Trade and investment in Latin America and Asia :

Potential perspectives from further integration

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Abstract

Recently, Asian and Latin American countries have been involved in a series of negotiations to liberalize trade and investment flows. This paper analyzes the potential impact of a Free Trade Agreement between countries of both regions, applying a world dynamic general equilibrium model (MIRAGE). An important feature of the model is that includes a new way of modeling bilateral investment flows and bilateral investment agreements. This is especially important given that investment plays a major role in the economic relations of the two regions. Our results show that most countries will benefit from the agreement; however, Latin American countries' gains will be higher, especially when all Asian countries participate. Latin American countries will also gain from increased FDI inflows, mainly from developed Asian countries.

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

JEL classification: F13, F15, C68

1 Introduction

During the last decade, there has been a proliferation of regional trade agreements (RTAs) worldwide. Asia and Latin America are part of this phenomenon, and even though South-South agreements are still rare, cooperation between countries from these two regions is on the rise. To date, there are 12 RTAs between Asian and Latin American countries, all of which have been signed in the last six years, and negotiations of six new free trade agreements (FTAs) are taking place. These agreements tend to increase the scope of traditional agreements, incorporating new issues such as investment, public procurement, and competition policy.

Trade and investment flows between both regions have intensified in recent years. Asia's share in Latin American imports rose from 14 percent in 2000–2002 to 20 percent in 2006–2008, while Latin America has also become a more important importer for Asia, representing 1.2 percent of total Asian imports in 2000–2002 and 2 percent in 2006–2008 (International Trade and Tariff Database–WTO 2010). One of the key countries behind these trends is China, which has become a main market for Latin American exports, especially of mineral and agriculture goods, and also a major provider of investment flows to Latin America (Romero 2010). Other Asian countries, such as Japan and Korea, have also intensified their economic links with Latin American countries through an increase in investment projects in the region. On the Latin American side, Chile and Peru have deepened economic ties with Asian countries the most through the signing of several trade and investment agreements, while Brazil is the Latin American country with the largest outflows of foreign direct investment to Asian markets.

Asia and Latin America are two very different regions in terms of trade and development patterns. While Asian exports are highly concentrated in industrial goods, Latin America relies more on agriculture and mineral exports. These specializations, consistent with their reciprocal comparative advantages, also characterize interregional trade. These two regions differ in their trade policy; while

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Asia has followed a more open strategy, Latin America has only recently started opening its economy. However, trade protection is higher in Asia than in Latin America, especially for agricultural goods. For this reason, Latin American countries on average face higher tariffs on their exports to Asia than do Asian countries on exports to Latin America. Economic performance in terms of GDP growth has been greater for Asia than for Latin America over the last two decades (2 percent annual GDP growth at constant prices from 1990–2007 in Asia versus 1.4 percent GDP growth in Latin America during the same time period), whereas poverty indexes, although worrisome in both continents, are especially high for Asian countries such as India, Nepal, and Bangladesh.

The high level of protection and low level of integration between countries of both regions suggest that a trade agreement between Asian and Latin American countries would entail both economic and social benefits and would be an unprecedented phenomenon in terms of trade agreements. This paper 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. We are interested in evaluating the potential effects of such a free trade agreement on trade and investment flows and the way these effects may boost economic growth.

One of the channels by which trade liberalization can stimulate growth and development is through foreign direct investment (FDI). While traditional modeling of RTAs tends to focus on static effects and usually predicts only meager gains from liberalization, we study the potential impact of this trade integration scenario on foreign investment with the help of an improved version of the MIRAGE model of the world economy. In this new version of MIRAGE, the investment decisions of firms are distinguished from the investment decisions 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. We also model the implementation of Bilateral Investment Treaties (BITs).

Our results suggest that an FTA between Asia and Latin America would bring benefits to most members of the agreement, although gains would be higher for Latin America countries, which would experience an increase in exports to Asia and in investment inflows to the region. Latin American exports would increase mostly in highly protected agro-food sectors; as a consequence, unskilled rural wages would increase, suggesting a potential reduction in rural poverty. Asian exports to Latin America would increase in industrial sectors, reinforcing the current trade pattern between the regions.

In the next section, we present the methodology used to evaluate the potential impact of an FTA between Asia and Latin America. This includes a brief description of the applied CGE model and a more detailed description of the improvements introduced in this paper. The results obtained under the different versions of MIRAGE are presented in Section 3. Finally, Section 4 presents some conclusions and policy implications.

2   Methodological approach

This section provides a description of the methodology used 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 paper.

2.1 *The MIRAGE model of the world economy*

MIRAGE is a multi-country, multi-sector 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/her income across goods. The origin of goods is determined by a CES (Constant Elasticity of Substitution) nested structure following the Armington (1996) assumption.[1] In addition, Northern countries are assumed to produce higher quality industrial goods compared with those supplied by 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 the inclusion of 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 across agricultural sectors and non-agricultural sectors. Total employment is constant. Investment is savings-driven and the real exchange rate is adjusted (through price adjustments) so that the current account is constant in terms of world Gross Domestic Product (GDP). This last assumption is particularly 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 in the standard version of MIRAGE model. First, we work with a different tariff aggregator. Second, we introduce modifications to the way we model FDI. Third, we also introduce the modelization of bilateral investment treaties (BITs).

2.2 Tariff aggregation

Historically, in order to introduce tariffs in CGE models, measures such as simple or trade-weighted average tariffs have been employed; however, these lack a theoretical foundation and may introduce significant biases in estimation. The most obvious problem with the trade-weighted average is

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[1] The MIRAGE model is based on GTAP Armington elasticities, which are low compared with those used in other models (for example, the World Bank's LINKAGE model).
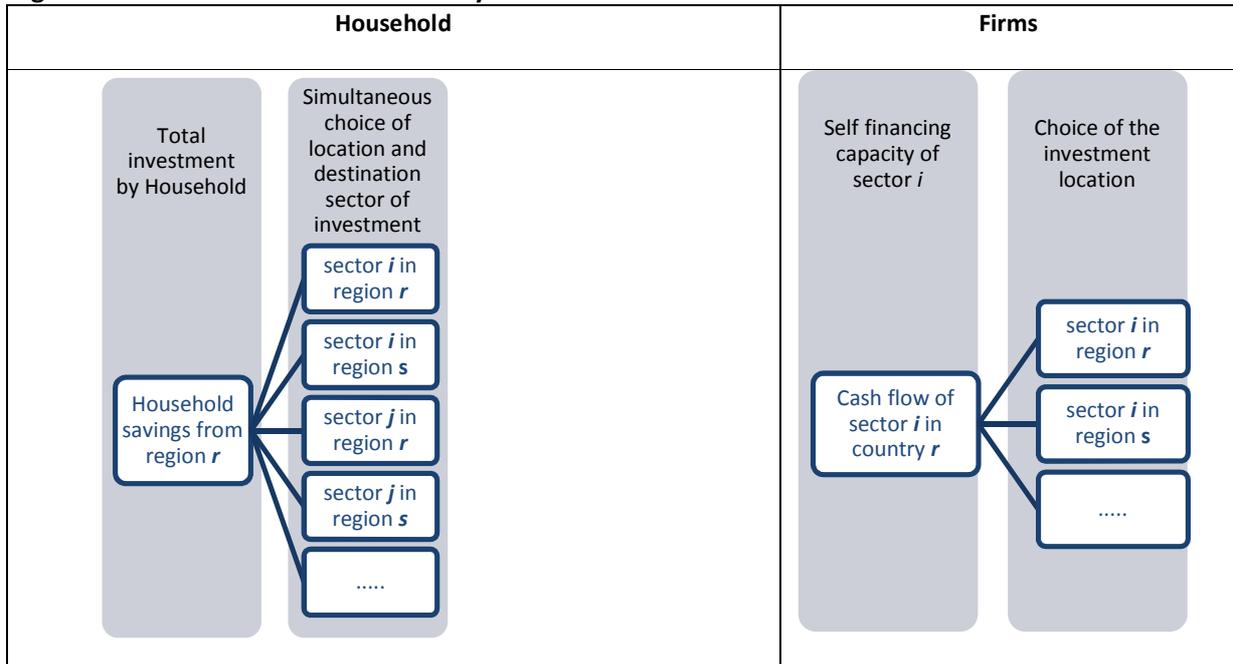
that the weight on any tariff declines as the tariff rises, with very high tariffs having vanishingly small weights even when their trade-distorting impacts may be large. More recently, new approaches with rigorous theoretical foundations for this aggregation problem have emerged. Anderson and Neary (1994) proposed a uniform tariff that yields the same welfare as the original differentiated tariff structure. In subsequent works (Anderson and Neary 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, non-uniform tariffs. Using an *atheoric* approach, the MAcMapHS6 methodology (Bouet, Decreux, Fontagne, Jean, and Laborde 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 mitigates 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 only able to apply their approach 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's 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 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 this into account, he 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 this idea using the methodology proposed by Laborde (2008) and already applied in 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: i) a trade-weighted average (using ex-post weights) to capture the right tariff revenue aggregator and ii) the true price index of the imports to produce an expenditure-consistent aggregator and capture the quantity wedge at world and domestic prices. We report results using both this tariff aggregator and the traditional trade-weighted average tariff aggregator. We should expect smaller gains from liberalization when we introduce the latter, as it tends to underestimate high peaks in tariff structure.

2.3 *Investment and Foreign Direct Investment*

The way in which FDI is modeled in this study differs significantly from the usual MIRAGE FDI framework. Contrary to the standard framework of MIRAGE, and following Laborde and Lakatos (2009), we assume that households and firms exhibit different investment 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 of investment. In this paper's approach, we maintain this household behavior unchanged; however, 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 **Erreur ! Source du renvoi introuvable.**.

Figure 1 **Investment decisions by households and firms**

Household		Firms	
Total investment by Household	**Simultaneous choice of location and destination sector of investment**	**Self financing capacity of sector _i_**	**Choice of the investment location**
Household savings from region _r_	sector _i_ in region _r_	Cash flow of sector _i_ in country _r_	sector _i_ in region _r_
	sector _i_ in region _s_		sector _i_ in region _s_
	sector _j_ in region _r_		.....
	sector _j_ in region _s_		
	.....		

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; since households will not invest in them either, they will shrink.

The data on bilateral FDI flows and stocks employed in our modeling exercise have been built by CEPII (France) and are documented in Boumellassa, Gouel, and Laborde 2007. As opposed 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 GTAP7.

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

In this paper, we consider the implementation of BITs between countries of each block to be complementary to the implementation of the FTA between both regions.[2] 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 BIT 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 with the reference situation (no BIT). Concretely, we shock the preference parameter to obtain, ceteris paribus, the desired evolution of the share pattern. Simulations are performed both with and without this effect to assess the robustness of our results.

2.4 *Baseline*

A baseline is implemented from 2008–2025, which depicts world trade as it would be 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 (Ukraine, Cape Verde, and Vietnam), an updated Japanese GSP (Generalized System of Preferences) scheme favoring LDC countries, modified bound tariffs on EU poultry, the 2007 EU enlargement to include Romania and Bulgaria, and the end of the EU EBA (Everything But Arms) regime for protocol products (sugar, banana, and rice). Regional agreements such as SAFTA are also implemented. However, we do not include agreements under negotiation (for example, EU-India) or the India-ASEAN FTA. In addition, we do not implement a wide FTA inside each block in the scenario or in the baseline.

This baseline serves as a point of comparison for all scenarios. The results are reported for the year 2025. Results are presented as the percentage difference between the baseline and the scenario for a certain macroeconomic variable in 2025. The analysis does not account for the surge in world

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[2] If several countries have already enforced BIT, the FTA scenario will not have direct effects on their FDI pattern. However, these countries may suffer negative consequences through an FDI dilution effect, as countries with new BTI become more attractive to foreign investors.

prices of energy and food products from 2004–2008. However, exogenous increases in active populations are included in the model, and each country's global factor productivity is affected so that GDP evolution, as described by the model, corresponds to the World Bank's GDP predictions.

2.5 Scenario Design

We focus on two simple trade scenarios:

- A complete free trade area between Asia and Latin America[3] is implemented from 2010–2014.

- A complete free trade area between the two regions is implemented (as in the scenario above), excluding the most developed Asian economies (namely, Japan and South Korea) since these two countries are the only Asian OECD countries and a FTA between High Income Countries and Middle Income Countries is still uncommon.

These two scenarios are run first with the traditional version of MIRAGE (TTA) and then with the following changes: i) change in the consistent tariff aggregator (CTA), ii) change in FDI framework (FDI), and iii) change in shifter parameter to consider the implementation of BIT(s).

Using the highly disaggregated information (5,113 products and more than 160 countries) of the MAcMapHS6 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; 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.

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[3] Latin American countries/regions are Argentina, Andean Community, Brazil, Chile, Rest of Mercosur, Venezuela, and Central America, while in Asia, the countries/regions considered are China, Japan, Korea, Hong Kong, Singapore, ASEAN, South Asia, India, and Central Asia.

Therefore, we can consider our estimates as 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 be not 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 two regions.

Methodological approach

In order to examine the implications of trade integration of Asia and Latin America, the study relies on the multi country, multi sector computable general equilibrium model, MIRAGE, a detailed description of which can be found in the Annex. There are two key innovative features included in this model that will enable us to obtain a more accurate picture of trade and investment flows following the implementation of the FTA. The first one has to do with the way in which tariffs are aggregated. While a more detailed discussion of this feature can be found in the Annex, it is important to note here that each tariff scenario implemented at the HS6 level on a bilateral basis is translated into two parameters that that are used in the model:

- A trade-weighted average (using ex-post weights) to capture the right tariff revenue aggregator and:

- The true price index of the imports to produce an expenditure-consistent aggregator and capture the quantity wedge at world and domestic prices.

This section will dedicate special attention to the modeling framework for investment and FDI given that this is the most important feature included in this FTA and it is usually not well tackled by traditional CGE models. The section will also provide a description of the scenarios designed for this study and will be followed by Section 4 on results.

3   Results

In the first subsection below, we present results obtained through the traditional version of the MIRAGE model of the world economy; in the second subsection below, we comment on results obtained with the new specification relating trade and foreign direct investment.

3.1 *Results obtained through the traditional version of MIRAGE*

Tables 1–4 present results of the evaluation of the following two scenarios: i) the implementation of a free trade area between Latin American countries and Asian countries and ii) the implementation of the same agreement excluding developed Asian countries (Japan and South Korea).

Erreur ! Source du renvoi introuvable. presents the impact of a free trade area between Latin American countries and Asian countries on macro variables; all countries concerned in the agreement benefit from it except the Andean countries, Central America, and Venezuela in Latin America and India, South Asia, and ASEAN in Asia. The loss of real income for some countries is not a surprise and may result from trade deflection effects being greater than trade creation effects (see Viner (1950) for theory of customs union). Indeed, these regions are hurt by a deterioration of terms of trade. For these Latin American countries, imports increase substantially from Japan (118 percent in Venezuela and 57 percent in Andean countries), Korea (101 percent and 75 percent, respectively) and China (99 percent and 79 percent, respectively) and fall from Latin American partners (especially MERCOSUR countries and Chile) and third-party trade partners (NAFTA and European countries). Asian regions strongly increase imports from all Latin American countries, especially Argentina, Brazil, and the Andean Community, and reduce imports from all other regions.

In terms of positive impacts, gains from the agreement are greater for Latin American countries, with substantial gains for Argentina (+0.7 percent), Chile (+1.2 percent), and Rest of Mercosur (Paraguay-Uruguay +2.6 percent). Exports increase substantially in volume in the case of Central

America (+10.4 percent), Brazil (+7.8 percent), Rest of Mercosur (+6.4 percent), and Andean countries (+6.2 percent). These countries experience the highest increase in exports from specific sectors whose markets are practically closed in some Asian countries in the reference year; this is the case for exports of rice from Brazil to Japan, oilseeds from Rest of Mercosur and Andean countries to Korea, and sugar for most Latin American countries to Japan. As far as Asian countries are concerned, the most benefited region is Central Asia, with welfare increases of 1.3 percent and export increases of 3.3 percent. All other Asian economies also increase their exports, but to a much lower extent than Latin American countries.

The impact on exports from regions not participating in the agreement is, as expected, negative, although this result does not have a significant negative effect on welfare. The most harmed regions not participating in the agreement are NAFTA, 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 1.   **Impact of Free Trade between Latin American countries and Asian countries –**
Macroeconomic variables - % Scenario/baseline - 2020

Region	Region	Exports (value, no intra trade)	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
Korea	Asia	0.6	0.08	0.11	0.16
South Asia	Asia	1.0	-0.02	-0.08	-0.02

Source: MIRAGE and authors' calculations

Erreur ! Source du renvoi introuvable. shows how production in volume is affected by the

agreement with an agro-food, industry, and services split. It confirms the expectation that this

agreement will reinforce the production specialization of Latin American countries in agro-food sectors,

while Asian countries will raise their allocation of production in industry.

Table 2. **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
Agro-food	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

Trade liberalization leads to a reinforcement of the sectors with comparative advantages in each region—agriculture in Latin America and manufacturing activities in Asia. The increase in real value added is substantial in the case of agro-food in Brazil (Rice: 119 percent, Beverages and Tobacco: 25.7 percent, and Sugar: 23.5 percent), Argentina (Rice: 21.8 percent, Vegetal oils: 18.6 percent, and Oilseeds: 16.9 percent), and Rest of Mercosur (Oilseeds: 47.9 percent and Sugar: 19.1 percent). It is noteworthy that the decline of industrial production is significant in Brazil, Argentina, Chile, and Andean countries. This suggests that this type of reform may entail some political costs. 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). In Korea, increase in production is seen in the agriculture sectors, mainly vegetal oil and other cereals.

When we exclude developed Asian countries from the agreement, the results are similar but, due to reduced trade creation, the increase in real income is lower for Argentina, Brazil, and Rest of Mercosur since they do not benefit from improved access to Japan and South Korea. Some larger Asian economies, such as ASEAN and China, benefit from the fact that developed countries are not part of the agreement; they gain increased access to Latin American markets without having to compete with Japan and South Korea. Exports to all Latin American markets increase by more than 50 percent for both China and ASEAN, compared with increases lower than 2 percent, or even decreases in exports, when Japan and Korea are part of the agreement.

In **Erreur ! Source du renvoi introuvable.**, we see that, when excluding Japan and South Korea, the pattern of specialization is the same but is less intense than when these two countries are part of the agreement (compare figures for Argentina, Brazil, and Rest of MERCOSUR in **Erreur ! Source du renvoi introuvable.** and **Erreur ! Source du renvoi introuvable.**). In the case of Rest of Mercosur (Paraguay and Uruguay), the impact on industrial production is now positive, so the political cost would

not be lower. Excluding them from the agreement annuls any production effect on Japan and South Korea and has no differentiated impact on production specialization for the rest of Asian countries, which still increase their industrial production.

Table 3.   Impact of Free Trade between Latin American countries and Asian countries (Japan and South Korea excluded) – Production in volume - % Scenario/baseline - 2020

	Argentina	Brazil	Rest of MERCOSUR	Andean countries	Central America	China	ASEAN	India	Japan	South Asia
Agro-food	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

Unskilled real wages in Latin American countries, especially in the agricultural sector, increase as a result of the expansion of agro-food sectors, as shown in Table 4. The increase is again particularly important for Rest of Mercosur countries and Chile and when developed Asian countries are part of the agreement. For most Asian countries, on the other hand, unskilled wages in the agricultural sector fall as a consequence of the specialization in industrial sectors. Given that poverty in Latin America is more concentrated in rural areas (according to ECLAC estimates, 52.2 percent of the rural population in 2008 was poor versus 27.6 percent of the urban population), an increase in wages for the agricultural sector may contribute to a reduction of poverty in the continent as a whole. Rural poverty is also higher in most Asian countries (World Development Indicator–World Bank, 2010); thus the specialization in manufacturing and the consequent fall in agricultural wages do not contribute to a reduction of poverty in Asia.

**Table 4.   Impact of Free Trade between Latin American countries and Asian countries– Wages -
% Scenario/baseline - 2020**

Region	Region	FTA including Japan and Korea			FTA excluding Japan and Korea		
		Skilled real wages	Unskilled real wages	Unskilled real wages in agriculture	Skilled real wages	Unskilled real wages	Unskilled real wages in agriculture
Andean Comm.	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
Korea	Asia	0.3	0.3	-0.2	0.0	0.0	-0.0
Rest of Asia	Asia	-0.0	-0.0	-0.4	-0.0	-0.0	-0.2
South Asia	Asia	0.0	0.0	-0.2	0.0	0.0	-0.2

Source: MIRAGE and authors' calculations

Erreur ! Source du renvoi introuvable. and **Erreur ! Source du renvoi introuvable.** show how

the impact on welfare and trade varies when we introduce modifications in the model—changing the

tariff aggregator (CTA), changing the FDI modeling framework (CTA+FDI), and modeling Bilateral Trade

Agreements between both regions (CTA+FDI+BIT). As with any trade policy assessment, the results

presented in the previous section (TTA) are sensitive to the tariff aggregator considered. When we

introduce the consistent tariff aggregator described in Section 2.2, gains for most countries from the FTA are higher, except in certain cases such as Chile and, to a lower extent, Rest of Mercosur, which originally present a more homogenous protection structure. As previously discussed, the average tariff tends to be higher when we apply the consistent tariff aggregator compared with when we apply the traditional trade-weighted average, especially when the original tariff structure presents high variance. For this latter reason, Brazil and Central America have higher gains from liberalization with the new tariff aggregator, while Chile and Rest of Mercosur have lower gains from liberalization and suffer from stronger preference erosion mechanisms. Among Asian countries, Korea reports higher welfare gains with the new tariff aggregator, also associated with an initially more disperse tariff structure. The higher average tariff among the countries participating in the agreements explains the higher increase in bilateral trade flows when we change the tariff aggregator in the model (see **Erreur ! Source du renvoi introuvable.**).

Table 5.   Impact of Free Trade between Latin American countries and Asian countries– Welfare - % Scenario/baseline - 2020

Region	Region	TTA	CTA	CTA + FDI	CTA + FDI + BIT
Asia		**0.05**	**0.05**	**0.05**	**0.06**
Latin America		**0.20**	**0.51**	**0.52**	**0.68**
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 & 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
Korea	Asia	0.16	0.33	0.33	0.34
Rest of Asia	Asia	-0.02	-0.20	-0.20	-0.19
South Asia	Asia	-0.03	-0.05	-0.05	-0.04
Andean Community	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

Source: MIRAGE results (various specifications) and authors' calculation

Note: 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+ BITs

Figure 2   Impact of Free Trade between Latin American countries and Asian countries (with and without developing countries) – Bilateral trade flows (in value at FOB prices)- 2020
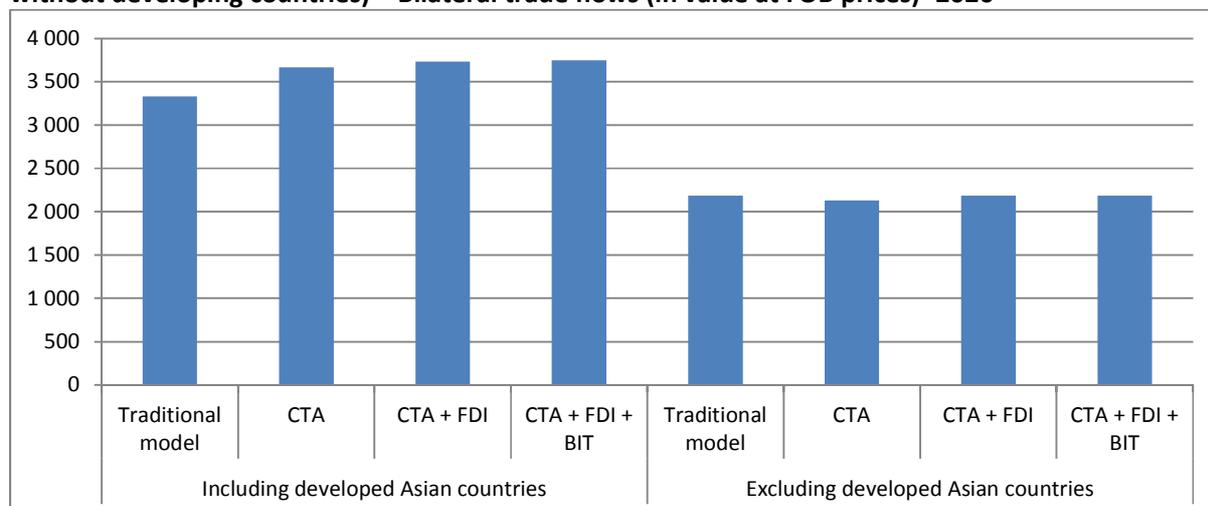
Source: MIRAGE and authors' calculation

Trade flows increase more when we also modify the FDI framework within the model; however, this change is not significant, whereas the impact on real income and especially on GDP is stronger, especially for those regions that become FDI captors. Gains under this framework are mostly associated with increases in investment and production and, to a much lesser extent, with changes in trade flows.

The positive impact on welfare in most countries/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 in the agreement implies additional welfare gains for the participants. Andean countries, for example, experience welfare increases instead of losses, and the same happens for Japan. Welfare still declines for Venezuela, although to a lesser extent. 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 the two regions, bilateral trade costs fall and trade rises. However, when BITs are implemented, service sector exports from Asian countries (especially developed Asian economies) to Latin America in fall.

Trade rises in those sectors that already expanded as a consequence of the trade agreement. However, there are some exceptions. In the case of Rest of Mercosur, for example, primary exports increase when BITs are introduced, whereas they fall in the rest of the simulation scenarios.

Latin American countries benefit from an increase in FDI inflows under the new FDI modeling framework. Again, except for Central America, all regions in Latin America increase GDP when foreign investment is introduced in the model, and even more when the FTA includes BITs. Brazil, Argentina, Rest of Mercosur, Andean countries, and Venezuela become FDI inflow captors; in all these economies, inward FDI increases by more than 1 percent (in the case of Rest of Mercosur, the increase is almost 7 percent). When we also introduce BITs in the model, the increase in FDI inflows in those countries is boosted, reaching 20 percent in the case of Rest of Mercosur (see **Erreur ! Source du renvoi introuvable.**). In absolute terms, though, the biggest economies in Latin America (Brazil, Andean countries, and Argentina) are the "winners" in capturing new investment inflows, which is in line with what has been found in empirical studies (Bittencourt, Domingo, and Reig 2006).[4] It is worth mentioning the case of Venezuela, which gains from an increase in FDI inflows but also increases FDI outflows as a result of an FTA with BIT with all Asian economies. These results are obtained when developed Asian countries are included in the agreements, as they become the main FDI outflow providers. The situation changes radically when those countries are excluded. In this case, even though bigger Latin American economies still capture FDI inflows, the increase is now much lower.

BITs increase FDI inflows for the participants of the agreement, especially for Latin American countries and even for those countries with previous BITs with Asian economies (such as Argentina or Chile). For those countries without previous BITs with Japan and Korea (such as Brazil, Andean countries, and Rest of Mercosur), these two countries become the main FDI inflows providers, whereas in the case of Argentina and Chile, inflows come mainly from Hong Kong and Singapore.

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

At the same time, Latin America loses investments from Europe and NAFTA. With more investments coming from "preferred" partners, the rate of return of capital in Latin American countries goes down (see **Erreur ! Source du renvoi introuvable.**); these markets become less attractive to third-party investors (creating a crowding-out effect on 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 developed Asian countries) increase FDI outflows, especially when BITs are included in the agreement. However, while there is investment creation, there is also a redirection of FDI and some regions lose their position as recipients of Asian FDI, such as ASEAN, European Union, and NAFTA, therefore reducing real income.

Figure 3 **Impact of Free Trade between Latin American countries and Asian countries– FDI flows - % Scenario/baseline – 2020**
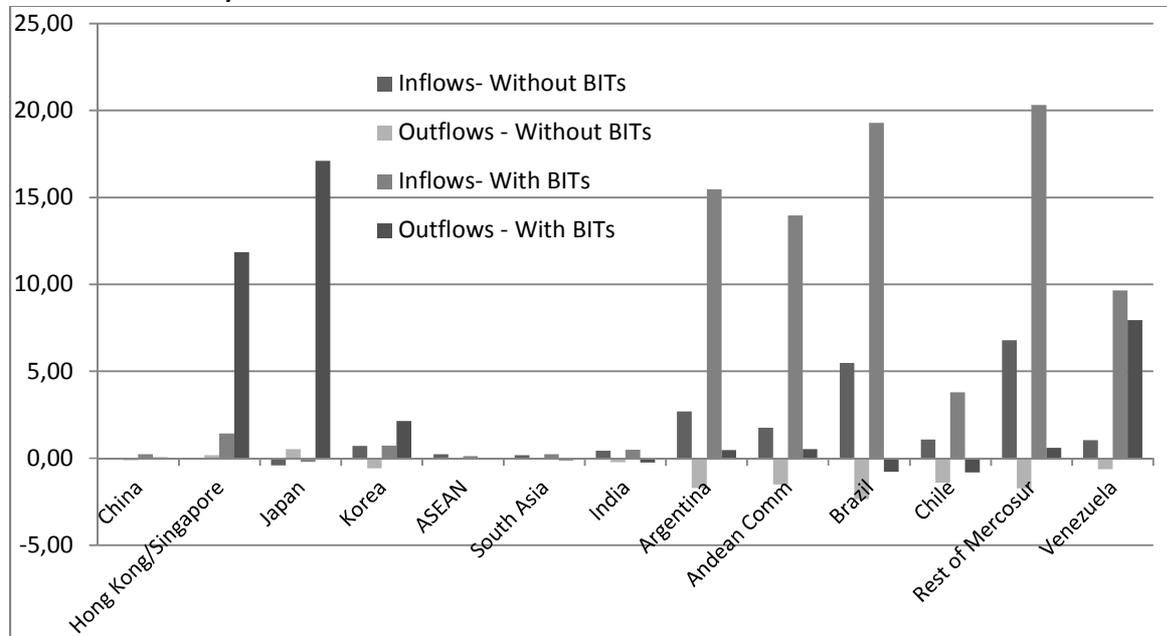
Source: MIRAGE and authors' calculations

Figure 4   Impact of Free Trade between Latin American countries and Asian countries– Real returns to capital - % Scenario/baseline - 2020
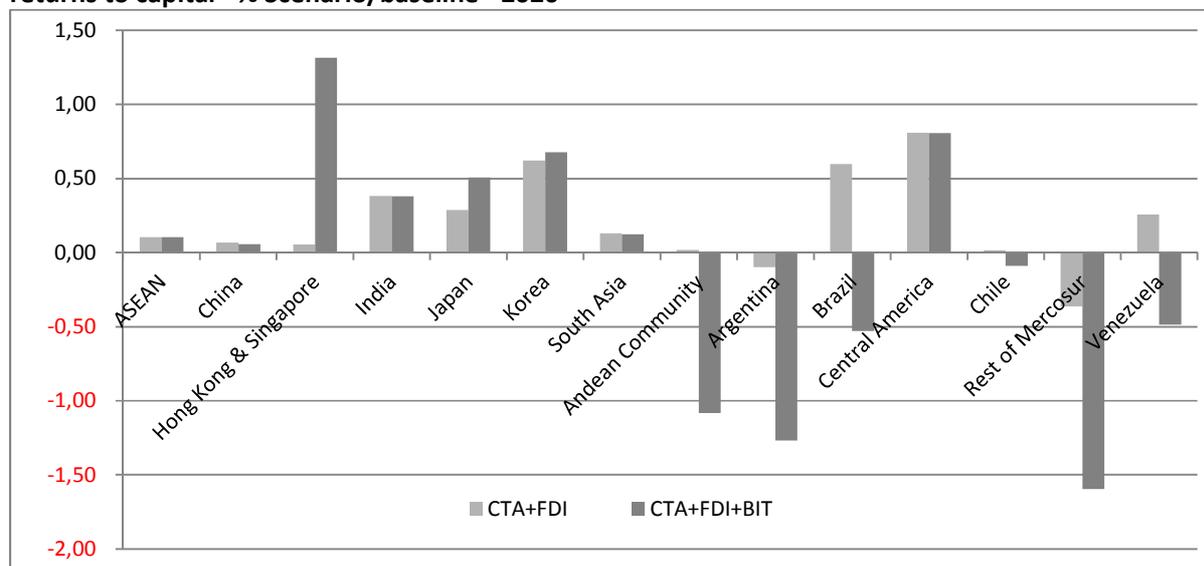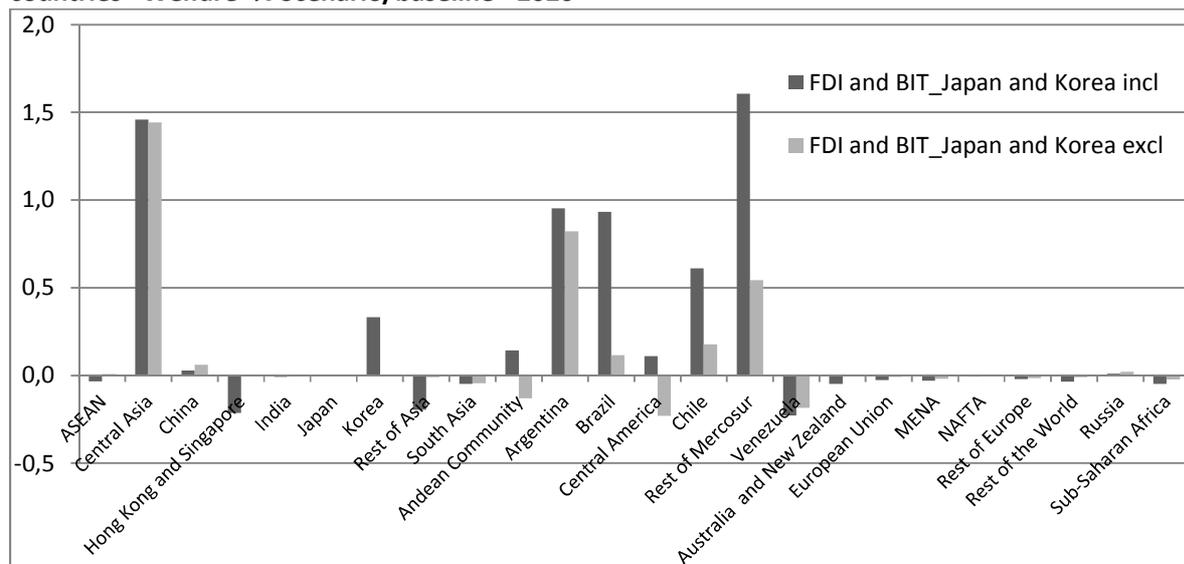

Source: MIRAGE and authors' calculations

When Japan and South Korea are excluded from the agreement, welfare gains are smaller for most Latin American countries, and there are welfare losses for Central America and Venezuela. Bilateral trade flows increase much less under this scenario (for any bilateral trade flow model specification discussed, see Figure 2), while FDI inflows to Latin America increase to a much lesser extent, as the main investment flows comes from Japan and Korea (**Erreur ! Source du renvoi introuvable.**). In this context, introducing BITs in 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 have welfare increases, while Rest of Asia has a lower welfare loss. These gains are associated with increased FDI inflows into those economies, partly because Japan and Korea, since they no longer have agreements with Latin America, can increase investment into the rest of Asia. Developing Asian countries also increase their exports when developed countries are not part of the agreement. India increases exports of vegetal oils and oilseed to Korea, while China increases rice and meat exports to Japan.

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

Figure 5   Impact of Free Trade between Latin American countries and developing Asian countries– Welfare- % Scenario/baseline - 2020

Source: MIRAGE and authors' calculations

Figure 6 Impact of Free Trade between Latin American countries and developing Asian countries– FDI flows (no BITs)- % Scenario/baseline - 2020
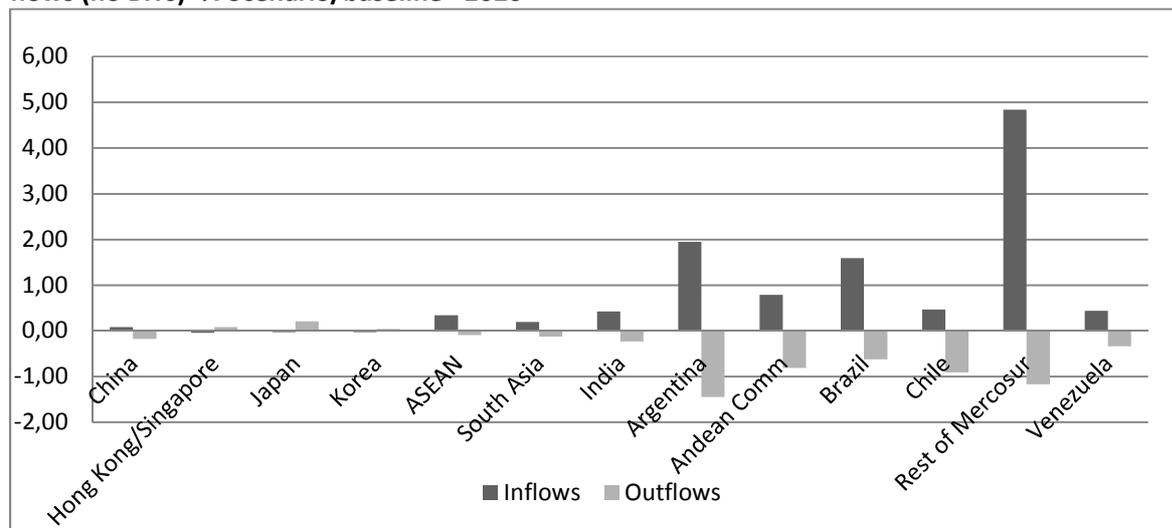
Source: MIRAGE and authors' calculations

4 Concluding remarks

In this paper, we study the opportunities for trade and investment that a free trade area between Latin American and Asian countries could imply. Such an agreement is particularly interesting because Latin America is specialized in agro-food products, which it predominantly exports, while Asian agricultural markets are protected. Similarly, Asia already intensively exports industrial products, while industrial protection in Latin America is still significant. Thus, a free trade agreement between both regions could lead to trade creation. South-South agreements, like the one that Asia and Latin American regions could be engaged in, are still uncommon, although there have been some examples in the last few years. Thus, analyzing the potential impact of this type of agreement becomes a relevant exercise which has not been done previously.

Our results, obtained through different and improved versions of the MIRAGE model of the world economy, show that the implementation of a free trade agreement between Asia and Latin America brings benefits for almost all countries directly concerned. Gains are especially high for Latin American countries, which substantially increase their exports of agricultural commodities and food. The agreement leads to a reinforced pattern of specialization, with Latin America producing agro-food products and Asian countries specialized in industry. If developed Asian countries (namely, Japan and South Korea) are not included in the free trade area, the gains for Latin American countries are reduced. However, developing Asian countries benefit more from the agreement if Japan and Korea do not participate, as they gain increased access to Latin American markets.

We should keep in mind that in these scenarios, we are not including sensitive products; therefore we are considering the maximum potential gains from an agreement between Asia and Latin

America. In reality, we might expect lower gains because Latin American exports increase in traditionally sensitive sectors for Asian countries (rice, dairies, soya, and sugar) and vice versa (textiles and wearing apparel), these sectors facing a high probability of only partial liberalization.

We also simulated a free trade agreement that also includes a bilateral trade agreement between both regions, as most recent South-South agreements incorporate such an agreement. The new generation of agreements has a positive effect on Latin America countries, where welfare increases as a consequence of trade creation and also as a consequence of higher FDI flows. These results hold when developed Asian countries are part of the agreement. If Japan and South Korea do not participate in the agreement, gains are much smaller, although still positive for most Latin American countries. However, developing Asian economies do not benefit from additional gains when the agreement also includes BITs except when Japan and Korea are not part of the agreement. In this latter case, developing Asian countries gain from increased FDI inflows, partly because Japan and Korea, since they no longer have agreements with Latin America, can increase investment in the rest of Asia. These results suggest that improving the modeling framework to introduce FDI and BITs is extremely important, especially when analyzing the effects of trade agreements that go beyond liberalization of trade in goods and services. Our results also show that with a consistent tariff aggregator, we obtain a more pronounced impact of FTA on trade flows due to increased initial tariff levels in most countries participating in the agreement.

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