)	(0.029)	
Distance[a]	-1.789***	-1.485***	-2.079***	-2.306***	-2.339***	-2.483***	-2.052***	-1.966***	-2.165***	-2.074
	(0.173)	(0.180)	(0.109)	(0.107)	(0.113)	(0.101)	(0.119)	(0.116)	(0.107)	
Remoteness Exporter[b]	-0.060	-0.670	-0.211	0.187	0.285	0.343	-0.425	-0.946**	-0.433	-0.214
	(0.577)	(0.567)	(0.413)	(0.475)	(0.445)	(0.413)	(0.375)	(0.411)	(0.360)	
Remoteness Importer[b]	1.753***	1.096***	2.066***	2.009***	2.132***	2.099***	2.313***	2.587***	2.838***	2.099
	(0.329)	(0.330)	(0.257)	(0.255)	(0.257)	(0.258)	(0.244)	(0.240)	(0.237)	
Common border [c]	0.671*	1.230***	0.280	-0.182	-0.544*	-1.290***	-0.444	-0.282	-0.607*	-0.130
	(0.355)	(0.369)	(0.349)	(0.307)	(0.294)	(0.411)	(0.279)	(0.268)	(0.346)	
Common language [d]	1.798***	2.018***	0.792***	0.738***	0.560***	0.629***	0.721***	0.843***	0.575***	0.964
	(0.267)	(0.291)	(0.182)	(0.182)	(0.183)	(0.172)	(0.182)	(0.184)	(0.174)	
Colonial linkage: UK[e]	--	--	3.365***	2.990***	3.273***	2.854***	1.841*	2.062**	2.240***	2.661
	--	--	(0.700)	(0.648)	(0.751)	(0.690)	(1.097)	(0.808)	(0.711)	
Colonial linkage: Spain[f]	-0.847**	-1.029***	0.809**	0.803**	1.006***	1.190***	1.030***	0.718**	0.923***	0.511
	(0.352)	(0.357)	(0.317)	(0.321)	(0.329)	(0.335)	(0.304)	(0.286)	(0.261)	
Colonial linkage: Portugal[g]	-1.979***	-1.984***	-0.810	-1.010	-0.945	-0.869	-0.733	-0.614	-0.567	-1.057
	(0.335)	(0.547)	(0.590)	(0.754)	(0.894)	(0.752)	(0.655)	(0.753)	(0.939)	

Nafta[h]	--	--	-2.434***	-1.825**	-1.490**	-2.054**	-2.159***	-2.010**	-1.972**	-1.992
	--	--	(0.709)	(0.819)	(0.739)	(0.880)	(0.819)	(0.825)	(0.798)	
Caricom[h]	--	--	5.226***	4.791***	4.467***	4.717***	3.430***	4.159***	4.141***	4.419
	--	--	(0.448)	(0.408)	(0.453)	(0.375)	(0.531)	(0.498)	(0.473)	
Mercosur[h]	-0.663	-0.323	-0.968	-1.047	-0.786	-0.451	-0.285	-0.072	-0.273	-0.541
	(0.722)	(0.687)	(0.674)	(0.677)	(0.681)	(0.724)	(0.625)	(0.628)	(0.666)	
Andean Pact[h]	0.630*	0.653**	0.783**	0.640*	0.943***	1.092***	1.285***	1.226***	1.339***	0.954
	(0.318)	(0.329)	(0.334)	(0.368)	(0.323)	(0.345)	(0.306)	(0.314)	(0.311)	
Cacm[h]	2.588***	2.745***	2.413***	2.091***	2.190***	2.263***	2.755***	2.364***	2.231***	2.404
	(0.359)	(0.376)	(0.337)	(0.315)	(0.318)	(0.342)	(0.322)	(0.309)	(0.303)	
EU Importer[k]	0.773*	0.836**	-0.098	0.415	0.315	0.084	-0.508*	-0.344	0.109	0.176
	(0.466)	(0.401)	(0.308)	(0.327)	(0.324)	(0.298)	(0.267)	(0.281)	(0.260)	
R-squared	0.573	0.589	0.665	0.652	0.652	0.661	0.630	0.650	0.673	
F-statistic	137.767	147.254	259.568	248.303	230.573	286.088	242.451	236.601	284.616	
N	1554	1560	2374	2408	2236	2657	2582	2315	2507	

White's robust standard errors in parenthesis.
*) Statistically significant at the 10 % level
**) Statistically significant at the 5 % level
***) Statistically significant at the 1 % level
a) Bilateral distance in kilometers between the capitals of trading partners.

b) *Remoteness* $i = \sum_{j \neq i} \left(d_{ij} \times \left(\frac{y_j}{y_w} \right) \right)$

Binary variables:
c) Equal to 1 if the two trading partners are contingent, i.e. they share a common border, 0 otherwise.
d) Equal to 1 if the two trading partners share a common commercial language, 0 otherwise.
e) Equal to 1 if one of the trading partners is the UK and the other a former British colony in the Western Hemisphere, 0 otherwise. (Note that the United States is not considered a former colony).
f) Equal to 1 if one of the trading partners is Spain and the other a former Spanish colony in the Western Hemisphere, 0 otherwise.
g) Equal to 1 if one of the trading partners is Portugal and other a former Portuguese colony in the Western Hemisphere, 0 otherwise.
h) Integration/regional dummies: Equal to 1 if both trading partners are members a specific trading agreement, (Nafta, Caricom, Mercosur, Andean Pact, or Cacm respectively), 0 otherwise.
k) Equal to 1 if the importing country is a member of the European Union, 0 otherwise.

Table 4: 'All Food Products' Trade (UNCTAD 1)

Dependent Variable: ln(exports of food products from country *i* to country *j* in U.S. dollars in a given year)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	Period Average
Constant	-22.855***	-26.756***	-28.071***	-29.308***	-32.283***	-42.684***	-30.785***	-27.172***	-29.336***	-29.917
	(4.139)	(4.159)	(3.611)	(3.745)	(3.694)	(4.315)	(3.864)	(3.984)	(3.490)	
GDP per capita Exporter	1.115***	1.069***	1.073***	1.071***	1.047***	1.294***	1.061***	1.061***	0.980***	1.086
	(0.059)	(0.061)	(0.053)	(0.055)	(0.053)	(0.071)	(0.059)	(0.060)	(0.052)	
GDP per capita Importer	1.037***	1.034***	1.005***	0.996***	0.923***	1.068***	0.980***	0.960***	0.950***	0.995
	(0.068)	(0.065)	(0.057)	(0.055)	(0.055)	(0.070)	(0.065)	(0.058)	(0.054)	
Population Exporter	0.704***	0.725***	0.915***	0.918***	0.941***	1.094***	0.993***	0.963***	0.912***	0.907
	(0.040)	(0.041)	(0.035)	(0.032)	(0.038)	(0.042)	(0.037)	(0.035)	(0.032)	
Population Importer	0.806***	0.799***	0.846***	0.876***	0.886***	1.004***	0.957***	0.837***	0.883***	0.877
	(0.047)	(0.044)	(0.024)	(0.026)	(0.031)	(0.034)	(0.031)	(0.025)	(0.028)	
Distance	-1.120***	-1.278***	-1.261***	-1.165***	-1.448***	-1.468***	-1.439***	-1.180***	-1.310***	-1.296
	(0.143)	(0.151)	(0.081)	(0.087)	(0.099)	(0.109)	(0.090)	(0.092)	(0.085)	
Remoteness Exporter	-1.145***	-0.621*	-0.742***	-0.949***	-0.628**	-0.630*	-0.854***	-1.618***	-0.825***	-0.890
	(0.321)	(0.331)	(0.277)	(0.279)	(0.286)	(0.327)	(0.283)	(0.319)	(0.256)	
Remoteness Importer	1.588***	1.671***	1.492***	1.678***	2.025***	2.280***	1.746***	2.132***	1.823***	1.826
	(0.277)	(0.285)	(0.238)	(0.238)	(0.237)	(0.282)	(0.261)	(0.253)	(0.230)	
Common border	0.799***	0.604**	0.185	0.224	-0.197	0.243	-0.101	0.346	0.187	0.255
	(0.285)	(0.284)	(0.257)	(0.227)	(0.274)	(0.256)	(0.253)	(0.230)	(0.229)	
Common language	0.320	-0.056	0.585***	0.711***	0.159	0.668***	0.696***	0.934***	0.692***	0.523
	(0.253)	(0.271)	(0.150)	(0.158)	(0.176)	(0.190)	(0.169)	(0.155)	(0.149)	
Colonial linkage: UK	--	--	2.945***	2.733***	3.155***	2.898***	2.398***	1.693***	2.148***	2.567
	--	--	(0.292)	(0.274)	(0.381)	(0.377)	(0.379)	(0.369)	(0.361)	
Colonial linkage: Spain	0.606*	0.939***	0.687***	0.742***	1.022***	0.914***	0.828***	0.556**	0.720***	0.779
	(0.323)	(0.335)	(0.258)	(0.252)	(0.253)	(0.290)	(0.285)	(0.260)	(0.235)	
Colonial linkage: Portugal	1.057**	1.677***	0.989***	0.861*	1.168	0.621	0.704	0.659	1.137**	0.986
	(0.244)	(0.337)	(0.327)	(0.457)	(0.732)	(0.773)	(0.502)	(0.874)	(0.482)	

Nafta	--	--	0.629	0.874	1.031*	-0.369	0.221	0.304	0.348	0.434
	--	--	(0.585)	(0.625)	(0.529)	(0.639)	(0.592)	(0.621)	(0.545)	
Caricom	--	--	3.365***	3.062***	2.612***	3.822***	3.341***	3.078***	3.049***	3.190
	--	--	(0.291)	(0.326)	(0.366)	(0.430)	(0.345)	(0.355)	(0.337)	
Mercosur	0.881**	0.586	0.965*	1.231**	1.050**	0.972*	1.422***	1.570***	1.286**	1.107
	(0.372)	(0.428)	(0.487)	(0.486)	(0.505)	(0.525)	(0.520)	(0.510)	(0.523)	
Andean Pact	0.435	1.005**	0.945***	1.259***	0.900*	1.208***	1.441***	1.622***	1.475***	1.143
	(0.494)	(0.472)	(0.366)	(0.321)	(0.540)	(0.338)	(0.323)	(0.308)	(0.270)	
Cacm	2.752***	2.700***	2.593***	2.877***	2.590***	3.131***	2.689***	2.843***	2.620***	2.755
	(0.348)	(0.323)	(0.273)	(0.251)	(0.276)	(0.327)	(0.273)	(0.281)	(0.261)	
EU Importer	0.126	0.568**	0.248	0.293	0.368*	0.641***	0.440***	0.511***	0.431**	0.403
	(0.259)	(0.240)	(0.202)	(0.209)	(0.210)	(0.238)	(0.205)	(0.180)	(0.185)	
R-squared	0.474	0.482	0.587	0.593	0.559	0.523	0.534	0.540	0.580	
F-statistic	69.390	72.659	136.019	142.529	118.099	121.478	126.424	119.988	152.026	
N	1173	1189	1740	1778	1694	2014	2004	1858	2002	

White's robust standard errors in parenthesis.
*) Statistically significant at the 10 % level
**) Statistically significant at the 5 % level
***) Statistically significant at the 1 % level
a) Bilateral distance in kilometers between the capitals of trading partners.

b) *Remoteness* $i = \sum_{j \neq i} \left(d_{ij} \times \left(\frac{y_j}{y_w} \right) \right)$

Binary variables:
c) Equal to 1 if the two trading partners are contingent, i.e. they share a common border, 0 otherwise.
d) Equal to 1 if the two trading partners share a common commercial language, 0 otherwise.
e) Equal to 1 if one of the trading partners is the UK and the other a former British colony in the Western Hemisphere, 0 otherwise. (Note that the United States is not considered a former colony)
f) Equal to 1 if one of the trading partners is Spain and the other a former Spanish colony in the Western Hemisphere, 0 otherwise.
g) Equal to 1 if one of the trading partners is Portugal and other a former Portuguese colony in the Western Hemisphere, 0 otherwise.
h) Integration/regional dummies: Equal to 1 if both trading partners are members a specific trading agreement, (Nafta, Caricom, Mercosur, Andean Pact, or Cacm respectively), 0 otherwise.
k) Equal to 1 if the importing country is a member of the European Union, 0 otherwise.

Table 5: Manufactured Good Trade (UNCTAD 5)

Dependent Variable: ln(exports of manufactured goods from country *i* to country *j* in U.S. dollars in a given year)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	Period Average
Constant	-37.899***	-36.521***	-35.237***	-38.145***	-38.700***	-44.064***	-39.064***	-39.071***	-36.123***	-38.314
	(3.484)	(3.538)	(3.033)	(3.058)	(3.056)	(3.461)	(3.143)	(3.443)	(2.739)	
GDP per capita Exporter	1.717***	1.778***	1.600***	1.625***	1.652***	1.772***	1.725***	1.766***	1.634***	1.697
	(0.049)	(0.048)	(0.044)	(0.042)	(0.042)	(0.050)	(0.048)	(0.049)	(0.040)	
GDP per capita Importer	0.882***	0.867***	0.865***	0.858***	0.849***	0.988***	0.939***	0.889***	0.889***	0.892
	(0.054)	(0.055)	(0.046)	(0.044)	(0.045)	(0.052)	(0.052)	(0.051)	(0.046)	
Population Exporter	1.208***	1.247***	1.299***	1.299***	1.326***	1.460***	1.443***	1.452***	1.368***	1.345
	(0.033)	(0.033)	(0.026)	(0.024)	(0.026)	(0.033)	(0.030)	(0.032)	(0.024)	
Population Importer	0.751***	0.740***	0.944***	0.976***	0.945***	0.989***	0.946***	0.925***	0.894***	0.901
	(0.038)	(0.038)	(0.023)	(0.023)	(0.025)	(0.026)	(0.025)	(0.024)	(0.022)	
Distance	-1.309***	-1.338***	-1.628***	-1.668***	-1.675***	-1.869***	-1.685***	-1.583***	-1.562***	-1.591
	(0.103)	(0.101)	(0.073)	(0.076)	(0.073)	(0.087)	(0.085)	(0.087)	(0.072)	
Remoteness Exporter	0.668**	0.918***	0.807***	0.997***	0.999***	0.881***	0.086	-0.305	-0.088	0.551
	(0.296)	(0.303)	(0.258)	(0.260)	(0.261)	(0.294)	(0.271)	(0.296)	(0.227)	
Remoteness Importer	0.491**	0.012	-0.038	0.059	0.107	0.431**	0.707***	1.029***	0.815***	0.401
	(0.228)	(0.223)	(0.192)	(0.179)	(0.175)	(0.198)	(0.187)	(0.196)	(0.182)	
Common border	0.552**	0.835***	0.200	-0.097	-0.231	-0.497	-0.363	-0.046	0.118	0.052
	(0.236)	(0.224)	(0.200)	(0.217)	(0.205)	(0.316)	(0.316)	(0.212)	(0.186)	
Common language	1.053***	1.075***	0.613***	0.723***	0.695***	0.798***	0.757***	0.822***	0.660***	0.800
	(0.182)	(0.174)	(0.123)	(0.117)	(0.120)	(0.131)	(0.130)	(0.128)	(0.117)	
Colonial linkage: UK	--	--	1.228***	1.240***	0.958***	0.914**	1.049***	0.965**	0.998***	1.050
	--	--	(0.321)	(0.284)	(0.334)	(0.365)	(0.329)	(0.418)	(0.367)	
Colonial linkage: Spain	-0.004	-0.029	0.652***	0.608**	0.564**	0.819***	0.523***	0.456**	0.643***	0.470
	(0.249)	(0.217)	(0.180)	(0.240)	(0.269)	(0.296)	(0.197)	(0.201)	(0.192)	
Colonial linkage: Portugal	-0.196	-0.063	0.227	-0.077	-0.187	0.082	0.124	0.292	0.489	0.077
	(0.896)	(0.767)	(0.803)	(0.654)	(0.384)	(0.388)	(0.172)	(0.288)	(0.349)	

Nafta	--	--	-0.263	0.146	0.420	-0.321	-0.193	-0.322	-0.191	-0.104
	--	--	(0.542)	(0.724)	(0.710)	(0.785)	(0.717)	(0.716)	(0.664)	
Caricom	--	--	3.483***	2.970***	2.925***	3.059***	3.031***	2.884***	2.705***	3.008
	--	--	(0.296)	(0.325)	(0.323)	(0.337)	(0.325)	(0.335)	(0.332)	
Mercosur	0.330	0.098	0.090	0.073	0.301	0.162	0.409	0.389	0.387	0.249
	(0.459)	(0.439)	(0.399)	(0.394)	(0.417)	(0.495)	(0.445)	(0.456)	(0.406)	
Andean Pact	0.660***	0.767***	0.693**	0.482*	0.943***	0.915***	1.028***	1.106***	1.164***	0.862
	(0.206)	(0.192)	(0.273)	(0.293)	(0.213)	(0.241)	(0.235)	(0.227)	(0.224)	
Cacm	2.715***	2.405***	2.327***	2.270***	2.377***	2.488***	2.595***	2.497***	2.278***	2.439
	(0.256)	(0.260)	(0.237)	(0.222)	(0.225)	(0.257)	(0.255)	(0.247)	(0.219)	
EU Importer	-0.238	-0.196	-0.508***	-0.544***	-0.240	-0.753***	-0.885***	-1.020***	-1.059***	-0.605
	(0.230)	(0.219)	(0.187)	(0.178)	(0.185)	(0.206)	(0.173)	(0.181)	(0.161)	
R-squared	0.703	0.718	0.739	0.754	0.745	0.700	0.714	0.726	0.751	
F-statistic	210.910	229.334	316.234	345.714	316.047	296.491	310.168	296.182	366.507	
N	1350	1364	2025	2051	1963	2308	2250	2033	2204	

White's robust standard errors in parenthesis.
*) Statistically significant at the 10 % level
**) Statistically significant at the 5 % level
***) Statistically significant at the 1 % level
a) Bilateral distance in kilometers between the capitals of trading partners.

b) *Remoteness* $i = \sum_{j \neq i} \left(d_{ij} \times \left(\frac{y_j}{y_w} \right) \right)$

Binary variables:
c) Equal to 1 if the two trading partners are contingent, i.e. they share a common border, 0 otherwise.
d) Equal to 1 if the two trading partners share a common commercial language, 0 otherwise.
e) Equal to 1 if one of the trading partners is the UK and the other a former British colony in the Western Hemisphere, 0 otherwise. (Note that the United States is not considered a former colony)
f) Equal to 1 if one of the trading partners is Spain and the other a former Spanish colony in the Western Hemisphere, 0 otherwise.
g) Equal to 1 if one of the trading partners is Portugal and other a former Portuguese colony in the Western Hemisphere, 0 otherwise.
h) Integration/regional dummies: Equal to 1 if both trading partners are members a specific trading agreement, (Nafta, Caricom, Mercosur, Andean Pact, or Cacm respectively), 0 otherwise.
k) Equal to 1 if the importing country is a member of the European Union, 0 otherwise.