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Trade and Investment in Latin America and Asia

Lessons from the Past and Potential Perspectives from Further Integration

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ABSTRACT

The last several years have seen an unprecedented cooperation in trade and investment between Asia and Latin America. Since 2003 an average of 2.2 regional trade agreements (RTAs)[*] per year have been signed between countries of these two regions, and more RTAs are being negotiated. This is an important and relatively new phenomenon, considering that prior to 2003 there was virtually no bilateral RTA between these regions. In light of these trends, this study examines the potential impacts of a free trade agreement (FTA) between Latin America and Asia using the MIRAGE computable general equilibrium (CGE) model of the world economy. The analysis introduces three key modeling innovations: (1) a new way of modeling foreign direct investment (FDI), (2) a new tariff aggregator, and (3) incorporation of bilateral investment treaties (BITs) in the model. These modeling improvements enable us to examine the potential impact of an FTA on FDI, a key aspect of economic relations between Asia and Latin America. The findings in this study show that an FTA between Asia and Latin America would bring benefits to most FTA members, although gains would be higher for Latin American countries as a result of increased investment inflows as well as increased exports to Asia under the FTA.

Keywords: trade liberalization, FTA, Asia, Latin America, CGE modeling

[*] RTAs in this paper refer to both free trade agreements (FTAs) and preferential trade agreements (PTAs).

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ABBREVIATIONS AND ACRONYMS

APTA	Asia–Pacific Trade Agreement
ASEAN	Association of Southeast Asian Nations
BACI	Base pour l'Analyse du Commerce International
BIT	Bilateral Investment Treaties
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CES–LES	Constant Elasticity of Substitution–Linear Expenditure System
CGE	Computable General Equilibrium
CTA	Changing Tariff Aggregator
EBA	Everything but Arms
EFTA	European Free Trade Agreement
EU	European Union
FDI	Foreign Direct Investment
FOB	Free on Board
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GSP	Generalized System of Preferences
IDB	Inter-American Development Bank
LA	Latin America
MERCOSUR	Southern Cone Common Market
MFN	Most-Favored Nation
MIRAGE	Modeling International Relationships in Applied General Equilibrium
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Cooperation and Development
OFDI	Outward Foreign Direct Investment
PPP	Purchasing Power Parity
PTA	Preferential Free Trade Agreement
RTA	Regional Trade Agreement
SAFTA	South Asian Free Trade Agreement
SEPA	Strategic Economic Partnership Agreement
TTA	Traditional Version of MIRAGE
WTO	World Trade Organization

1. INTRODUCTION

During the last several years there has been an unprecedented cooperation in trade and investment between Asia and Latin America. Since 2003, an average of 2.2 regional trade agreements (RTAs)[1] per year have been signed between countries of these two regions, and the number is expected to increase as negotiations on seven other RTAs are under way. This is an important and relatively new phenomenon, considering that prior to 2003 there were virtually no bilateral RTAs between these regions.

An important feature of RTAs between Asia and Latin America is that in addition to the usual coverage of trade in goods and services, the vast majority of them also cover the so-called Singapore issues, such as investment, government procurement, and competition policy. This is especially important because investment plays a key role in the economic relations of these two regions. In recent years, Asian countries such as China, Japan, and South Korea have been increasingly seeking investment opportunities in Latin America. China has emerged as a major investor, concentrating primarily on Latin American natural resources. Japan, on the other hand, invested roughly 8.7 percent ($39 billion)[2] of its outward foreign direct investment (OFDI) stock by the end of 2006 in the region's finance, insurance, transportation, and manufacturing sectors (ECLAC 2008b).

In addition to investing in Latin America, Asia has also become a key trading partner for Latin America, with China playing a key role. Between 1997 and 2007, Chinese trade with Latin America increased tenfold (up to $102 billion), making China the largest trading partner of the region after the United States (Ratlif 2008). On the other hand, Asian countries, especially China and India, represent major markets for some manufactures like automotives, electronics, cellular phones, and the like, in which several Latin American countries (such as Brazil and Mexico) are gaining comparative advantages (ECLAC 2008b).

The deepening of trade relations between these two regions could have important implications for trade and investment flows because the regions exhibit quite different trade characteristics in terms of trade openness, protection structure, regionalization of trade, and specialization and structure of trade. While there is opportunity for future gains from further integration, it should be noted that trade between these two regions today is strongly intersectoral, with Latin America exporting mainly primary products to Asia and Asian countries sending high-tech manufactures to Latin America (ECLAC 2008b).

In light of recent trends in trade and investment cooperation between these two regions, this study examines the potential impacts of a free trade agreement (FTA) between Latin America and Asia using the MIRAGE[3] computable general equilibrium (CGE) model of the world economy. The analysis is first conducted with the traditional version of the MIRAGE model, and then the results are compared with the new version of the MIRAGE model, which includes three key innovations: (1) a new way of modeling foreign direct investment (FDI), (2) a new tariff aggregator, and (3) the incorporation of bilateral investment treaties (BITs) in the model.

While traditional modeling of RTAs focuses on static effects and usually concludes on meager gains from liberalization, recent improvements in the MIRAGE model allow us to examine the potential impact of an FTA on FDI, a key aspect of economic relations between Asia and Latin America. In the new version of MIRAGE, investment decisions of firms are distinguished from those of households. Firms keep a share of their profits to reinvest in their sector and choose only the location of their investments. In our modeling exercise, we also improve the way tariffs are aggregated, applying a consistent tariff aggregator. Finally, we also model the implementation of BITs. For calibration purposes, we use the database on bilateral FDI flows and stocks recently developed by Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), France, which is documented by Boumellassa, Gouel, and Laborde (2007).

The findings in this study show that an FTA between Asia and Latin America would benefit most

[1] RTAs in this paper refer to both free trade agreements (FTAs) and preferential trade agreements (PTAs).
[2] All dollar amounts are in U.S. dollars.
[3] Modeling international relationships in applied general equilibrium.

FTA members, although gains would be higher for Latin American countries as a result of an increase in the investment inflows to the region as well as an increase in exports to Asia. Latin American exports would mainly increase in highly protected agrifood sectors, and as a consequence unskilled rural wages would increase, suggesting a potentially significant reduction in rural poverty. Asian exports to Latin America would increase in industrial sectors, reinforcing the current trade patterns between the two regions.

The rest of the paper is organized as follows. Section 2 provides a review of the experience from past liberalization and recent liberalization trends in and between these two regions. This is followed by Section 3, which looks at key trade indicators for these two regions, including the level of protection they apply on imports and face on exports, product composition of their exports, and revealed comparative advantages. Section 4 provides the CGE analysis of the potential impact of an FTA between Asia and Latin America, including a description of the methodology used to conduct the analysis. Then Section 5 provides the main results from our model and Section 6 concludes.

2. TRADE LIBERALIZATION: PAST EXPERIENCE AND RECENT TRENDS

Liberalization Experience in Asia and Latin America

Both Asia and Latin America have gone through major economic and trade reforms, moving away from import substitution industrialization toward more open economic policies. Their experiences, however, differ for several reasons. First, reforms began in Asia much earlier than in Latin America. Some Asian countries began implementing basic reforms as early as the 1950s, and by the late 1980s most Asian economies had already moved away from import substitution to export orientation (James, Naya, and Meier 1989). On the other hand, Latin American countries introduced major reforms only toward the end of the 1980s, with the exception of Chile, which began implementing key reforms in 1973 and within less than a decade became one of the most open economies in the world (Agosin and Ffrench-Davis 1995).

Second, in terms of trade policy, countries of both regions pursued unilateral liberalization, but their specific approaches differed. The approach of Latin America was a rapid and indiscriminate liberalization of imports (Agosin and Ffrench-Davis 1995). Asian economies, on the other hand, especially Japan, South Korea, Singapore, and Hong Kong, pursued a more gradual and managed trade liberalization (Young 1996).

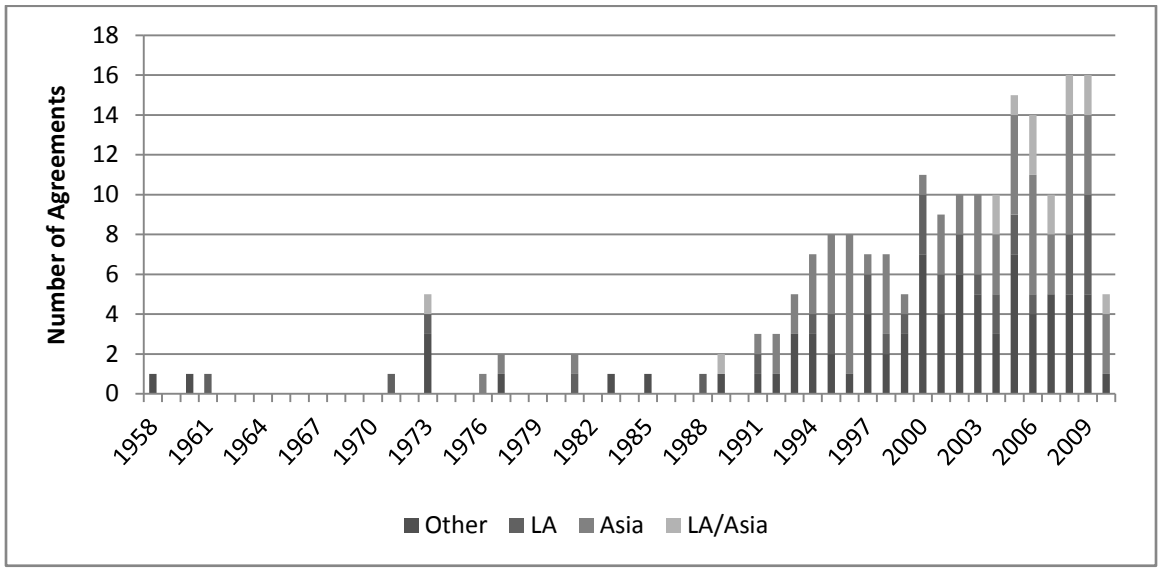
Third, a crucial aspect of the liberalization process has also been the way in which these two regions managed their exchange rate policies. As Duran and Mulder (2008) observe, in Latin America trade liberalization took place in the context of real exchange rate appreciation. The introduction of fixed nominal exchange rate anchors to control inflation usually led to an overappreciation of the exchange rate in the midterm. In Asian countries such as China, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam, on the other hand, the process of trade liberalization was accompanied by more competitive and less volatile real exchange rates (Duran and Mulder 2008).

In addition to the above general characteristics that distinguish these two regions, it should be noted that even within the same region some countries followed different trade strategies. For example, south Asian countries such as India, Pakistan, Bangladesh, and Sri Lanka have been the most protective countries in Asia in terms of average tariffs that they have applied to imports (James, Naya, and Meier 1989). They also pursued a strategy that was aimed at achieving industrial self-sufficiency through the implementation of various price-distortive policies, which in turn affected their industrial development (James, Naya, and Meier 1989). Their approach was generally more inward-looking, thus resembling more the trade strategy of Latin American countries rather than the outward-looking, export-oriented strategy followed by other Asian economies such as Japan, South Korea, Singapore, and Hong Kong.[4]

Today, these two regions are experiencing a new wave of trade liberalization represented by a worldwide proliferation of regional trade agreements (RTAs). Out of 86 RTAs established between 2004 and 2010 and notified to the World Trade Organization (WTO), 66 percent involve either an Asian or a Latin American country or both (see Figure 1). Two important trends have emerged from the recent worldwide increase in the number of RTAs. First, there is a growing number of RTAs between developing countries (south–south RTAs), and Asia and Latin America are leading the way in this trend. Second, these south–south RTAs are no longer purely intraregional as more developing and emerging economies are pursuing RTAs outside their respective regions. This is especially true in the case of Asian and Latin American countries, which have been actively pursuing bilateral RTAs with developing and developed countries, both within and outside their respective regions.

[4] See James, Naya, and Meier (1989) for a comparison of the development performance of various Asian countries.

Figure 1. Regional trade agreements notified to the WTO, 1958–2010

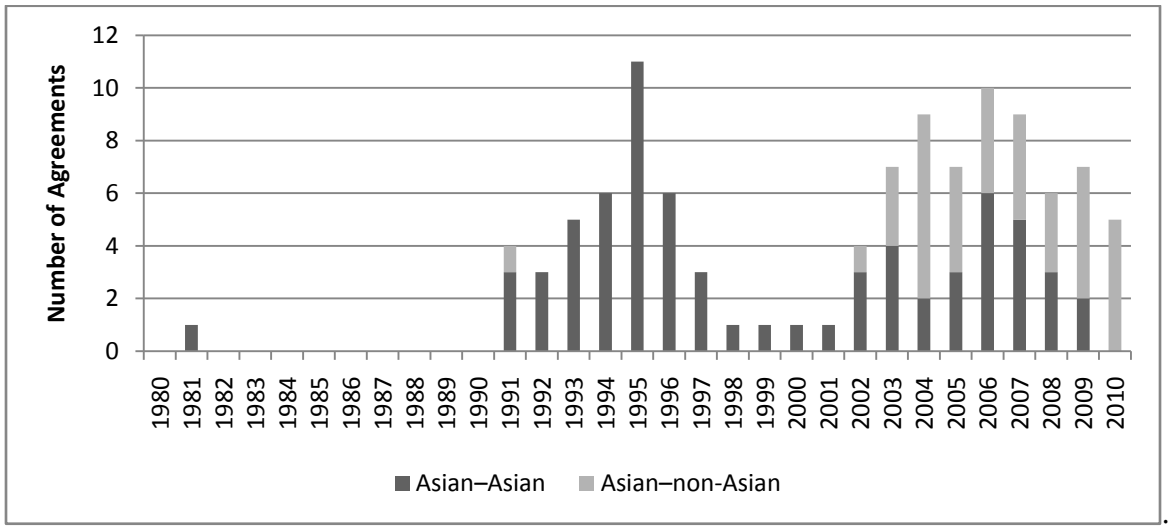


Source: Author's calculations based on WTO (n.d.) regional trade agreements information system data.
Note: LA: Latin America.

While Figure 1 depicts RTAs notified to the WTO, Figure 2 and Figure 3 provide a more accurate picture of the existing RTAs in Asia and Latin America by including agreements that have not been notified to the WTO. This is especially important since numerous agreements that are signed among various countries are either not notified to the WTO or are notified several years after they have been signed. According to the database of Asian bilateral RTAs maintained by the Asian Development Bank's Regional Integration Center (Asian Development Bank n.d.), there is a total of 108 bilateral or plurilateral RTAs established by Asian countries, one-third of which have not yet been notified to the WTO. In addition, according to the same database, as of November 2010, Asian countries are in the process of negotiating an additional 55 agreements; this does not include 46 agreements that have been proposed or are under study. Obviously, some of these proposed agreements may take a long time to be concluded or may never even materialize, but they are still an indication of a growing interest among countries to establish RTAs, especially as the multilateral trade negotiations under Doha stand in limbo.

The key driver of bilateral RTAs within Asia is Japan, and to a lesser extent China and India. On the other hand, Asian cross-regional RTAs are primarily driven by Singapore's bilateral agreements with developed economies (for example, European Free Trade Agreement [EFTA] countries, Australia, New Zealand, and the United States).

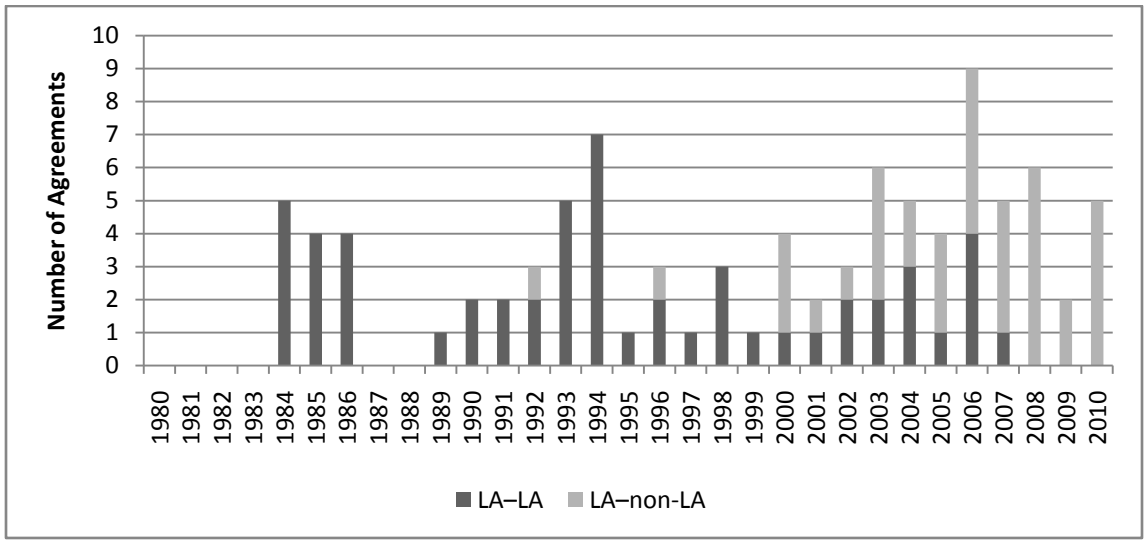
Figure 2. Trade agreements: Asia, 1980–2010



Source: Authors' calculations based on Asian Development Bank (n.d.) Asia Regional Integration Center data.

On the Latin American side, the number of RTAs reached 97 by November 2010[5] (Figure 3). About 43 percent of these agreements were established between 2003 and 2010; of these, 74 percent are cross-regional agreements. Before 2003, Latin America kept mostly to itself; in fact, with the exception of a handful of agreements (for example, NAFTA, Chile's and Mexico's bilateral agreements with the European Union and EFTA countries, Chile–Canada, and Costa Rica–Canada), all RTAs established before 2003 were among Latin American countries themselves (see Figure 3). Chile has been the key driver, accounting for almost one-third of all agreements signed by this region since 2003. After Chile, Peru follows with its focus on trade agreements with countries outside Latin America, including Canada, China, Singapore, the United States, and most recently South Korea.

Figure 3. Trade agreements: Latin America, 1980–2010



Source: Authors' calculations based on Organization of American States (n.d.), foreign trade information system (SICE).
Note: LA: Latin America.

[5] The number of RTAs in Latin America in this section also includes agreements in the Caribbean.

Trade and Investment Cooperation between Asia and Latin America

In terms of economic cooperation between Asia and Latin America, a closer look at cross-regional agreements that countries of these two regions have signed since 2003 indicates the growing importance that these regions represent for each other. About 58 percent of all cross-regional agreements signed by Latin American countries are with Asian economies. Similarly, RTAs with Latin American countries represent 51 percent of all cross-regional agreements signed by Asian countries since 2003. Within the last eight years, an average of 2.2 agreements per year have been signed between Asian and Latin American countries, bringing the number of such agreements to 18 by November 2010[6] (see Table A.1 and Figure 4). The last three years in particular have seen a surge in efforts to establish new bilateral trade agreements between Asia and Latin America; 10 out of 18 FTAs concluded between countries of these two regions have been signed between 2007 and 2010. This is an important and relatively new phenomenon, considering that prior to 2003 there were virtually no bilateral RTAs between countries of these two regions.

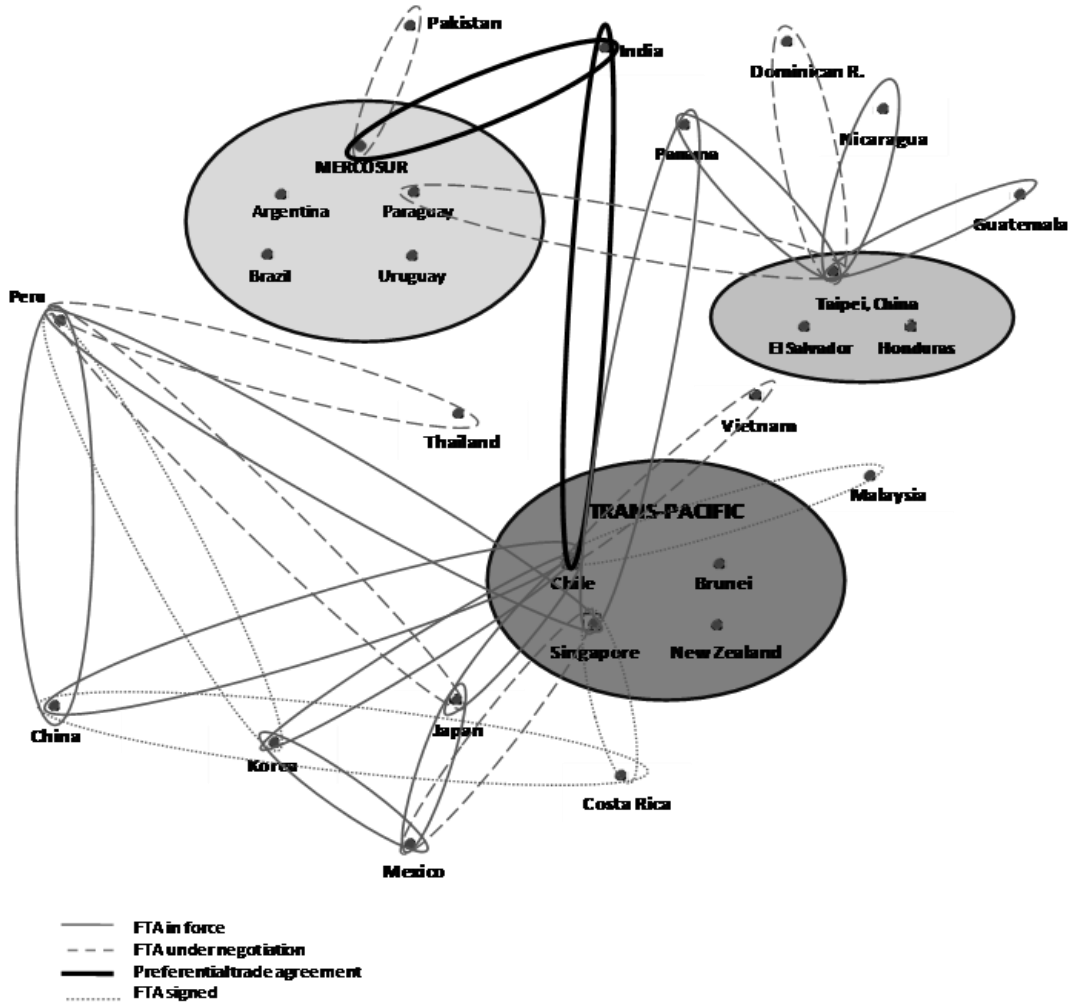
In Latin America, this cross-regional cooperation is led by Chile and Peru, which have the greatest number of bilateral RTAs with Asian countries. To date, Chile has established RTAs with seven Asian countries (China, India, Japan, South Korea, Malaysia, and the Trans-Pacific Strategic Economic Partnership Agreement [SEPA], which includes two Asian countries—Brunei and Singapore—as well as New Zealand) and is currently negotiating an RTA with Vietnam. Peru, on the other hand, has RTAs with three Asian countries (China, South Korea, and Singapore)—signed within the last two years—and launched negotiations with Japan in 2009. Peru also hopes to become a member of the Trans-Pacific SEPA.

A distinguishing feature of RTAs between Asian and Latin American countries is that their scope goes beyond the traditional coverage of trade in goods. Most of these agreements also incorporate services and additional elements like the so-called Singapore issues, such as investment, government procurement, and competition policy. All RTAs, except the preferential trade agreements (PTAs) between India and Chile and between India and MERCOSUR (the Southern Cone Common Market), cover services. It should be noted, however, that many RTAs between Asian and Latin American countries provide limited coverage of financial services or exclude them altogether. Furthermore, all agreements exclude air transport services and in some cases cabotage in maritime transport (for example, Chile–India, Chile–Japan, and Mexico–Japan). Traditionally, air transport services have been negotiated through separate bilateral treaties, whereas foreign participation in cabotage in maritime transport is often deemed sensitive (Fink and Molinuevo 2008).

The majority of agreements between Asian and Latin American countries incorporate provisions on promoting and protecting investment (see, for example, the Peru–China, Peru–Singapore, Panama–Singapore, Chile–South Korea, Chile–Japan, and Mexico–Japan agreements as well as Taipei, China, agreements with Nicaragua, Panama, and Honduras and El Salvador). These provisions provide national and most-favored nation (MFN) treatment of investments with respect to establishment, acquisition, expansion, management, conduct, operation, and sale. They also address issues of expropriation and transfers. Many agreements also incorporate an "investment and environment" article that discourages parties from relaxing environmental rules in order to attract investment and authorizes countries to take appropriate measures to ensure that investment activities are sensitive to environmental concerns (see, for example, Peru–Singapore, Chile–South Korea, Chile–Japan, and Mexico–Japan RTAs, and Taipei, China, agreements with Nicaragua, Panama, and Honduras and El Salvador). The Chile–China FTA currently does not address investment, but the two countries are in the process of negotiating an investment agreement.

[6] In 2010 alone, four agreements were signed between countries of these two regions.

Figure 4. FTAs between Latin America and Asia as of November 2010



Sources: Organization of American States (n.d.) foreign trade information system (SICE); UNESCAP (n.d.), the trade agreements database of the United Nations Economic and Social Commission for Asia and the Pacific; Asian Development Bank (n.d.), the free trade agreement database for Asia, of the Asia Regional Integration Center; various web-based news articles and updates, official government websites, and the like.

In addition to investments, these agreements also cover government procurement, intellectual property rights, and competition policy (see, for example, Mexico–Japan, Chile–Japan, Chile–South Korea, and Trans-Pacific SEPA FTAs). A recent analysis of five selected bilateral FTAs between the two regions concluded that they represent an intraregional cooperation that is consistent with the WTO rules concerning WTO notification and agreement scope (Loewen 2009). Like most bilateral trade agreements, however, they also incorporate complex rules of origin that can hamper trade flows and increase the "noodle bowl" effect (see Figure 5) (Loewen 2009).

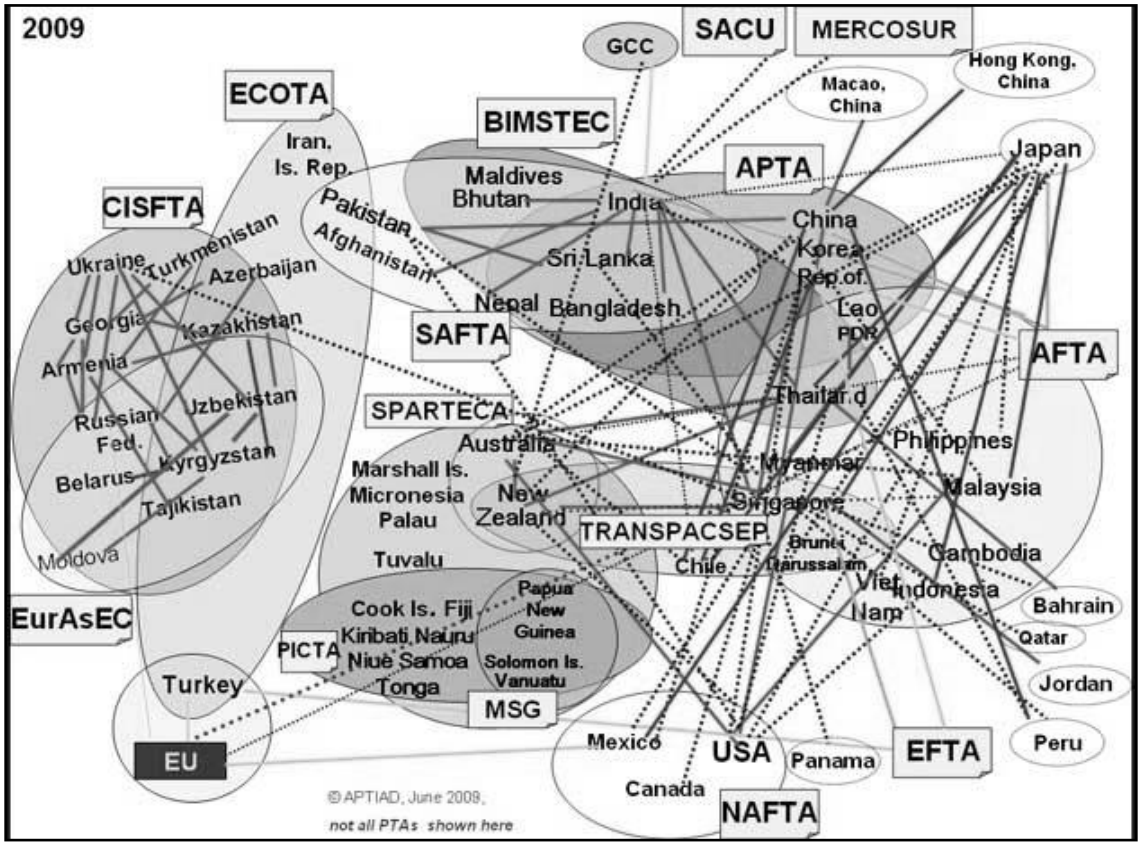
In terms of tariff liberalization, the majority of RTAs between Asia and Latin America eliminate tariffs on more than 90 percent of bilateral trade within a 10-year period. As a result, it could be said that most agreements between Asia and Latin America take a gradual rather than immediate approach to liberalization. Some agreements, however, such as the Trans-Pacific SEPA and Singapore's agreements with Peru and Panama, liberalize more than 90 percent of bilateral trade immediately upon

implementation. For example, Singapore offers immediate duty-free access to all products of Peru and Panama, whereas the latter countries provide immediate duty-free access to 87 percent and 98 percent of Singapore's exports to these countries, respectively, and phase out liberalization for a number of goods over a period of 10 years.

Gradual liberalization is generally a feature of south–south agreements. Wignaraja and Lazaro (2010) note, for example, that the Asia–Pacific Trade Agreement (APTA), which has been in force since 1976, covers far less than 50 percent of the tariff lines and is still on the fourth round of exchanges of tariff concessions.[7]

The proliferation of trade agreements can be a concerning factor due to their overlapping nature and other aspects, such as rules of origin that contribute to their complexity. Figure 5 depicts the complex web of agreements existing in Asian and Latin American regions.

Figure 5. Asian RTA noodle bowl, 2009: Selected RTAs



Source: Asia-PacificTrade and Investment Agreements Database (APTIAD)(n.d.).

There is a growing cooperation in trade and investment between these two regions, although it still remains limited and is driven by a handful of countries. It is noteworthy that before 2004, there was no cross-regional bilateral trade agreement among developing countries notified to the WTO.

The recent emergence of China as a major player in economic relations between Asia and Latin America is remarkable. Although China currently implements a free trade agreement only with Chile and Peru, Chinese trade with Latin America increased tenfold (up to $102 billion) between 1997 and 2007 (Ratlif 2008), making China the largest trading partner of Latin America after the United States (MercoPress 2009); China supplanted the United States in 2009 as the main trade partner for both Brazil

[7] Another example is the South Asian Free Trade Agreement (SAFTA); see Bouet, Mevel, and Thomas 2010.

and Chile (Morton 2009). China's presence in Latin America has also become prominent through its recent increase in lending and investment there, especially as the traditional lenders to the region have been dealing with the consequences of the 2007–2009 economic and financial crisis. In 2009, China became a donor member of the Inter-American Development Bank (IDB), committing $350 million to this institution's program (Garr 2009).

Chinese engagement in the region may be a reflection of the country's interest in securing access to natural resources to fuel its economic growth, but the Latin American market is also a destination for exports of Chinese manufactures. Just recently, China signed an agreement with Brazil's national energy company, Petrobras, lending it $10 billion in return for guaranteed oil supply over the next decade (Reuters 2009c). Another $10 billion deal with Argentina provides the latter country access to Chinese currency to pay for its imports from China. Furthermore, in 2009 China and Venezuela agreed to double the development fund in Venezuela from $6 billion to $12 billion; the deal also implies increasing oil shipments from Venezuela to China from 380,000 barrels a day to one million (Romero and Barrionuevo 2009). The oil sector of Ecuador also represents a major investment area for China. In November 2009, China signed an oil-for-cash deal with Ecuador, ensuring a supply of 69 million barrels of oil during a two-year period from 2010 to 2012 in return for $1 billion in advance payment (Mapstone 2009). The two countries hope to embark on a $1.1 billion joint project to develop oil fields in Ecuador's Amazon region (Reuters 2009b). According to a Chinese official, Beijing's total direct investment in Ecuador has reached $2.2 billion, while trade between the two countries reached $2.4 billion in 2008, a 50 percent increase from 2007 (Agence France-Presse 2009). The two countries have also been negotiating a lending deal of $1.7 billion so that Ecuador can build a hydroelectric plant. The deal has not yet been reached because Ecuador found Chinese conditions for the loan to be unacceptable (Agence France-Presse 2009). In addition, China's third largest steelmaker recently bought a 21.5 percent stake in one of the iron ore mines of Brazil. The company also intends to make further investment in the steel industry through a joint venture in Brazil (Wheatley 2009). In Peru, China has already become a major investor, pouring in more than $5 billion, mainly in the mining sector (Reuters 2009a).

Almost half of Chinese investments in 2006 went to Latin America. It should be noted, however, that most of these investments went to the tax haven territories of the Cayman Islands and the British Virgin Islands (ECLAC 2008b). Japan and South Korea have also made notable investments in Latin America. At the end of 2006, roughly 8.7 percent of Japan's OFDI stock ($39 billion) was invested in Latin America and the Caribbean. Unlike Chinese investments—which were concentrated mainly in natural resources—finance and insurance absorbed almost half the total Japanese investment in the region, followed by transportation services and manufacturing (ECLAC 2008b). Similarly, as of 2008, South Korea has invested about 7 percent of its OFDI stock in Latin America and the Caribbean. As with Chinese investments, major recipients of South Korean investments have been tax haven countries such as Bermuda, the Cayman Islands, and the British Virgin Islands, and to a smaller extent Brazil (which absorbed 13 percent of the total invested), Peru (9 percent), and Mexico (9 percent). By sector, South Korean investments are concentrated in manufacturing (24 percent), mining (30 percent), agriculture and fishery (2 percent), and services and trade (44 percent) (ECLAC 2008b).

A Japanese firm recently bought a 30 percent stake in a Chilean mining company, an investment of $1.3 billion. This reflects the fact that the FDI increase in Chile is concentrated mainly in the mining sector. Similarly, a consortium of Japanese and South Korean firms invested just over $3 billion in 2008, purchasing a 40 percent stake in a subsidiary of Brazilian steelmaker Compañía Siderúrgica Nacional (CSN) (ECLAC 2008a). Japanese and South Korean firms Sharp and Samsung, respectively, have also invested in the Mexican television industry aiming to strengthen Mexican competition in this area.

On the Latin American side, Brazil is the country with the largest net flows of outward FDI. Recently, the Brazilian national energy company, Petrobras, signed an agreement to purchase ExxonMobil's 87.5 percent stake in a refinery in Japan, which will allow Petrobras to commercialize biofuels in Japan and other Asian markets. A Brazilian manufacturer of bus bodies entered joint ventures in India and Egypt to produce buses for the Indian, African, European, and Middle Eastern markets. Latin America's largest mining enterprise, Companhia Vale do Rio Doce, has invested $410 million in a

hydroelectric plant in Indonesia (ECLAC 2008a).

While Asian countries represent a great opportunity for Latin American countries to diversify their trading partners, the economic links between the two regions generally remain weak and show little diversification (ECLAC 2008b). The two regions lack a coordinated strategy to strengthen trade and investment ties between them (ECLAC 2008b). In addition, there are certain barriers that may affect the cooperation between the two regions, such as high effective tariffs in agriculture and natural resources based in the Asia–Pacific region, high transport costs in Latin America, the education gap between the two regions, and the like. (Medalla and Balboa 2009). In terms of investments, it should be noted that the nationalization process and threats directed to transnational firms may discourage such firms from investing in the region (ECLAC 2008a).

3. KEY TRADE INDICATORS

While trade cooperation between Asia and Latin America has increased in recent years, the trade relationship between the two regions is still highly asymmetrical. Although Asia is becoming an increasingly important trading partner for Latin America, Latin America does not represent the same level of importance for Asian countries (ECLAC 2008b). Indeed, the share of total Asian exports to Latin America was only 1.75 percent in 2007, while in the same year about 22 percent of all Latin American exports went to Asian markets[8] (see Figures A.1–A.4). The interregional relationship is characterized by low intra-industry trade; Latin American countries export mainly primary products to Asia while Asian countries export high-tech manufactures to Latin America (Medalla and Balboa 2009).

These two regions differ from one another on several key trade and development indicators. First, in terms of regional integration, intraregional trade is stronger in Asia than in Latin America. In the last 20 years, for example, intra-Asian exports made up 40 percent of total exports, while in the case of Latin America, the share of intraregional exports in total exports reached 30 percent by the end of the 1990s and has decreased ever since. In the case of imports, the figures are even more contrasting: While intraregional imports were 55 percent of all Asian imports in 2007, the intraregional share in Latin American imports was only 30 percent.

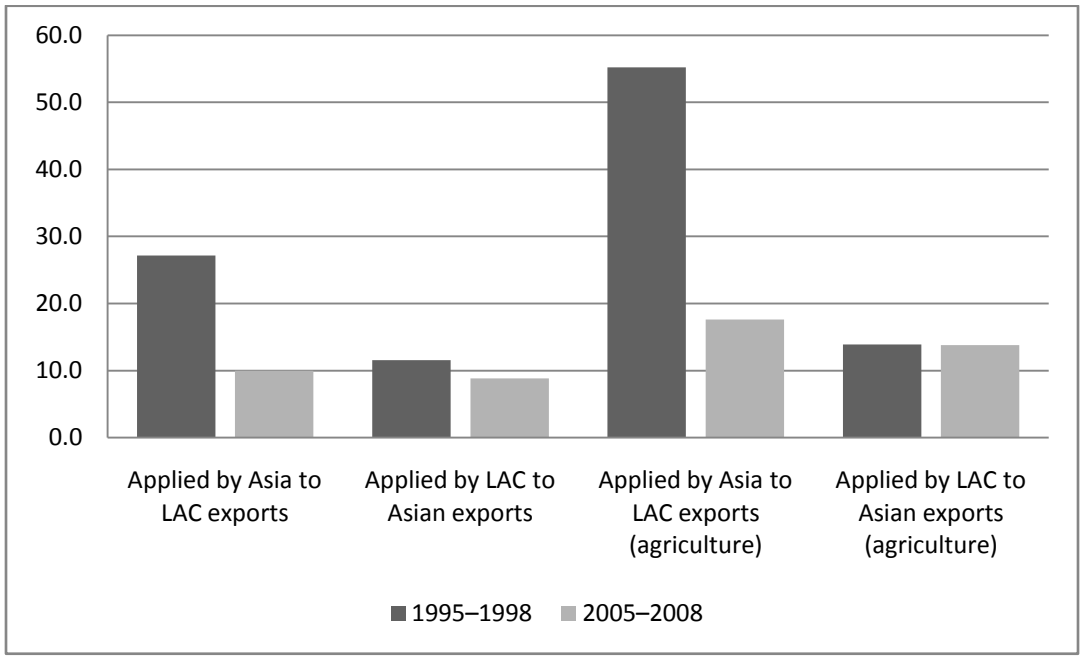
Second, trade specialization is another factor that distinguishes these two regions. Latin American countries are specialized in agricultural and other primary products, resulting in an intersectoral trade pattern; in other words, the region exports mainly agricultural and primary products and imports manufactures. On the other hand, in Asia manufactures represent the bulk of both exports and imports, leading to an intrasectoral trade pattern.[9] It is noteworthy that during the last several years this trend has deepened in Asia, while the trade patterns in Latin America have remained more or less the same. Trade specialization of these two regions is consistent with their respective comparative advantage: The majority of countries in Latin America have a comparative advantage in agricultural products, whereas the comparative advantage of most Asian economies lies in industrial products such as textiles and wearing apparel.

Third, Asia and Latin America also differ in terms of the level and structure of protection that they apply to imports. On one hand, Latin America applies a relatively low and homogenous protection across sectors. On the other hand, some Asian countries still maintain high tariffs in agriculture while having opened their industrial sectors to benefit from international division of labor. This means the protection that these two regions face when exporting to one another is asymmetrical. In other words, the key Latin American exports to Asia face higher tariffs on average than the main Asian exports to Latin America. This is true even though Asia has significantly reduced the protection applied to agricultural exports, especially those coming from Latin America, between 1995–1998 and 2005–2008 (see Figure 6).

[8] All statistics in this section have been calculated based on the Base pour l'Analyse du Commerce International (BACI) database developed by CEPII.

[9] Manufactures represented 74 percent of Asian imports and 75 percent of Asian exports in 2007, while in Latin America these figures were 72 percent and 43 percent, respectively, in the same year.

Figure 6. Bilateral protection, average 1995–1998 and 2005–2008 (percent)



Source: Authors' calculations based on MAcMap-Hs6 V2, reference group weights.
Note: LAC: Latin American countries.

Nevertheless, while the applied protection in agriculture has fallen in these two regions, support for agriculture has been increasing. For example, Anderson and Martin (2009) note an upward trend of support to import-competing agriculture in Asia. In southeast Asia, for example, farmers were taxed more than $100 billion per year in the early 1980s (over $200 per person working in agriculture), but now they receive support amounting to over $30 per person employed on farms in China and $70 in southeast Asia (Anderson and Martin 2009). Similarly, south Asia countries like India, Bangladesh, and Sri Lanka all provide input subsidies to farmers.

Similarly, in Latin America, Anderson and Valdés (2009) note the emergence of positive assistance for agriculture in Latin America since the 1990s. Instead of being taxed nearly $17 billion a year as in the 1980s, now farmers in Latin America receive support of more than $5 billion a year (nearly $150 per person employed on farms) (Anderson and Valdés 2009).

The fourth aspect that distinguishes these two regions from one another is the level of protection they face at the global level. Many countries in Latin America face a relatively high level of protection on exports, especially Guyana, Uruguay, and Nicaragua. For these countries, exports are concentrated in a few agricultural products like rice (Guyana, Uruguay), sugar (Guyana), meat and dairy products (Uruguay), or textiles and apparel (Nicaragua), products that are highly protected worldwide. On the other hand, Asian countries face lower protection on their exports because they export more manufacturing products, the worldwide protection on which has declined considerably as a result of the Uruguay Round.

This is in line with the overall trends in exports of these two regions. Asian exports are concentrated in industrial goods; the share of industrial exports in total exports has hovered around 90 percent within the last 15 years. The share of Latin American exports of both agricultural and industrial goods, in total exports of the region, has declined over the last decade (reaching 26 percent and 43 percent respectively in 2007), while exports of primary products have increased over the last several years. Both regions exhibit a similar import structure, in which industrial goods have been gaining importance since 2004.

According to the data, there is potential for trade complementarity between the two regions.[10] This is especially true for Asian exports to Latin America, which currently represent only 2 percent of total Asian exports and have a lower share of industrial goods than do total Asian exports. Latin American exports to Asia also differ qualitatively from total Latin American exports, with the former having a higher share of industrial and agricultural products. The prospects for trade gains from a free trade agreement between these two regions appear to be good for both sides and especially for Asia as far as its potential for increasing its industrial exports to Latin America.

Before turning to the FTA simulations designed in this study, it is important to look briefly at how these two regions fare in terms of development indicators such as income, poverty, and inequality. The first observation here is that there is a great diversity in the performance of various countries within each region on the above indicators (see Table 1). While Latin America, for example, appears to be better off than Asia in terms of per capita income, which in most countries is above $6,000 with poor accounting for less than 10 percent of the population, there are some Latin American countries that perform much worse than the average, such as Haiti, Bolivia, Nicaragua, and to a lesser extent, Honduras. On average, however, the growth of GDP per capita in Asian countries is higher than in Latin American countries, reflecting high growth rates in Cambodia, China, and India. In addition, some Asian countries like China and Pakistan have experienced significant reduction in poverty, a domain in which Latin America has made little or no progress. Latin America is characterized by higher inequality than is Asia, where country Gini coefficients are below 50. In Asia, the most successful experiences in terms of development indicators are Malaysia, Thailand, and China, which has substantially increased its per capita income and reduced poverty in the last 20 years.

[10] The trade complementarity index measures the extent to which the exports of one region match the import pattern of the other region. It is defined as the sum of the absolute value of the difference between the import category shares and the export shares of the partners, divided by two. The index takes values between 0 and 100, with 0 indicating no complementarity and 100 indicating a perfect match in the import/export pattern (ESCAP 2007). For 2007, the index takes a value of 68.3 for Asian exports to Latin America and 58.2 for Latin American exports to Asia.

Table 1. Development indicators, selected Latin American and Asian countries

	GDP per capita (PPP dollars)		Hunger index		Poverty headcount ($1.25 PPP a day)		Inequality (Gini coefficient)	
Country	1995–1997	2004–2006	1990	2009	1995–1997	2004–2006	1995–1997	2004–2006
Argentina	8,464	10,896	<5	<5	2.0	5.4	47.6	49.9
Bolivia	2,857	3,667	15.4	11.3	18.9	19.6	55.6	50.5
Brazil	6,655	8,667	7.3	<5	11.3	8.9	58.7	56.5
Chile	8,186	12,254	<5	<5	2.0	2.0	54.9	-
Colombia	5,276	6,780	9.1	5.7	12.4	16.0	57.3	55.8
Costa Rica	5,759	8,846	<5	<5	5.8	2.4	46.3	48.1
Dominican Republic	4,277	6,653	14	9.3	6.3	4.5	49.7	51.3
Ecuador	4,715	6,599	13.1	7.8	-	9.8	51.4	56.6
El Salvador	4,454	6,394	8.7	6.2	13.6	11.0	51.3	48.4
Haiti	1,089	1,196	33.6	28.2	-	-	-	-
Honduras	2,768	3,604	13.5	7.7	15.6	20.2	54.9	55.4
Nicaragua	1,837	2,416	23.4	10.5	-	15.8	-	-
Paraguay	3,474	3,968	7.6	5.6	12.7	9.3	56.2	54.6
Peru	4,644	6,522	14.9	7.3	8.6	8.1	49	47.6
Uruguay	7,478	9,635	-	<5	2.0	2.0	43.1	45.6
Venezuela	8,515	10,026	6.6	6.1	11.2	6.8	50.3	46.5
Bangladesh	694	1,137	35.9	24.7	59.4	49.6	39	33.7
Cambodia	678	1,451	31.7	21.2	-	40.2	44.2	41.7
China	1,681	4,113	11.6	5.7	36.4	15.9	30.6	46.9
India	1,158	2,091	31.7	23.9	-	41.6	32.8	36.8
Indonesia	2,429	3,220	19.7	14.8	-	21.4	35	39.4
Malaysia	8,184	11,663	8.8	<5	2.0	2.0	49.2	40.3
Nepal	678	967	27.6	19.8	68.4	55.1	46.6	47.2
Pakistan	1,604	2,238	24.7	21	48.1	22.6	29.9	31.2
Philippines	2,085	2,943	19	13.2	21.6	22.6	47.2	-
Sri Lanka	2,245	3,580	21.1	13.7	16.3	-	41.4	-
Thailand	4,897	6,866	16.4	8.2	2.0	2.0	49.2	-
Vietnam	1,105	2,152	24.8	11.9	-	22.8	36.7	34.4

Sources: International Monetary Fund (2009), von Grebmer et al. (2009), World Development Indicators (World Bank), and World Institute for Development Economics Research - United Nations University (n.d.).
Notes: GDP: gross domestic product; PPP: purchasing power parity. Hunger Index ranks 84 developing countries using three equally weighted indicators: (1) the proportion of people who are calorie deficient, (2) the prevalence of underweight in children under the age of five, and (3) the under-five mortality rate (von Grebmer et al., 2009). Poverty headcount is the percentage of population living on $1.25 per day or less. The Gini coefficient measures the inequality in income distribution in a country or region; it takes values between 0 and 100, 0 being a perfectly equal distribution of income and 100 a perfectly unequal distribution of income.

4. METHODOLOGICAL APPROACH

This section describes the methodology adopted in this study to evaluate the consequences of trade integration between Asian and Latin American countries, with the idea that this kind of agreement could have important implications for both trade flows and foreign investment. We start with a snapshot of the MIRAGE model of the world economy and a description of the special tariff aggregation used in this modeling exercise. This is followed by a detailed description of the modeling framework for investment and FDI and the baseline designed for this study. Finally, we present the scenarios that are evaluated in this study.

The MIRAGE Model of the World Economy

Mirage is a multicountry, multisector computable general equilibrium model of the world economy. In each country, a representative consumer maximizes a CES–LES (constant elasticity of substitution–linear expenditure system) utility function under a budget constraint to allocate his or her income across goods. The origin of goods is determined by a CES (constant elasticity of substitution) nested structure following the Armington (1969) assumption.[11] In addition, northern countries are assumed to produce higher-quality industrial goods than southern countries. On the production side, value-added and intermediate goods are complements under a Leontief hypothesis. The value-added is a CES function of unskilled labor and a composite of skilled labor and capital; this allows for including less substitutability between the last two production factors. In agriculture and mining, production also depends on land and natural resources. New capital is perfectly mobile across sectors while installed capital is immobile. Skilled labor is perfectly mobile across sectors while unskilled labor is imperfectly mobile between agricultural and nonagricultural sectors. Total employment is constant. Investment is savings-driven and the real exchange rate adjusts freely to maintain the current account surplus or deficit of each country constant as a share of world gross domestic product (GDP). This implies that the level of over- or undervaluation of each currency remains constant.[12] This last assumption is important in this study since tariff reductions will have positively correlated impacts on both imports and exports for every country. In this paper, we introduce three innovations over the standard version of the MIRAGE model. First, we work with a different tariff aggregator. Second, we introduce modifications in the way we model FDI. Third, we also introduce the modeling of bilateral investment treaties (BITs).

Tariff Aggregation

Historically, in order to introduce tariffs in CGE models, measures such as simple or trade-weighted average tariffs have been employed, but they lack theoretical foundation and may introduce significant biases in estimation. The most obvious problem with the trade-weighted average is that the weight on any tariff declines as the average rises, with very high tariffs having vanishingly small weights even when their trade-distorting impacts may be large. More recently, new approaches with rigorous theoretical foundations for the aggregation problem have emerged. Anderson and Neary (1994) proposed a uniform tariff that yields the same welfare as the original differentiated tariff structure. In their subsequent work (1996, 2003, 2005), they developed uniform tariff measures that are equivalent in their effects on the value of exports. The unifying feature of these aggregators is that they return the uniform tariff rate that yields the same value of a specific objective function as the actual, nonuniform tariffs. Using an atheoretic

[11] The MIRAGE model is based on GTAP Armington elasticities, which are low compared to those used in other models (the World Bank's LINKAGE model, for example).

[12] We do not include in our scenario any reduction of exchange rate misalignments since that would constitute a supplementary shock that would drastically change the impact of the trade agreements that we study. It would be possible to include a modification of these misalignments in both the scenario and the baseline, but that would marginally affect the difference between the two.

approach, the MAcMap-HS6 methodology (Bouet et al. 2008) proposes to use an instrumental variable, the imports of a reference group, to reduce the endogeneity bias of protection at the bilateral level.

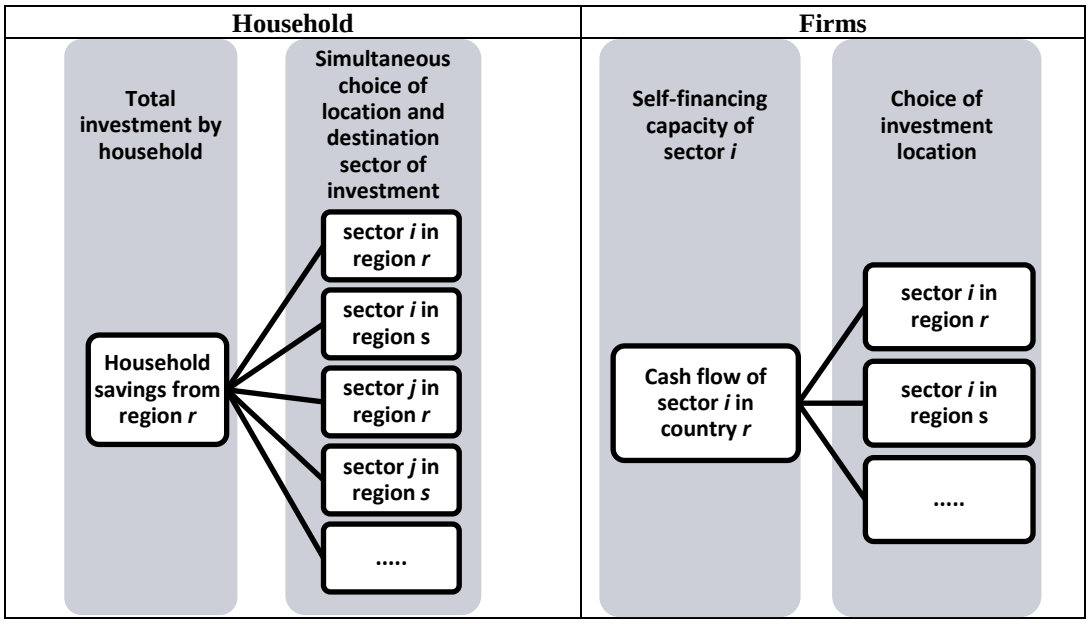
Building on the Anderson-Neary approach, Bach, Martin, and Stevens (1996) and Bach and Martin (2001) proposed an approach to tariff aggregation in the context of structural economic models that would mitigate many of the problems resulting from the use of atheoretic aggregators—and showed that the implications of aggregation could be large for specific countries. However, they were able to apply their approach only to individual countries or regions. In a single-country model, a different tariff aggregator can be introduced into the expenditure and tariff revenue functions and used to solve for the welfare impacts of changes in tariffs. When this is done in a global model, however, a major difficulty arises because Walras' Law is no longer satisfied at the global level. When, for instance, a reduction in a particularly high tariff in one country results in a more rapid decline in expenditures than in tariff revenues, the country experiences a gain in welfare without there being any corresponding increase in income elsewhere. Anderson (2009) resolved this problem ingeniously by recognizing that the quantity indexes at domestic prices are different from quantity indexes at world prices. To take account of this, Anderson notes that expenditure on aggregate good *j* at domestic prices must equal expenditure on the good at border prices plus the value of the tariff. In this paper, we implement the idea of Anderson (2009) using the methodology proposed by Laborde (2008) and already applied by Laborde, Martin, and van der Mensbrugghe (2009).

Therefore, each tariff scenario implemented at the HS6 level on a bilateral basis is translated into two parameters that will be used in the model: (1) a trade-weighted average (using ex post weights) to capture the right tariff revenue aggregator and (2) the true price index of the imports to have an expenditure-consistent aggregator and capture the quantity wedge at world and domestic prices. We report results using this tariff aggregator and the traditional trade-weighted average one. We should expect smaller gains from liberalization when we introduce the latter, as it tends to underestimate high peaks in tariff structure.

Investment and Foreign Direct Investment

The way in which FDI is modeled in this study differs significantly from the usual MIRAGE FDI framework. In contrast to the standard framework of MIRAGE, and following Laborde and Lakatos (2009), we assume that households and firms invest with different behaviors. In the standard version of MIRAGE, all firm profits are given to the household, which invests its savings across sectors and countries based on its preferences (calibrated on existing investment patterns) and the evolution of real return on investment. In this paper's approach, we maintain this household behavior unchanged, but we assume that firms keep a share of their profits to reinvest in their own sector, being able to choose only the location of their investments. These two behaviors are designed to mimic the difference between portfolio investments and FDI, as shown in Figure 7.

Figure 7. Investment decisions by households and firms



Source: Authors' elaboration.

In dynamics, the most profitable sectors will invest more in themselves and will focus on optimizing the location of their investments. On the other hand, declining sectors will have fewer resources of their own, and since households will not invest in them either, they will shrink.

The data on bilateral FDI flows and stocks employed in our modeling exercise has been built by CEPII (France) and is documented by Boumellassa, Gouel, and Laborde (2007). In contrast to other data sources, this database is fully consistent, balanced, and suitable for use in a CGE framework. It is designed to be compatible with the GTAP 7 database.

FTAs are assumed to foster FDI among participants, through a "mechanical" link between FDI and trade as well as through an important institutional component. The trust of the investors is reinforced by the strong commitments of the countries in the FTA to liberalize trade (and therefore to secure trade channels for the future), to harmonize some rules, and in most of the cases, to consider legal solutions for dealing with disputes. In addition, most FTAs involve several dispositions concerning FDI and lead to the implementation or reinforcement of BITs.

In this paper, we consider the implementation of BITs between countries of each region as complementary to the implementation of the FTA between the regions.[13] To simulate this type of agreement, we introduce a shifter in the preference parameters of the investment function of both firms and households. The shifter is calibrated based on the estimated effects of BITs in gravity literature explaining FDI (Bittencourt, Domingo, and Reig 2006). *Ceteris paribus,* bilateral investment flows are multiplied by the exponential of the coefficient in the BIT dummy when BITs are implemented in comparison to the reference situation (no BIT). Concretely, we shock the preference parameter to obtaining, *ceteris paribus,* the desired evolution of the share pattern. Simulations will be performed with and without this effect to assess the robustness of our results.

[13] If several countries have already enforced BITs, the FTA scenario will not have direct effects on their FDI pattern. However, they may suffer negative consequences through FDI dilution effect (countries with new BTIs become more attractive for foreign investors).

Baseline

A baseline is implemented from 2008 to 2020, which depicts the world without a new multilateral agreement. In the baseline, we also implement main trade policy changes since 2004, such as ongoing WTO accession commitments, including those of the most recent members (for example, Ukraine, Cape Verde, and Vietnam); the updated Japanese GSP (generalized system of preferences) scheme in favor of least developed countries; modified bound tariffs on European Union (EU) poultry; the EU enlargement to Romania and Bulgaria in 2007; and the end of the EU EBA (everything but arms) regime for protocol products (sugar, bananas, and rice), and regional agreements such as the South Asian Free Trade Agreement (SAFTA). However, we do not include agreements under negotiation (for example, EU–India) or the India–ASEAN (Association of Southeast Asian Nations) FTA. In addition, we do not implement a wide FTA inside each region in the scenario or in the baseline.

This baseline serves as a point of comparison with all scenarios. The results are reported for year 2020. Results are presented as the percentage difference between the baseline and the scenario for a certain macroeconomic variable in 2020. The analysis does not account for the surge in world prices of energy and food products between 2004 and 2008. However, exogenous increases in active populations are included in the model and each country's global factor productivity is affected such that GDP evolution, as described by the model, corresponds to the World Bank's GDP predictions.

Scenario Design

We focus on two simple trade scenarios:

1. A complete free trade area between Asia and Latin America (see list of countries in each group in Table A.3) is implemented between 2010 and 2014;
2. A complete free trade area between the two regions is implemented (as above), excluding the most developed Asian economies (namely Japan and South Korea), since these two countries are the only Asian countries in OECD (Organization for Economic Cooperation and Development), and FTAs between high-income countries and middle-income countries are still uncommon.

These two scenarios are run first with the traditional version of MIRAGE (TTA) and then introducing the following changes in steps: (1) change in the consistent tariff aggregator (designated as *CTA*), (2) change in FDI framework (designated as *FDI*), (3) change in shifter parameter to consider the implementation of BITs (designated as *BIT*).

Using the highly disaggregated information (5,113 products and more than 160 countries) of the MAcMap-HS6 version 2 (Boumellassa, Laborde, and Mitaritonna 2009), we compute the evolution of the trade-weighted average tariff—but with endogenous trade weights—to have the correct tariff revenue aggregator and the true price index of imports at domestic prices (the correct expenditures aggregator) at the aggregation level of the model. We assume CES preferences across HS6 products belonging to one aggregated sector in the model, with an elasticity of substitution of 2. The latter value is a conservative assumption, and the lack of relevant econometric estimates makes it difficult to choose higher values on a robust ground, knowing that welfare effects increase significantly with the value of this parameter. Therefore, we can consider our estimates as a lower bound (see Laborde, Martin, and van der Mensbrugghe 2009 for a discussion of this parameter and sensitivity analysis).

It is important to emphasize that we do not include "exceptions" or sensitive products that will not be liberalized in the FTA design. Similarly, all tariffs are eliminated on goods and we do not consider the implementation of tariff rate quotas. Therefore, our assessment focuses on the maximum potential trade and welfare effects of trade liberalization between the two regions.

5. RESULTS

The introduction of a few key innovations in the model makes a difference in terms of the amount and quality of information we obtain on the impacts of a potential FTA between Asia and Latin America. This section provides two sets of results. The first set comes from using the traditional version of the MIRAGE model (TTA) the second set from using the new, improved version of MIRAGE, which includes three new features: (1) a new tariff aggregator, (2) a new way of modeling the foreign direct investment (FDI), and (3) modeling of bilateral investment treaties (BITs).

Results Obtained through the Traditional Version of MIRAGE

Table 2 through Table 5 present results of two scenarios designed in this study: (1) a free trade agreement (FTA) between countries of Latin America and of Asia, and (2) an FTA between countries of Latin America and of Asia, excluding developed Asian countries such as Japan and South Korea.

Note that the results in this section come from the traditional version of MIRAGE, which means that they do not include the three new modeling features mentioned above. The interpretation of results focuses on the impact of the two FTA scenarios on real income, exports, production, and unskilled real wages. Table 2 presents the impact of the first scenario, namely the FTA between Latin America and Asia, on macrovariables. While most countries benefit from the agreement, some countries or subregions do not benefit; the latter include Andean countries, Central America, and Venezuela on the Latin American side and India, south Asia, and ASEAN countries on the Asian side.

Unsurprisingly, some countries experience real income losses, which may be explained by trade deflection effects being greater than trade creation effects (see Viner 1950). Indeed these regions are hurt by deterioration of terms of trade. Under the agreement, Latin American countries import substantially more from Japan, South Korea, and China and less from their Latin American partners—especially MERCOSUR and Chile—as well as third trade partners such as NAFTA countries and European countries. For example, Venezuela and Andean countries experience increases in imports from Japan by 118 percent and 57 percent respectively, from South Korea by 101 percent and 75 percent respectively, and from China by 99 percent and 79 percent respectively. Asian countries also see significant increases on imports from all Latin American countries, especially from Argentina, Brazil, and the Andean countries, reducing imports from all other origins.

Welfare gains from the agreement are greater for Latin American countries than for Asia, with substantial gains for Argentina (0.7 percent), Chile (1.2 percent), and the rest of MERCOSUR (Paraguay and Uruguay: 2.6 percent). In addition, export volume increases substantially in the case of Central America (10.4 percent), Brazil 7.8 percent), the rest of MERCOSUR (6.4 percent), and Andean countries (6.2 percent). It is important to note that the highest increase in exports in these countries comes in those sectors for which markets are virtually closed in some Asian countries in the reference year. This is the case of exports of rice from Brazil to Japan, oilseeds from the rest of MERCOSUR and Andean countries to South Korea, and sugar from most Latin American countries to Japan. As far as Asian countries are concerned, the region that benefits most is central Asia, with increases of 1.3 percent and 3.3 percent in welfare and exports, respectively. All other Asian economies also increase their exports, but to a much lower extent than do Latin American countries.

The impact on exports from other regions that do not participate in the agreement is, as expected, negative, although this result does not have a significant negative effect on welfare. The nonparticipant regions that experience the greatest negative effects are NAFTA countries, with a 0.5 percent fall in exports, and Sub-Saharan Africa, with the highest fall in welfare (-0.04 percent) and in real GDP (-0.02 percent).

Table 2. Impact of free trade between Latin American countries and Asian countries: Macroeconomic variables, % scenario/baseline, 2020

Region	Region	Exports (value, no intratrade)	GDP (volume)	Terms of trade	Welfare
Andean countries	Latin America	6.4	0.20	-0.81	-0.11
Argentina	Latin America	5.5	0.49	1.17	0.67
Brazil	Latin America	8.4	0.26	0.52	0.27
Central America	Latin America	10.8	0.18	-1.26	-0.21
Chile	Latin America	4.5	0.65	1.39	1.20
Rest of MERCOSUR	Latin America	10.4	1.62	3.13	2.60
Venezuela	Latin America	2.3	0.02	-0.66	-0.31
ASEAN	Asia	0.6	-0.02	-0.03	-0.03
Central Asia	Asia	3.3	0.58	1.52	1.31
China	Asia	0.8	0.02	0.07	0.04
Hong Kong and Singapore	Asia	0.1	0.00	0.02	0.03
India	Asia	2.7	0.02	-0.37	-0.01
Japan	Asia	0.9	0.06	0.01	0.03
South Asia	Asia	1.0	-0.02	-0.08	-0.02
South Korea	Asia	0.6	0.08	0.11	0.16

Source: MIRAGE and authors' calculations.

Table 3 shows the effects of the agreement on production volume of agrifood products, industrial products, and services. Unsurprisingly, the FTA between Latin America and Asia reinforces production specialization of Latin American countries in agrifood sectors and Asian production specialization in industry.

Table 3. Impact of free trade between Latin American countries and Asian countries: Production in volume, % scenario/baseline, 2020

	Argentina	Brazil	Rest of MERCOSUR	Andean countries	Central America	China	ASEAN	India	Japan	South Asia
Agrifood	4.91	6.67	3.37	1.02	0.48	-0.17	-0.44	-1.24	-1.83	-0.39
Industry	-1.59	-2.48	-0.50	-1.70	0.27	0.13	0.38	0.72	0.35	0.53
Services	0.38	0.09	0.18	0.15	-0.02	-0.00	-0.11	-0.15	-0.03	-0.07

Source: MIRAGE and authors' calculations.

The FTA benefits those sectors in which each region has a comparative advantage: agriculture in Latin America and manufacturing in Asia. The increase in real value-added is substantial in the case of agrifood in Brazil (rice 119 percent, beverages and tobacco 25.7 percent, and sugar 23.5 percent), Argentina (rice 21.8 percent, vegetable oils 18.6 percent, and oilseeds 16.9 percent), and the rest of MERCOSUR (oilseeds 47.9 percent and sugar 19.1 percent). On the other hand, Brazil, Argentina, Chile, and Andean countries experience a significant decline in industrial production, which could make the agreement a politically sensitive issue. In Asian countries, value-added in industry increases mainly for

textiles (ASEAN +1.2 percent and south Asia +1.1 percent), wearing apparel (India +3 percent, south Asia + 1.1 percent, and ASEAN 1.1 percent), and leather (India +1.9 percent).

The second scenario involving the same FTA between Latin America and Asia as described above, but without developed Asian countries such as Japan and South Korea, produces similar results. This time, however, real income gains for Argentina, Brazil, and MERCOSUR are more moderate as compared to the previous scenario since these countries no longer benefit from improved access to Japanese and South Korean markets as they did in the previous scenario. On the other hand, some big Asian economies, such as ASEAN and China, benefit from the fact that developed countries are not part of the FTA: They gain from increased access to Latin American markets without having to compete with Japan and South Korea. As a result, Chinese and ASEAN exports to Latin America increase by more than 50 percent compared to a less than 2 percent increase or even a decline of their exports to Latin America when Japan and South Korea are part of the agreement.

In Table 4 we see that when excluding Japan and South Korea, the pattern of specialization is similar to but not as strong as when these two countries are part of the agreement (compare figures for Argentina, Brazil, and the rest of MERCOSUR in Table 3 and Table 4). In the case of the rest of MERCOSUR (Paraguay and Uruguay), the impact on industrial production is now positive, which could potentially make the agreement more desirable and less sensitive politically. Excluding Japan and South Korea from the agreement annuls any production effect on these countries and does not alter production specialization of the rest of Asian countries, which still increase their industrial production.

Table 4. Impact of free trade between Latin American countries and Asian countries (Japan and South Korea excluded): Production volume, % scenario/baseline, 2020

	Argentina	Brazil	Rest of MERCOSUR	Andean countries	Central America	China	ASEAN	India	Japan	South Asia
Agrifood	4.43	4.46	0.85	0.55	-0.04	-0.11	-0.14	-1.22	-0.01	-0.39
Industry	-1.46	-1.63	2.73	-1.12	0.06	0.13	0.33	0.73	-0.02	0.57
Services	0.36	0.07	-0.05	0.06	0.00	0.01	-0.09	-0.15	-0.00	-0.07

Source: MIRAGE and authors' calculations.

The expansion of the agrifood sector in Latin America leads to an increase of unskilled real wages, especially in agriculture, as Table 5 shows. This increase is higher when Japan and South Korea are part of the agreement and, again, MERCOSUR and Chile are the main beneficiaries. For most Asian countries, on the other hand, unskilled wages in the agriculture sector fall, as a consequence of these countries' specialization in industrial sectors. Given that poverty in Latin America is concentrated in rural areas (according to ECLAC 2008a) estimates, in 2008, 52.2 percent of rural population was poor versus 27.6 percent of urban population), an increase in wages for the agricultural sector may contribute to a reduction of poverty in this region. Rural poverty is also higher in most Asian countries (World Bank n.d.), and thus the specialization in manufacturing and the consequent fall in agricultural wages do not contribute to a reduction of poverty in this region.

Table 5. Impact of free trade between Latin American countries and Asian countries: Wages, % scenario/baseline, 2020

Country	Region	FTA including Japan and South Korea			FTA excluding Japan and South Korea		
		Skilled real wages	Unskilled real wages	Unskilled real wages in agriculture	Skilled real wages	Unskilled real wages	Unskilled real wages in agriculture
Andean countries	Latin America	-0.1	0.3	2.5	-0.2	-0.0	0.7
Argentina	Latin America	0.6	1.1	6.3	0.5	1.0	5.6
Brazil	Latin America	0.1	0.6	9.7	0.1	0.3	5.5
Central America	Latin America	0.9	1.2	2.4	0.7	0.8	0.9
Chile	Latin America	1.1	2.1	16.5	0.2	0.4	2.0
Rest of MERCOSUR	Latin America	1.8	5.2	16.6	1.1	2.0	4.8
Venezuela	Latin America	-0.3	-0.1	-0.1	-0.3	-0.2	-0.3
ASEAN	Asia	0.1	0.0	-0.6	0.2	0.1	-0.4
Central Asia	Asia	0.4	0.2	0.1	0.4	0.2	0.1
China	Asia	0.1	0.1	-0.1	0.1	0.1	-0.0
Hong Kong and Singapore	Asia	0.0	0.0	-0.3	-0.0	-0.0	-0.2
India	Asia	0.2	0.0	-0.8	0.2	0.0	-0.8
Japan	Asia	0.2	0.1	-4.6	-0.0	-0.0	-0.1
South Asia	Asia	0.0	0.0	-0.2	0.0	0.0	-0.2
South Korea	Asia	0.3	0.3	-0.2	0.0	0.0	-0.0

Source: MIRAGE and authors' calculations.

Results Obtained through the New Version of MIRAGE

The improved version of MIRAGE, which includes three innovative features, alters the outcome (discussed in the preceding subsection) of the two policy scenarios discussed in the preceding section—the FTA between Latin America and Asia, and the FTA between these two regions without South Korea and Japan. Table 6 and Figure 8 illustrate the impact of the FTA between Latin America and Asia on welfare and trade when the analysis is done employing the improved model with the three new features: (1) changing the tariff aggregator (designated as *CTA*), (2) changing the FDI modeling framework (designated as *CTA + FDI*), and (3) modeling bilateral trade agreements between both regions (designated as *CTA + FDI + BIT*).

As with any trade policy assessment, the results presented in the previous section, based on the traditional version of MIRAGE (TTA), are sensitive to the tariff aggregator considered. When we introduce the consistent tariff aggregator described in section 0, gains for most countries that are part of the FTA are higher, except in certain cases, such as Chile and, to a lesser extent, the rest of MERCOSUR, which originally exhibit a more homogenous protection structure. As previously discussed, the average tariff tends to be higher when applying the consistent tariff aggregator as compared to applying the traditional trade-weighted average, especially when the original tariff structure is characterized by a high variance. This explains why Brazil and Central America have higher gains from liberalization with the new tariff aggregator, while Chile and the rest of MERCOSUR have lower gains from liberalization and suffer from stronger preference erosion mechanisms. Among Asian countries, the new tariff aggregator more than doubles welfare gains for South Korea, which has the highest welfare increase as compared to the outcome under the traditional version of MIRAGE. These gains can also be attributed to South

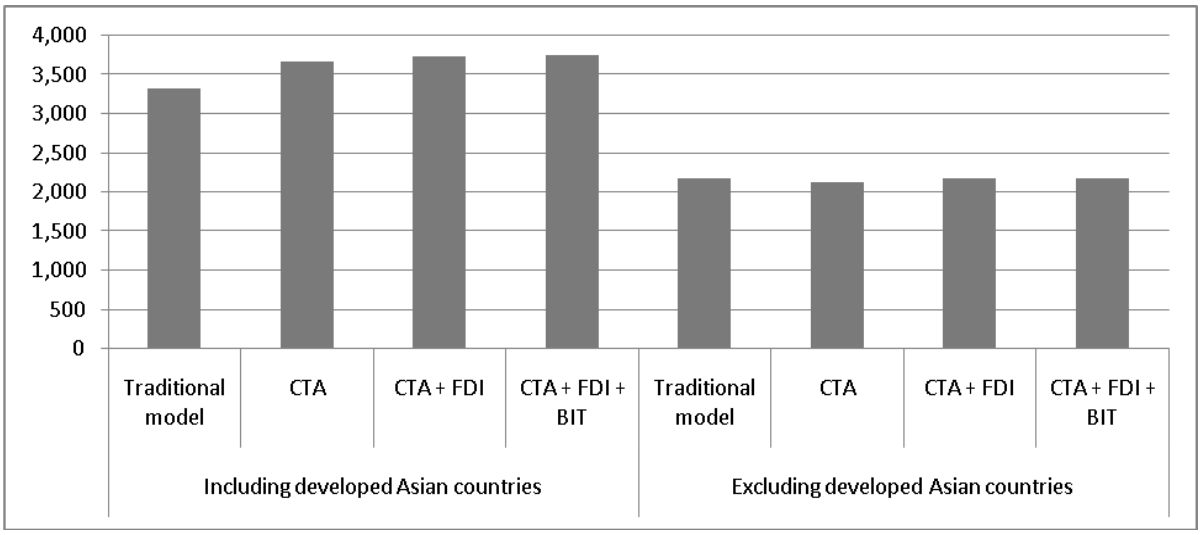
Korea's dispersed tariff structure before the agreement. The higher average tariff among countries participating in the agreement explains the higher increase in bilateral trade flows when we change the tariff aggregator in the model (see Figure 8).

Table 6. Impact of free trade between Latin American countries and Asian countries: Welfare, % scenario/baseline, 2020

Country	Region	TTA	CTA	CTA + FDI	CTA + FDI + BIT
All	**Latin America**	**0.20**	**0.51**	**0.52**	**0.68**
All	**Asia**	**0.05**	**0.05**	**0.05**	**0.06**
Andean countries	Latin America	-0.11	-0.06	-0.02	0.14
Argentina	Latin America	0.67	0.90	0.95	1.23
Brazil	Latin America	0.27	0.94	0.93	1.17
Central America	Latin America	-0.21	0.10	0.11	0.11
Chile	Latin America	1.20	0.60	0.61	0.60
Rest of MERCOSUR	Latin America	2.60	1.61	1.61	1.82
Venezuela	Latin America	-0.31	-0.29	-0.23	-0.10
ASEAN	Asia	-0.03	-0.02	-0.03	-0.04
Central Asia	Asia	1.31	1.47	1.46	1.45
China	Asia	0.04	0.03	0.03	0.02
Hong Kong and Singapore	Asia	0.03	0.05	0.04	-0.21
India	Asia	-0.01	-0.01	-0.01	-0.01
Japan	Asia	0.03	-0.01	-0.00	0.03
South Asia	Asia	-0.03	-0.05	-0.05	-0.04
South Korea	Asia	0.16	0.33	0.33	0.34

Source: MIRAGE results (various specifications) and authors' calculations.
Notes: TTA: original MIRAGE version; CTA: consistent tariff aggregator; CTA + FDI: consistent tariff aggregator plus new way of modeling FDI; CTA + FDI + BIT: consistent tariff aggregator plus new way of modeling FDI plus bilateral trade agreements.

Figure 8. Impact of free trade between Latin American countries and Asian countries (with and without developed Asian countries): Bilateral trade flows (in value at FOB prices), 2020



Source: MIRAGE and authors' calculations.
Notes: CTA: consistent tariff aggregator; CTA + FDI: consistent tariff aggregator plus new way of modeling FDI; CTA + FDI + BIT: consistent tariff aggregator plus new way of modeling FDI plus bilateral trade agreements.

A further increase in trade flows is noted when the FDI framework in the model is modified. The additional increase, however, is not significant as is, for example, the impact on real income and on GDP, especially for those regions that become FDI captors. Gains under this framework are associated mostly with increases in investment and production, and to a much lesser extent, with changes in trade flows.

The positive impact on welfare in most regions is more pronounced when we also consider the negotiation of BITs among both regions. This occurs because in this case bilateral FDI flows increase strongly with the shift in investor preferences. Thus, introducing BITs into the agreement implies additional welfare gains for the participants. As a result, Andean countries experience welfare gains instead of the losses they suffered in all other cases when the BITs were not modeled; the same happens for Japan. Welfare still declines for Venezuela, although the decline is not as strong as before. BITs reinforce the increase in trade flows, although the increase is not sharp. Except in Central America, all Latin American countries and regions increase exports (in value) when BITs are included in the agreement. When capital flows increase between two regions, bilateral trade costs fall and trade rises. However, when BITs are implemented, exports from Asian countries (especially developed Asian economies) to Latin America in service sectors fall.

Trade rises in those sectors that already expanded as a consequence of the FTA. There are some exceptions, however, like in the case of the rest of MERCOSUR, where primary exports increase when BITs are introduced, as opposed to falling as in the rest of the simulation scenarios.

The new FDI modeling framework reveals that Latin American countries benefit from an increase in FDI inflows. Except for Central America, all regions in Latin America increase GDP when foreign investment is introduced in the model, and even more so when the FTA includes BITs. Brazil, Argentina, the rest of MERCOSUR, Andean countries, and Venezuela become FDI inflow captors: In all these economies, incoming FDI increases by more than 1 percent (in the case of the rest of MERCOSUR the increase is almost 7 percent). When we also introduce BITs into the model, the increase in FDI inflows in those countries is boosted, reaching 20 percent in the case of the rest of MERCOSUR (see Figure 9). In absolute terms, however, the biggest economies in Latin America (Brazil, Andean countries, and Argentina) manage to capture most of the new investment inflows, which is in line with empirical

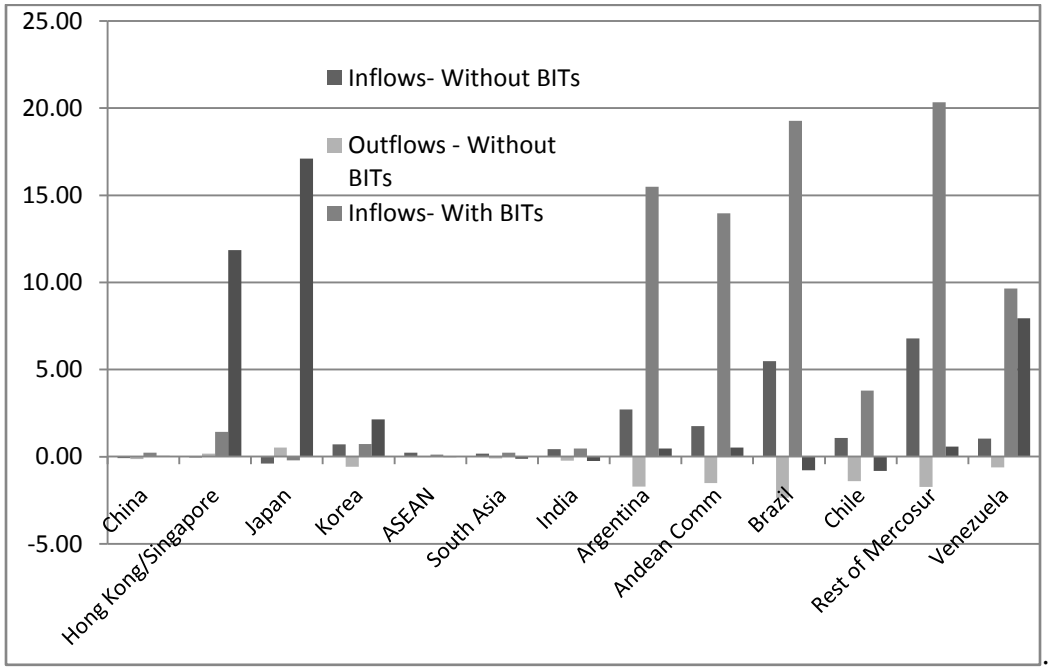
evidence (Bittencourt, Domingo, and Reig 2006).[14] The case of Venezuela is worth noting here since it not only gains from an increase in FDI inflows but also increases its FDI outflows as a result of an FTA between Latin America and Asia that incorporates the BITs. It should be noted that these results are obtained when developed Asian countries are part of the agreement, since they become the main FDI outflow providers. The situation changes radically when those countries are excluded. Even though bigger Latin American economies are still capturing FDI inflows, the increase now is much lower.

BITs increase FDI inflows for countries participating in the agreement, especially for Latin American countries but even for those countries with previous BITs with Asian economies (such as Argentina or Chile). For countries that previously did not have a BIT with Japan and South Korea (such as Brazil, the Andean countries, and the rest of MERCOSUR), these two developed Asian countries become the main FDI providers, whereas in the case of Argentina and Chile, flows come mainly from Hong Kong and Singapore.

At the same time, Latin America loses investments from Europe and NAFTA. With more investments coming from "preferred" partners, the rate of return on capital in Latin American countries goes down (see Figure 10) and these markets become less attractive for third investors (this is the crowding-out effect of third parties). This last effect dominates the positive effect that BITs may have on investment from other countries through increased growth and higher profits.

As already mentioned, Asian economies (especially those of developed Asian countries) increase FDI outflows, especially when BITs are included in the agreement. However, just as there is investment creation, there is also redirection of FDI, and some regions, such as ASEAN, the European Union, and NAFTA, lose their position as recipients of Asian FDI and thereby reduce their real income.

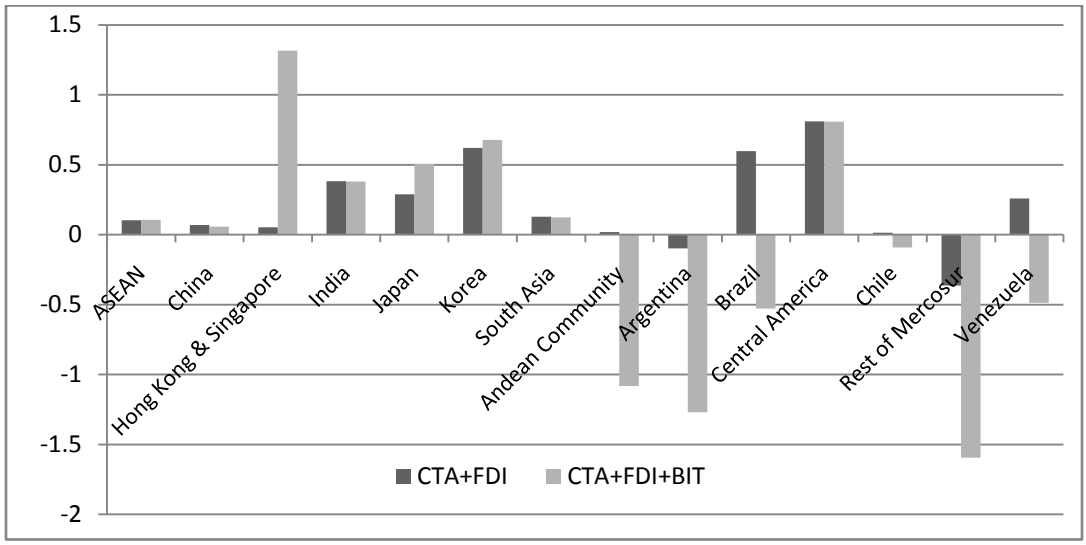
Figure 9. Impact of free trade between Latin American countries and Asian countries: FDI flows, % scenario/baseline, 2020



Source: MIRAGE and authors' calculations.

[14] However, this effect might be underestimated because in the model we are not considering economies of scale, so larger markets do not have an advantage per se.

Figure 10. Impact of free trade between Latin American countries and Asian countries: Real returns on capital, % scenario/baseline, 2020

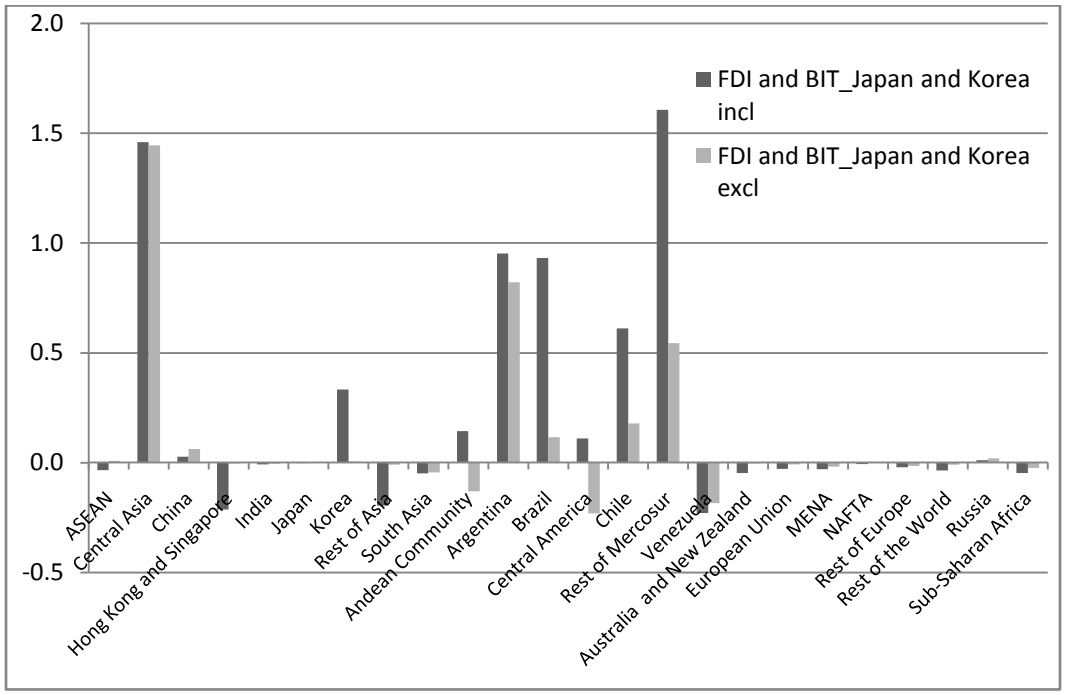


Source: MIRAGE and authors' calculations.
Notes: CTA + FDI: consistent tariff aggregator plus new way of modeling FDI; CTA + FDI + BIT: consistent tariff aggregator plus new way of modeling FDI plus bilateral trade agreements.

The same FTA between Latin America and Asia, but excluding Japan and South Korea, implies smaller welfare gains for most Latin American countries and welfare losses for Central America and Venezuela. Bilateral trade flows increase much less under this scenario no matter which model specification we are considering (see Figure 11), and FDI inflows to Latin America still increase, but much less since the main investment flows come from Japan and South Korea (Figure 12). In this context, introducing BITs into the agreement does not have any effect on FDI flows. Most Asian economies are better off when developed Asian countries are not part of the agreement: ASEAN and China now have welfare increases. These gains are associated with increased FDI inflows into those economies, partly coming from Japan and South Korea, which in absence of an agreement with Latin America, direct their investment into their own region. The exports of developing Asian countries also increase more when Japan and South Korea are not part of the agreement, mainly directed to these latter markets: India increases exports of vegetable oils and oilseed to South Korea, while China increases rice and meat exports to Japan.

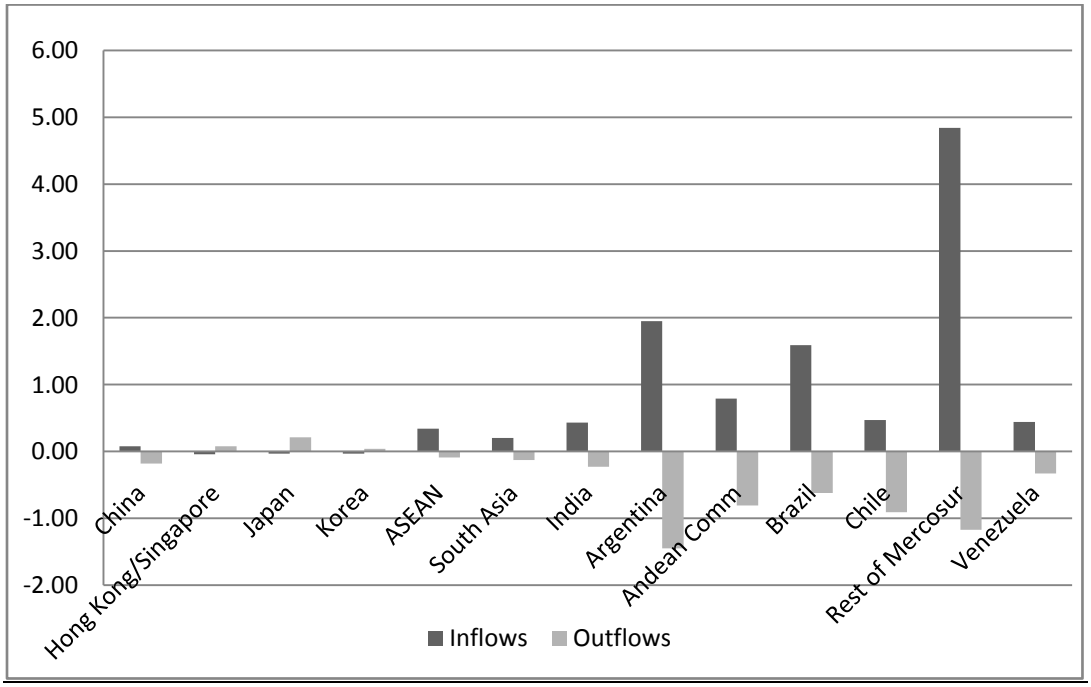
Other regions, not part of the agreement (Russia, Sub-Saharan Africa, NAFTA countries, the European Union), also benefit when Japan and South Korea do not participate. In the case of NAFTA and the European Union, this is related to a lower negative impact on exports to Latin American markets. Sub-Saharan African countries lose fewer FDI inflows while Russia gains from increased exports to Asian countries (especially developed countries).

Figure 11. Impact of free trade between Latin American countries and Asian countries: Welfare, % scenario/baseline, 2020



Source: MIRAGE and authors' calculations.
Notes: FDI: foreign direct investment; BIT: bilateral investment treaties.

Figure 12. Impact of free trade between Latin American countries and Asian countries (without Japan and South Korea): FDI flows (no BITs), % scenario/baseline, 2020



Source: MIRAGE and authors' calculations.

6. CONCLUDING REMARKS

Given the increased economic cooperation between Asia and Latin America in recent years, this study analyzed the potential trade and investment opportunities that could arise from a free trade area between countries of Latin America and those of Asia. From an analytical point of view, such an agreement looks interesting, especially since Latin America is specialized in agrifood products, which it predominantly exports, while Asian agricultural markets are protected. Similarly, Asian countries intensively export industrial products, and industrial protection in Latin America is significant. Our results show the implementation of a free trade area benefiting almost all FTA member countries. Under our model, gains are especially high for Latin American countries, which substantially increase their exports of agricultural commodities and food. The agreement reinforces existing patterns of specialization, with Latin America continuing to produce agrifood products and Asian countries maintaining their specialization in industry. Export increases are especially high for Argentina, Brazil, Paraguay, and Uruguay—the four founding members of MERCOSUR—in beverage and tobacco products, oilseeds, sugar, and vegetable oils.

Excluding developed Asian economies, namely Japan and South Korea, from the agreement has different implications for these two regions. For example, without Japan and South Korea, gains for Latin American countries are smaller because they no longer benefit from improved access to Japanese and South Korean markets. In contrast, developing Asian countries benefit more from the agreement if Japan and South Korea do not participate because they gain increased access to Latin American markets without having to compete with Japan and South Korea in those markets.

We should keep in mind, however, that these scenarios do not account for sensitive products, and the results therefore reflect the maximum potential gains from an agreement between Asia and Latin America. In reality, we might expect lower gains because Latin American exports would increase in sectors traditionally sensitive in Asian countries (rice, dairy products, soy, sugar) and vice versa (textiles, wearing apparel), these sectors having a high probability of being liberalized only partially.

This study contributes to the existing body of literature on the impact of FTAs by incorporating three innovations into the MIRAGE computable general equilibrium: (1) a new tariff aggregator, (2) a new foreign direct investment (FDI) framework, and (3) incorporation of bilateral investment treaties (BIT).

The study finds that when the FDI is modeled, the FTA leads to a greater impact on real income and GDP, especially for those regions that become FDI recipients, but it does not lead to substantial increases in trade flows. The GDP for all Latin American regions, except for Central America, increases when FDI is introduced into the model and even more so when the FTA includes bilateral investment treaties (BITs). In absolute terms, the biggest economies in Latin America (Brazil, Andean countries, Argentina) manage to capture most of the new investment inflows, which is in line with empirical evidence (Bittencourt, Domingo, and Reig 2006). Asian developed economies become the largest FDI providers. Indeed, both Japan and South Korea have already made some notable investments in Latin America over the last few years. In 2008, Japanese and South Korean firms invested over $3 billion in a Brazilian steelmaking company (ECLAC 2008a). As a result, their inclusion in the FTA could potentially enhance the conditions for further and more diversified investments by these two countries in Latin America (see Section 2.2 for more details). Removing them from the agreement, on the other hand, changes the situation drastically; although the big Latin American economies still capture FDI inflows, the increase is now much lower than when Japan and South Korea were part of the agreement.

At the same time, Latin America loses investments from Europe and NAFTA (due to the crowding-out effect of third parties). With more investments coming from "preferred" partners, the rate of return on capital in Latin American countries goes down and these markets become less attractive for third investors. This last effect is much more important than the positive effect that BITs may have on investment through increased growth and higher profits.

APPENDIX: SUPPLEMENTARY TABLE

Table A.1. Trade arrangements between Latin American and Asian countries as of November 2010[15]

	Agreement	Status	Coverage
1	Chile–China FTA	Negotiations launched in 2005; agreement signed in 2005; under implementation since 2006	Trade in goods since 2006; services agreement signed in 2008; investment agreement is under negotiation
2	Chile–India PTA	Negotiations launched in 2005; agreement signed in 2006; under implementation since 2008	Trade in goods
3	Chile–Indonesia	Feasibility study launched	n.a.
4	Chile–Japan SEPA	Negotiations launched in 2005; agreement signed in 2007; under implementation since 2007	Trade in goods; trade in services; investment and related areas
5	Chile–South Korea FTA[16]	Negotiations launched in 1999; agreement signed in 2003; under implementation since 2004	Trade in goods; trade in services; investment and related areas
6	Chile–Malaysia FTA	Agreement signed in November 2010; expected to enter into force in the first half of 2011[17]	Trade in goods; trade in services; investment and related areas
7	Chile–Thailand	Feasibility study conducted in July 2006; countries announced the beginning of negotiations at the November 2010 APEC meeting	n.a.
8	Chile–Vietnam	Under negotiations since 2008; completed seventh round in November 2010	Trade in goods; trade in services; investment and related areas
9	Costa Rica–China FTA	Agreement signed in April 2010; not yet in force	Trade in goods; trade in services
10	Costa Rica–Singapore FTA	Agreement signed in April 2010; not yet in force	Trade in goods; trade in services; investment and related areas
11	Dominican Republic–Taipei, China	Under negotiation since 2006; completed first round in 2006; negotiations are on hold since 2007	Trade in goods; trade in services; investment and related areas
12	El Salvador–Honduras–Taipei, China FTA	Negotiations launched in 2006; agreement signed in 2007; under implementation since 2008	Trade in goods; trade in services; investment and related areas
13	Guatemala–Taipei, China FTA	Negotiations launched in 2005; agreement signed in 2005; under implementation since 2006	Trade in goods; trade in services; investment and related areas
14	MERCOSUR–India PTA	Negotiations launched in 2003; agreement signed in 2004; under implementation since 2009	Trade in goods
15	MERCOSUR–South Korea	Proposed/under consultation and study since 2005	n.a.
16	MERCOSUR–Thailand	Proposed/under consultation	n.a.
17	MERCOSUR–Pakistan PTA	Framework agreement signed in 2006; no progress on negotiations has been reported since then	Trade in goods

[15] Agreement names are arranged in alphabetical order by Latin American countries
[16] The agreement was updated in November 2009; see Myo-ja and Eun-joo 2009.
[17] See NASDAQ 2010.

Table A.1. Continued

	Agreement	Status	Coverage
18	Mexico–South Korea FTA	Under negotiation since 2006; completed first round in December 2007; negotiations have been suspended since 2007	n.a
19	Mexico–Japan SEPA	Negotiations launched in 2002; agreement signed in 2004; under implementation since 2005	Trade in goods; trade in services; investment and related areas
19	Mexico–Singapore FTA	Under negotiation since 2000; completed six rounds of negotiations; negotiations have been suspended	Trade in goods; trade in services; investment and related areas
20	Nicaragua–Taipei, China FTA	Negotiations launched in 2004; agreement signed in 2006; under implementation since 2006	Trade in goods; trade in services; investment and related areas
21	Panama–Singapore FTA	Negotiations launched in 2004; agreement signed in 2006; under implementation since 2006	Trade in goods; trade in services; investment and related areas
22	Panama–Taipei, China FTA	Negotiations launched in 2002; agreement signed in 2003; under implementation since 2004	Trade in goods; trade in services; investment and related areas
24	Peru–China FTA	Negotiations launched in 2008; agreement signed in 2009; under implementation since March 2010	Trade in goods; trade in services; investment and related areas
25	Peru–Japan EPA	Under negotiation since 2009; negotiations concluded in November 2010	Trade in goods; trade in services; investment agreement was signed in 2008
26	Peru–South Korea FTA	Agreement signed in November 2010; not yet in force	Trade in goods; trade in services; investment and related areas
27	Peru–Singapore FTA	Negotiations launched in 2006; agreement signed in 2008; under implementation since 2009	Trade in goods; trade in services; investment and related areas
28	Peru–Thailand FTA	Under negotiation since 2002; second protocol was signed in November 2009	Trade in goods; trade in services; investment and related areas
29	Trans-Pacific SEPA (Brunei, Singapore, New Zealand, and Chile)	Negotiations launched in 2003; agreement signed in 2005; under implementation since 2006	Trade in goods; trade in services; investments are under negotiation

Sources: Organization of American States (n.d.) foreign trade information system (SICE); UNESCAP (n.d.) trade agreements database; Asian Development Bank (n.d.) free trade agreement database for Asia; various web-based news articles and updates, official government websites, and the like.
Notes: FTA: free trade agreement; PTA: preferential free trade agreement; SEPA: strategic economic partnership agreement.

Table A.2. Bilateral investment treaties between Latin American and Asian countries

Country	Partner	Signed	Entered in force
Argentina	China	5-Nov-92	1-Aug-94
	India	20-Aug-99	12-Aug-02
	Indonesia	7-Nov-95	
	Malaysia	6-Sep-94	20-Mar-96
	Philippines	20-Sep-99	1-Jan-02
	Thailand	18-Feb-00	7-Mar-02
	Vietnam	3-Jun-96	1-Jun-97
Barbados	China	20-Jul-98	1-Oct-99
Belize	China	16-Jan-99	
Bolivia	South Korea	1-Apr-96	
Brazil	South Korea	1-Sep-95	
Chile	China	23-Mar-94	14-Oct-95
	Indonesia	7-Apr-99	
	South Korea	6-Sep-96	18-Nov-99
	Malaysia	11-Nov-92	4-Aug-95
	Philippines	20-Nov-95	6-Nov-97
	Vietnam	16-Sep-99	
Costa Rica	China	25-Mar-99	
	South Korea	11-Aug-00	7-May-02
Dominican Rep.	China	5-Nov-98	27-Nov-01
Ecuador	China	21-Mar-94	1-Jul-97
El Salvador	South Korea	6-Jul-78	25-May-02
Guatemala	South Korea	1-Aug-00	17-Aug-02
Guyana	China	27-Mar-03	26-Oct-04
	South Korea	31-Jul-06	1-Apr-96
Jamaica	China	26-Oct-94	
	Indonesia	10-Feb-99	
Mexico	India	21-May-07	23-Feb-08
	South Korea	14-Nov-00	28-Jun-02
Nicaragua	China	29-Jul-92	8-Jan-93
	South Korea	15-May-00	17-Apr-01
Panama	China	26-Mar-92	14-Jul-92
	South Korea	10-Jul-01	8-Feb-02
Paraguay	South Korea	22-Dec-92	6-Aug-93
Peru	China	9-Jun-94	1-Feb-95
	South Korea	3-Jun-93	20-Apr-94
	Malaysia	13-Dec-95	
	Singapore	27-Feb-03	
	Thailand	15-Nov-91	15-Nov-91
Suriname	Indonesia	28-Oct-95	
Trinidad and Tobago	China	22-Jul-02	24-May-04
	South Korea	5-Nov-02	27-Nov-03
Uruguay	China		1-Dec-97
	Malaysia	9-Aug-95	

Source: Organization of American States (n.d.) foreign trade information system (SICE).

Table A.3. Countries and regions included in simulations

Latin America and the Caribbean	Asia
Andean countries	ASEAN
Argentina	Central Asia
Brazil	China
Central America	Hong Kong and Singapore
Chile	India
Rest of MERCOSUR	Japan
Venezuela	South Asia
	South Korea

Source: Authors' compilation.

Table A.4. HS2 chapters 2007 nomenclature

HS2	Title
1	Live animals.
2	Meat and edible meat offal.
3	Fish and crustaceans; mollusks and other aquatic invertebrates.
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included.
5	Products of animal origin, not elsewhere specified or included.
6	Live trees and other plants; bulbs, roots, and the like; cut flowers and ornamental foliage.
7	Edible vegetables and certain roots and tubers.
8	Edible fruit and nuts; peel of citrus fruit or melons.
9	Coffee, tea, maté, and spices.
10	Cereals.
11	Products of the milling industry; malt; starches; inulin; wheat gluten.
12	Oilseeds and oleaginous fruits; miscellaneous grains, seeds, and fruit; industrial or medicinal plants; straw and fodder.
13	Lac; gums, resins, and other vegetable saps and extracts.
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included.
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes.
16	Preparations of meat, of fish, or of crustaceans, mollusks, or other aquatic invertebrates.
17	Sugars and sugar confectionery.
18	Cocoa and cocoa preparations.
19	Preparations of cereals, flour, starch, or milk; pastry cooks' products.
20	Preparations of vegetables, fruit, nuts, or other parts of plants.
21	Miscellaneous edible preparations.
22	Beverages, spirits, and vinegar.
23	Residues and waste from the food industries; prepared animal fodder.
24	Tobacco and manufactured tobacco substitutes.
25	Salt; sulphur; earths and stone; plastering materials; lime and cement.
26	Ores, slag, and ash.
27	Mineral fuels, mineral oils, and products of their distillation; bituminous substances; mineral waxes.
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements, or of isotopes.
29	Organic chemicals.

Table A.4. Continued

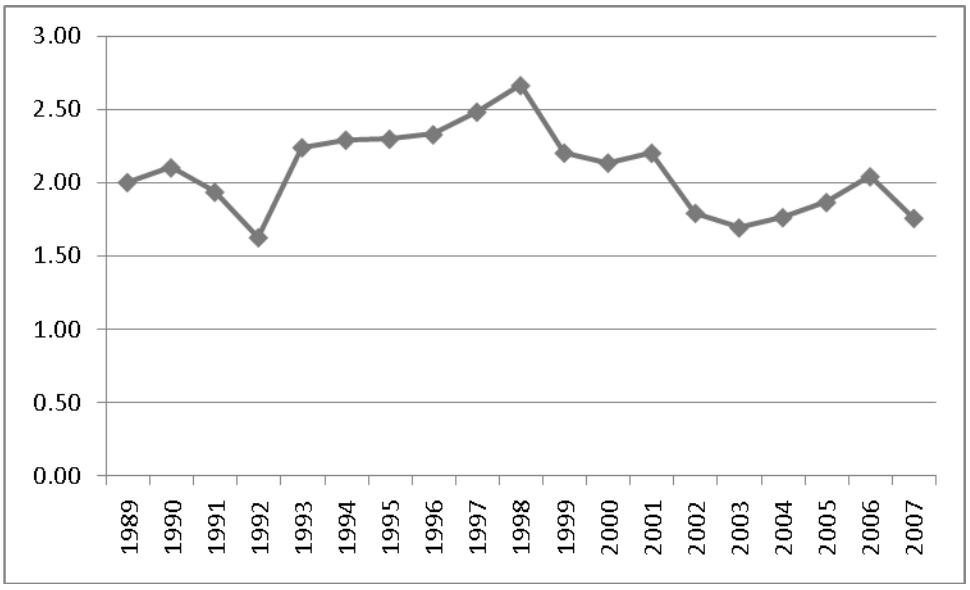
HS2	Title
30	Pharmaceutical products.
31	Fertilizers.
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments, and other coloring matter; paints and varnishes; putty and other mastics; inks.
33	Essential oils and resinoids; perfumery; cosmetic or toilet preparations.
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modeling pastes, "dental waxes," and dental preparations with a basis of plaster.
35	Albuminoidal substances; modified starches; glues; enzymes.
36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations.
37	Photographic or cinematographic goods.
38	Miscellaneous chemical products.
39	Plastics and articles thereof.
40	Rubber and articles thereof.
41	Raw hides, skins (other than fur skins), and leather.
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut).
43	Fur skins and artificial fur; manufactures thereof.
44	Wood and articles of wood; wood charcoal.
45	Cork and articles of cork.
46	Manufactures of straw, of esparto, or of other plaiting materials; basketware and wickerwork.
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard.
48	Paper and paperboard; articles of paper pulp, of paper, or of paperboard.
49	Printed books, newspapers, pictures, and other products of the printing industry; manuscripts, typescripts, and plans.
50	Silk.
51	Wool; fine or coarse animal hair; horsehair yarn and woven fabric.
52	Cotton.
53	Other vegetable textile fibers; paper yarn and woven fabrics of paper yarn.
54	Man-made filaments.
55	Man-made staple fibers.
56	Wadding, felt, and nonwovens; special yarns; twine, cordage, ropes, and cables, and articles thereof.
57	Carpets and other textile floor coverings.
58	Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery.
59	Impregnated, coated, covered, or laminated textile fabrics; textile articles of a kind suitable for industrial use.
60	Knitted or crocheted fabrics.
61	Articles of apparel and clothing accessories, knitted or crocheted.
62	Articles of apparel and clothing accessories, not knitted or crocheted.
63	Other made up textile articles; sets; worn clothing and worn textile articles; rags.
64	Footwear, gaiters, and the like; parts of such articles.
65	Headgear and parts thereof.
66	Umbrellas, sun umbrellas, walking sticks, seat sticks, whips, riding crops, and parts thereof.
67	Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of human hair.
68	Articles of stone, plaster, cement, asbestos, mica, or similar materials.

Table A.4. Continued

HS2	Title
69	Ceramic products.
70	Glass and glassware.
72	Iron and steel.
73	Articles of iron or steel.
74	Copper and articles thereof.
75	Nickel and articles thereof.
76	Aluminum and articles thereof.
77	(Reserved for possible future use in the Harmonized System)
78	Lead and articles thereof.
79	Zinc and articles thereof.
80	Tin and articles thereof.
81	Other base metals; cermets; articles thereof.
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.
83	Miscellaneous articles of base metal.
84	Nuclear reactors, boilers, machinery, and mechanical appliances; parts thereof.
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles.
86	Railway or tramway locomotives, rolling stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signaling equipment of all kinds.
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof.
88	Aircraft, spacecraft, and parts thereof.
89	Ships, boats, and floating structures.
90	Optical, photographic, cinematographic, measuring, checking, precision, medical, or surgical instruments and apparatus; parts and accessories thereof.
91	Clocks and watches and parts thereof.
92	Musical instruments; parts and accessories of such articles.
93	Arms and ammunition; parts and accessories thereof.
94	Furniture; bedding, mattresses, mattress supports, cushions, and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings.
95	Toys, games, and sports requisites; parts and accessories thereof.
96	Miscellaneous manufactured articles.
97	Works of art, collectors' pieces, and antiques.

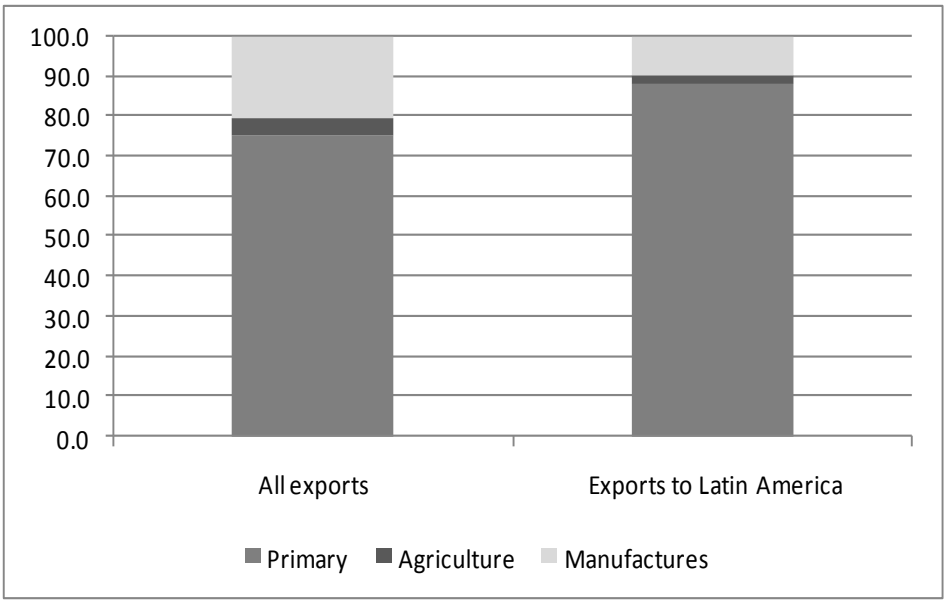
Source: World Customs Organization.

Figure A.1. Share of Latin America in Asian exports (percent)



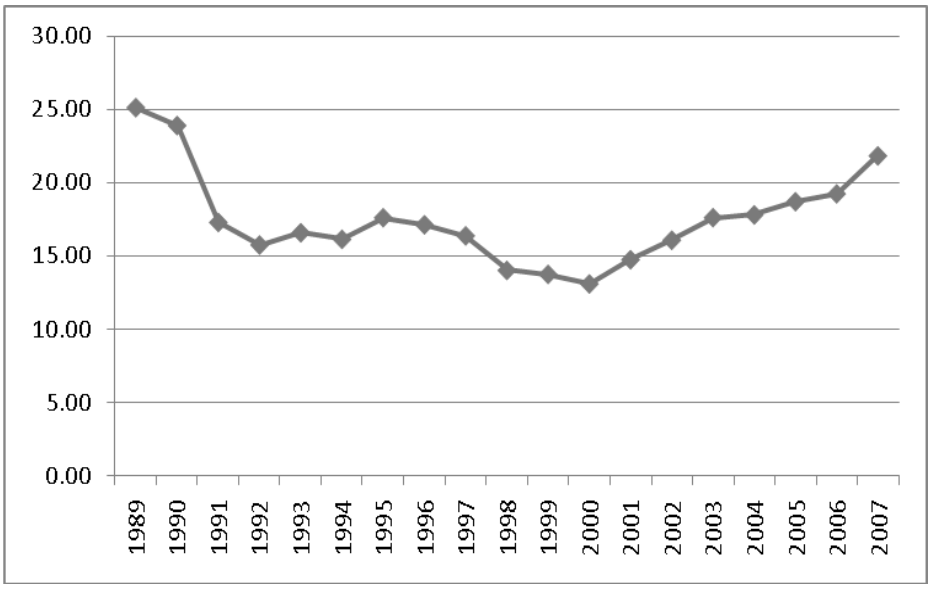
Source: Authors' calculations based on data from Base pour l'Analyse du Commerce International (BACI).

Figure A.2. Sectoral composition of Asia's total exports and exports to Latin America (percent)



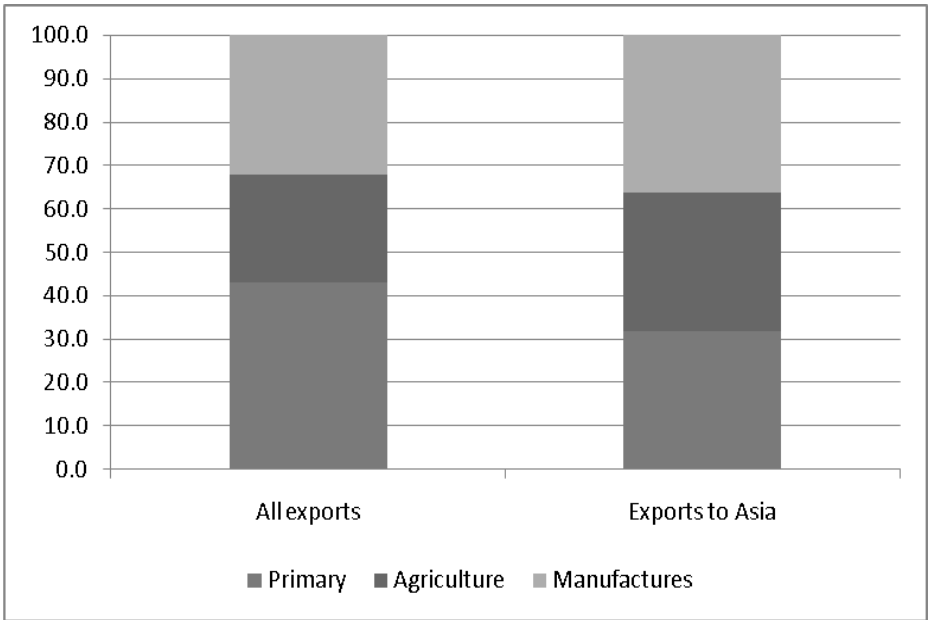
Source: Authors' calculations based on data from Base pour l'Analyse du Commerce International (BACI).

Figure A.3. Share of Asia in Latin America's exports (percent)



Source: Authors' calculations based on data from Base pour l'Analyse du Commerce International (BACI).

Figure A.4. Sectoral composition of Latin America's total exports and exports to Asia (percent)



Source: Authors' calculations based on data from Base pour l'Analyse du Commerce International (BACI).

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