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**PRC-Latin America Economic Cooperation:
Going beyond Resource and
Manufacturing Complementarity**

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Abstract

Despite the rapid development of economic interaction between the People's Republic of China (PRC) and Latin American and Caribbean (LAC) countries, their trade and investment ties are still in their very early stages, and the complementarity of factor endowments dominates their bilateral trade pattern. By examining the determinants of trade performance of the PRC and LAC economies, and simulating alternative scenarios for their economic opening and cooperation, we argue that the PRC and LAC economies need to move beyond their traditional focus on resource complementarity to more dynamic, foreign direct investment (FDI)-based intra-industry trade. Policies that encourage deep economic integration would help Latin American firms integrate into the value chains of global production, and enable Chinese and other East Asian firms to have greater and more stable access to resources and markets. Further liberalization of trade, FDI regimes, and regulatory policies should be of high priority for most LAC countries, while the PRC and other East Asian economies could make a great contribution to trade ties by investing in manufacturing sectors and infrastructure in Latin America.

JEL Classification: C33, C68, F14, F15

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1. INTRODUCTION

Rapid integration with the global economy has been a leading feature of the economic rise of the People's Republic of China (PRC) over the past two decades. In 2007, the PRC's trade (the sum of merchandise exports and imports) to gross domestic product (GDP) ratio reached 66.3%, more than double the 1990 level of 32.6%. Its share of world merchandise trade rose from 1.6% to 7.2% over the same period. Its share of world stock of inward foreign direct investment (FDI) rose from 1.1% in 1990 to 2.2% in 2007.¹ The PRC is now the world's third largest merchandise exporter after Germany and the United States (US), and the largest FDI recipient in the developing world. Facilitated by favorable policy reforms, improvements in transportation and communication infrastructure, low labor costs, and massive FDI inflows, the PRC has emerged as the center of global manufacturing production, serving as an important conduit for exporting manufactured products from Asia to the North American and European markets.

Partly as a consequence of the dominance of this "triangular" trade pattern, the PRC's trade has been heavily oriented toward neighboring Asian economies and affluent western Organisation for Economic Co-operation and Development (OECD) markets. However, in recent years, the PRC's trade linkages with emerging, non-traditional trading partners, such as Latin America, Africa, and the Middle East, have increased significantly. During 2000–2007, the PRC's exports to Latin American and Caribbean (LAC) countries grew sevenfold, and imports from this region jumped more than twelvefold. In 2007, the trade volume between the PRC and the LAC region exceeded US\$100 billion, making the PRC the second largest trading partner of this region (International Monetary Fund [IMF] 2008).

The increased economic linkages between the PRC and Latin America reflect the PRC's growing prominence in the world economy and its structural complementarity with many LAC economies. With explosive economic growth, a rapidly expanding manufacturing sector, and growing scarcity of land and natural resources, the PRC developed a huge appetite for commodity imports, in which most LAC countries possess a strong comparative advantage. The PRC is now the world's largest importer of copper and soybeans and the second largest importer of oil. In 2006, the PRC imported 11.6 million tons of soybeans from Brazil, a 46% increase over the previous year. Imported soybeans from Brazil and Argentina accounted for 63% of the PRC's total soybean imports. Chile and Peru, the world's two leading copper producers, accounted for 50% of the PRC's total copper imports (General Administration of Customs of the People's Republic of China 2007). The demand from the PRC contributed to the recent strength in world commodity markets—at least until the outbreak of the global financial crisis in 2008—and brought important gains to commodity exporters in Latin America.

Aside from these benefits, the rapid development of PRC-Latin America economic relations has triggered concerns about possible adverse impacts on LAC economies. The PRC's rise as a manufacturing power has exerted competitive pressure on both the home and export markets for LAC manufacturing sectors, especially among Mexican and some Central American manufacturers. For commodity exporting countries, their booming commodity exports have led to worries about Dutch Disease effects—i.e., the loss of export competitiveness of manufacturing sectors resulting from a real exchange rate appreciation associated with a surge in exports of natural resources—and other negative effects due to the specialization in natural resources.²

1 See United Nations Conference on Trade and Development (2008). The PRC's share of developing world stock of FDI grew from 3.9% to 7.7% over the same period.

2 See OECD (2007) for a discussion on the possible negative effects related to the natural resource specialization in Latin America.

Despite the recent rapid expansion of trade, PRC-Latin America economic cooperation is still at an early stage. How much potential is there for expanding and deepening economic cooperation between the two regions? How should both parties work to achieve a win-win outcome from further intensified trade and investment linkages? This paper attempts to answer these questions by examining the recent trade performance of the PRC and LAC economies, and simulating alternative scenarios for their future economic opening and cooperation. We argue that the strong complementarity between the PRC's—and more broadly East Asia's—and Latin America's economic structures would lay a sound foundation for enhancing future cooperation in trade and investment. However, to make such economic cooperation sustainable, both sides need to move beyond the traditional focus on complementarity of endowments. Policies that encourage deep economic integration would help Latin American firms integrate into the value chains of global production, and enable Chinese and other East Asian firms to have greater and more stable access to resources and markets. Further liberalization in trade and FDI regimes and regulatory policies would be of high priority for most LAC countries, while the PRC and other East Asian economies can make a great contribution by investing in manufacturing sectors and infrastructure in Latin America.

This paper is organized as follows. Section 2 is an overview of trade development in the PRC and Latin America over the past decade. Section 3 uses a gravity model to examine the trade performance of the PRC and Latin America and assesses the trade potential between the two regions. Section 4 then uses a global computable general equilibrium (CGE) model to estimate the economic effects of East Asia-Latin America trade cooperation. Section 5 offers conclusions.

2. TRADE DEVELOPMENT OF THE PRC AND LATIN AMERICA IN THE PAST DECADE

The past decade witnessed a sharp contrast between the PRC's rapid rise and Latin America's slow and volatile growth. The LAC economies grew at an annual average rate of 3% over 1997–2007, less than one third of that recorded by the PRC (Figure 1). Latin America also lagged behind in the extent of its integration into the global market. In the late 1990s, Latin America had a trade-to-GDP ratio equal to that of the PRC. By 2007, the PRC's trade-to-GDP ratio became one half larger than that of Latin America (Figure 2). From 1997 to 2007, the PRC's foreign trade grew by 20.9% annually on average, twice the rate of Latin America.

The weak performance of Latin America's trade is reflected not only in its volume, but also in the product composition of its trade. As shown in Table 1, Latin America is an important supplier of primary products, which accounted for 25.4% of Latin America's total exports in 1996. In 2006, this percentage further rose to 30.6%. This sharply contrasts with the PRC, whose primary exports constituted only 1.9% of total exports in 2006, down from 6.4% in 1996. Within the PRC's manufacturing exports, there has been a significant structural shift from textiles and apparel to electronics in the past decade. For Latin America, the broad composition of its manufacturing exports has remained largely unchanged.

The changing export composition of the PRC has been underpinned by its increasing export sophistication. Using the productivity (or income) level embodied in a product, Hausmann, Hwang, and Rodrik (2005) defined an export sophistication index to measure the productivity level associated with a country's export specialization pattern. Their calculation of this index for four LAC countries (Argentina, Brazil, Chile, and Mexico) showed that only Mexico has a level of export sophistication comparable to that of East Asia. The PRC's export sophistication index exceeds those of Brazil, Argentina, and Chile by a wide margin, even though the PRC's per capita income is roughly only half as large as those of the LAC countries. Using a similar index, Rodrik (2006) further examined the PRC's export

sophistication. He argued that the PRC is an outlier in terms of the overall sophistication of its exports, as its export bundle is that of a country with an income level three times higher. Using a different metric of sophistication, Schott (2006) also reached the conclusion that the PRC's export structure more closely resembles that of high-income countries, rather than countries with similar income levels and factor endowments. Besides the improvement in product structure of exports, there is also evidence of increasing unit values of the PRC's exports, suggesting an enhanced quality of the PRC's products (Wang and Wei 2008; Álvarez and Claro 2007).

Participation in Asia's production network in the past decade has been a key driver of the PRC's trade growth. Production fragmentation within East Asia emerged in the second half of the 1980s, driven mainly by the desire of Japanese multinational corporations to improve their competitive position within the regional market by locating different processes and plants where they were most efficiently utilized. This trend has been facilitated by favorable policy settings—such as reduction of tariffs on manufactured imports, creation of export processing zones, and promotion of export-oriented FDI—and improvements in transportation and communication services. It has been accompanied by the growing relocation of industrial activities and the expansion of back-and-forth trade of parts and components. Countries engaged in regional production networks are specializing in the optimal parts of the supply chain on the basis of their resource endowment, technological capabilities, and comparative advantage. Underpinned by low labor costs and a liberal policy toward processing trade, the PRC has become a favorite destination for export-oriented FDI. Along with the relocation of final stages of production from mature Asian economies to the PRC, its imports of parts and components from other parts of Asia have grown sharply as its exports of final goods to advanced economies have increased significantly. In addition to promoting the increase of trade volume, the formation of regional production networks has also facilitated the technology upgrading of the PRC's exports. Based on the PRC's city-level export data, Wang and Wei (2008) found that processing trade, foreign investment firms, and government-sponsored high tech zones have contributed significantly to raising the unit values of Chinese exports within a given product category.

In Latin America, so far there has been very little international production sharing, except in Mexico and a few Central American countries. In 2007, intraregional trade accounted for nearly half of East Asia's total trade, while in Latin America, the share of intraregional trade was only 21.5%.³ As the formation of regional production networks is often accompanied by massive FDI inflows, the subdued growth of FDI flows to Latin America in 2000–2005 partly accounted for the underdevelopment of LAC firms' regional production sharing (Figure 3).

Despite the weak performance of Latin America's overall trade, bilateral trade between the PRC and Latin America has increased dramatically, especially since 2000. This may reflect the low basis of their initial bilateral trade and, more importantly, the strong complementarity in comparative advantage between the two parties. As a measure of comparative advantage, the sectoral trade balance shown in Figure 4 illustrates the complementarity between the PRC and Latin America. The PRC ran deficits in the trade of resource-intensive products such as agricultural goods, energy, and minerals, in which LAC countries have a strong comparative advantage. On the manufacturing front, the PRC has a comparative advantage in electronics, machinery, and textiles and apparel, while Latin America has a comparative disadvantage in food processing. The commodity composition of bilateral trade between the PRC and Latin America indicates that the PRC's exports to Latin America are dominated by manufactured products, with large volumes of exports in electronics, machinery, and textiles and apparel. For Latin America, primary products accounted for more than half of its exports to the PRC in 2006 (Figure 5). It is estimated that primary products and resource-based

³ The share of intraregional trade was 31.8% in 2007 when the US was included.

manufactured products accounted for around three quarters of Latin America's total exports to the PRC (Lall and Weiss 2005).

The strong complementarity between the trade structures of the PRC and Latin America suggests huge potential for them to further expand bilateral trade and investment. We argue that economic cooperation between the two parties could go well beyond this traditional pattern of factor endowment-based trade. The development of international trade in the past decades has shown that, while inter-industry trade along traditional Ricardian lines of comparative advantage based on different factor endowments remains an important component of global trade, modern international trade has been driven increasingly by intra-industry trade. Intra-industry trade developed in Asia has been based on differential factor proportions, skills, and technology levels, which may be called "vertical" intra-industry trade. This is different from the "horizontal" intra-industry trade that has been developed among industrialized countries—the one based on economies of scale, love of variety, and multinational marketing. In today's global economy, due to rapidly declining transportation and communication costs, the main impetus for integration is the fragmentation of production processes across countries and the capturing of added value through domestic and international supply chains. This is becoming a pervasive feature of Asian trade, but is absent in trade between the PRC and Latin America. Given the long-term growth potential in both the PRC—and more broadly East Asian economies—and LAC countries, the two regions may explore the potential for greater intra-industry trade.

3. TRADE LINKAGES BETWEEN THE PRC AND LATIN AMERICA: A GRAVITY ANALYSIS

In empirical trade studies, the gravity model has been the workhorse for analyzing the determinants of international trade flows. In its most basic form, the gravity model posits that trade increases with the economic size of the trading partners and decreases with the distance between them. The basic gravity equation is often augmented with a number of country-specific variables to capture the trade effects of geographic, cultural, and economic proximity. The theoretical underpinnings of the gravity model have been validated in recent literature.⁴

For the purpose of our analysis, we adopted the following specification of gravity equations:

$$\begin{aligned} \ln X_{ijt} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln GDPPC_{it} + \beta_4 \ln GDPPC_{jt} + \beta_5 \ln D_{ij} \\ & + \beta_6' Z_{ij} + \beta_7 CHN_E + \beta_8 CHN_M + \beta_9 LAC_E + \beta_{10} LAC_M \\ & + \beta_{11} CAC_CHN + \beta_{12} SA_CHN + \beta_{13} CHN_LAC + \eta_t + \varepsilon_{ijt} \end{aligned} \quad (1)$$

where X_{ijt} is the exports of country i to country j in year t ; GDP_{it} is the real GDP of country i in year t ; $GDPPC_{it}$ is per capita real GDP of country i in year t ; D_{ij} is the physical distance between two countries, i and j ; and Z_{ij} is a vector of a number of other time invariant country-pair dummy variables that previous studies have found significant in explaining trade flows—such as shared borders, common languages, colonial ties, and common free trade areas.

As we were concerned with the trade performance of the PRC and Latin America, we introduced a set of regional and region-pair dummies to represent the different components of the two regions' trade. CHN_E is a dummy for capturing the PRC as an exporter, while

⁴ Anderson (1979) and Anderson and van Wincoop (2003) suggested that the gravity equation can be derived from a model of product differentiation and monopolistic competition. Deardorff (1998) derived a gravity model from a Heckscher-Ohlin framework, and Eaton and Kortum (2002) derived a gravity model from a Ricardian type trade model with homogeneous goods.

CHN_M is a dummy for the PRC as an importer. Similarly, *LAC_E* and *LAC_M* are regional dummy variables for Latin America and the Caribbean as an exporter and an importer, respectively. Because of the heterogeneity among LAC countries in their economic structures and factor endowments, we have distinguished two subregions of Latin America by using several dummy variables to capture differential export relations of the LAC subregions vis-à-vis the PRC. Specifically, *CAC_CHN* is the bilateral dummy for the exports of Central America (including Mexico) and the Caribbean to the PRC, and *SA_CHN* is the dummy for South America's exports to the PRC.⁵ The bilateral dummy *CHN_LAC* denotes exports from the PRC to Latin America.⁶

Equation (1) was estimated on a panel of 161 countries from 2000 to 2006. The data sources and variables are described in Appendix II. We used pooled ordinary least squares, including fixed time effects to account for common shocks affecting all countries over time. The estimation results reported in the first column of Table 2 indicate that the standard gravity model in Equation (1) can explain nearly 70% of the variation in bilateral trade flows. As expected, economic size has a highly significant and positive impact on bilateral trade. The coefficients on exporters' and importers' GDP are close to 1, consistent with the unitary income elasticities for both importers and exporters implied by theoretical gravity models such as Anderson and van Wincoop (2003). Per capita income has a positive impact on trade volume, suggesting that high-income countries are more dependent on trade than low-income countries. A 1% increase in bilateral distance decreases bilateral trade by 1%. Shared borders, common languages, colonial ties, and free trade agreements all have a significant and positive impact on trade.

With respect to the trade performance of the PRC and Latin America, the estimation results show that the PRC's trade over-performed the world average in terms of its overall trade, and its export performance was stronger than its import performance. In contrast, Latin America under-traded in terms of its exports, compared with the world average. Its import performance was also slightly less than the world average, but the coefficient estimate is not statistically significant. Even controlling for the PRC as an over-performer in trade, the coefficient for its exports to Latin America is still positive, suggesting the PRC's strong export performance in the LAC region. For Latin America's exports to the PRC, the performance is mixed. Although on the whole Latin America and the Caribbean was an under-performer in exports, South America had strong export performance in the PRC, while Central America had weak export performance there. The coefficient suggests that the export of Central America and the Caribbean to the PRC was about 60% lower than the LAC average.

A number of other factors, which are not fully captured by the standard gravity model specification of Equation (1), may further explain the divergent trade performance of the PRC and Latin America. Recent literature has emphasized the roles of institutions and infrastructure in determining trade performance. Levchenko (2007) suggested that the difference in institutional quality can be a source of comparative advantage, creating more trade flows. Using a gravity model, Anderson and Marcoullier (2002) found that bilateral trade volumes are positively affected by the trading countries' institutional quality. Helpman, Melitz, and Rubinstein (2008) found that regulation costs are important determinants of trade between two countries.

Table 3 summarizes the global ranking of major East Asian and LAC economies in terms of the ease of doing business as an indicator of the business environment. The ranking is intended to capture the extent to which a government creates a regulatory environment that is conducive to operating a business. The table shows that some middle-income economies

5 See Appendix I for a list of the countries that are included in the dummies.

6 In our preliminary analysis, we also estimated the model with two bilateral dummies for the PRC's exports to LAC, i.e., *CHN_CAC* and *CHN_SA*. Because the quantitative regression results of both specifications were quite similar, we decided to report only the results of a single dummy for the PRC's exports to LAC here.

in East Asia—such as Thailand and Malaysia—performed much better than any middle-income country in Latin America. The largest emerging economy in the world, the PRC, performed better than many middle-income LAC countries, including Brazil, which is the largest in Latin America. Even Viet Nam, a low-income East Asian country, performed better than many middle-income LAC countries. Although some East Asian economies—Lao People’s Democratic Republic, Philippines, Cambodia, and Indonesia—are ranked low as in the case of several LAC countries, the table suggests that overall LAC economies lag behind East Asian economies in terms of business environment.

Because transport costs represent a significant barrier to international trade, infrastructure is also likely to have a significant effect on trade. By studying Sub-Saharan African trade, both internally and with the rest of the world, Limão and Venables (2001) found that infrastructure problems largely explain the relatively low levels of African trade. Nordås and Piermartini (2004) arrived at similar conclusions using a global data set. By incorporating institutional and infrastructure variables into a gravity model, Francois and Manchin (2007) found that institutional quality and infrastructure are significant determinants not only of export volumes, but also of the possibility of exports taking place at all.

To capture the effects of institutional and infrastructure factors on bilateral trade flows, we augmented the standard gravity model in Equation (1) with a set of institutional and infrastructure variables. The percentage of paved roads out of total roads and the number of mobile phones per 1,000 people are included as measures of infrastructure. We also included the number of legal procedures needed for an entrepreneur to legally start a business to reflect the regulation costs of firm entry.⁷ Cross-border trading costs are also included in the augmented gravity model. These trading costs are official costs incurred for exporting or importing a container of goods, excluding the costs of ocean transit and trade policy barriers. The data for both regulation costs and cross-border trading costs were obtained from the World Bank’s Doing Business Index database. All these infrastructure and institutional variables are in natural logarithm in the gravity equation.

As the data for regulation costs and infrastructure were not available for 10 of the 161 countries examined in the standard gravity model, our sample for the augmented model was 151 countries. Column 2 of Table 2 shows the estimation results of the augmented gravity model. They suggest that the coefficients of all the gravity variables are largely unaffected, with the exception of per capita GDP. The estimate of the per capita GDP coefficient decreases from positive in the standard gravity model to negative, suggesting that this variable partly captured cross-country differences in infrastructure development and institutional quality in the standard gravity model.

With the exception of the percentage of paved roads out of total roads, all the coefficients of infrastructure, regulation cost, and cross-border trading cost variables are statistically significant and present the correct sign. Transportation and communication infrastructure in both exporting and importing countries have a positive effect on trade volumes. The effect of regulation and trading costs on trade seems even greater, with an estimated elasticity of 0.2–0.3.

Once the differences in infrastructure, regulation costs, and trading costs at the border are controlled for, the coefficients of the PRC as an exporter and as an importer (*CHN_Exporter* and *CHN_Importer*) are reduced by around half. Thus, the PRC’s relatively high infrastructure quality, light regulation, and low trade costs were likely explanations for its superior trade performance in the standard gravity model. The institutional and infrastructure factors also partly accounted for the weak trade performance of Latin America, albeit to a lesser extent compared with the PRC. However, the coefficients on the bilateral trade

⁷ This is from the World Bank’s Doing Business Index Database reported in Table 3. As suggested by Helpman, Melitz, and Rubinstein (2008), these costs affect the firm-level fixed costs of trade.

dummy between the PRC and Latin America remain largely unaffected by the introduction of institutional and infrastructure variables, suggesting the role of other factors in the determination of their bilateral trade flows.

As discussed in the previous section, FDI has played an important role in the formation of the regional production network and, consequently, the rapid growth of trade in Asia. To assess the impact of FDI on trade in Asia and Latin America, we further augmented the gravity model with FDI variables. Following Kawai and Urata (1998), we used one period lagged inward aggregate FDI flows of exporting countries to remedy the possible endogeneity. To distinguish the varied roles of FDI in different regions, we interacted the dummies for four regional exporters (East Asia, Central America and Caribbean, South America, and the rest of the world) with the FDI variable, denoted in column 3 of Table 2 by *EastAsia_FDI*, *CAC_FDI*, *SA_FDI*, and *ROW_FDI*, respectively. The results point toward a strong and significant complementary relationship between FDI and exports in East Asia. For South America and the rest of the world, the interaction between FDI and exports is positive and significant, but of much smaller magnitude. The coefficient estimate for Central America is small and only marginally significant at the 10% level. These results confirm that the export-enhancing effects of inward FDI are pronounced in East Asia, present in South America, and virtually absent in Central America and the Caribbean.

With the interaction dummies of FDI inflows and exporting regions included, the coefficient estimate of the PRC dummy as an exporter changes from positive to negative, indicating that massive FDI inflows to the PRC may fully account for its exceptional export performance. On the contrary, the coefficient of the LAC dummy as an exporter changes from significantly negative to insignificantly positive, reflecting that the weak growth of FDI flows to LAC countries in the past decade may have been responsible for their weak export performance. The coefficient estimates of bilateral trade dummies are not much affected by the introduction of FDI variables. We postulate that some bilateral factors, such as strong complementarity in comparative advantage between the PRC and South America, which is not reflected in the gravity framework, may lead to their above average bilateral trade linkages.

4. TRADE COOPERATION BETWEEN THE PRC AND LATIN AMERICA: ALTERNATIVE CGE SCENARIOS

Looking forward, the rapid rise of the PRC and other East Asian economies will significantly reshape the global growth pattern, leading to a shift of global economic gravity toward Asia. This presents tremendous opportunities for expanding economic cooperation between East Asia and Latin America. To realize this potential, policy reform that supports the economic integration of the two regions will be vital.

Latin America has a long tradition in pursuing regional integration. However, after substantial progress in the 1990s, its regional integration has become lackluster in recent years. Most south-south free trade agreements in Latin America are shallow and narrow, impaired by the persistence of non-tariff barriers, behind-the-border restrictions, inadequate regional infrastructure, and weakness in national and regional institutions. The most prominent north-south free trade agreement in the region, the North American Free Trade Agreement (NAFTA), is doing better, bringing many significant benefits to participants such as Mexico. But the effects of preferential access to the US market are falling, as the US is expanding its network of free trade agreements to economies outside the Americas and importing from these new emerging and developing partners. In recent years, reflecting the increased economic ties between Latin America and East Asia, some LAC countries have pursued free trade agreements with Asian countries, resulting in agreements such as Republic of Korea-Chile, Japan-Mexico, PRC-Chile, Japan-Chile, and, most recently, PRC-Peru. These cross-regional agreements will help LAC countries to boost their underperforming exports to East

Asian countries and facilitate the entry of Latin American firms to global manufacturing production networks.

Despite the progress toward greater openness and integration with regional and global economies, there has also been a risk of a resurgence of protectionism in Latin America, especially in response to rapidly growing imports from the PRC. For example, Facchini et al. (2007) found that LAC countries have a higher level of import protection toward products originating from the PRC. This is costly for them because it creates efficiency losses.

To shed some light on the possible outcome of different policy choices to promote trade cooperation between Latin America and East Asia, we conducted simulation analysis of four scenarios using a global computable general equilibrium (CGE) model with imperfect competition, increasing returns to scale technology, and firm heterogeneity in productivity. The CGE model used here has its intellectual roots in the group of multi-country applied general equilibrium models used over the past two decades to analyze the impact of trade policy reform (Shoven and Whalley 1992; Hertel 1997). In contrast to previous models, we incorporated firm heterogeneity and a fixed cost of exporting—in addition to variable trade costs—in our model. This enabled us to investigate the intra-industry reallocation of resources and the exporting decision by firms, thereby capturing the intensive and extensive margins of trade in the model.⁸

Table 4 summarizes the four scenarios we considered. The first scenario, labeled as *LAC_CLOS*, represents a pessimistic scenario under which LAC countries raise their tariffs for imports from the PRC by 50%. This scenario may not be realistic, but it reflects the potential risks of protectionism in Latin America. The second scenario, *FRAG*, features a world trading system that is fragmented into two trade blocs—East Asia and the Americas.⁹ It assumes that LAC countries continue to view the US as their major trade partner and form a pan-American free trade area (FTA). It also assumes that East Asian economies form an East Asia-wide FTA. The third scenario, *EALAC*, assumes that economic cooperation between East Asia and Latin America leads to the creation of a large cross-regional FTA between the two regions. The final scenario, *EALAC_DI*, augments *EALAC* with “deep integration” measures. In this scenario, a high-quality FTA between East Asia and Latin America is assumed to cover not only trade in goods and services, but also investment and trade facilitation. Specifically, bilateral, variable trade costs are reduced by 5% of the value of trade in both the merchandise and services sectors, and bilateral fixed exporting costs are also cut by 50% in the manufacturing and services sectors.¹⁰

Table 5 presents the simulation results on real income (measured as equivalent variation). Under the scenario of Latin America raising tariffs on imports from the PRC by 50% (*LAC_CLOS*), both LAC countries and the PRC would experience welfare losses, albeit at a small magnitude, partly due to the relatively small existing trade flows between them. The US, Europe, a few Asian countries, and the rest of the world would gain slightly, as the increased trade barriers against the PRC would give their products a competitive advantage over Chinese products in LAC markets. In Latin America, Mexico would experience the largest welfare loss, reflecting its high dependence on imports of manufacturing intermediate goods from the PRC. Unlike other LAC countries, Mexico has a relatively large manufacturing export base, and its manufacturing production heavily depends on imported parts and components. The PRC is the major source of electronics and auto parts imports for Mexico, and these two sectors are Mexico’s leading export sectors. With the rising tariffs on imports from the PRC, the manufacturing producers in Mexico would face higher prices and fewer varieties of intermediate inputs. As a result, their costs of production would rise

8 Appendix III summarizes the model specification. See Zhai (2008) for a detailed description of the structure of the model.

9 Another important trade bloc, the EU, is not considered in this scenario.

10 The model assumes that there are no fixed costs for the trade of agricultural and mining products.

and exports would shrink. As shown in Table 6, the exports of Mexico would shrink by 1% in the wake of the tariff increase against the PRC, and its real exchange rate would depreciate. This result reveals the important economic ties between the PRC and Mexico implied by manufacturing production chains. Overall, global welfare would decline by US\$2.2 billion (at 2004 prices), or 0.01% of world GDP, suggesting some—albeit small—welfare cost of protectionism in Latin America.

If two separate regional trade blocs in East Asia and the Americas were created, all members of the respective FTAs would benefit in terms of welfare and all outsiders would lose, with the exception of the PRC. Similarly to our previous findings, the PRC would lose from an East Asian FTA, reflecting the special features in the PRC's trade pattern.¹¹ In aggregate, the welfare gains from the two regional trade blocs would be 0.7% of GDP for East Asia and 0.3% of GDP for Latin America. Given the higher trade dependence of many Association of Southeast Asian Nations (ASEAN) countries, their welfare gains relative to their GDP would be much larger than those of other East Asian and LAC countries.

With the formation of an East Asia-Latin America FTA, more benefits would be created for both East Asian and LAC economies. The overall welfare gains of both East Asia and Latin America would rise by 30% compared to the scenario of separate free trade blocs for East Asia and Latin America. The welfare gains of East Asia and Latin America would be respectively 1.0% and 0.5% of GDP. However, Latin America's shift of FTA partners from the US and Canada to East Asia would lead to an uneven distribution of gains among its countries. Mexico, Chile, and Argentina would be better off compared to scenario *FRAG*, while other countries would be worse off. Of the two LAC subregions, South American countries would tend to gain and Central American and Caribbean countries would tend to lose due to the creation of an East Asia-Latin America FTA. This result highlights the large heterogeneity across LAC economies. The LAC countries with a higher proportion of manufacturing exports and larger trade linkages with East Asia would benefit from a cross-regional FTA with East Asia. For countries with smaller manufacturing sectors and limited trade linkages with East Asia, a pan-American FTA would be more in line with their interests.

The above simulations are limited to the elimination of tariff distortions to merchandise trade. Although they provide useful insight into the economic incentives and disincentives of trade liberalization and regional integration, they may be misleading due to the neglect of deep integration. The recent wave of free trade agreements in Latin America, East Asia, and the rest of the world has gone substantially beyond conventional agreements and includes a number of “behind-the-border” issues that are typically not subject to World Trade Organization (WTO) discipline. Issues such as regulatory reforms; facilitation of customs procedures; cooperation in science and technology, media and broadcasting, electronic commerce, and information and communication technology; movement of natural persons; and human resource development, are often included in recent free trade agreements in addition to trade liberalization. Deep integration aims at reducing market segmenting effects of domestic regulatory policies through international cooperation and coordination. An FTA

11 Zhai (2006) analyzed factors behind the welfare losses of the PRC due to the formation of an East Asia-wide FTA. One reason is the terms of trade effect. Given its role as an importer of intermediate goods from Asian neighbors and an exporter of final goods to the US and EU, the PRC's bilateral trade liberalization with its regional trade partners raises the relative price of intermediate parts and components to the final goods, resulting in a deterioration in the PRC's terms of trade. Moreover, because the intra-industry trade in intermediate goods accounts for a large proportion of Asian intra-regional trade, the liberalization toward an East Asia-wide FTA would further raise the prices of intermediate goods, inducing a larger deterioration in the PRC's terms of trade and welfare. Another factor contributing to the PRC's welfare reduction under an East Asia-wide FTA is the changes of sectoral composition of production resulting from trade liberalization. Japan and the Republic of Korea are important markets for the PRC's agricultural exports, even though they are highly protected. Their trade liberalization with the PRC would result in expansion of the PRC's agricultural sector, diverting resources from the industrial sectors. As a consequence, the industrial sectors would contract. Since industrial sectors are assumed to be operated under increasing returns to scale technology, their contraction would have negative welfare implications because of the loss of agglomeration and variety effects.

with these wider issues is an important vehicle of deep integration, as some sensitive cross-border and behind-the-border issues cannot be addressed under multilateral settings such as the WTO.

Scenario *EALAC_DI* mimics the effects of deep integration by reducing variable trade costs and fixed exporting costs in all merchandise and services sectors. Its simulation results suggest that the reward of deep integration would be significantly higher than that of traditional shallow integration. This is most evident in the remarkable real income rises in some of the most trade-dependent East Asian economies, such as Malaysia and Singapore. Although the PRC may lose from an East Asia-wide FTA or a cross-regional East Asia-Latin America FTA, it would gain significantly from deep integration between East Asia and Latin America. In contrast to a shallow East Asia-Latin America FTA, the deep integration between the two regions would benefit all LAC economies. Although Mexico and Chile would still enjoy the largest gains among LAC economies, the benefits to small economies in Central America and the Caribbean would also be substantial.

5. CONCLUSION

Despite the rapid development of economic interaction between the People's Republic of China (PRC) and Latin American and Caribbean (LAC) countries, their trade and investment ties are still in their very early stages. The complementarity of factor endowments dominates their bilateral trade pattern, and much of the investment from the PRC to LAC countries has gone into natural resource extraction. Although the existing patterns of trade and investment cooperation between the PRC and Latin America are well grounded on their respective comparative advantages, both sides need to move beyond this traditional focus to a more dynamic, foreign direct investment (FDI)-based modern intra-industry trade.

We have used augmented gravity models to examine the trade performance of the PRC and Latin America. The analysis suggested that although the differences in institutional quality and infrastructure can partly account for the divergent export performance between the PRC and the LAC countries, the ability to absorb export-oriented FDI inflows is likely a more important factor. Relatively weak FDI inflows in recent years and the small contribution of FDI inflows to export activities in LAC countries may be the key factors behind their overall subdued export performance. The gravity model analysis also found that although Latin America is underperforming in terms of its overall exports, the bilateral export of South America to the PRC is significantly larger than the average export of Latin America to the PRC. This may indicate a strong complementarity in comparative advantage between the two parties.

To expand economic cooperation between the PRC and Latin America, LAC countries need to further liberalize their trade and FDI regimes and regulatory policies, and strengthen the integration with dynamic East Asian economies. A rise of protectionism against the PRC in Latin America would be harmful for all LAC economies. Our model-based analysis suggests that Mexico would suffer most if LAC countries raised tariffs on imports from the PRC, because Mexico's manufacturing sector has developed strong dependence on imports of parts and components from the PRC.

Establishing a cross-regional free trade area (FTA) between Latin America and East Asia will provide an important impetus for their economic integration. Given the heterogeneity in natural endowments, development stages, and production and trade patterns among LAC economies, an East Asia-Latin America FTA may not benefit all LAC countries at the moment. Our simulation results show that the South American countries with a high proportion of manufacturing exports and large trade linkages with East Asia would benefit from a cross-regional FTA with East Asia, while Central American and Caribbean countries would tend to lose. This result underscores that the current bilateral approach pursued by

East Asian and LAC economies for establishing cross-Pacific FTAs may be a practical means for East Asia-Latin America integration.

Policy efforts at deepening economic integration between East Asia and Latin America would help LAC firms participate in the value chains of global manufacturing production, and enable Chinese and other East Asian firms to have greater and more stable access to resources and markets. In recent years, some relatively advanced LAC countries—such as Mexico—have developed strong ties with the PRC in manufacturing production and trade. Deep integration—through reduction of behind-the-border impediments—between Latin America and East Asia will help LAC manufacturing firms join the Asian regional supply chains, and facilitate the development of cross-regional production networks.

As shown in our gravity model analysis, FDI has been a key driver of export growth in East Asia. Given the large surplus savings in the PRC and its neighbor economies, East Asia can contribute to Latin American economic development by investing in the latter's manufacturing sectors and infrastructure. This will help some of the lagging players in Latin America rapidly catch up. With these efforts, a more sustainable and inclusive pattern of East Asia-Latin America economic cooperation could emerge, providing immense economic opportunities to both parties.

REFERENCES

- Álvarez, R., and S. Claro. 2007. On the Sources of China's Export Growth. Working Papers Central Bank of Chile 426 (August). Santiago: Central Bank of Chile.
- Anderson, J. E. 1979. A Theoretical Foundation for the Gravity Equation. *American Economic Review* 69(1, March): 106–116.
- Anderson, J. E., and E. van Wincoop. 2003. Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Review* 93(1, March): 170–192.
- Anderson, J. E., and D. Marcoullier. 2002. Insecurity and the Pattern of Trade: An Empirical Investigation. *Review of Economics and Statistics* 84(2, May): 342–352.
- Central Intelligence Agency (CIA). 2008. The CIA World Factbook 2009. New York: Skyhorse Publishing.
- Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). 2009. CHELEM Database. Available: <http://www.cepii.fr/anglaisgraph/bdd/chelem.htm>
- Deardorff, A. V. 1998. Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World? In *The Regionalization of the World Economy*, edited by J. A. Frankel. Chicago: University of Chicago Press.
- Eaton, J., and S. Kortum. 2002. Technology, Geography, and Trade. *Econometrica* 70(5, September): 1741–1779.
- Facchini, G., M. Olarreaga, P. A. Silva, and G. Willmann. 2007. Substitutability and Protectionism: Latin America's Trade Policy and Imports from China and India. World Bank Policy Research Working Paper No. 4188 (April). Washington, DC: World Bank.
- Francois, J., and M. Manchin. 2007. Institutions, Infrastructure, and Trade. Policy Research Working Paper Series 4152 (March). Washington, DC: World Bank.
- General Administration of Customs of the People's Republic of China. 2007. *China's Customs Statistics*. Beijing: General Administration of Customs.
- Hausmann, R., J. Hwang, and D. Rodrik. 2005. What You Export Matters. NBER Working Paper No. W11905 (December). Cambridge: National Bureau of Economic Research.
- Helpman, E., M. Melitz, and Y. Rubinstein. 2008. Estimating Trade Flows: Trading Partners and Trading Volumes. *Quarterly Journal of Economics* 123(2, May): 441–487.
- Hertel, T. W., ed. 1997. *Global Trade Analysis: Modeling and Applications*. Cambridge: Cambridge University Press.
- International Monetary Fund (IMF). 2008. Direction of Trade Statistics database. Washington, DC: IMF.
- Kawai, M., and S. Urata. 1998. Are Trade and Direct Investment Substitutes or Complements? An Empirical Analysis of Japanese Manufacturing Industries. In *Economic Development and Cooperation in the Pacific Basin*, edited by H. Lee and D. W. Roland-Holst. Cambridge: Cambridge University Press.
- Lall, S., and J. Weiss. 2005. China's Competitive Threat to Latin America: An Analysis for 1990–2002. *Oxford Development Studies* 33(2, June): 163–194.
- Levchenko, A. A. 2007. Institutional Quality and International Trade. *Review of Economic Studies* 74(3, July): 791–819.
- Limão, L., and A. Venables. 2001. Infrastructure, Geographical Disadvantage, Transport Costs, and Trade. *World Bank Economic Review* 15(3, October): 451–479.

- Melitz, M. J. 2003. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71(6, November): 1695–1725.
- Nordås, H., and R. Piermartini. 2004. Infrastructure and Trade. WTO Staff Working Paper ERSD-2004-04 (August). Geneva: World Trade Organization.
- Organisation for Economic Co-operation and Development (OECD). 2007. *Latin American Economic Outlook 2008*. Paris: OECD.
- Rodrik, D. 2006. What's So Special about China's Exports? NBER Working Papers 11947 (January). Cambridge: National Bureau of Economic Research.
- Schott, P. K. 2006. The Relative Sophistication of Chinese Exports. NBER Working Papers 12173 (April). Cambridge: National Bureau of Economic Research.
- Shoven, J. B., and J. Whalley. 1992. *Applying General Equilibrium*. Cambridge: Cambridge University Press.
- United Nations Conference on Trade and Development (UNCTAD). 2008. *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*. New York and Geneva: United Nations.
- . 2009. Foreign Direct Investment database. Available: <http://www.unctad.org/Templates/StartPage.asp?intItemID=2921&lang=1>
- van der Mensbrugge, D. 2005. LINKAGE Technical Reference Document: Version 6.0. Mimeographed. Washington, DC: World Bank.
- Wang, Z., and S. -J. Wei. 2008. What Accounts for the Rising Sophistication of China's Exports? NBER Working Paper 13771 (February). Cambridge: National Bureau of Economic Research.
- World Bank. 2008. World Development Indicators 2008 database. Washington, DC: World Bank.
- . 2009. Doing Business Index database. Available: <http://www.doingbusiness.org/>
- World Trade Organization. 2009. Regional Trade Agreements database. Available: <http://rtais.wto.org/?lang=1>
- Zhai, F. 2006. Preferential Trade Agreements in Asia: Alternative Scenarios of “Hub and Spoke.” ERD Working Paper No. 83 (October). Manila: Asian Development Bank.
- . 2008. Armington Meets Melitz: Introducing Firm Heterogeneity in a Global CGE Model of Trade. *Journal of Economic Integration* 23(3, September): 575–604.

Table 1: Product Composition of Total Exports: PRC and Latin America
(%)

	PRC		Latin America	
	1996	2006	1996	2006
Primary products	6.4	1.9	25.4	30.6
Agriculture	3.1	0.9	10.7	6.5
Energy and materials	3.4	1.0	14.8	24.1
Manufacturing	93.6	98.1	74.6	69.4
Textiles and apparel	32.4	18.4	7.9	4.2
Food	4.5	1.9	12.1	8.8
Electronics	12.2	30.2	6.0	7.9
Machinery and transportation equipment	15.1	19.6	20.7	27.4
Other manufactured goods	29.3	28.0	27.8	28.1

Source: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) (2009).

Table 2: Estimation Results of the Trade Gravity Models

	Standard model	Augmented with infrastructure and institutional variables	Augmented with FDI variables
Ln GDP _i	1.021 * (0.009)	1.039 * (0.010)	0.926 * (0.013)
Ln GDP _j	0.814 * (0.009)	0.845 * (0.009)	0.853 * (0.009)
Ln GDPPC _i	0.066 * (0.011)	-0.107 * (0.021)	-0.091 * (0.020)
Ln GDPPC _j	0.042 * (0.011)	-0.112 * (0.019)	-0.123 * (0.018)
Ln Distance	-1.094 * (0.023)	-1.125 * (0.024)	-1.230 * (0.024)
Border	1.068 * (0.112)	1.141 * (0.114)	1.012 * (0.116)
Language	0.767 * (0.048)	0.818 * (0.048)	0.829 * (0.047)
Colony ties	0.941 * (0.097)	0.870 * (0.098)	0.934 * (0.095)
FTA	0.471 * (0.042)	0.342 * (0.043)	0.292 * (0.043)
CHN_Exporter	1.092 * (0.103)	0.696 * (0.111)	-0.355 * (0.116)
CHN_Importer	0.685 * (0.158)	0.304 *** (0.170)	0.259 (0.162)
LAC_Exporter	-0.324 * (0.041)	-0.232 * (0.047)	0.060 (0.151)
LAC_Importer	-0.057 (0.038)	0.019 (0.042)	0.068 *** (0.040)
CHN_LAC	0.468 *** (0.242)	0.511 ** (0.235)	0.531 ** (0.234)
CAC_CHN	-0.863 ** (0.436)	-0.923 ** (0.447)	-0.731 *** (0.428)
SA_CHN	1.479 * (0.474)	1.458 * (0.377)	1.443 * (0.388)
Ln Paved road_Exporter		0.015 (0.022)	0.054 * (0.023)
Ln Mobile phones_Exporter		0.119 * (0.016)	0.058 * (0.016)
Ln Paved road_Importer		0.054 * (0.020)	0.048 * (0.020)
Ln Mobile phones_Importer		0.059 * (0.014)	0.064 * (0.014)
Ln Proc. of starting business_Exporter		-0.338 * (0.037)	-0.472 * (0.040)
Ln Proc. of starting business_Importer		-0.232 * (0.039)	-0.248 * (0.038)
Ln exporting costs at border		-0.382 * (0.039)	-0.142 * (0.040)
Ln importing costs at border		-0.291 * (0.034)	-0.292 * (0.034)
EastAsia_FDI			0.247 * (0.012)
CAC_FDI			0.047 *** (0.024)
SA_FDI			0.124 * (0.022)
ROW_FDI			0.106 * (0.011)
Observations	107563	98240	93944
R ²	0.664	0.682	0.693

Notes: FDI = foreign direct investment; year fixed effects included but not reported; robust standard errors are in parentheses (clustering by country pair); *, **, and *** define 1%, 5%, and 10% significance levels, respectively.

Source: Authors' calculation.

Table 3: Ease of Doing Business Rank 2009: East Asia and Latin America

	Overall Ranking	Starting a Business	Dealing with Construction Permits	Employing Workers	Registering Property	Getting Credit	Protecting Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Closing a Business
OECD Countries	27	47	46	78	51	36	63	59	33	33	24
Eastern Europe and Central Asia	76	74	121	97	66	52	68	111	101	51	89
East Asia and Pacific	81	94	70	58	89	92	79	68	72	87	101
Middle East and North Africa	90	93	96	86	79	112	93	63	74	116	88
Latin America and Caribbean	92	93	79	88	99	73	81	107	89	113	99
South Asia	111	64	112	83	117	102	75	98	118	132	116
Sub-Saharan Africa	138	127	114	118	123	119	113	110	133	117	125
East Asia and India	72	101	83	83	73	58	65	81	55	72	79
Singapore	1	10	2	1	16	5	2	5	1	14	2
Hong Kong	4	15	20	20	74	2	3	3	2	1	13
Japan	12	64	39	17	51	12	15	112	17	21	1
Thailand	13	44	12	56	5	68	11	82	10	25	46
Malaysia	20	75	104	48	81	1	4	21	29	59	54
Korea, Rep. of	23	126	23	152	67	12	70	43	12	8	12
Taipei, China	61	119	127	159	26	68	70	100	30	88	11
China, People's Rep of	83	151	176	111	30	59	88	132	48	18	62
Brunei Darussalam	88	130	72	5	177	109	113	35	42	157	35
Viet Nam	92	108	67	90	37	43	170	140	67	42	124
India	122	121	136	89	105	28	38	169	90	180	140
Indonesia	129	171	80	157	107	109	53	116	37	140	139
Cambodia	135	169	147	134	108	68	70	24	122	136	181
Philippines	140	155	105	126	97	123	126	129	58	114	151
Lao People's Dem. Rep.	165	92	110	85	159	145	180	113	165	111	181
United States	3	6	26	1	12	5	5	46	15	6	15
Canada	8	2	29	18	32	28	5	28	44	58	4

	Overall Ranking	Starting a Business	Dealing with Construction Permits	Employing Workers	Registering Property	Getting Credit	Protecting Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Closing a Business
Chile	40	55	62	74	39	68	38	41	53	65	112
Colombia	53	79	54	80	78	59	24	141	96	149	30
Mexico	56	115	33	141	88	59	38	149	87	79	23
Peru	62	116	115	149	41	12	18	85	93	119	96
El Salvador	72	103	121	87	42	43	113	124	57	53	78
Panama	81	32	73	172	75	28	104	172	8	116	72
Nicaragua	107	85	134	66	136	84	88	162	99	66	67
Uruguay	109	120	139	79	149	43	88	167	127	99	44
Guatemala	112	147	164	106	27	28	126	120	123	106	90
Argentina	113	135	167	130	95	59	104	134	106	45	83
Paraguay	115	82	96	177	70	68	53	102	138	103	116
Costa Rica	117	123	123	77	45	59	164	152	94	132	98
Brazil	125	127	108	121	111	84	70	145	92	100	127
Ecuador	136	158	85	171	64	84	126	69	124	101	131
Bolivia	150	165	98	180	129	109	126	176	117	133	59
Venezuela	174	142	96	180	92	163	170	177	164	71	149

Notes: (1) The regional average rank is the arithmetic average of ranks of the individual economies in that region.

(2) East Asia and Pacific excludes Japan and the Republic of Korea, while East Asia and India includes Japan, Republic of Korea, and India.

Source: World Bank (2009).

Table 4: Summary of CGE Scenarios

<i>Scenario</i>	<i>Description</i>
<i>LAC-CLOS</i>	<u>A more closed Latin America and Caribbean</u> <ul style="list-style-type: none"> - Latin American (including Caribbean) countries raise tariff rates by 50% for all merchandise imports from the PRC.
<i>FRAG</i>	<u>A fragmented world trade system</u> <ul style="list-style-type: none"> - Two parallel trade blocs—an East Asia-wide Free Trade Area and a Pan-American Free Trade Area. - The East Asia-wide Free Trade Area includes Japan; Republic of Korea; PRC (including Hong Kong, China); Taipei,China; and six ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand, and Viet Nam). - The Pan-American Free Trade Area includes NAFTA and all LAC countries. - Within these two trade blocs, all tariffs for bilateral merchandise trade are eliminated.
<i>EALAC</i>	<u>Integration of East Asia and Latin America and the Caribbean</u> <ul style="list-style-type: none"> - An East Asia-Latin America Free Trade Area that includes all LAC countries and major East Asian economies. - All bilateral tariffs for merchandise trade within this FTA are eliminated.
<i>EALAC-DI</i>	<u>Deep integration of East Asia and Latin America and the Caribbean</u> <ul style="list-style-type: none"> - All bilateral tariffs for merchandise trade within the East Asia-Latin America Free Trade Area are eliminated. - Within the FTA, bilateral, variable trade costs are reduced by 5% of the value of trade for both merchandise and services sectors. - Bilateral fixed exporting costs are also cut by 50% in manufacturing and services sectors.

Notes: ASEAN = Association of Southeast Asian Nations, FTA = free trade area, LAC = Latin America and the Caribbean, NAFTA = North American Free Trade Agreement.

Source: Authors' assumptions.

**Table 5: Impacts on Real Income under Different Scenarios
(% change relative to base year)**

	EV, bn US\$				EV, % of GDP			
	LAC_CLOS	FRAG	EALAC	EALAC_DI	LAC_CLOS	FRAG	EALAC	EALAC_DI
<u>World</u>	-2.23	64.1	73.6	316.9	-0.01	0.2	0.2	0.8
<u>East Asia</u>	-1.20	61.4	79.4	317.3	-0.01	0.7	1.0	3.8
PRC and Hong Kong, China	-1.27	-12.8	-8.0	49.5	-0.07	-0.7	-0.4	2.7
Japan	0.06	24.8	29.1	68.9	0.00	0.5	0.6	1.5
Korea, Rep. of	0.00	20.2	22.6	57.1	0.00	3.0	3.3	8.4
Taipei, China	-0.02	7.0	8.2	29.9	-0.01	2.3	2.7	9.8
Indonesia	0.01	0.7	1.2	11.8	0.00	0.3	0.5	4.6
Malaysia	0.00	4.9	7.6	25.2	0.00	4.3	6.7	22.0
Philippines	0.00	0.1	0.2	5.7	0.01	0.1	0.2	6.7
Singapore	0.00	2.1	2.3	26.1	0.00	2.0	2.2	24.5
Thailand	0.00	7.6	8.6	27.1	0.00	4.7	5.3	16.8
Viet Nam	0.02	6.8	7.6	16.0	0.05	15.7	17.7	37.3
<u>Latin America</u>	-1.55	7.3	9.7	79.1	-0.07	0.3	0.5	3.7
Mexico	-1.43	3.9	7.8	46.3	-0.21	0.6	1.1	6.8
Argentina	0.00	0.0	0.2	3.4	0.00	0.0	0.1	2.3
Brazil	0.00	0.2	0.0	6.5	0.00	0.0	0.0	1.1
Chile	-0.02	0.2	0.8	4.3	-0.02	0.3	0.9	4.8
Colombia	0.00	0.5	0.6	2.6	0.00	0.5	0.6	2.7
Peru	-0.01	0.4	0.4	2.1	-0.02	0.6	0.6	3.1
Venezuela	-0.02	0.3	0.1	2.3	-0.02	0.3	0.1	2.1
Rest of South America	-0.03	0.2	0.0	3.2	-0.03	0.2	0.0	4.2
Central America and Caribbean	-0.05	1.5	-0.2	8.2	-0.02	0.6	-0.1	3.1
Canada	0.03	1.5	-0.2	-1.1	0.00	0.1	0.0	-0.1
United States	0.23	6.6	-0.7	-17.5	0.00	0.1	0.0	-0.1
Australia and New Zealand	0.00	-0.5	-0.5	-0.8	0.00	-0.1	-0.1	-0.1
Europe	0.16	-9.9	-11.5	-47.3	0.00	-0.1	-0.1	-0.4
India	0.00	-0.6	-0.6	-2.5	0.00	-0.1	-0.1	-0.4
Rest of Asia	0.03	-0.3	-0.2	-1.0	0.01	-0.1	-0.1	-0.3
Rest of the world	0.07	-1.6	-1.9	-9.3	0.00	0.0	-0.1	-0.3

Notes: CGE = computable general equilibrium, EV = equivalent variation, GDP = gross domestic product.

Source: Authors' CGE simulations.

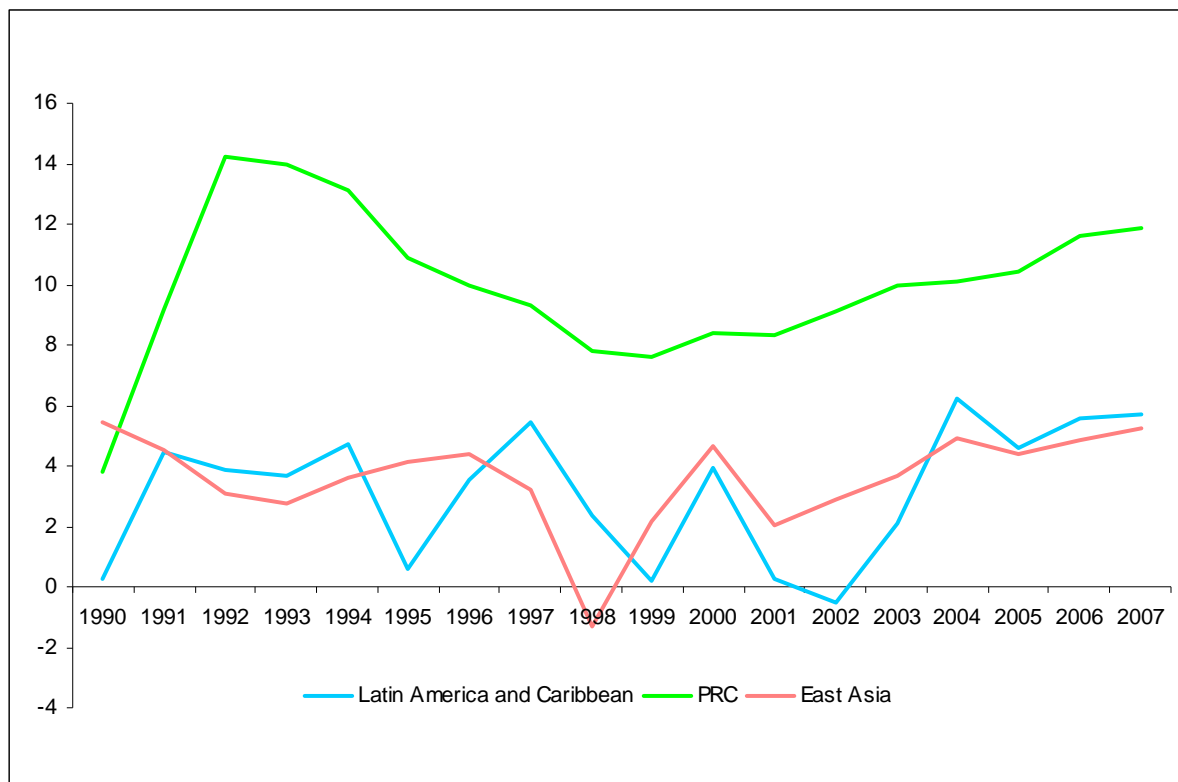
**Table 6: Impacts on Exports under Different Scenarios
(% change relative to base year)**

	LAC_CLOS	FRAG	EALAC	EALAC_DI
<u>East Asia</u>				
PRC and Hong Kong, China	-0.6	13.4	16.2	51.5
Japan	0.0	13.1	15.4	45.2
Korea, Rep. of	0.0	19.0	21.5	57.5
Taipei,China	0.0	16.8	18.8	53.9
Indonesia	0.0	13.3	15.2	49.8
Malaysia	0.0	10.3	11.8	30.3
Philippines	0.0	11.4	11.8	32.2
Singapore	0.0	2.8	3.6	52.4
Thailand	0.0	34.5	37.0	70.9
Viet Nam	0.1	94.3	103.5	149.1
<u>Latin America</u>				
Mexico	-1.0	3.7	18.8	50.0
Argentina	-0.2	4.9	6.1	28.9
Brazil	-0.4	9.4	10.8	34.4
Chile	-0.3	1.1	5.8	25.6
Colombia	-0.3	28.4	28.6	59.9
Peru	-0.6	20.4	23.1	66.4
Venezuela	-0.2	16.6	14.8	30.6
Rest of South America	-1.3	11.4	12.5	35.9
Central America and Caribbean	-0.5	31.2	17.0	47.7
Canada	0.0	2.7	-0.9	-2.5
United States	0.1	2.5	-1.7	-3.9
Australia and New Zealand	0.0	-1.7	-1.4	-2.6
Europe	0.0	-1.0	-0.9	-2.5
India	0.0	-1.9	-1.8	-3.5
Rest of Asia	0.0	-1.9	-1.7	-3.5
Rest of the world	0.0	-0.8	-0.7	-2.0

Notes: CGE = computable general equilibrium, PRC = People's Republic of China.

Source: Authors' CGE simulations.

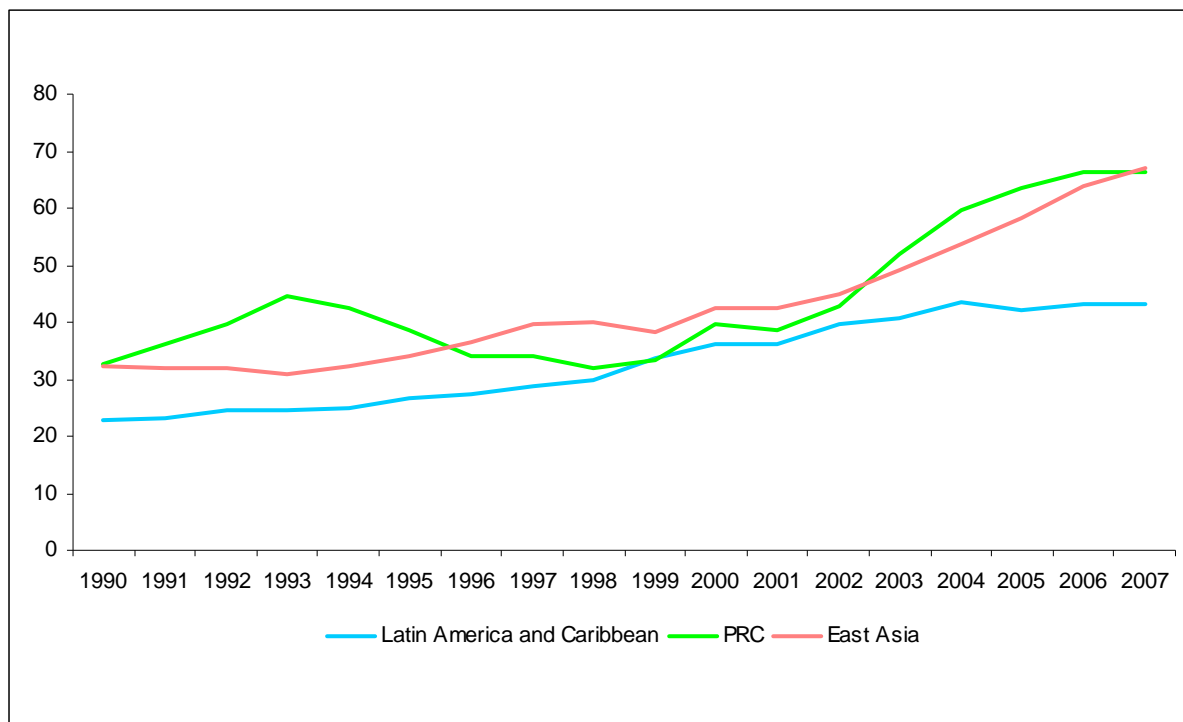
Figure 1: GDP growth rates of Latin American and the Caribbean, East Asia, and PRC, 1990–2007 (%)



Notes: GDP = gross domestic product, PRC = People's Republic of China

Source: World Bank (2008).

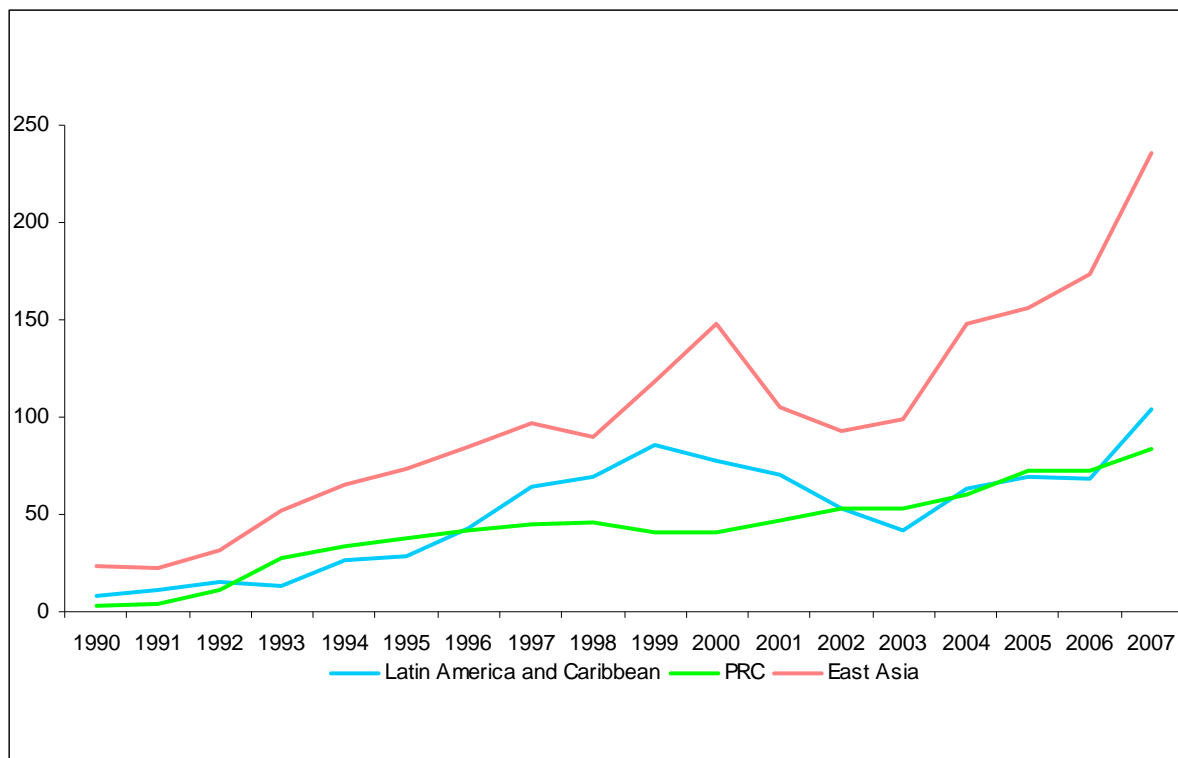
Figure 2: Trade-to-GDP ratio of Latin American and the Caribbean, East Asia, and PRC, 1990–2007 (%)



Notes: GDP = gross domestic product, PRC = People's Republic of China

Source: World Bank (2008).

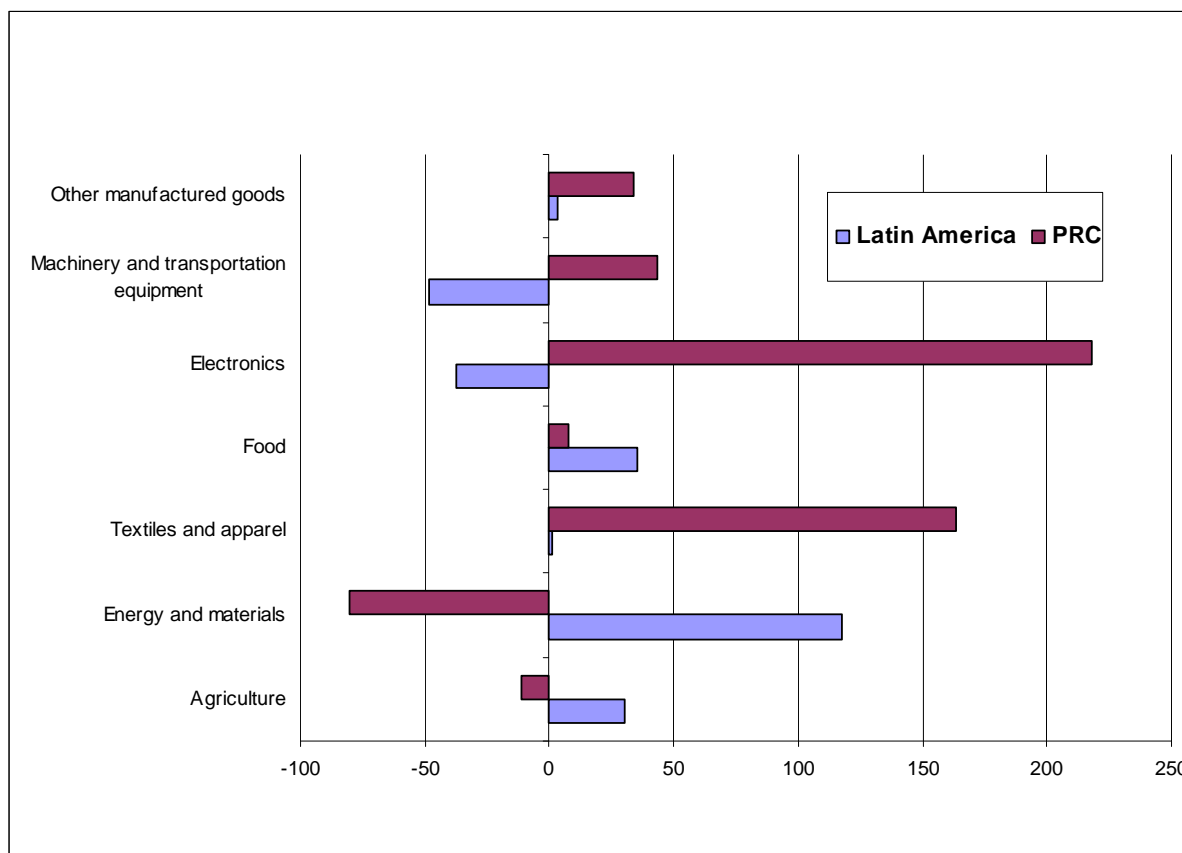
Figure 3: Inward FDI Flows in Latin America and the Caribbean, East Asia, and PRC, 1990–2007 (US\$ billion)



Notes: FDI = foreign direct investment, PRC = People's Republic of China

Source: United Nations Conference on Trade and Development (UNCTAD) (2008).

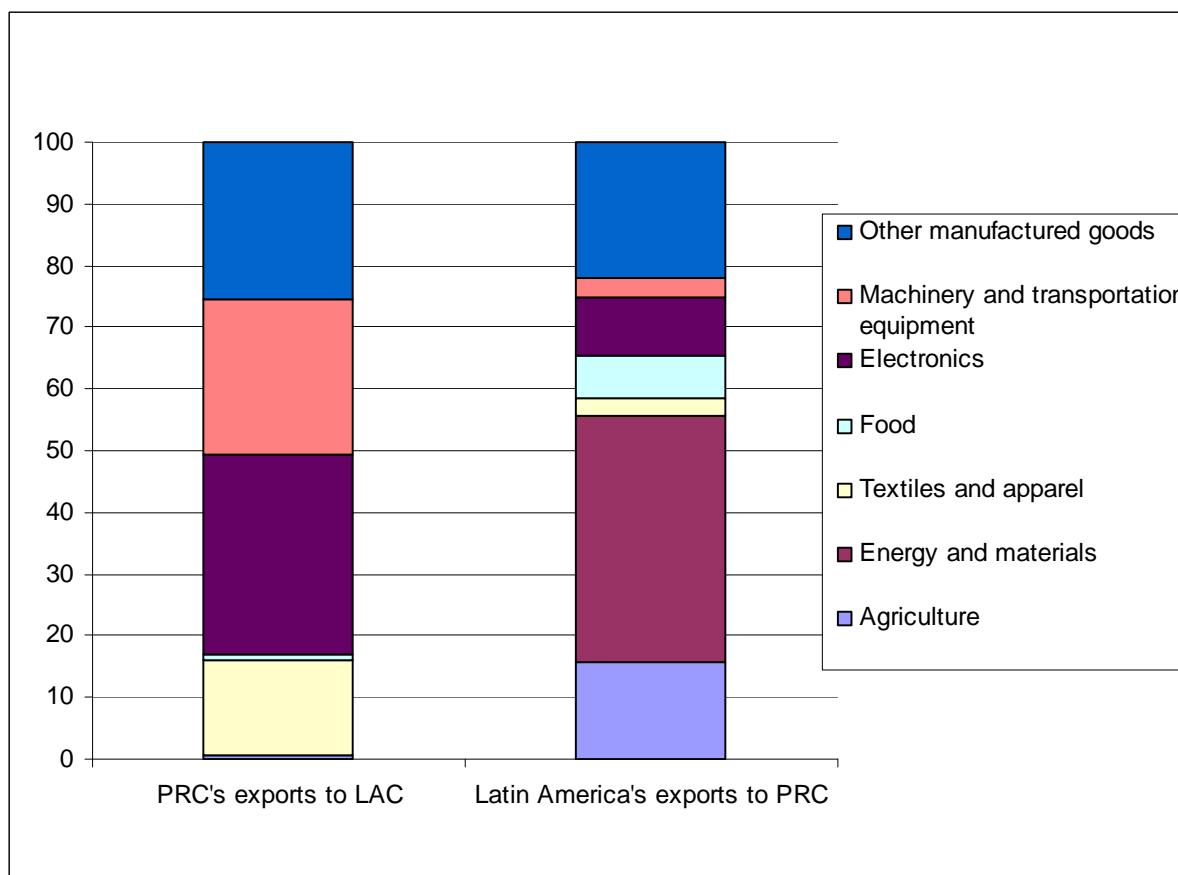
**Figure 4: Net Trade Balance of Latin America and PRC, 2006
(US\$ billion)**



Note: PRC = People's Republic of China

Source: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) (2009).

Figure 5: Sectoral Structure of PRC-Latin America Trade, 2006 (%)



Note: PRC = People's Republic of China

Source: CEPII (2009).

APPENDIX I: LIST OF ECONOMIES IN THE GRAVITY MODEL ANALYSIS

Central America and the Caribbean

Costa Rica
Dominican Republic
El Salvador
Guatemala
Haiti
Honduras
Mexico
Nicaragua
Panama
Bahamas
Dominica
Grenada
Guyana
Belize
Jamaica
St. Kitts and Nevis
St. Lucia
Suriname
Trinidad and Tobago

South America

Argentina
Bolivia
Brazil

Chile
Colombia
Ecuador
Paraguay
Peru
Uruguay
Venezuela

Other economies

United States
United Kingdom
Austria
Belgium
Denmark
France

Germany
Italy

Luxembourg

Netherlands
Norway
Sweden
Switzerland
Canada
Japan
Finland
Greece
Iceland
Ireland
Malta
Portugal
Spain
Turkey
Australia
New Zealand
South Africa
Bahrain
Cyprus
Iran
Israel
Jordan
Kuwait
Lebanon

Oman
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
Egypt
Yemen, Republic of
Bangladesh
Brunei Darussalam
Myanmar
Cambodia
Sri Lanka
Hong Kong, China
India

Indonesia
Korea, Republic of
Lao People's Dem. Rep.

Macao
Malaysia
Maldives
Nepal
Pakistan
Philippines
Singapore
Thailand
Viet Nam
Djibouti
Algeria
Angola
Burundi
Cameroon
Central African Rep.
Chad
Congo, Republic of
Congo, Dem. Rep. of
Benin
Ethiopia
Gabon
Ghana
Guinea-Bissau
Guinea

Côte d'Ivoire
Kenya
Liberia
Libya
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Niger
Nigeria
Zimbabwe

Rwanda
Seychelles
Senegal

Sierra Leone
Sudan
Tanzania
Togo
Tunisia
Uganda
Burkina Faso
Zambia
Solomon Islands
Fiji
Vanuatu
Papua New Guinea
Tonga
Armenia
Azerbaijan
Belarus
Albania
Georgia
Kazakhstan
Kyrgyz Republic
Bulgaria
Moldova
Russia
Tajikistan
China, People's Rep. of
Turkmenistan
Ukraine
Uzbekistan
Czech Republic
Slovak Republic
Estonia
Latvia
Hungary
Lithuania
Mongolia
Croatia
Slovenia
Macedonia, FYR
Bosnia and Herzegovina
Poland
Romania

APPENDIX II: DATA SOURCES AND DEFINITIONS OF THE GRAVITY MODEL VARIABLES

Variable	Definition	Source
<i>X</i>	Bilateral real exports (in constant 2000 US\$, deflated by the US CPI)	International Monetary Fund, Direction of Trade Statistics database
<i>GDP</i>	Real GDP (in constant 2000 US\$)	World Bank, WDI 2008 database
<i>GDPPC</i>	Per capita GDP (in constant 2000 US\$)	World Bank, WDI 2008 database
<i>Distance</i>	Distance between the capital cities of two countries (in kilometers)	CEPII, CHELEM database
<i>Border</i>	Dummy variable taking the value of one if two countries share a common border and zero otherwise	CIA, World Factbook 2009
<i>Language</i>	Dummy variable taking the value of one if two countries share a common language and zero otherwise	CIA, World Factbook 2009
<i>Colony tie</i>	Dummy variable taking the value of one if two countries share the same colonial origin and zero otherwise	CIA, World Factbook 2009
<i>FTA</i>	Dummy variable taking the value of one if two countries are members of a common free trade agreement and zero otherwise	World Trade Organization, Regional Trade Agreements database
<i>Paved road</i>	Percentage of paved roads out of total roads	World Bank, WDI 2008 database
<i>Mobile phones</i>	Number of mobile phones per 1,000 people	World Bank, WDI 2008 database
<i>Proc. of starting business</i>	Number of legal procedures needed for legally starting a business (average of 2004–2009)	World Bank, Doing Business Index database
<i>Exporting costs at border</i>	Cost to export across borders (US\$ per container) (average of 2004–2009)	World Bank, Doing Business Index database
<i>Importing costs at border</i>	Cost to export across borders (US\$ per container) (average of 2004–2009)	World Bank, Doing Business Index database
<i>FDI</i>	One year lagged inward FDI flows (in constant 2000 US\$, deflated by the US CPI)	United Nations Conference on Trade and Development, FDI database

Notes: CEPII = Centre d'Etudes Prospectives et d'Informations Internationales, CIA = Central Intelligence Agency, CPI = Consumer Price Index, FDI = foreign direct investment, GDP = gross domestic product, WDI = World Development Indicators.

APPENDIX III: THE CGE MODEL

The computable general equilibrium (CGE) model used in this study is a version of the global general equilibrium model developed by van der Mensbrugghe (2005) and Zhai (2008). It is calibrated to the Global Trade Analysis Project (GTAP) (version 7) global database with 2004 as the base year and implemented in the General Algebraic Modeling System (GAMS) programming language. It includes twenty-six countries/regions and eighteen sectors.

The agriculture and mining sectors are assumed to be subject to perfect competition. In each of these two sectors, there is a representative firm operating under constant returns to scale technology. The manufacturing and services sectors are characterized by monopolistic competition, and their structure of production and trade follows Melitz (2003). Each of these sectors consists of a continuum of firms that are differentiated by the varieties they produce and their productivity. Firms face fixed production costs, resulting in increasing returns to scale. There is also a fixed and a variable cost associated with the exporting activities. On the demand side, the agents are assumed to have Dixit-Stiglitz preference over the continuum of varieties. As each firm is a monopolist for the variety it produces, it sets the price of its product at a constant markup over its marginal cost. A firm enters domestic or export markets if and only if the net profit generated from its domestic sales or exports in a given country is sufficient to cover the fixed cost. This zero cutoff profit condition defines the productivity thresholds for a firm's entering domestic and export markets, and in turn determines the equilibrium distribution of non-exporting firms and exporting firms, as well as their average productivities. Usually, the combination of fixed and variable (iceberg) export costs ensures that the exporting productivity threshold is higher than that for production for the domestic market, i.e., only a small fraction of firms with high productivity engages in export markets. Exporting firms supply their outputs for both domestic and export markets.

Incomes generated from production accrue to a single representative household in each country/region. A household maximizes utility using an Extended Linear Expenditure System (ELES). All commodity and factor markets are assumed to clear through price adjustment. There are five primary factors of production. Capital, agricultural land, and two types of labor (skilled and unskilled) are fully mobile across sectors within a country/region. In the natural resource sectors of forestry, fishing, and mining, a sector-specific factor is introduced into the production function to reflect the resource constraint. These sector-specific factors are modeled using upward sloping supply curves. The stocks of other primary factors are fixed for any given year. The numeraire of the model is defined as the manufactured export index of the high-income countries, which is held constant.