Regional Trade Blocks and International Trade: A Comparison Study of Asia and Latin America

E. M. Ekanayake
Bethune-Cookman University

Bala Veeramacheneni
Farmingdale State College

Amit Mukherjee
The Richard Stockton College of New Jersey

This paper analyzes the major trade blocks in Asia and Latin America and their effects on intra-regional trade flows using annual trade data for the period 1970-2006. The paper uses a gravity model augmented with several sets of dummy variables to estimate the effect of various trade blocks such as the Association for South East Asian Nations (ASEAN), South Asian Association for Regional Cooperation (SAARC), the Central American Common Market (CACM), the Central American-Dominican Republic Free Trade Agreement (CAFTA-DR), the Andean Pact or Andean Community (AC), and the Southern Cone Common Market (MERCOSUR) on trade flows within and across membership groupings as well as the effect of trade blocks on members' trade with other Asia-Pacific and Western Hemispheric countries.

INTRODUCTION

The economic, technological, social and political integration of the world in the twenty first century or the phenomena what we call as globalization includes integration of trade and finance among countries as well. In the backdrop of rapid globalization, if one looks closer they can observe a parallel and sometimes antithetical process of regionalism on the rise. Most studies have focused on a debate between regionalism versus globalization or on how regional trade agreements (RTAs) or preferential trade agreements (PTAs) impact upon the global trading system. However, observing the Western Hemisphere there is a trend from regional or sub-regional groupings towards integration into a much larger regional group or supra regional grouping in the name of the Free Trade Area of the Americas (FTAA). This supra-regional system contains economies as different in size, outlook and level of development as any in the World Trade Organization (WTO). In this paper we try to see the rationale for having a supra-

regional grouping, the FTAA. Especially we review using empirical trade data, using gravity model, if there is a sub-regional inward bias among themselves or a hemispheric bias.

The Free Trade Area of the Americas (FTAA) is the most ambitious regional trade agreement proposed to date. Negotiating countries include every nation in the Americas except Cuba with a total population of 800 million and a market of $13 trillion. Difficulties between Brazil and America, co-chairs of the negotiations, have resulted in a scaled down version of the agreement (dubbed "FTAA á la carte") that allows countries to opt out of certain contentious areas like agriculture subsidies, investment, intellectual property rights, and anti-dumping.

Opponents of this pared-down agreement, mainly Canada and Chile, criticize the attempt to limit the scope of FTAA, which aims for a continent wide FTA, arguing that it makes the free trade area meaningless. They argue that the US and Brazil are setting the agenda at the expense of the other participating members who are interested in liberalizing more than just import tariffs. Compared to Europe, RTA dynamics in the western hemisphere are more heterogeneous in nature with several major players engaged in multilayered RTA processes and not necessarily sharing similar objectives. Latin American countries share a tradition of regional integration (Andean Common Market (AC); Caribbean Community and Common Market (CARICOM); Central American Common Market (CACM); Central American-Dominican Republic Free Trade Agreement (CAFTA-DR); Latin American Integration Association (LAIA); North American Free Trade Agreement (NAFTA); Southern Common Market (MERCOSUR)), which is quite different from the more recent and market oriented RTAs being pursued by Canada and USA.

While little progress has been made towards this objective, the same cannot be said for sub-regional and cross-regional RTAs where much has happened in recent years. One of the most noteworthy development is this respect is United States' shift from a reluctant to an adamant RTA player. Having secured RTAs with Singapore, Chile and Jordan in 2003, it has signed in 2004 FTAs with Australia, Morocco and as a part of the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA), with Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and the Dominican Republic; it has concluded negotiations with Bahrain and it is exploring similar agreements with Oman and the United Arab Emirates (UAE); it has advanced negotiations with Southern African Customs Union (SACU); opened negotiations with three members of the Andean Community (Colombia, Ecuador and Peru) and Panama; and announced its intentions to open FTA negotiations with Thailand.

RTA developments in Latin America suggest increasing efforts towards consolidation and deepening of the network of RTAs among South and Central American countries. MERCOSUR members are working towards the objective of a full-fledged Customs Union and have concluded a framework agreement with three members of the Andean Community, which aims for the gradual establishment of an FTA. Recently, Mexico has signaled its intention to apply for associate membership of the MERCOSUR. Latin American countries have also been very active in FTA negotiations with partners further afield, Mexico has an FTA with Japan; Chile with Republic of Korea; Panama is negotiating with Singapore; MERCOSUR with India and MERCOSUR-China FTA is being considered.

At a theoretical level regional economic integration is being taken to mean deepening of intra-regional trade, expansion of mutual foreign direct investment (FDI) and harmonization of commercial regulations, standards and practices. Regional economic integration can potentially have many formal shapes and, therefore, names. It could cover a spectrum of arrangements

varying from preferential trading areas, to free trade areas, to customs union, to common markets and finally to economic union (see Figure 1).

The question now is does having a continent wide FTA benefit trade? Table 2 gives a birds-eye view of the scope for such an endeavor. Even though Intra-Block trade because of RTAs has increased between 1970 and 2006, they were not significant changes. They are quite low with the exception of NAFTA.

There has been substantial increase in Inter-Block trade in the Western Hemisphere, which makes a case of having a continent wide FTA. The degree of regional integration through trade in Latin America has been rising fast over the last twenty years. From 1970 to 2006, inter-regional trade for the Western Hemisphere (all regional blocks) in its total trade has risen from 46.2 % to 56.7%. The share of Intra-regional trade within Latin America is still lower than the European Union share of 62 % but higher than the 52% for East Asia (Kawai, 2004).

All countries in the region, except for Cuba, Chile, the Dominican Republic, and Panama, are currently members of one of the five main multilateral RTAs in the region, which are the NAFTA, CACM, CARICOM, the Andean Community, and the MERCOSUR. In addition, there are a number of bilateral agreements. By end 2009, at least 20 more RTAs will have been concluded, which might at first sight seem to increase the complexity of the network of RTAs in the region. In fact, this busy phase is likely to lead to a partial consolidation, whereby some of the above-mentioned five main RTAs will have concluded free trade agreements either with each other or in some cases with individual countries. For example, the Andean Community's agreements with Argentina and Brazil are likely to have been superseded by its agreement with MERCOSUR and at least some of Chile's bilateral RTAs will have been superseded through its membership in MERCOSUR. Also all CACM members will have concluded separate agreements with Mexico to finalize the CACM-Mexico FTA. Moreover, the number of cross-regional agreements or RTAs from this region will have increased significantly by end 2009. An alternative scenario may occur after the entry into force of the Free Trade Area of the Americas (FTAA), which would cover 34 countries. It is yet to be seen what impact such an arrangement might have on the existing five multilateral agreements in the Americas.

Therefore, the objectives of this paper are (a) to analyze the major PTA/RTAs in Latin America and Asia and study their effects on Intra-regional trade flows; (b) to use a gravity model to estimate the effect of various RTAs on trade flows within and across member groups; and to measure the effect of RTAs on members' trade with other Latin American and Asian countries.

SURVEY OF PREVIOUS STUDIES

This section summarizes the previous studies that used gravity model to estimate the effects of regional trading agreements on trade flows among member and non-member countries. The popularity of the gravity model is relatively recent. Bayoumi and Eichengreen (1995) call the gravity model "the workhorse for empirical studies of the pattern of trade". Its empirical robustness made it the workhorse for investigations of the geographical pattern of trade. It was used during the 1960s and 1970s to estimate trade flows but was criticized because it lacks a strong theoretical foundation. Tinbergen (1992), Poyhonen (1963), and Linneman (1966) provided initial specifications and estimates of the determinants of trade flows and Aitken (1973) applied it to RTAs. After Anderson (1979) provided a rigorous economic justification, its use expanded again.[1] Due to a revival of interest among economists in the interconnectedness of economics and geography, the gravity model has again become popular. Bergstrand (1985) and

Deardorff (1997) have provided partial theoretical foundations for the gravity equation, although none of the models generate exactly the same equation generally used in empirical work.

Indeed, many empirical studies have found such a relationship. For example, Frankel (1993) finds in his study of bilateral trade flows among 63 countries for 1980, 1985, and 1990 that economic size (GNP) and geographic distance have positive and negative effects on bilateral trade flows, respectively. In addition to these two basic variables, Frankel (1993) adds per capita GNP and regional dummies. Per capita GNP is included to capture the factors associated with the level of economic development, thus affecting flows of intra-industry trade. One may argue that industrial countries tend to specialize in production, leading to greater dependence on foreign trade. Furthermore, the residents of high-income economies tend to desire greater variety in their consumption, leading to greater dependence on trade, particularly intra-industry trade. Regional dummies are included to test the existence of a special regional bias in some regions such as East Asia and the European Community—the precursor of the European Union. Frankel finds a positive effect of per capita GNP, as expected, and positive effects for the Western Hemisphere, the European Community, and East Asia dummies, indicating the presence of a regional bias in bilateral trade. He also finds that the regional bias in East Asia declined as the estimated coefficients on the East Asia dummy became smaller over time.

Trade statistics confirm that the magnitude of intra-trade within the following three regional groupings, namely, the European Union, Asia-Pacific and North America, has been disproportionately high. One plausible explanation behind this apparent bias towards intra-regional trade in these three country groups is geographical proximity among the countries. The immediate consequence of geographical proximity is reduction in transport costs, short delivery time, less interest payments on export credits and low spoilage. Both Krugman (1991) and Summers (1991) have opined that the disproportionate intra-trade in above-named three country groups is largely due to proximity, and the other traits associated with proximity. They are wedded to the concept that proximity promotes trade. Krugman (1991) goes further and argues that the three trading blocs are welfare enhancing natural groupings. This naturally means that there are some "unnatural" trade groupings where partners do not have proximity but are far apart. He provided the example of a trading arrangement between the United Kingdom and the members the Commonwealth as an "unnatural" trading arrangement. The argument supporting this hypothesis is that due to less or no distance between trading partners, intra-continental RTAs are likely to be more trade creating than trade diverting.

Using the gravity model, Solonga and Winters (1999) examined the impact of nine RTAs, namely, ANDEAN, AFTA, CACM, EU, EFTA, Gulf Co-operation Council (GCC), LAIA[2], MERCOSUR and NAFTA. Using non-fuel imports and exports data for 58 countries, they compared the before-and-after scenario of these nine PTAs' trade patterns. The central variables of the gravity model—the volume of GDP of countries i and j, the area of these countries, and the absolute distance between countries i and j were found to have the expected sign and were all significant at 1 percent. Trade was found to increase with the level of GDP of the importer and exporter and decrease with the size and distance. The variables reflecting population of importer and exporter were positive and almost always significant. The degree of remoteness of the importer country from its suppliers had the expected positive sign and was always significant. The estimated parameters for "common land borders" were not significant in any year of the sample, reflecting probably some co-linearity with the parameter for remoteness. Their results show that for all the PTAs involving Latin American countries (CACM, LAIA, and ANDEAN) the intra-trade coefficients were positive and statistically significant for the whole

sample. However, their results were far from uniformly positive and statistically significant. For NAFTA, it was positive but never significant, while for the GCC it was positive but significant for only a certain number of years. The coefficients for the intra-bloc trade were negative for the EU, EFTA and ASEAN, although they were not statistically significant.

Again, Frankel and Wei (1997) provide an extensive examination of possible RTAs in Asia-Pacific. They also considered a sequence of "nested country groupings" in Asia, like ASEAN, East Asia, and South Asia and the whole of Asia. In their gravity model exercise, they measured the log of distance between the two major cities—usually the capital cities—of the respective countries for their empirical model. They also added a dummy "adjacent" variable to indicate when two countries shared a common border. In another similar study, Frankel, Stein, and Wei (1994) tried to test with a more thorough measure of distance that took into account land and sea routes. The results of both the studies tended to be similar. Frankel and Wei (1997) took GNP in product form because it is empirically well established in bilateral trade regressions and can be justified by the modern theory of trade under imperfect competition. Countries *a priori* choose larger countries to trade with because they offer greater variety of goods to choose from than smaller countries. Also common language tends to facilitate trade by enhancing exporters' and importers' understanding of each others' commercial and legal systems and cultures which have a great deal of influence on trade. To capture these effects Frankel and Wei (1997) included dummy variables that took the value of one if the country pair in question had a favorable impact on trade due to these effects, and zero if they did not. They used ordinary least square (OLS) regression, which tests effects of each independent variable while holding constant the effects of the others. They used United Nations trade matrix and the International Monetary Fund's *Direction of Trade Statistics* for data and employed panel regression technique that allows for year-specific intercepts.

The inferences of Frankel and Wei (1997) may be summarized as follows. As posited by the gravity model, geography matters. Distance has an economically and statistically large effect on trade. As distance increased by 1 percent, trade declined by 0.5 percent. The "adjacency" dummy showed that two countries with a common land border have a larger volume of trade than two otherwise identical countries. Another important conclusion was that common language or past colonial connections facilitated trade; it brought in 50 percent more trade than otherwise.

As regards the degree of integration within Asia, two ASEAN countries were found to have 600 percent more trade than two otherwise identical economies. As Singapore is an entrepot trade center, its imports and exports are usually more than 100 percent of GDP. It is possible that the apparent intra-ASEAN bias was partly or wholly a reflection of the extreme openness of Singapore. A Singapore dummy was added to examine this. The coefficient of ASEAN dummy was reduced somewhat but remained quantitatively large and statistically significant. This suggested that Singapore's extreme openness did not explain all of the apparent inward bias among the ASEAN countries. It was also found that all East and Southeast Asian countries tended to concentrate their trade with each other, and that the tendencies of the ASEAN economies were not unique in this regard. As expected, two Chinese-speaking countries appeared to trade an estimated four and half times as much as other similarly situated countries. The large magnitude of Chinese language term raises the possibility that the influence of the Chinese Diaspora was a dominant source of East Asian intraregional trade. A noteworthy point here is that China-Taiwan trade does not appear in the statistics because official statistics deny it. However, this trade is large and rapidly growing, and routed through Hong Kong. Thus, this trade was counted twice in their data and may have exaggerated the estimate of the influence of

the Chinese variable. This double counting in trade was corrected, and re-ran the gravity estimates with trade among the so-called three Chinas. The independent Chinese language effect was no longer found to be significantly stronger than other linguistic links around the globe. The two South Asian economies in the sample, India and Pakistan, were negatively impacted by their historical animosity. Their trade was found to be 70 percent less than two otherwise identical countries. Overall, the assertion of Krugman (1991) and Summers (1991) stands to reason that proximity promotes trade. The gravity equation estimated convincingly that distance is very important determinant of trade. South Asia has proved to be an exception, apparently because of historical enmity reduced trade between India and Pakistan.

To examine the link between foreign direct investment (*FDI*) and foreign trade in East Asia, a series of papers by Kawai (1997), Kawai and Urata (1998), and Urata (2001) have expanded the basic gravity equation by introducing *FDI* as one of the explanatory variables. They hypothesize that *FDI* causes foreign trade. The justification for this view is that trade and *FDI* do not have to be substitutes but instead can be complements, particularly in industries where intra-industry trade can be naturally developed by multinational corporations. In addition, *FDI* stock—the accumulated value of past *FDI* flows—in some sense represents the accumulation of business knowledge, information and transaction experience with the country or the particular sector. Although a number of studies have suggested the existence of a link between *FDI* and trade, very few studies have examined this link empirically. On the other hand, causation may go the other way—from trade to *FDI* —as well: *FDI* flows may be explained by the basic gravity variables and trade flows. Thus, using gravity model they reached two vitally important conclusions. First, East and Southeast Asian economies clearly show certain inward bias among themselves. Second, even after controlling for a special Asia effect, East and Southeast Asian economies as a group appear to trade more among themselves than one would expect based on their economic and geographic characteristics. Adding the Hong Kong and Singapore dummies do not change the qualitative feature of the picture.

METHODOLOGY AND DATA

Methodology

This study uses an augmented gravity model to analyze the trade flows in Latin America. Gravity models were introduced to economic theory in the 1960s. Linneman's (1969) seminal study applied a gravity model to analyze the factors that explain trade for a sample of 80 countries. Gravity models have been augmented with variables representing factors that could either facilitate or impede trade. The gravity model has been extensively applied (see for example Frankel, Stein, and Wei (1995), McCallum (1995), Eichengreen and Irwin (1995), Deardorff (1997), Frankel and Romer (1999), Freund (2000), and Frankel and Rose (2002)) and widely accepted as the preferred systematic framework for measuring "natural" trade patterns based on economic size and geographic distance between economies. In a direct and simple application it relates volume of trade between two countries positively to their incomes and negatively to transaction costs. Thus, economic size (GDP, population, or land area) and transaction costs (geographic distance between the two countries, and cultural dissimilarities) are treated as the two most important factors explaining bilateral trade flows in this model. It is called gravity model because it is analogous to gravitational attraction between two masses in physics (Bergstrand, 1985). Lee and Roland-Holst (1998), Blavy (2001) and others specify the basic resulting equation in multiplicative form as follows.

$$T_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} d_{ij}^{\beta_5} A_{ij}^{\beta_6} e^{\beta_7 Z_{ij}} u_{ij} \quad (1)$$

where T_{ij} is the bilateral trade flow from country i to country j, Y_i and Y_j are the exporting and importing countries' gross domestic products, N_i and N_j are the exporting and importing countries' populations, d_{ij} is the geographical or economic distance between the two countries, Z_{ij} is an array of dummy variables such as those for preferential trading arrangements, A_{ij} is an array of other factors that could either facilitate or impede trade between country i to country j, and u_{ij} is a log-normally distributed error term with $E(\log(u_{ij})) = 0$. The per capita income variable is generally included in A_{ij}.

Taking the natural logarithms of both sides yields:

$$\ln(T_{ij}) = \ln(\beta_0) + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(N_i) + \beta_4 \ln(N_j) + \beta_5 \ln(d_{ij}) + \beta_6 \ln(A_{ij}) + \beta_7 Z_{ij} + u_{ij} \quad (2)$$

Most studies augment equation (2) with variables to account for geographic, ethno-linguistic, and economic conditions. This article follows numerous authors and specifies the following gravity equation which controls for the basic determinants of international trade. We also replaced population variable by gross domestic product (GDP), since either one can be used to measure the size of the economy.

$$\begin{aligned} \ln(T_{ij}) = {} & \beta_0 + \beta_1 \ln(PCGDP_i) + \beta_2 \ln(PCGDP_j) + \beta_3 \ln(GDP_i) + \beta_4 \ln(GDP_j) + \beta_5 \ln(Dist_{ij}) \\ & + \beta_6 Border + \beta_7 Language + \beta_8 Colony + \beta_9 RTA(I) + \beta_{10} RTA(O) + \beta_{11} BFTA + u_{ij} \end{aligned} \quad (3)$$

where $PCGDP_i$ is the per capita gross domestic product of country i, $PCGDP_j$ is the per capita gross domestic product of country j; GDP_i is the gross domestic product of country i; GDP_j is the gross domestic product of country j; $Dist_{ij}$ is the geographical or economic distance between the two countries; *Border* is a dummy variable which takes the value 1 if the two countries share a contiguous border and zero otherwise; *Language* is a dummy variable which takes the value 1 if the two countries share a common language and zero otherwise; *Colony* is a dummy variable that equals 1 if the exporting country is a former colony of importing country or if the two countries share a common colonial linkage and zero otherwise; $RTA(I)$ is a binary variable which is unity if two countries belong to the same regional trade agreement; $RTA(O)$ is a binary variable which is unity if country i belong to an RTA and country j does not, or *vice versa*; *BFTA* is a dummy variables that equals 1 if country i and country j has a bilateral free trade agreement; and u_{ij} is a normally distributed error term. Thus, the dummy $RTA(I)$ measures the degree of trade-creation effects of the RTA between members, while the dummy $RTA(O)$ captures the degree of trade-diverting effects between members and nonmembers, compared to the "normal" bilateral trade flows.

According to Frankel (1993), per capita *GDP* is included to capture the factors associated with the level of economic development. It also captures the productive capacity of the exporting country and the purchasing power of the importing country. The coefficients of the per capita *GDP* variables are expected to be positive. Population variables represent the size of the

countries and are expected to have positive signs. According to Venables (1987) and Krugman (1980), the larger countries are better able to absorb imports than smaller countries and are better able to experience economies of scale and thus develop a comparative advantage in their export industries than are smaller countries.

The coefficient of the distance variable ($Dist_{ij}$) is expected to be negative. This is a proxy for transportation costs and time, access to market information, access to markets, and other factors that make it difficult for nations to engage in trade. The anticipated sign on all eight dummy variables is positive, reflecting the idea that proximity, common language, historical links, and regional trading agreements are trade creating networks.

Data Sources

This study uses annual data from 1970 to 2006. The dependent variable used in the analysis is exports from country i to country j. The data on exports and imports for the study period of 1970-2006 are from the UN Commodity Trade Statistics (UN Comtrade) database.[3] Additional data on exports and imports are from International Monetary Fund, *Direction of Trade Statistics Yearbook*. Data on population are from International Monetary Fund, *International Financial Statistics Yearbook*. Information on per capita gross domestic product is from International Monetary Fund, *World Economic Outlook Database*, April 2008. The distance variable is obtained from the World Bank, *Trade, Production, and Protection 1976-2004* database.[4]

EMPIRICAL RESULTS

We estimated three sets of regression models to measure pool effects, fixed effects, and random effects for each of the two regions, Latin America and Asia. The estimated results for Latin America are presented in Table 4 while the estimated results for Asia are presented in Table 5. First we discuss the results for Latin America. The conventional variables behave very much the same way as the model predicts, and the estimated coefficients are statistically significant. The adjusted R^2 values range from a low of 0.587 to a high of 0.703. These values are acceptable for a cross-sectional study and are comparable to those obtained in other studies employing the gravity model to examine intra-regional trade flows.

The coefficients of the per capita income variables are positive in all models estimated. They are also statistically significant at the 1% level of significance. The GDP coefficients are positive and statistically significant in all models. The distance variable has the expected negative sign and is highly significant in all models estimated.

The Border variable has a positive sign in all models and statistically significant in all cases. This result is also comparable to findings of other studies. The border effect in the case of Asian trade flows is relatively low, ranging from 3.42 to 3.53. This value indicates that countries sharing a common border, on average, tend to have three and a half times as much trade compared with countries with no common borders. However, Helliwell (1996, 1998) and McCallum (1995) estimate the border effect to be around 20 in Canada-US trade.

The language and colony dummy variables have the expected positive sign in all three models estimated and they are all statistically significant. The dummy variables for membership in a regional trade agreement suggest that trade diversion effects tend to exceed the trade creation effects. In addition, all coefficients of regional dummy variables are positive and significant, indicating that the bilateral trade agreements tend to enhance more trade than multilateral trade agreements.

Having discussed the results for Latin America, now we discuss the results for Asia presented in Table 5. The conventional variables behave very much the same way as the model predicts, and the estimated coefficients are statistically significant. The adjusted R^2 values range from a low of 0.667 to a high of 0.764. These values are acceptable for a cross-sectional study and are comparable to those obtained in other studies employing the gravity model to examine intra-regional trade flows.

The coefficients of the per capita income variables are positive in all models estimated. They are also statistically significant at the 1% level of significance. The GDP coefficients are positive and statistically significant in all models. The distance variable has the expected negative sign and is highly significant in all models estimated.

The Border variable has a positive sign in all models and statistically significant in all cases. This result is also comparable to findings of other studies. The border effect in the case of Asian trade flows is relatively low, ranging from 2.30 to 2.69. These estimates are lower than the estimates for Latin America. This value indicates that countries sharing a common border, on average, tend to have two and a half times as much trade compared with countries with no common borders. However, Helliwell (1996, 1998) and McCallum (1995) estimate the border effect to be around 20 in Canada-US trade.

The language and colony dummy variables have the expected positive sign in all three models estimated and they are all statistically significant. The dummy variables for membership in a regional trade agreement suggest that trade diversion effects tend to exceed the trade creation effects. In addition, all coefficients of regional dummy variables are positive and significant, indicating that the bilateral trade agreements tend to enhance more trade than multilateral trade agreements.

SUMMARY AND CONCLUSIONS

Employing the gravity model in the analysis of intra-regional trade flows in Latin America and Asia reveals some interesting observations concerning Latin American and Asian trade and integration arrangements, such as the importance of language and culture as determinants of trade resistance.

The findings of this study are, for the most part, consistent with findings of previous studies on Latin American and Asian trade flows. The coefficients of per capita GDP, population, and distance had expected signs and magnitudes in all models estimated. This confirms the results of other studies. The growth of intra-regional trade will help countries in Latin America to form larger regional trading agreements, such as FTAA. The rapidly evolving economic and political climates provide many opportunities for the investigation of the success of economic integration in Latin America and Asia.

REFERENCES

Anderson, J. E. and E. V. Wincoop (2003), “Gravity with Gravitas: A Solution to the Border Puzzle”, *American Economic Review*, 93 (1), 170-192.

Anderson, J. E. (1979), “A Theoretical Foundation for the Gravity Equation”, *American Economic Review*, 69(1): 106-116.

Bergstrand, J. H. (1985). 'The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence', *The Review of Economics and Statistics*, 67, 474-81.

Brada, J. C. and J. A. Mendez (1983), "Regional Economic Integration and the Volume of Intra-Regional Trade: A Comparison of Developed and Developing Country Experience," *KYKLOS*, 36, 92-105.

Carrillo, C. and C. A. Li (2002), "Trade Blocks and the Gravity Model: Evidence from Latin American Countries", *Working Paper* (downloaded), Department of Economics, University of Essex, UK.

Das, D. K. (2001), "Regional Trading Agreements and the Global Economy: An Asia Pacific Perspective", Center for International Development, Harvard University, Cambridge, Massachusetts, USA.

Deardorff, A. V. (1998), "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?" in Jeffrey A. Frankel (ed.), *Regionalization of the World Economy*, Chicago: University of Chicago Press, 7-22.

Eichengreen, B. and D. A. Irwin (1995) "Trade Blocs, Currency Blocs and Reorientation of World Trade in the 1930s," *Journal of International Economics*, 38(1), 1-24.

Evans, C. L. (2000), "The Economic Significance of National Border Effects," Mimeo, Federal Research Bank of New York.

Evenett, S. J. and W. Keller (1998), "On the Theories Explaining the Success of the Gravity Equation", NBER Working Paper No. 6529, Cambridge, MA: National Bureau of Economic Research.

Feenstra, R., J. Markusen and A. Rose, (2001), "Using the Gravity Equation to Differentiate Among Alternative Theories of Trade" *Canadian Journal of Economics*, Vol. 1, May, 430-447.

Frankel, J. (1997), "Regional Trading Blocs in the World Economic System", Institute for International Economics.

Frankel, J. and D. Romer (1999) "Does Trade Cause Growth?" *American Economic Review*, 89(3), 379-399.

Frankel, J., E. Stein and S. Wei (1995) "Trading Blocs and the Americas," *Journal of Development Economics*, 47(1), 61-95.

Freund, C. (2000) "Different Paths to Free Trade: The Gains from Regionalism," *Quarterly Journal of Economics*, 115(4), 1317-1341.

Garman, G., J. Petersen, and D. Gilliard (1998), "Economic Integration in the Americas: 1975-1992," *Journal of Applied Business Research*, 14(3), 1-12.

Greene, W. H. (2003), *Econometric Analysis*, Fifth Edition, New Jersey: Prentice Hall.
Helliwell, J. F. (1996), "Do National Borders Matter for Quebec's Trade?", *Canadian Journal of Economics*, 26(3), 507-522.

Helliwell, J. F. (1998), *How Much Do National Borders Matter?* ,Washington, D.C.: The Brookings Institution.

Kawai, M. (2004). "Trade and Investment Integration for Development in East Asia: A case for the Trade-FDI Nexus," ABCDE European Meeting, Brussels.

Kawai, M. (1997), "Japan's Trade and Investment in East Asia." David Robertson (ed.), *East Asian Trade after the Uruguay Round* (Cambridge: Cambridge University Press), 209-226.

Krugman, P. (1991), "The Move Toward Free Trade Zones." in Policy Implications of Trade and Currency Zones. Kansa City. Wyoming. Federal Reserve Bank of Kansas City. 7-41.

Lee, H. and D. Roland-Holst. (1998). "Prelude to the Pacific Century: Overview of the Region", in Lee, H. and D. Roland-Holst (eds.) *Economic Development and Cooperation in the Pacific Basin*, Cambridge: Cambridge University Press. 3-36.

Limao, N. and A. Venables (2001), "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade", *The World Bank Economic Review*, 15(3), 451 – 479.

Martinez-Zarzoso, I. and F. Nowak-Lehmann (2003), "Augmented Gravity Model: An Empirical Application to Mercosur-European Union Trade Flows", *Journal of Applied Economics*, 6(2), 291-316.

McCallum, J. (1995), "National Borders Matter: Canada-US Regional Trade Patterns", *American Economic Review*, 85(3), 615-623.

Olarreaga, M. and I. Soloaga (1998), "Endogenous Tariff Formation: The Case of Mercosur", in *The World Bank Economic Review*, 12(2), 297 – 320.

Panagariya, A. (1996), "The Free Trade Area of the Americas: Good for Latin America?" *World Economy*, 19, 485-515.

Roessler, F. (1993), "The Relationship between Regional Integration Agreements and the Multilateral Trade Order", in K. Anderson and R. Blackhurst (eds.), *Regional Integration and the Global Trading System*, New York: Harvester Wheatsheaf.

Soloaga, I. and L. A. Winters (2001), "How has Regionalism in the Nineties Affected Trade?", *North American Journal of Economics and Finance*, 12, 1-29.

Urata, S. (2001), "Emergence of an FDI-Trade Nexus and Economic Growth in East Asia," in Joseph Stiglitz and Shahid Yusuf (eds.), *Rethinking the East Asian Miracle* (New York: Oxford University Press), 407-459.

Wei, S. J. (1996), “Intra-National versus International Trade: How Stubborn are Nations in Global Integration?”, NBER Working Paper No. 5531, (Cambridge, MA: National Bureau of Economic Research).

WTO (World Trade Organization) (1995), *Regionalism and the World Trading* System, Geneva.
Yeats, A. (1998), “Does Mercosur’s Trade Performance Raise Concerns about the Effects of Regional Trade Arrangements?” in *The World Bank Economic Review*, 12(1), 1–28.

ENDNOTES

1. Other attempts were made to provide a theoretical foundation for the gravity model but they lacked a compelling economic justification. Anderson (1979) derived a reduced-form gravity equation from a general equilibrium model incorporating the properties of expenditure systems.

2. Former name of LAIA was LAFTA or the Latin American Free Trade Area. This is a case of dual membership. All the members of the ANDEAN group and MERCOSUR are also the members of LAIA or LAFTA.

3. http://unstats.un.org/unsd/comtrade/default.aspx

4. http://web.worldbank.org/Home/Topics/Data and Statistics/Trade/

TABLE 1A
REGIONAL TRADE AGREEMENTS IN LATIN AMERICA

Agreement	Member Countries	Status
Andean Common Market (also known as Andean Pact or Andean Community) (AC)	Bolivia, Colombia, Ecuador, Peru, Venezuela	The 1969 Andean Pact founding agreement was a step forward in creating a customs union with a longer term goal of creating a common market. Andean Pact became Andean Community in 1996.
Central American Common Market (CACM)	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua	Original treaty signed in 1960 and 1963 but although most intra-regional trade is duty-free, integration process continues.
Central American-Dominican Republic Free Trade Agreement (CAFTA-DR)	Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, United States	The free trade agreement was signed on August 5, 2004. As of September 2005, the agreement had been ratified by six countries. Costa Rica has not ratified. The agreement is expected to enter into force in January 2006.
Latin American Integration Association (LAIA)	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela	The LAIA framework is a preferential trade arrangement consisting of about 40 partial scope agreements involving two or more countries. Most were signed in the 1990s.
Southern Common Market (MERCOSUR)	Argentina, Brazil, Paraguay, Uruguay	The treaty was signed in 1991. The goal of the treaty is to form a common market. The program has progressively removed trade barriers and established a common external tariff structure with selected national exceptions.

Source: World Trade Organization.

TABLE 1B
REGIONAL TRADE AGREEMENTS IN ASIA

Agreement	Member Countries	Status
Association of Southeast Asian Nations (ASEAN)	Brunei-Darussalam, Cambodia, China, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam	ASEAN was formed in 1967 by Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Brunei-Darussalam joined in 1984, Vietnam in 1995, Myanmar and Lao People's Democratic Republic (PDR) in 1997, Cambodia in 1999, and China in 2004.
Economic Cooperation Organization (ECO)	Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan, Turkey, Turkmenistan, and Uzbekistan	ECO was established in 1985 by Iran, Pakistan and Turkey for the purpose of promoting economic, technical and cultural cooperation among the Member States. Membership was extended to other seven members in 1992.
South Asia Association for Regional Cooperation (SAARC)	Bangladesh, India, Pakistan, Maldives, Nepal and Sri Lanka	SAARC was established when its Charter was formally adopted on December 8, 1985 by the Heads of State or Government of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The agreement on SAARC Preferential Trading Arrangement (SAPTA) was signed in 1993.

Source: World Trade Organization.

Table 2. Intra-Block Trade in Latin American RTAs, 1970-2006

Year	ANCOM	CACM	FTAA	LAIA	MERCOSUR	LA Average Inc. FTAA	LA Average Exc. FTAA
1970	1.8	26.0	45.0	9.9	9.4	37.4	9.9
1971	5.2	24.3	47.0	13.6	9.3	40.4	12.0
1972	2.8	22.7	48.4	11.6	7.8	40.3	10.5
1973	2.9	23.1	44.9	11.2	7.5	37.0	10.2
1974	2.9	25.2	46.9	12.1	9.0	38.6	11.3
1975	3.7	23.4	45.4	14.2	8.5	38.4	12.5
1976	4.5	21.7	46.5	14.1	8.9	39.0	12.5
1977	5.4	19.1	47.3	14.7	8.7	38.8	12.4
1978	4.2	21.6	46.3	13.5	8.8	38.2	11.7
1979	4.5	19.1	44.6	14.3	12.2	37.0	13.1
1980	3.8	24.4	43.4	13.9	11.6	35.9	12.9
1981	4.0	23.5	45.1	13.8	8.8	36.9	12.2
1982	4.8	21.2	43.6	12.4	8.1	35.6	11.1
1983	3.5	20.4	45.1	9.0	5.9	35.8	8.2
1984	2.9	18.0	48.5	9.5	6.3	38.2	8.4
1985	3.2	14.6	49.7	9.2	5.5	39.1	7.9
1986	3.4	10.5	48.6	11.6	8.5	39.7	9.9
1987	3.9	13.5	49.5	10.5	7.6	40.4	9.3
1988	4.9	14.2	46.4	11.2	6.7	38.2	9.5
1989	4.3	15.5	46.1	11.8	8.2	38.3	10.3
1990	4.1	15.3	46.6	11.6	8.9	38.7	10.4
1991	5.8	17.6	47.8	12.2	11.1	39.9	11.6
1992	7.8	20.5	49.8	14.3	14.0	41.8	13.8
1993	9.8	19.3	52.3	16.4	18.5	44.2	16.4
1994	10.5	21.0	54.0	16.7	19.2	45.3	16.8
1995	12.0	21.8	52.6	17.3	20.3	44.3	17.5
1996	9.7	22.6	53.7	16.2	22.6	44.9	17.3
1997	10.8	18.7	55.8	17.0	24.8	46.6	18.2
1998	12.8	15.8	58.1	16.8	25.0	48.4	18.1
1999	8.8	13.6	59.7	12.8	20.6	48.7	14.0
2000	8.5	13.2	60.8	13.1	20.0	49.2	14.3
2001	10.3	13.9	60.6	13.0	17.1	48.9	13.9
2002	9.5	13.4	60.9	11.3	11.5	48.1	11.6
2003	9.8	20.2	60.0	11.5	11.9	47.1	11.8
2004	8.7	20.9	59.8	13.2	12.7	46.6	13.0
2005	9.0	18.9	60.2	13.6	12.9	46.4	13.3
2006	8.4	16.8	58.4	14.3	13.5	44.9	13.8

Key:

ANCOM : Andean Community
CACM : Central American Common Market
FTAA : Free Trade Area of the Americas
LAIA : Latin American Integration Association
MERCOSUR : Southern Common Market

Source: United Nations Conference on Trade and Development (UNCTAD), *Handbook of Statistics 2008*.

Table 3. Intra-Block Trade in Asian RTAs, 1970-2006

Year	ASEAN	Bangkok Agreement	ECO	GCC	MSG	SAARC	Asia Average
1970	22.4	2.8	2.2	4.6	0.4	3.2	18.7
1971	24.1	2.3	1.7	3.7	0.5	3.3	20.5
1972	21.0	3.0	1.7	2.8	0.5	5.1	17.0
1973	18.8	3.7	2.5	2.6	0.4	6.3	15.0
1974	16.2	1.7	4.5	2.4	0.4	4.2	12.2
1975	16.7	2.1	4.0	2.9	0.4	4.7	12.2
1976	15.0	1.5	3.7	3.2	0.6	4.0	10.4
1977	15.0	1.5	6.4	3.7	0.4	4.5	10.5
1978	15.9	1.7	4.4	2.7	0.4	4.6	11.8
1979	17.1	1.7	3.5	3.2	0.4	4.8	12.5
1980	17.4	1.7	6.3	3.0	0.7	4.8	12.5
1981	17.7	1.8	5.2	3.4	1.0	4.9	12.3
1982	20.3	1.9	7.1	4.2	0.9	4.2	14.6
1983	21.0	2.0	10.1	4.3	0.8	3.6	15.8
1984	18.8	2.7	10.2	4.5	0.9	4.6	14.2
1985	18.6	1.9	9.9	4.9	1.1	4.5	14.1
1986	16.9	1.7	5.2	8.9	0.6	3.8	13.0
1987	17.7	1.3	6.3	8.8	0.8	3.5	13.8
1988	17.6	1.3	4.8	9.5	0.8	3.8	14.1
1989	17.8	1.5	3.7	9.8	0.8	3.7	14.4
1990	19.0	1.6	3.2	8.0	0.3	3.2	15.1
1991	19.8	3.3	3.2	5.8	0.2	3.6	15.5
1992	20.1	4.0	5.2	6.1	0.5	3.9	15.5
1993	21.4	6.1	7.2	6.6	0.2	3.6	16.4
1994	24.4	6.0	7.4	6.9	0.2	3.8	19.2
1995	24.6	6.8	7.9	6.8	0.4	4.4	19.2
1996	24.5	7.6	7.1	6.4	0.4	4.3	19.0
1997	24.0	8.0	7.5	6.5	0.5	4.2	18.3
1998	21.2	7.0	6.8	8.0	0.6	4.8	16.1
1999	21.7	7.3	5.8	6.7	0.5	4.0	16.5
2000	23.0	8.0	5.6	4.9	0.6	4.1	17.4
2001	22.4	8.6	5.5	5.2	0.7	4.3	16.6
2002	22.7	9.3	5.8	5.8	0.8	4.2	16.6
2003	24.7	10.1	6.6	5.2	0.7	5.8	16.1
2004	24.9	11.0	6.7	5.0	0.8	5.7	15.8
2005	25.3	12.1	7.6	4.8	0.8	5.6	15.4
2006	24.9	12.9	8.5	4.8	0.8	5.6	15.2

Key:

ASEAN : Association of South-East Asian Nations
ECO : Economic Cooperation Organization
GCC : Gulf Cooperation Council
MSG : Melanesia Spearhead Group
SAARC : South Asian Association for Regional Cooperation

Source: United Nations Conference on Trade and Development (UNCTAD), *Handbook of Statistics 2008* .

TABLE 4
EFFECTS OF RTAs ON TRADE FLOWS IN LATIN AMERICA

Variable	Panel ELGS	Fixed Effects	Random Effects
Constant	1.146**	-0.633	0.973***
	(2.07)	(-0.61)	(1.73)
$\ln(GDP_i)$	1.261*	0.935*	1.159*
	(43.21)	(16.01)	(39.68)
$\ln(GDP_j)$	0.973*	1.009*	0.995*
	(12.20)	(13.48)	(13.83)
$\ln(PCGDP_i)$	0.171*	0.686*	0.328*
	(2.45)	(4.99)	(4.80)
$\ln(PCGDP_j)$	0.092*	0.175*	0.167*
	(5.30)	(10.06)	(10.09)
Distance	-1.340*	-1.546*	-1.499*
	(-42.55)	(-54.58)	(-56.42)
Border	0.648*	0.288*	0.362*
	(11.22)	(5.15)	(6.96)
Language	0.389*	0.272*	0.293*
	(8.78)	(6.76)	(7.34)
Colony	0.996*	1.078*	1.073*
	(9.56)	(12.14)	(12.13)
RTA(*I*)	0.971*	0.764*	0.974*
	(8.29)	(3.96)	(8.76)
RTA(*O*)	0.353*	0.538*	0.390*
	(5.20)	(3.97)	(6.23)
BFTA	1.230*	1.262*	1.250*
	(31.06)	(30.79)	(31.52)
Adjusted R^2	0.634	0.703	0.587
Observations	31,590	31,590	31,590
Border effect	1.91	1.33	1.43
Language effect	2.71	2.94	2.93
Colony effect	1.48	1.32	1.34
Intra – block trade effect	2.64	2.14	2.65
Extra – block trade effect	1.42	1.71	1.48
Bilateral FTA effect	3.42	3.53	3.49

Note: * significant at the 1% level; ** significant at the 5% level; *** significant at the 10% level.

TABLE 5
EFFECTS OF RTAs ON TRADE FLOWS IN ASIA

Variable	Panel ELGS	Fixed Effects	Random Effects
Constant	1.505*	3.027*	2.545*
	(7.26)	(8.59)	(12.82)
$\ln(GDP_i)$	0.685*	0.678*	0.687*
	(38.95)	(16.51)	(37.56)
$\ln(GDP_j)$	0.824*	0.842*	0.837*
	(13.79)	(16.63)	(14.92)
$\ln(PCGDP_i)$	0.577*	0.557*	0.572*
	(39.10)	(16.11)	(34.66)
$\ln(PCGDP_j)$	0.170*	0.173*	0.172*
	(21.15)	(21.31)	(21.87)
Distance	-1.148*	-1.308*	-1.269*
	(-50.87)	(-63.31)	(-63.98)
Border		0.257*	
	0.192**	(3.89)	0.154**
	(2.57)		(2.34)
Language	0.532*	0.564*	0.556*
	(14.59)	(19.02)	(19.18)
Colony	0.182*	0.563*	0.473*
	(2.91)	(9.54)	(8.33)
RTA(*I*)	0.107	0.041	0.012
	(0.76)	(0.32)	(0.92)
RTA(*O*)	0.389*	0.061	0.135
	(2.82)	(0.48)	(1.07)
BFTA	0.988*	0.833*	0.866*
	(19.36)	(17.24)	(19.41)
Adjusted R^2	0.703	0.764	0.667
Observations	32,076	32,076	32,076
Border effect	1.21	1.29	1.17
Language effect	1.20	1.76	1.62
Colony effect	1.70	1.77	1.74
Intra – block trade effect	1.11	1.04	1.01
Extra – block trade effect	1.47	1.06	1.15
Bilateral FTA effect	2.69	2.30	2.38

Note: * significant at the 1% level; ** significant at the 5% level.

Appendix Table 1. Countries Included in the Gravity Model Sample

Antigua and Barbuda	Guatemala	Pakistan
Argentina	Guyana	Panama
Australia	Haiti	Papua New Guinea
Austria	Honduras	Paraguay
Bahamas	Hong Kong	Peru
Bahrain	Hong Kong SAR	Philippines
Bangladesh	Hungary	Poland
Barbados	India	Portugal
Belgium	Indonesia	Qatar
Belize	Iran	Romania
Benin	Ireland	Russia
Bhutan	Italy	Saint Kitts and Nevis
Bolivia	Jamaica	Saint Lucia
Brazil	Japan	Saint Vincent and the Grenadines
Brunei Darussalam	Jordan	Saudi Arabia
Cambodia	Kenya	Seychelles
Cameroon	Korea	Singapore
Canada	Kuwait	South Africa
Chile	Laos	Spain
China	Lebanon	Sri Lanka
Colombia	Libya	Suriname
Costa Rica	Malaysia	Sweden
Czech Rep.	Maldives	Switzerland
Denmark	Mexico	Syria
Dominica	Morocco	Thailand
Dominican Rep.	Mozambique	Trinidad and Tobago
Ecuador	Myanmar	Tunisia
Egypt	Nepal	Turkey
El Salvador	Neth. Antilles	United Arab Emirates
Fiji	Netherlands	United Kingdom
Finland	Netherlands Antilles	Uruguay
France	New Zealand	USA
Germany	Nicaragua	Venezuela
Ghana	Nigeria	Viet Nam
Greece	Norway	Yemen
Grenada	Oman	Zimbabwe