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Is MERCOSUR's External Agenda Pro-Poor?

An Assessment of the European Union-MERCOSUR Free-Trade Agreement on Poverty in Uruguay Applying MIRAGE

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ABSTRACT

In 2010, after several years of being stalled, negotiations between MERCOSUR (the Common Market of the Southern Cone) and the European Union (EU) to build a free-trade agreement (FTA) were resumed. This FTA is expected to have an important impact on MERCOSUR economies, especially if both blocs reach an agreement regarding the agricultural sector. This paper analyzes the impact of an FTA between MERCOSUR and EU, with a special focus on distributional impacts on Uruguay. For this we apply an improved version of MIRAGE (Modeling International Relationships in Applied General Equilibrium) with household heterogeneity. The representative agent in the standard version of the MIRAGE model is decomposed into a private and a public agent for all regions, and into a high number of households for Uruguay. Results show that a trade agreement between MERCOSUR and EU would have a significant impact on trade flows between both blocs. MERCOSUR economies would increase agriculture exports to EU and industrial imports from EU. Welfare increases in all countries participating in the agreement but is more pronounced for the two small countries of MERCOSUR: Paraguay and Uruguay. In Uruguay, welfare increases for different categories of households, but the richest households benefit the most. In spite of this, inequality decreases as a consequence of the agreement, and poverty rates decrease throughout the country.

Keywords: CGE modeling, trade negotiations, sensitive products, poverty, MERCOSUR

1. INTRODUCTION

In 2010, after several years of being stalled, negotiations between the Common Market of the Southern Cone (MERCOSUR) and the European Union (EU)[1] to build a free-trade agreement (FTA) were resumed. According to official sources, there is optimism that this time negotiations will conclude in the medium term. This FTA is expected to have an important impact on the economies of MERCOSUR countries, especially if both blocs reach an agreement regarding the agricultural sector. For Uruguay, one of the small MERCOSUR economies with strong comparative advantages in agrofood products, the conclusion of this agreement is expected to have an important impact on the economy, as an FTA with the EU may increase the access of agricultural exports to the European market. At the same time, industrial imports from Europe may increase, as manufacturing imports represent the highest share of current imports from Europe. As production sectors receive differentiated impacts, we may also expect important distributional effects as a consequence of the agreement.

Negotiations between the EU and MERCOSUR are almost as old as MERCOSUR itself. In 1995, the year MERCOSUR officially started to operate, both trade blocs signed the EU–MERCOSUR Framework Cooperation Agreement, which entered into force in 1999. Negotiations started in 2000, but in 2004, after 13 meetings of the Biregional Negotiations Committee and an exchange of offers, they were suspended due to lack of agreement. The main discrepancies were in the agricultural-sector liberalization. MERCOSUR countries were not satisfied with the treatment of tariff quotas offered by the EU (affecting 20 percent of agriculture tariff lines) regarding the volume of the quotas, the in- and out-of-quota tariffs, and the administration of the quotas. The EU, on its side, was not satisfied with MERCOSUR's offer on liberalization on services and government procurement (Kutas 2006).

After the suspension of negotiations, both regions kept dialogue, but negotiations did not move further, as actors were expectant about the evolution of negotiations within the Doha Round. The outcomes of the Doha Round would determine the offers made by the EU to MERCOSUR, especially regarding the agricultural sector (Veiga and Rios 2007). However, it does not seem that the Doha Round will conclude in the short run, so negotiations between MERCOSUR and EU were relaunched in March 2010, during the Madrid Summit. Negotiations seek to reach an "Association Agreement" in three areas: political dialogue, cooperation, and trade.

In this paper, we analyze the latter of the pillars of the agreement, assessing the trade and macroeconomic impacts of an FTA between MERCOSUR and EU for all countries participating in the agreement, and extending the analysis to poverty and income distribution in Uruguay. To do so, we apply an extension of the MIRAGE (Modeling International Relationships in Applied General Equilibrium) model of the world economy that introduces household heterogeneity (MIRAGE-HH). Computable general equilibrium (CGE) models, especially multicountry models such as MIRAGE, are adequate for this type of analysis because they evaluate both direct and indirect impact of trade policies on the participating economies. Previous assessments of a trade agreement between the EU and MERCOSUR that apply CGE models (Monteagudo and Watanuki 2002; Bouët et al. 2003; Laens and Terra 2006; Laborde and Ramos 2008) usually include only one representative agent and lack an analysis on income and welfare at a disaggregated level.

In this paper we overcome this limitation by applying a new version of MIRAGE that splits the original representative private agent into a public agent and a private agent for all countries or regions in the model, and disaggregates the representative private agent for specific countries into a diverse number of households. This allows us to model in a consistent way the behavior of households within the model and to compute how welfare for each household, measured as equivalent variation, is affected as a consequence of the trade agreement. To our knowledge, this version of the model, developed and fully

1 In this paper, we will consider the four foundational member countries of MERCOSUR: Argentina, Brazil, Paraguay, and Uruguay. Venezuela's entry to the Customs Union was ratified recently, on 31 July 2012. The country will adopt MERCOSUR's Common External Tariff and other regulations after a transition period. For the EU, we consider the 27 current member countries.

documented in Bouët, Estrades, and Laborde (2010, 2012), is the first multicountry CGE model with household disaggregation.

This paper constitutes the first effort to work with a high number of representative households within MIRAGE-HH, as well as to link MIRAGE-HH with microsimulations to account for changes in poverty and income distribution. We disaggregate the representative private agent from MIRAGE-HH into 411 households for one country, Uruguay, using microdata from a national household survey. After obtaining results from MIRAGE, we carry out microsimulations following the approach suggested by Agénor, Chen, and Grimm (2003). Microdata used in microsimulations are the same used to disaggregate households within MIRAGE, such that full reconciliation between the micro and macro models is guaranteed.

To our knowledge, no previous assessments exist on poverty and income distribution of an FTA between MERCOSUR and EU. This exercise allows us to analyze how the potential gains of the FTA are distributed among the MERCOSUR members. As has been pointed out with MERCOSUR, gains from a trade agreement might be distributed differently among members, and the main differences might arise in the size of the economies, with Argentina and Brazil on one side (large economies) and Paraguay and Uruguay on the other side (small economies). We will also explore how the gains for one country, Uruguay, are distributed among its population, so as to identify potential winners and losers from the agreement and to understand the different reactions of the households. Because the household disaggregation is done within the model, the reactions of households to the shock are completely captured in the model.

In the next section we present the recent evolution of trade flows and protection levels between both blocs. Then, in Section 3 we briefly describe the MIRAGE structure and the changes introduced in the specification applied in this paper. Section 4 presents the results of a trade agreement between MERCOSUR and EU on trade, macroeconomic indicators, and household welfare; and Section 5 concludes.

2. TRADE AND PROTECTION BETWEEN THE EUROPEAN UNION AND MERCOSUR

MERCOSUR (the Common Market of the Southern Cone) and the European Union (EU) show remarkable differences in terms of economic size, population, and development. These differences can also be noticed among MERCOSUR countries.[2] In this section we present briefly these differences and we analyze the trends in trade and protection between both blocs.

Economic Characteristics of MERCOSUR and EU

Table 2.1 shows strong differences in size (both of the economies and of the populations) among MERCOSUR countries and also between MERCOSUR and the EU. The smaller MERCOSUR countries, Paraguay and Uruguay, account for only 4 percent of total population and 2.4 percent of total gross domestic product (GDP) of MERCOSUR. However, in terms of GDP per capita, the small countries differ: Uruguay has the highest GDP per capita and lowest poverty rates among MERCOSUR countries, while Paraguay has the highest poverty rates. In terms of income distribution, Brazil is the most unequal and Uruguay is the most equal. The asymmetry between both trade blocs is also high: the EU doubles MERCOSUR in population and has a GDP eight times higher than MERCOSUR's.

Table 2.1—GDP, population, poverty, and inequality indicators of MERCOSUR and EU, 2009

	Argentina	Brazil	Paraguay	Uruguay	EU
GDP (million 2012 US$)	307,082	1,594,490	14,240	31,322	16,346,608
Population (million people)	40.1	193.2	6.3	3.3	500.7
GDP per capita (2012 US$)	7,658	8,253	2,260	9,492	32,648
Gini coefficient[a]	0.4584	0.5390	0.5195	0.4242	0.304
Poverty headcount (% of total population)[b]	13.2	21.4	35.1	20.9	16.3

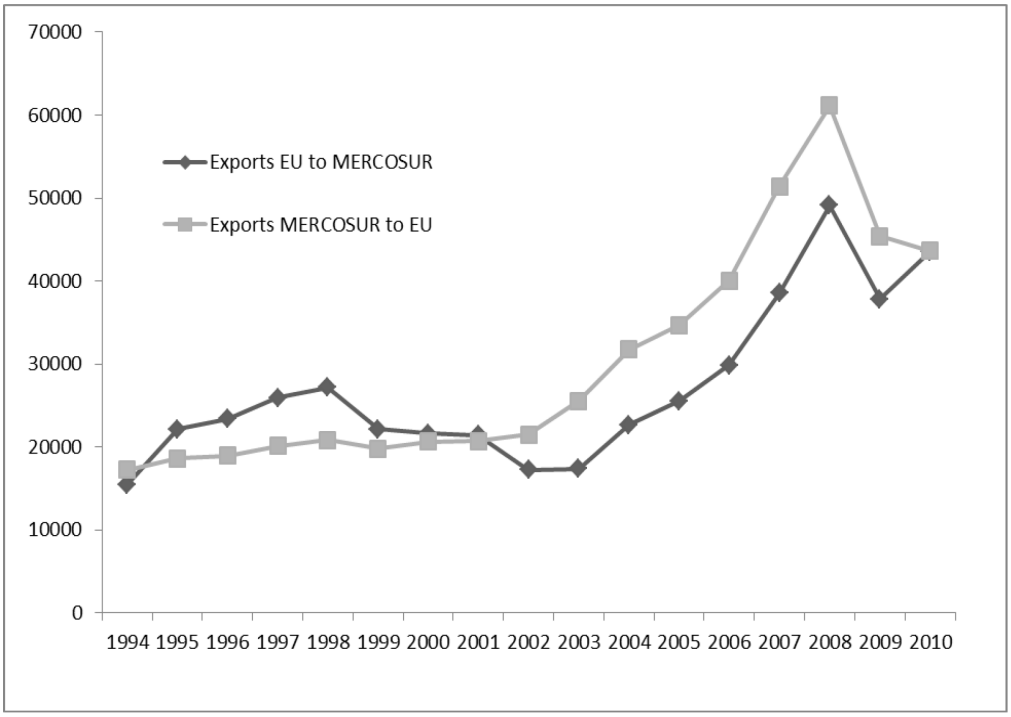
Source: World Bank (2012)
Notes: [a]. For Paraguay, year 2008. For EU, source Eurostat (2012)
[b]. For Argentina, percentage of urban population. For EU, source Eurostat (2012)

Trends in Trade Flows

The value of trade between MERCOSUR and the EU has shown an increasing trend in the last 20 years, as shown in Figure 2.1. Exports from EU to MERCOSUR increased between 1990 and 1998, fell after the devaluations of domestic currencies in Brazil (1999) and Argentina (2002), and increased again sharply between 2003 and 2008, partly due to the increase in international commodities prices. Following the global trend, the 2008 financial crisis had a negative impact on trade flows between both regions in 2009. Exports from MERCOSUR to EU, on the other hand, showed a slight increasing trend during the 1990s and show the same sharp increase as EU exports in the 2000s. In the last decade, exports from MERCOSUR to EU have been larger in value than those from EU to MERCOSUR.

[2] Within the EU, countries also have strong differences. However, for simplification purposes, we will consider the EU as a homogenous bloc.

Figure 2.1—Evolution of trade between MERCOSUR and EU, 1994–2010, in million 2012 US$

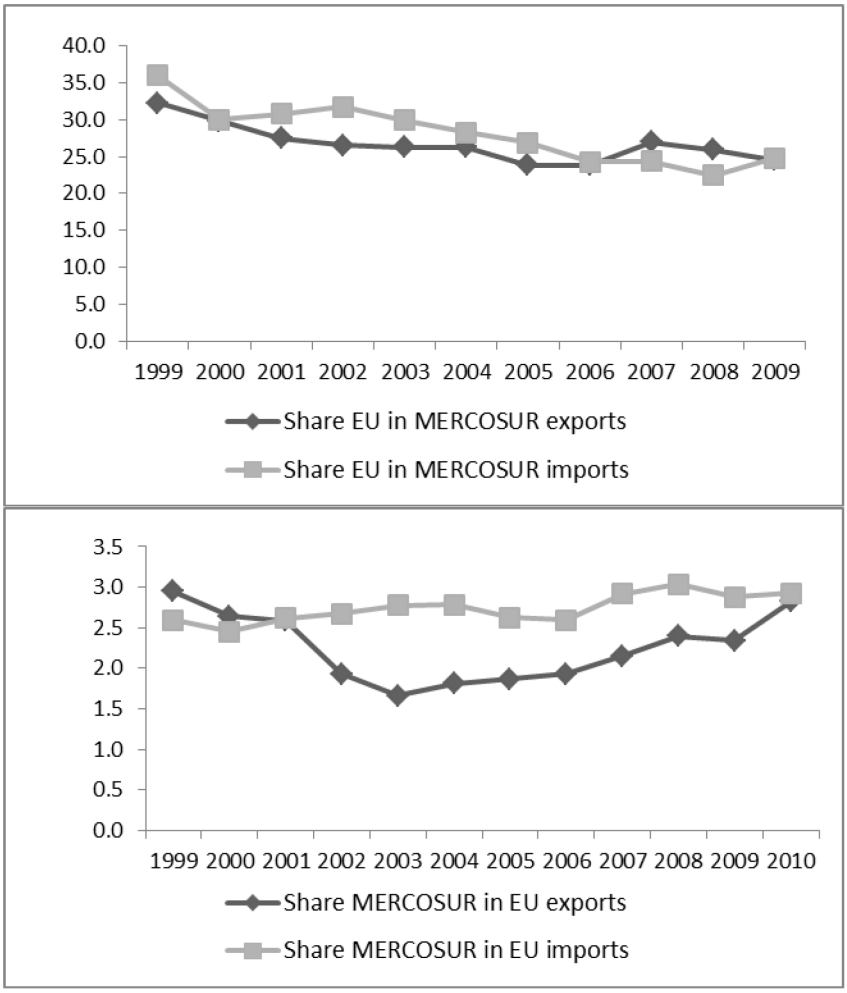


Source: UN Comtrade (2012).

The importance of each bloc in total trade of the other bloc is highly asymmetrical (Figure 2.2). While EU represents an important share of MERCOSUR exports and imports (around 25 percent in 2009), MERCOSUR represents only 3 percent of European exports and imports, considering extra European trade. However, export biratios for both regions are greater than the unit, which reflects the fact that MERCOSUR is not a neglectful partner for the EU.[3] The importance of the EU in MERCOSUR trade has declined over time: in 1999, the EU represented 35 percent of MERCOSUR's total exports and 32 percent of its imports. On the other hand, since 2003 MERCOSUR has increased its importance as a trading partner of the EU, especially as an origin of EU imports, and it is the most important partner of the EU in Latin America.

[3] Exports biratios are calculated according to the formula $BRi,j \frac{X_{i,j}/X_{i,.}}{X_{.,j}/X_{.,.}}$, where Xi,j represents exports from region i to region j and the dot reflects a sum (meaning X.,. represents world exports). For 2009, BRMerc,EU = 0.21 / 0.13 = 1.6 and BREU,Merc = 0.03 / 0.02 = 1.6.

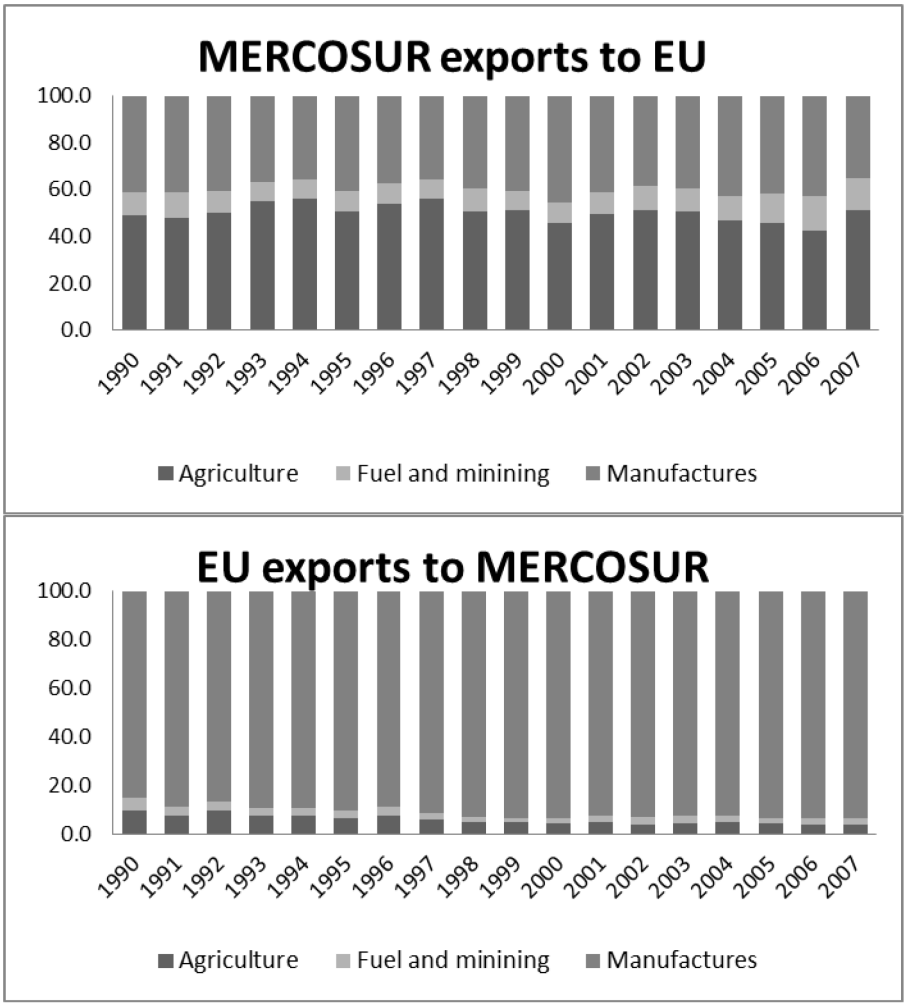
Figure 2.2—Importance of each bloc in other bloc trade, 1999–2009, in percentage



Source: Author's calculation based on data from Eurostat (2012) and Centre for the International Economy (2012).

The composition of MERCOSUR exports to the EU has remained similar over time, as Figure 2.3 shows. The share of agriculture in total exports to the EU shows some fluctuations along the two decades, from 56.3 percent in 1997 to 45.7 percent in 2000, mostly at the expense of industrial exports; but these changes can be attributed to variations in world prices of agricultural products. In contrast, the composition of exports from EU to MERCOSUR varies over time. Agricultural exports have lost importance in the last decade, going from 10 percent in 1990 to 4 percent in 2007.

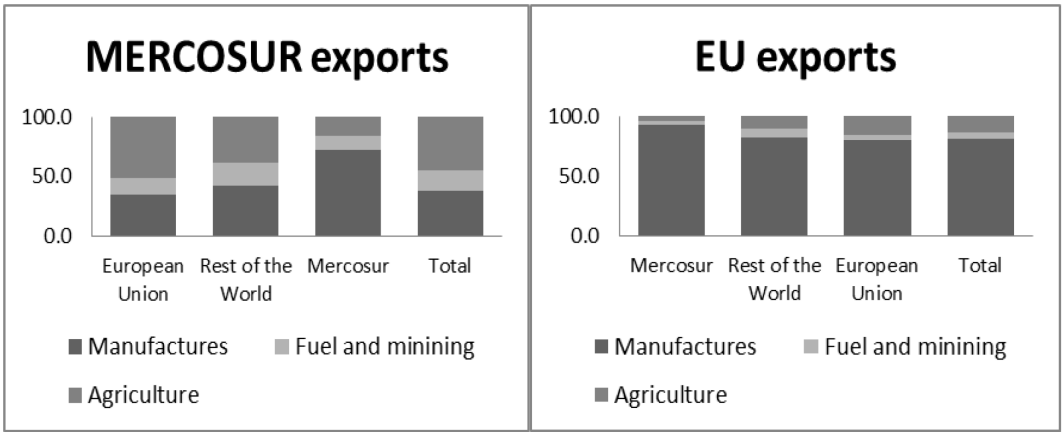
Figure 2.3—Evolution of composition of exports between both blocs



Source: Author's elaboration with data from Gaulier and Zignago (2010).

The composition of exports from MERCOSUR to EU does not follow the same pattern as total MERCOSUR exports. As Figure 2.4 shows, while half of MERCOSUR exports to the EU are agricultural products, these products represent 38 percent of total exports. Both manufacturing and mining products are underrepresented in exports to the EU. In the opposite case, European exports to MERCOSUR also show a distinctive pattern: manufacturing exports are overrepresented. These exports constitute 80 percent of total European exports, but they reach 94 percent of exports to MERCOSUR and almost dominate exports to the region.

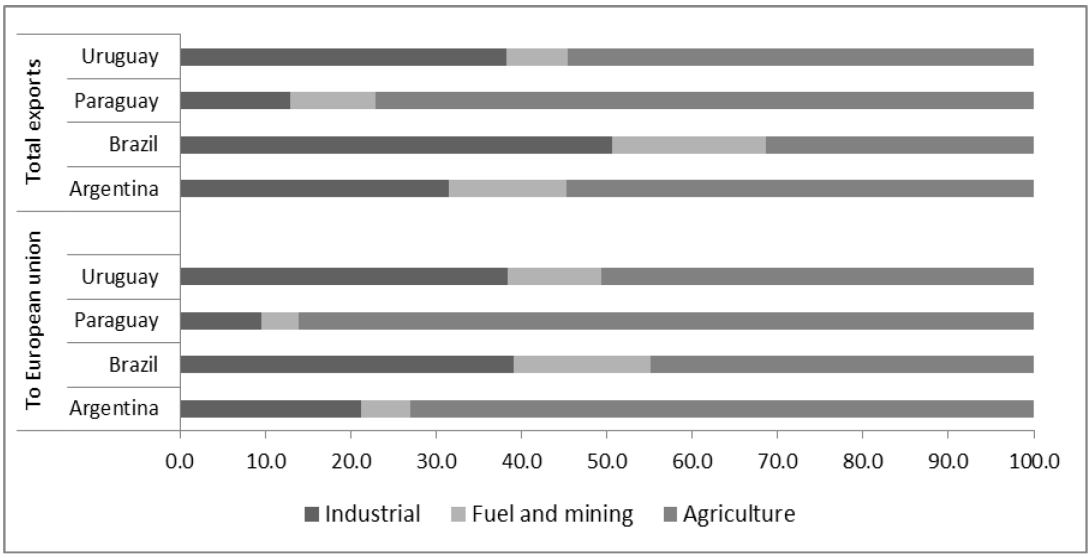
Figure 2.4—Composition of exports: Intraregional, to the other bloc, to the rest of the world, and total, 2007



Source: Author's own elaboration with data from Gaulier and Zignago (2010).

These four MERCOSUR countries present clear differences in terms of trade composition with the EU (see Figure 2.5).[4] Brazil is the country with the highest share of manufacturing exports to EU (almost 40 percent), while Paraguay has the highest share of agricultural exports (86 percent). Comparing the composition of total exports of the four countries with that of exports to the EU, we find some differences. Uruguay is the only country for which the share of agricultural exports to the EU is smaller than its share of agricultural exports to the world. This may be explained by the protection that this country's agricultural exports face in the EU, which we will analyze in the next subsection.

Figure 2.5—Share of agricultural products, fuel, and manufactures in total exports by MERCOSUR country, 2007



Source: Author's own elaboration with data from Gaulier and Zignago (2010).

[4] This section takes data from the BACI (Base pour l'Analyse du Commerce International, Centre d'Études Prospectives et d'Informations Internationales) database. Figures from the Global Trade Analysis Project (GTAP) database, used to calibrate the model, are very similar.

Trade in commercial services between both blocs has been gaining importance in the last few years. In 2009, bilateral trade in commercial services represented 20 percent of total bilateral trade flows in goods and services. Currently, 2.6 percent of total EU commercial services (not considering intra-EU trade) is destined to MERCOSUR, mainly to Brazil (72 percent) and Argentina (20 percent). These two countries also are the main providers of exports of services to EU. In this paper we will not analyze the impact of liberalization in services, although we acknowledge that it may be an important source of economic gains for both blocs.

Protection

The average level of protection (taking into account tariffs and tariff-rate quotas) that the two regions applied on each other's exports is highly similar: 12.6 percent by the EU and 12.4 percent by MERCOSUR. However, behind these average figures are different trade policy strategies applied by both regions. We first analyze the protection that EU exports face in MERCOSUR, and then we present the trade policy of the EU.

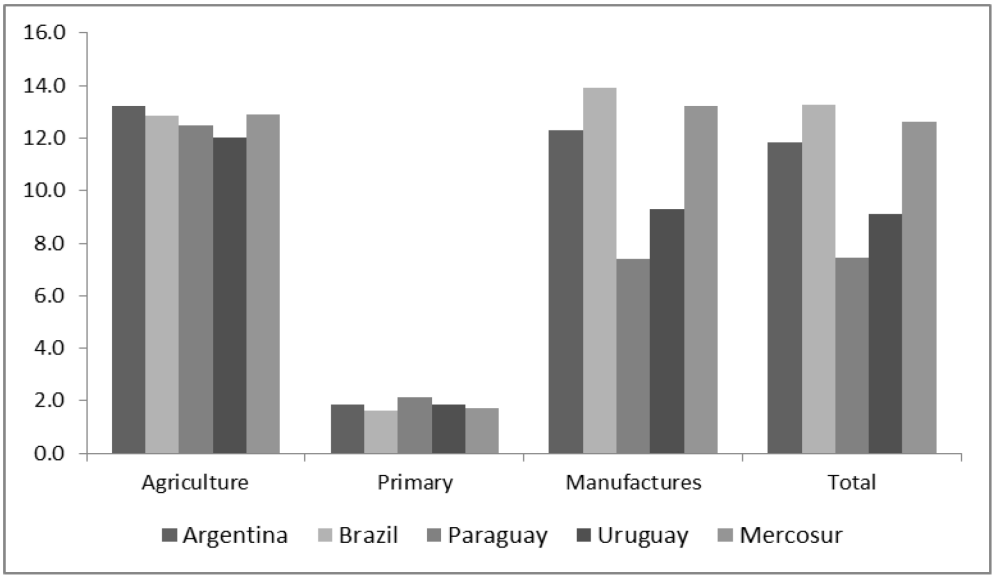
Protection Applied by MERCOSUR Countries

MERCOSUR countries apply a common external tariff (CET) that covers around 85 percent of total tariff lines. Special regimes on capital goods and on computing and telecommunications goods allow the countries to establish different rates for these goods. Small countries (Uruguay and Paraguay) usually apply tariffs that are lower than the CET for these goods, while big countries (especially Brazil) apply higher tariffs. Besides these regimes, these four MERCOSUR countries are also granted exemptions to the CET.[5]

As Figure 2.6 shows, the average protection applied to EU exports in agricultural goods is very similar among MERCOSUR countries; however, EU manufacturing exports face different protection levels depending on the destination country within MERCOSUR, as exemptions to CET concentrate on this sector. On average, Brazil has the highest protection levels on manufacturing products, followed by Argentina. In both cases this is mainly driven by the high level of tariffs applied to imports of motor vehicles, and also footwear in the case of Brazil. Primary goods face on average the lowest tariffs.

[5] Decision 56/10 of MERCOSUR establishes a maximum of 100 tariff lines up to 2015 exempted from CET to Argentina and Brazil, 649 tariffs lines up to 2019 for Paraguay, and 225 tariff lines up to 2017 for Uruguay. Exemptions in this case usually imply tariffs that are lower than the CET and are concentrated in organic chemicals and iron and steel (Argentina); organic chemicals, pharmaceutical products, and dairy products (Brazil); organic chemicals, iron and steel, and electronic equipment (Paraguay); and plastics, iron and steel, and organic chemicals (Uruguay). Tariffs that are higher than the CET are applied in animal and vegetable fats and oils, milling products, edible vegetables, and gums and resins (Argentina); edible vegetables, wines, rubber, electronic equipment, and cotton (Brazil); live plants (Paraguay); and animal and vegetable fats and oils, and vegetables and fruits (Uruguay).

Figure 2.6—Protection applied by MERCOSUR countries to EU exports, 2007, in percentage

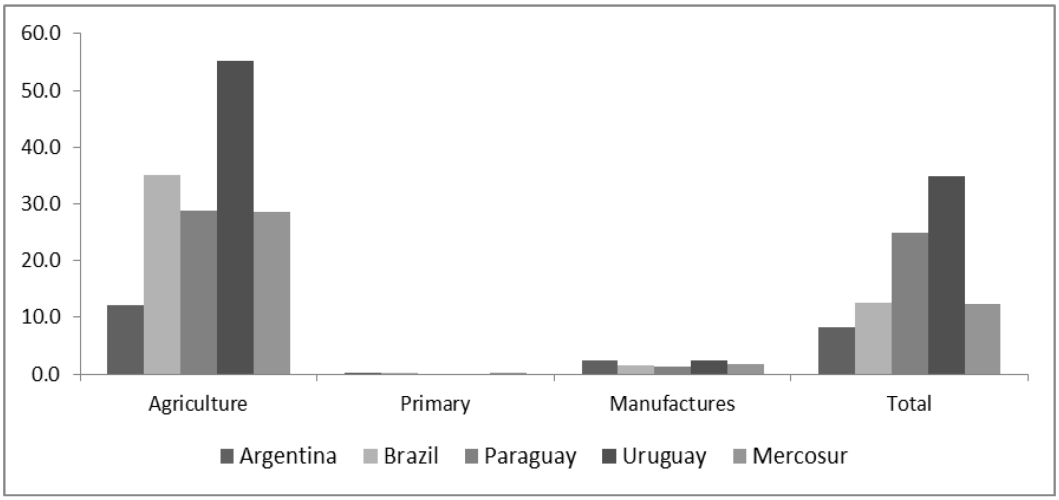


Source: Author's own elaboration with data from Laborde (2012) using applied tariffs and reference group weights.

Protection Applied by European Union

Protection faced by MERCOSUR exports in the EU presents a completely different picture (see Figure 2.7). First, different MERCOSUR countries face different protection levels. Uruguay exports face on average the highest level of protection in the EU, followed by Paraguay. The higher level of tariffs is explained by protection in agricultural sectors, where the EU also applies tariff-rate quotas (TRQs).[6] For some of the products that Uruguay exports more, such as rice, the EU not only grants smaller quotas but also applies a higher out-of-quota tariff. Argentina and Brazil benefit more from tariff quotas in sectors such as meats, vegetables, and dairy products (Laborde and Ramos 2008). The expansion of tariff quotas has been among the controversial issues in trade negotiations between MERCOSUR and EU in the past.

Figure 2.7—Protection applied by EU to MERCOSUR exports by country, 2007, in percentage

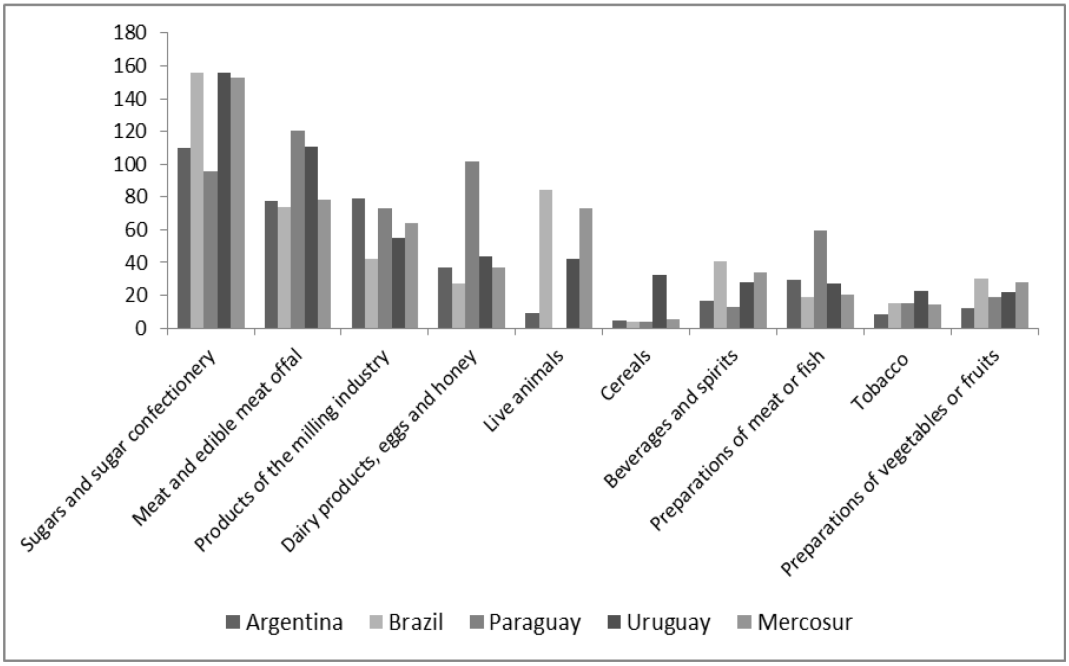


Source: Author's own elaboration with data from Laborde (2012) using applied tariffs and reference group weights.

[6] The TRAD database includes ad valorem equivalents of TRQs. See Laborde (2012) for an explanation of its treatment.

Second, protection differs significantly according to sectors. Protection applied to the manufacturing sector is very low, and to the primary sector is practically zero. The bulk of protection in the EU is concentrated in the agricultural sector, mainly for sugar, meat, dairy products, and cereals. As Figure 2.8 shows, for some products (sugars, meat, and dairy products) protection can be higher than 100 percent.

Figure 2.8—Protection applied by EU to MERCOSUR exports: Ten highest protected products (2-digit Harmonized System; average MERCOSUR), 2007, in percentage



Source: Author's own elaboration with data from Laborde (2012) using applied tariffs and reference group weights.

To sum up, protection levels applied by each bloc to the other bloc's exports are highly asymmetrical, especially considering protection by sector. Protection faced by MERCOSUR agricultural exports to the EU is particularly high. The protection pattern is consistent with the comparative advantages of each bloc: agricultural goods in MERCOSUR and industrial products in EU. Next, we present the methodology applied in this paper to evaluate the trade, economic, and poverty impacts of removing these trade barriers.

3. METHODOLOGY

This section presents the methodology applied in this paper to evaluate a free-trade agreement (FTA) between MERCOSUR (Southern Cone Common Market) and the European Union (EU). We apply the MIRAGE (Modeling International Relationships in Applied General Equilibrium) model of the world economy, a multisector, multiregion computable general equilibrium model devoted to trade policy analysis. We work with an extension of MIRAGE that introduces household heterogeneity (MIRAGE-HH), as developed in Bouët, Estrades, and Laborde (2010, 2012). This paper constitutes a first effort to work with a high number of representative households within MIRAGE-HH, as well as to link it with microsimulations. This is done to evaluate the effects on poverty and income distribution for one of MERCOSUR's smaller countries, Uruguay.

MIRAGE Model

Overview of MIRAGE Model

A detailed technical description of the standard version of MIRAGE is available on the MIRAGE wiki web page.[7] The model assumes perfect competition across all sectors.[8] On the production side, value added and intermediate goods are complementary under a Leontief hypothesis. The intermediate inputs function is an aggregate constant elasticity of substitution (CES) function of all goods: it means that substitutability exists between two intermediate goods, depending on the relative prices of these goods. This substitutability is constant and at the same level for any pair of intermediate goods. Similarly, value added is obtained through a nested CES function that combines unskilled labor, land, natural resources, and a bundle of skilled labor and capital at the upper level, and skilled labor and capital at the lower level. This nesting implies less substitutability between capital and skilled labor than between these two and other factors. In other words, when the relative price of unskilled labor increases, this factor is replaced by a combination of capital and skilled labor, which are complementary.[9]

Factor endowments are fully employed. The only factor whose supply is constant is natural resources. Capital supply is modified during each period because of depreciation and investment. Growth rates of labor supply are fixed exogenously. Land supply is endogenous; it depends on the real returns to land.

Skilled labor is the only factor that is perfectly mobile. Installed capital and natural resources are sector specific. New capital is allocated among sectors according to an investment function. Unskilled labor is imperfectly mobile between agricultural and nonagricultural sectors according to a constant elasticity of transformation (CET) function: remuneration of unskilled labor in agricultural activities is different from that in nonagricultural activities. This factor is distributed between agricultural and nonagricultural sectors according to the ratio of remunerations. Land is also imperfectly mobile in the agricultural sector.

We assume full employment of labor; more precisely, all countries have a constant aggregate employment (wage flexibility). This assumption could underestimate the benefits of trade liberalization for developing countries (in this paper's case, MERCOSUR countries): in full-employment models, increased demand for labor (from increased activity and exports) leads to higher real wages, such that the origin of comparative advantage is progressively eroded; whereas in models with unemployment, real wages are constant and exports increase much more.

[7] http://www.mirage-model.eu/miragewiki/index.php/Main_Page.

[8] There is a version of MIRAGE with imperfect competition, usually in the manufacturing sector. However, this version requires detailed information on economies of scale, markups, and number of firms in each sector under imperfect competition, so we chose to work with perfect competition.

[9] Substitution elasticity between unskilled labor, land, natural resources, and the bundle of capital and skilled labor is 1.1 for all sectors except agriculture and mining, where it is equal to 0.2, whereas it is only 0.6 between capital and skilled labor.

Capital in a given region, whatever its origin, domestic or foreign, is assumed to be obtained by combining intermediate inputs according to a specific combination. The capital good is the same regardless of the sector. In this version of MIRAGE, we assume that all sectors operate under perfect competition, there is no fixed cost, and price equals marginal cost.

In the external sector, real exchange rate is endogenous and adjusts to keep the ratio of current account balance to gross domestic product (GDP) fixed.

Household Heterogeneity in MIRAGE

In this paper, we work with a new version of MIRAGE that introduces household heterogeneity. This section presents the main changes of this new version, which are described in more detail in Bouët, Estrades, and Laborde (2012).

In the traditional version of MIRAGE, the demand side is modeled in each region through a representative agent with an intratemporal utility function. This agent presents a constant propensity to save and uses the remaining income to purchase final consumption of goods following a LES-CES (Linear Expenditure System – Constant Elasticity of Substitution) function. In this new version, we first split the representative agent in a public and a private agent for all regions in the model. In a second step, we split the private agent in different households for only some countries. In this paper, Uruguay is the only country with household disaggregation.

The public agent receives income from taxation. It can spend more (public deficit) or less (public surplus) than tax receipts, but this difference remains constant in proportion to the country's GDP.[10]

To keep tax receipts constant as a result of liberalization and avoid a crowding-out effect on private investment, we introduce a consumption tax that affects all households equally.[11] Consumption of the public agent is modeled through Cobb-Douglas preferences, implying that the share of public consumption of sector *i* in total public expenditures is constant in value. A consumption tax is imposed on public expenses, which is the same as for private consumption.

The private agent receives income from production activities and public transfers, and pays income taxes, defined by a constant tax rate over income from production activities, and consumption taxes. Public transfers to households are constant in proportion to a country's GDP. For Uruguay, with household disaggregation, we also include intrahousehold transfers within the country. Private transfers are modeled following the model of pure altruism developed by Lucas and Stark (1985), which implies that an interhousehold private transfer varies positively with the donor's after-tax pre-remittance income and negatively with the recipient's after-tax pre-remittance income.[12]

Preferences of the private agent, as in previous versions of MIRAGE, are represented through a LES-CES function. These preferences define private final demand for each good. This implies that consumption has a nonunitary income elasticity; when the consumer's income is increased by x percent, the consumption of each good is not systematically raised by x percent, other things being equal. The sector subutility function used in MIRAGE is a nesting of four CES-Armington functions that define the origin of the goods. In this study, Armington elasticities are from the Global Trade Analysis Project (GTAP) 7 database and are assumed to be the same across regions.

The savings rate for the private agent is constant over time. When the private agent is disaggregated in several households, savings rates are different among households. This assumption leads to changes in the gross national savings rate, as household revenue may react differently to the trade policy shocks. Because poorer households have usually lower savings rates, a pro-poor shock might

[10] This assumption, together with the assumption that public transfers to households remain constant in terms of GDP, is realistic related to Uruguay, the focus of our study. In Appendix A, we test how results change when we assume public deficit and public transfers as constant in real terms and nominal terms, respectively.

[11] Robustness of results to this assumption is also presented in Appendix A. We test sensitivity of the results to changes in the type of tax implemented: consumption tax, income tax, and no tax.

[12] See Bouët, Estrades, and Laborde (2012) for a more detailed presentation of this point.

decrease national savings in relative terms. Total final consumption is the sum of public consumption and private consumption for each good.

Microaccounting Approach for Poverty Analysis

The disaggregation of households in MIRAGE, especially the high disaggregation applied in this paper, allows us to enrich the analysis of welfare at the household level. However, it still presents some limitations in measuring effects on poverty and income distribution. To do this, we apply a microaccounting approach for Uruguay, as presented in Löfgren, Robinson, and El-Said (2002) and Agénor, Chen, and Grimm (2003). It is a top-down microsimulation approach, in that it takes results from the macro model, in this case MIRAGE, into microdata from a national household survey. In the microaccounting approach, each household in the survey is linked to a representative household in the model. This is straightforward in our approach because we use the household survey to disaggregate households in MIRAGE in the first place, so macro and micro modules are fully reconciled.

After households are matched between the macro and the micro modules, and after computing the shock in the CGE model, we feed the household survey with the results obtained in the macro model. First, changes in prices are taken into account to update poverty lines.[13] In this case, we take the changes in consumer price index. Second, we take variation of income by sources. By doing this, we account for intragroup income variation.[14] With the new income after the shock, we compute poverty and income distribution indicators. In this paper we chose to compute Foster-Greer-Thorbecke (FGT) poverty headcount index and poverty gap and Gini and Theil coefficients.[15] Except for the Gini coefficient, all indicators are decomposable (World Bank 2005), so we compute the indicators for different demographic groups. Specifically, we present results by sex of household head and geographic location.

This approach still has some caveats, for example, not taking into account dynamics in the model. This can be solved at a later stage through reweighting techniques, as proposed in Agénor, Chen, and Grimm (2003).[16]

Data

The main source of data for the MIRAGE model is the GTAP 7 database,[17] which provides an exhaustive picture of the world economy for the year 2004 (see Narayanan and Walmsley 2008). We aggregated the data into 19 countries or regions of the world, specifically identifying the 4 MERCOSUR countries and the EU (27), and into 30 sectors, as presented in Table 3.1 and Table 3.2. The disaggregation of regions seeks to identify the main trade partners of MERCOSUR besides the EU, such as China, the United States, Chile, and Andean countries. We also consider important partners of the EU: European Free Trade Association (EFTA) and developed Asian countries (Japan, Hong Kong, South Korea, and Singapore). As for sectors, agricultural and food products—the main export products of MERCOSUR countries—are highly disaggregated, and the main industrial import goods for the region are identified.

[13] The National Statistics Institute for Uruguay, the official statistics office of the country, defines two poverty lines, one for Montevideo and one for the rest of the country. We take these values from www.ine.gub.uy.

[14] As Lofgren et al. (2002) present, we could take average income per representative household, and in this case we would assume a constant distribution of income within groups.

[15] This procedure follows the methodology applied by official sources to calculate poverty indicators in Uruguay.

[16] Reweighting techniques are used to modify the samples in the microdata in order to reflect changes in the population structure, such as an increase of population in urban areas, or in the economic structure, such as an increase of skilled workers. Not using reweighting techniques in this study is actually consistent with the model; in this stage we are not considering these types of changes. Population growth is assumed equal for all households in the model.

[17] www.gtap.org.

Table 3.1—Countries and regions considered in the model

Argentina	ARG	Rest of Latin America and Caribbean	XLAC
Brazil	BRA	EFTA	EFTA
Paraguay	PRY	China	CHN
Uruguay	URY	Developed Asian countries	Dvp_AS
European Union (27)	EU27	Rest of Asia	XAS
United States	USA	Australia and New Zealand	ANZCERTA
Mexico	MEX	Commonwealth of Independent States	CIS
Chile	CHL	Middle East and North Africa	MENA
Venezuela	VEN	Sub-Saharan Africa	SSA
Andean countries	ANDC	Rest of the World	ROW

Source: Author's own elaboration.

Table 3.2—Sectors included in the model

Rice	Agrofood	Textiles	Industry
Cereals	Agrofood	Leather products	Industry
Vegetable and fruits	Agrofood	Wood and paper	Industry
Other seeds	Agrofood	Chemicals, plastics, rubber	Industry
Sugar	Agrofood	Manufactures	Industry
Other crops	Agrofood	Motor vehicles	Industry
Cattle meat	Agrofood	Transport equipment	Industry
Other meat	Agrofood	Electronic equipment	Industry
Dairy products	Agrofood	Machinery and equipment	Industry
Other agriculture products	Agrofood	Electricity and gas distribution	Services
Vegetable oils	Agrofood	Other services	Services
Other food	Agrofood	Construction	Services
Beverage and tobacco	Agrofood	Private services	Services
Primary	Primary	Transport services	Services
Crude oil and gas	Primary		
Minerals	Primary		

Source: Author's own elaboration.

Household disaggregation in Uruguay was made through a clustering procedure (hierarchical analysis), taking into account three variables: income per capita of the household (in logarithm), consumption structure (share of each GTAP product in total consumption), and income structure (share of capital, labor, self-employed labor, and transfers in total income of the household).[18] As the clustering procedure seeks to minimize the variance within clusters and maximize the variance between clusters, the choice of these variables guarantees that households grouped in clusters have similar income and consumption structure and also similar levels of income per capita. Using this technique, we identified 411 representative households in Uruguay. Table 3.3 shows how income variation within groups is

[18] A more detailed explanation of data treatment is found in Bouët, Estrades, and Laborde (2012).

minimized: for all generalized entropy indexes presented, the income distribution is explained mainly by between-group dispersion and very little by within-group dispersion of income.[19] The household data used for Uruguay is the 2005/2006 Income and Expenditure Survey carried out by the National Statistics Office.

Table 3.3—Decomposition of generalized entropy (GE) indexes of income distribution, Uruguay

	GE(0)	GE(1)	GE(2)
Within groups	0.0001	0.0000	0.0000
Between groups	0.3737	0.3855	0.6745
Total population	0.3738	0.3855	0.6745

Source: Author's own elaboration with data from National Statistics Institute (2007).

Table 3.4 presents information on these households gathered into three categories: poor, vulnerable, and nonpoor. Poor households are 24.1 percent of total population. In this group we also include the extremely poor households, which represent 1.8 percent of the population. We define *vulnerable households* as those for which average income is above the poverty line, but with values very close to it (up to 30 percent higher). These households represent 38.6 percent of the population. Nonpoor households represent 37.2 percent of the population.

Table 3.4—Characteristics of households in Uruguay, 2006

	Poor	Vulnerable	Nonpoor	Total population
Percentage in total population	24.1	38.6	37.2	100.0
Sociodemographic characteristics (in %)				
Children presence	45.0	24.6	15.6	29.0
Female-headed households	66.1	65.2	57.8	62.6
Urban households	84.0	80.7	86.9	83.8
Households located in Montevideo	18.2	27.7	57.9	36.6
Consumption structure (in %)				
Share of food in total consumption	25.5	19.9	13.1	16.2
Share of services in total consumption	56.3	64.2	72.9	68.9
Sources of income (in %)				
Capital	29.7	29.2	37.2	34.3
Skilled labor	4.3	7.7	24.3	17.7
Unskilled labor	41.1	44.8	23.3	31.0
Land	0.4	1.0	1.6	1.3
Total transfers	24.5	17.4	13.6	15.7
Net private transfers	6.5	0.7	–1.4	0.0

Source: Author's own elaboration with data from National Statistics Institute (2007) and model data at benchmark.

[19] GE(α) are the generalized entropy indexes, defined by the following formula:

$$GE(\propto) = \frac{1}{N\propto(1-\propto)}\sum_{i=1}^{N}\left[\left(\frac{y_i}{\bar{y}}\right)^{\propto} - 1\right]$$

where N is the population, y_i is the income of individual i, and α is the income difference sensitivity parameter (the higher the value, the more sensitive the index to income differences at the top of the distribution). When there is perfect "diverse" data (i.e., perfect distribution), GE(α) = 0. GE(1) is known as Theil index.

We can find distinct characteristics for these three categories. Poor households have on average more children and have a higher probability of being female headed. Even though all household groups live mostly in urban areas, nonpoor households are more concentrated in the country's capital city, Montevideo. The consumption pattern is highly distinctive as well, as poor households spend a higher share of their income on food and a lower share on services. Also highly distinctive is income structure by sources: the main sources of income for poor households are transfers and unskilled labor wages, while richer households get income to a greater extent from skilled labor, capital, and land. Poor and vulnerable households are net receivers of transfers from nonpoor households. For poor households, private transfers represent a relatively high proportion of their total income: 6.5 percent.

Baseline and Simulations

In the baseline we include a pre-experiment, in which we compute some changes of the world economy from 2004 (year of GTAP database) to 2009, such as the end of the Multifiber Agreement and the expansion of the EU to 27 member countries. The reference baseline is calculated up to 2020 and includes exogenous population growth and economic growth. We consider as part of MERCOSUR only the four foundational member countries Argentina, Brazil, Paraguay, and Uruguay. We do not include Venezuela as part of MERCOSUR, because even when the country's entrance has been ratified, the country still has to go through a transition period in order to incorporate MERCOSUR's regulations.

We simulate four different scenarios of bilateral liberalization (complete elimination of tariffs) among the two blocs between 2011 and 2015.[20] One scenario is a complete liberalization of trade between MERCOSUR and EU (entitled FTA). The other three scenarios include sensitive products: sensitive products in both regions (SENS1), sensitive products only for MERCOSUR countries (SENS2), and sensitive products for EU (SENS3). The list of sensitive products for the EU follows the offer made by the bloc to MERCOSUR in 2004, and the list for MERCOSUR follows the methodology proposed by Jean, Laborde, and Martin (2010). In this last scenario, the choice of sensitive products depends on the initial level of tariffs, the share of the product in bilateral imports, and the suggested tariff cut. EU's sensitive products cover 55 tariff lines for which the bloc offered an increase in quotas; these are concentrated in meat (44 percent of sensitive lines), dairy products (24 percent), and cereals (10 percent). MERCOSUR's sensitive products, on the other hand, consist of 25 tariff lines and are concentrated in motor vehicles and parts, beverages and tobacco, and other food products.[21] In the scenarios with sensitive products, we assume that tariffs for those products remain unchanged. This is an extreme assumption. In reality, in the EU we might expect an increase in tariff quotas for those products. However, as our specification of the model does not include rent allocation of quotas, we do not explicitly simulate tariff quota expansions. This is not a big caveat of our study because we do not focus in depth on trade effects but on the distributional effects of a trade agreement. Effects of the scenario with sensitive products can be interpreted as a lower bound for an agreement with tariff quota expansions.

We leave out of our study other issues of an agreement between MERCOSUR and EU, such as liberalization of services or export tax removal. Both issues are of interest to the EU and might have important effects on MERCOSUR economies, where the service sector accounts for more than 60 percent of value added and 18 percent of total trade in goods and services.[22] Export tax removal would be particularly important if our focus was on Argentina, but our focus is on Uruguay, which applies export tax rates on few products (meat and meat products, hides and wool, with taxes no higher than 1.6 percent); therefore this issue is not very relevant. In spite of these limitations, our simulations provide interesting insights about the potential gains of an agreement between MERCOSUR and EU, as we present next.

[20] In Appendix A we test results when the liberalization time is longer.

[21] The full list of sensitive products for each region is detailed in Appendix B.

[22] Paraguay presents lower figures than the average for MERCOSUR: services represent 57 percent of value added and 11 percent of trade in goods and services. For the rest of the MERCOSUR countries, services have a similar weight in value added and trade. Figures are for 2010 and are taken from World Bank (2012).

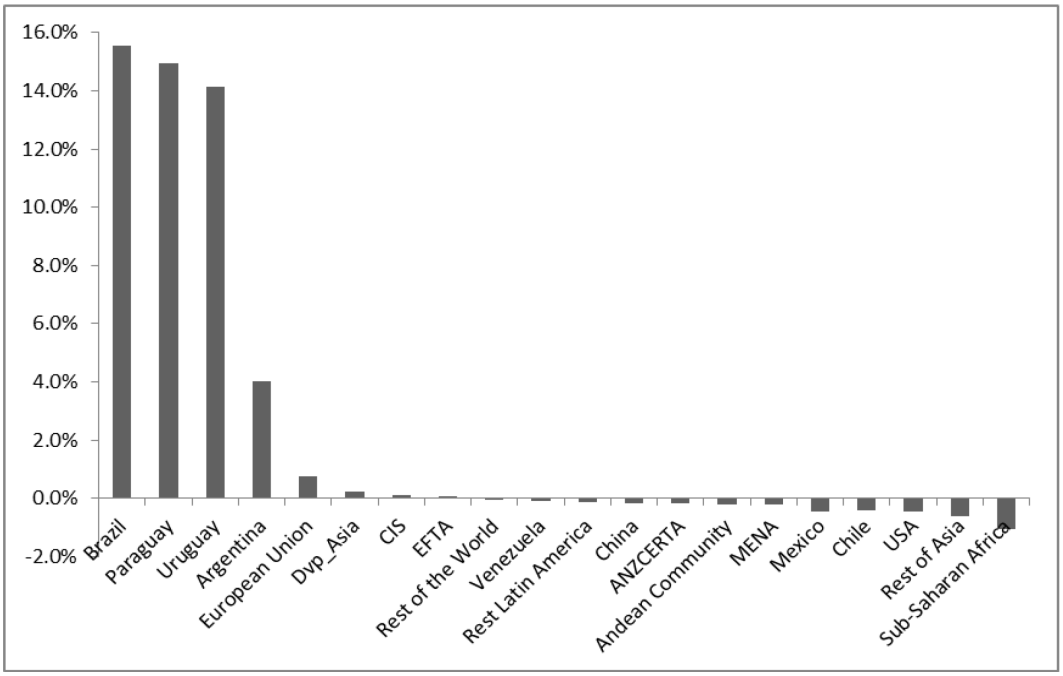
4. RESULTS

In this section we present the main results from the simulation scenarios presented above. All results are presented for the year 2020 and are expressed as percentage change of the values in the simulation with respect to the values in the same year at the baseline. We first present results on trade flows, then on macroeconomic variables, and finally on labor market and welfare. Finally we focus on the impact on poverty and income distribution that a free-trade agreement (FTA) with the European Union (EU) might have on one of the small countries of MERCOSUR (the Common Market of the Southern Cone), Uruguay.

Trade

Full trade liberalization between MERCOSUR and the EU brings about an increase in exports for the countries participating in the agreement. In relative terms, Brazil, Paraguay, and Uruguay are the countries that benefit most: exports in value for those countries increase 15.5 percent, 14.9 percent, and 14.1 percent, respectively, followed by Argentina (4 percent). Argentina benefits less because it faces initially lower protection levels in the EU, as shown in Figure 4.1. In current (2012) monetary terms, this represents a total increase in MERCOSUR exports of US$38.7 billion.[23] EU exports increase slightly in relative terms (0.7 percent) but significantly in absolute terms: $44.4 billion. As might be expected, exports fall for those countries or regions with an important trade relation with MERCOSUR countries (Mexico, Chile, United States) or Europe (Sub-Saharan Africa, Rest of Asia).

Figure 4.1—Total exports in value: Percentage change of FTA scenario, 2020



Source: MIRAGE results.
Note: Dvp_Asia stands for Developed Asian countries; CIS for Commonwealth of Independent States; ANZCERTA for Australia and New Zealand; MENA for Middle East and North Africa.

[23] All dollar amounts are expressed in U.S. dollars.

Also as expected, MERCOSUR countries expand their exports of agriculture and food products, especially dairy products, cereals, meat, and rice, while the EU increases mainly industrial exports but also primary exports (Table 4.1). Thus, the pattern of trade between both regions, based on their respective comparative advantages, is reinforced.

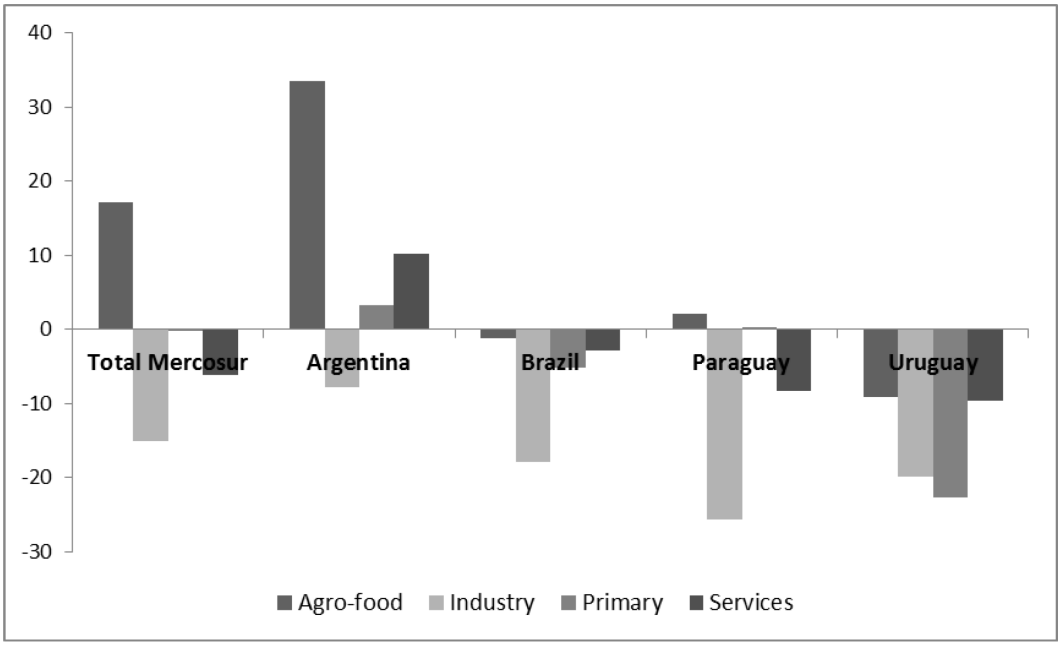
Table 4.1—Impact on total exports in value by sector: Percentage change of FTA scenario, 2020

	Argentina	Brazil	Paraguay	Uruguay	European Union
Agrofood	11.4	89.2	52.8	67.4	–3.2
Industry	–1.2	–9.3	–22.0	–21.7	1.4
Primary	–3.0	–6.3	–7.1	–24.3	0.5
Services	–0.7	–6.1	–12.0	–13.8	0.0

Source: MIRAGE results.

The agreement with the EU reduces trade flows among MERCOSUR countries (Figure 4.2). The reduction is particularly important for industrial goods, as are they are now imported from the European market. Uruguay is the country that reduces the most exports toward MERCOSUR partners. Industrial exports of this country, such as leather, textiles, and motor vehicles and parts, as well as service exports, are highly concentrated in the Argentinean and Brazilian market. Thus, the agreement leads to important adjustments in production by sectors in Uruguay, as shown in Table 4.2.[24]

Figure 4.2—Intra-MERCOSUR exports by sector in value: Percentage change of FTA scenario, 2020



Source: MIRAGE results.

[24] These results would suggest a reduction in trade diversion effects created by the creation of MERCOSUR (the Common Market of the Southern Cone), even though there is no consensus in the literature about the presence and magnitude of this effect within MERCOSUR (see Yeats 1998 and Nagarajan 1998 for a discussion).

Table 4.2—Impact on production in value by sector: Percentage change of FTA scenario, 2020

	Argentina	Brazil	Paraguay	Uruguay
Agrofood	5.6	28.4	18.6	25.0
Industry	–3.4	–9.9	–9.7	–19.7
Primary	–1.8	–8.0	0.0	–24.0
Services	0.2	0.0	–1.2	0.3

Source: MIRAGE results.

These results are significantly affected when sensitive products are included in negotiations. MERCOSUR exports to the EU increase in those sectors sensitive for the latter, and thus when sensitive products are included, exports still increase, but much less, as shown in Table 4.3. Considering only sensitive products for the EU (SENS3 scenario), we find that export flows are particularly affected in Uruguay and Paraguay, as exports in these countries are highly concentrated in sectors that are sensitive for the EU (meat, dairy, rice, sugar). On the other hand, the impact on European exports is small, but this is related to the slight relative increase in exports of this region in the first place. For small MERCOSUR countries, especially Uruguay, including sensitive products in MERCOSUR lists (SENS2) has practically no effect on their exports, as now export flows to big MERCOSUR countries are less affected.

Table 4.3—Impact on total exports in value: Percentage change of FTA and FTA with sensitive products scenarios, 2020

	FTA	SENS1	SENS2	SENS3
Argentina	4.0	2.5	3.6	2.9
Brazil	15.5	5.7	14.6	6.7
Paraguay	15.0	1.3	14.9	1.4
Uruguay	14.2	3.1	14.2	3.2
European Union	0.7	0.4	0.7	0.5

Source: MIRAGE results.

Import flows also increase between both blocs as a consequence of the trade agreement (Table 4.4). For the EU, agrofood imports increase significantly. MERCOSUR imports increase for all products, but the increase is higher in agrofood and manufacturing, especially for motor vehicles and machinery from EU. The inclusion of sensitive products in MERCOSUR lists significantly reduces import flows from the EU.

Table 4.4—Impact on total imports in value: FTA and FTA with sensitive products scenarios, percentage change 2020

	Argentina	Brazil	Paraguay	Uruguay	European Union
			Full Liberalization (FTA)		
Total	5.6	21.2	17.6	11.9	0.7
Agrofood	10.4	38.5	25.1	17.6	8.2
Industry	6.9	28.3	18.8	11.6	0.3
Primary	2.1	10.0	5.7	2.1	0.0
Services	0.5	6.7	17.0	16.7	0.0
			Agreement with Sensitive Products (SENS1)		
Total	3.5	7.8	1.5	2.6	0.4
Agrofood	11.3	8.9	1.1	5.2	1.3
Industry	4.4	13.3	2.2	3.4	0.4
Primary	–0.2	–0.6	–0.5	–0.4	0.0
Services	–0.9	–1.4	–1.9	–0.1	0.2

Source: MIRAGE results.

We should not forget that the existence of tariff-rate quotas (TRQs) by the EU imposes a restriction on the increase of exports from MERCOSUR to the bloc. Indeed Table 4.5 shows that the impact of an FTA on exports in volume would be significant, even when sensitive products are included. However, exports show a significant increase between 2004 and 2020 only as a consequence of economic and population growth. Given that exports from MERCOSUR to the EU are expected to increase sharply in sectors with TRQs in the baseline, such as meat, dairy, and cereals, the quotas are estimated to be initially binding and to remain binding even after the enlargement currently discussed in the negotiations. Therefore, the FTA scenario is clearly overestimating the gains of the negotiated agreements, and the scenarios with sensitive products are more realistic. Indeed, if the TRQs remain binding, no extensive effects (trade creation) will take place and we will only see rent shifting: from EU tariff revenue to TRQ rents. Then, the key issue is the TRQ rent allocation between agents and countries. This issue and its implications at the household level are beyond the scope of this paper.

Table 4.5—Total exports in volume, percentage change FTA and FTA with sensitive products scenarios, 2020

	Baseline Changes from 2004 to 2020	FTA	SENS1	SENS2	SENS3
Argentina	34.0	3.1	2.6	2.3	3.4
Brazil	42.6	11.1	6.0	9.7	7.3
Paraguay	47.4	6.4	1.7	6.1	2.0
Uruguay	31.2	4.3	3.0	4.1	3.2

Source: MIRAGE results.

Macroeconomic Impact

As a consequence of the agreement, terms of trade improve for MERCOSUR countries while for the European countries they deteriorate, although slightly (Table 4.6). Gains are particularly important to small MERCOSUR countries, which face higher protection levels at the benchmark. In the four MERCOSUR countries in this analysis, the real exchange rate appreciates as a consequence of the agreement, to compensate for the initially higher increase in exports than imports and keep the current account balanced. When sensitive products are included, the appreciation occurs only in Uruguay.

Table 4.6—Terms of trade and real exchange rate: Percentage change of FTA and FTA with sensitive products scenarios, 2020

	Real Exchange Rate				Terms of Trade			
	FTA	SENS1	SENS2	SENS3	FTA	SENS1	SENS2	SENS3
Argentina	–0.2	–0.2	0.1	–0.5	0.1	–0.1	0.3	–0.4
Brazil	2.7	–0.3	3.1	–0.7	3.2	–0.4	3.6	–0.8
Paraguay	5.2	–0.3	5.2	–0.3	6.0	–0.3	6.0	–0.4
Uruguay	5.9	0.1	6.0	0.0	7.5	0.1	7.7	0.0
EU (27)	–0.1	0.1	–0.2	0.2	–0.1	0.0	–0.1	0.1

Source: MIRAGE results.

Welfare gains are significant in all countries participating in the agreement, especially for small MERCOSUR countries (Table 4.7). When sensitive products are included, welfare increases only for Uruguay and falls for Paraguay.

Table 4.7—Impact on welfare: Percentage change of FTA and FTA with sensitive products scenarios, 2020

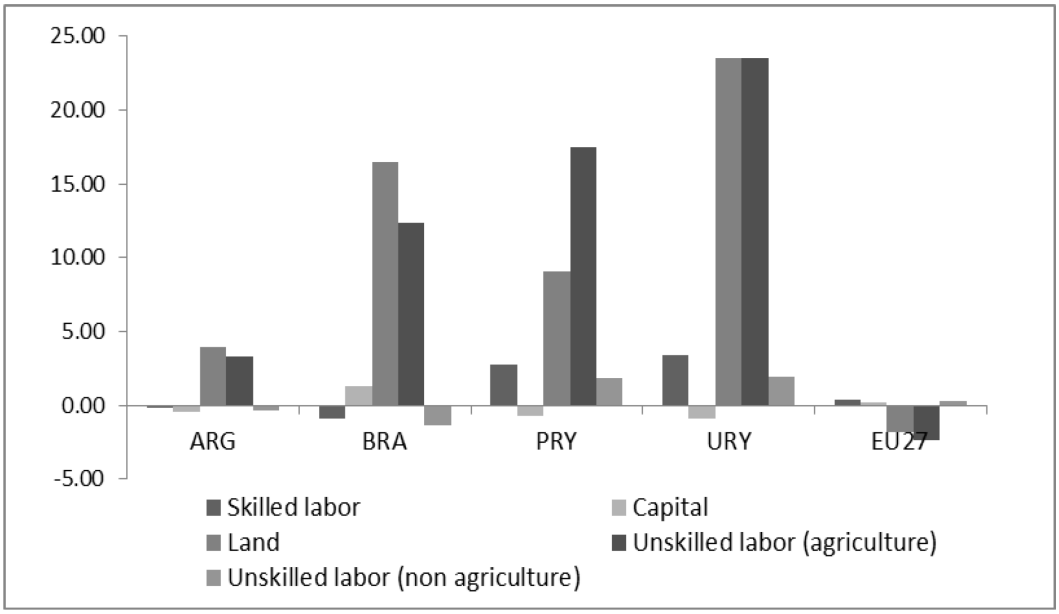
	FTA	SENS1	SENS2	SENS3
Argentina	0.3	0.0	0.4	0.0
Brazil	1.0	0.0	1.1	–0.1
Paraguay	6.5	–0.1	6.5	–0.1
Uruguay	4.5	0.3	4.5	0.3
European Union	0.2	0.1	0.2	0.1

Source: MIRAGE results.
Note: Welfare is computed as equivalent variation taking into account private consumption. For Uruguay, results are obtained when running the model with one household.

Returns to Factors

As the agreement leads to sectoral specialization, this has an impact on relative factor returns in the different countries. As shown in Figure 4.3, in MERCOSUR countries, returns to land and unskilled labor in the agricultural sector increase sharply, due to the expansion in agricultural production. We should keep in mind that we are not considering foreign direct investment in our model, and thus supply of capital is limited. With the inclusion of foreign direct investment, as well as labor unemployment, we could expect a less significant impact on returns to factors.

Figure 4.3—Real returns to factors: Percentage change of FTA scenario, 2020



Source: MIRAGE results.

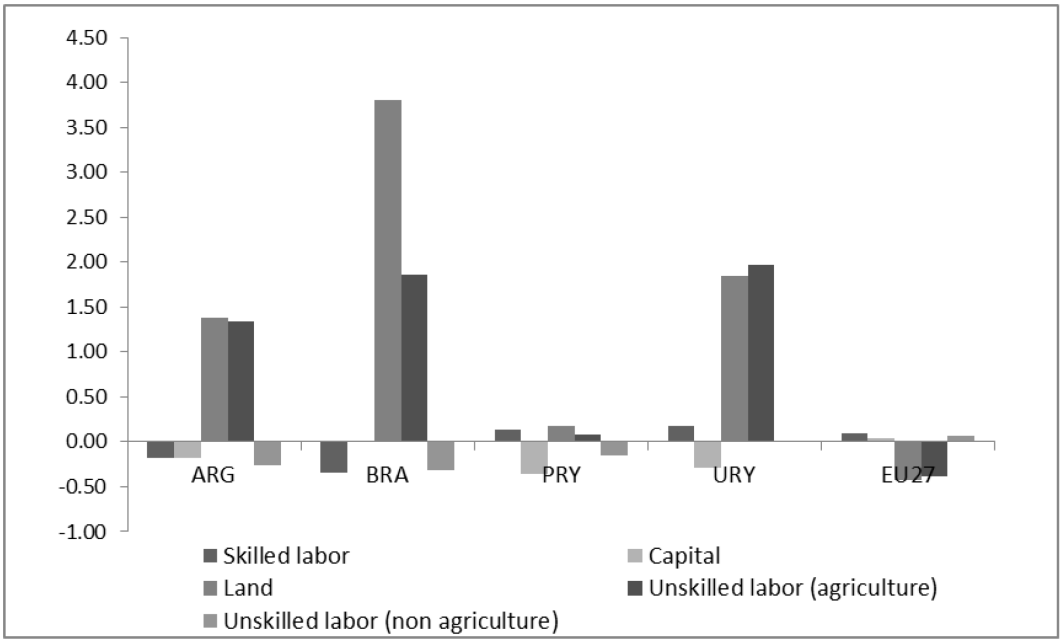
In Brazil, skilled-labor wages and nonagricultural unskilled-labor wages fall, due to the contraction in production of some manufacturing sectors, such as textiles, chemicals and plastics, and machinery and equipment. In the rest of the MERCOSUR countries, returns to capital are negatively affected, although slightly. In Uruguay, this is related to decreased production of manufactured items, such as leather, textiles, and wool.

In the two small MERCOSUR countries, skilled labor and unskilled labor in the nonagricultural sector also gain, mainly because of the expanding service sector in both countries (most of which is categorized as *other services*, which includes recreation and public services). In Paraguay, the increased production of sugar also explains the increase in wages for skilled workers.

In the EU, the agricultural sector is negatively hit, and this has an impact on returns to land and to unskilled workers in this sector. The remaining factors of production gain, but the increase is less pronounced than in MERCOSUR.

The effect on returns to factors is less pronounced when sensitive products are included in the negotiations (Figure 4.4). In Uruguay, returns to land and unskilled labor in agriculture still show the highest increase, but the impact is less significant. Skilled wages do not change and returns to capital experience a slighter fall than under an FTA scenario.

Figure 4.4—Real returns to factors: Percentage change of FTA with sensitive product scenario, 2020



Source: MIRAGE results.

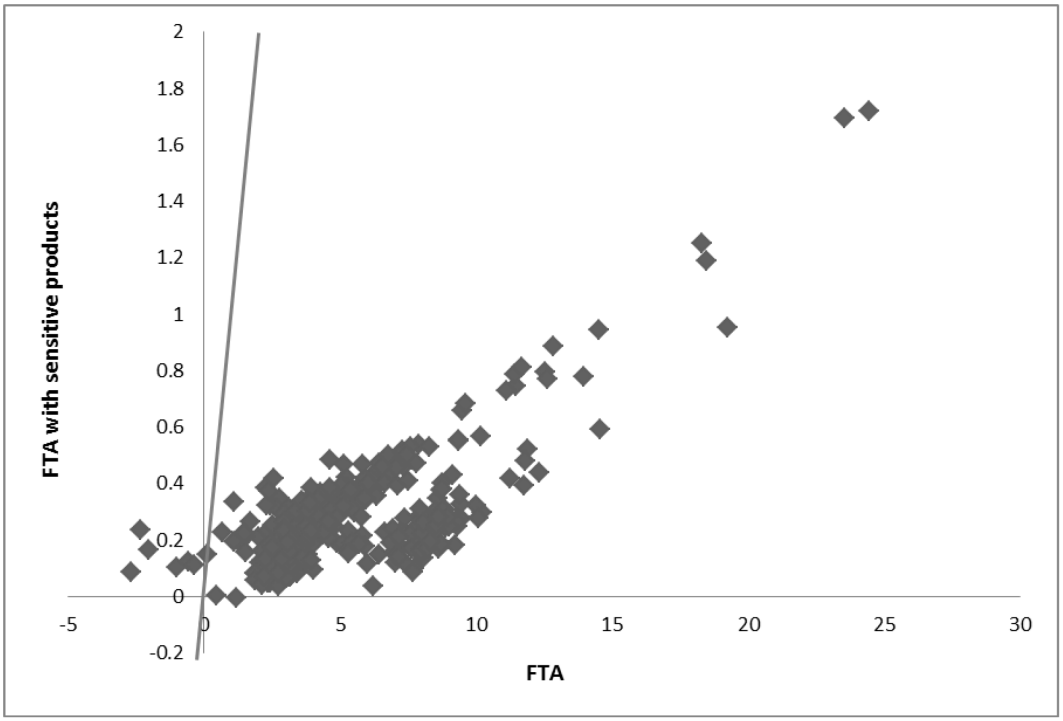
Poverty and Income Distribution

The improved version of MIRAGE applied in this paper allows us to analyze with higher detail the impact of the agreement on Uruguayan households. On average, gains from the full agreement are positive and significant; but when we analyze the differentiated impact on 411 representative households, we find distinctive results, mostly explained by their original factor endowments and the differentiated impact of the agreement on returns to factors.

Figure 4.5 presents variation in welfare for each representative household, comparing the impact from an FTA (x-axis) and an FTA with sensitive products (y-axis). Most households present welfare gains as a consequence of an FTA with EU, with gains between 0 and 25 percent. A very small part of the population (slightly below 1 percent) loses welfare, because their income comes mainly from nonagricultural skilled-labor wages, which show a small increase, and they experience an increase in consumer prices.[25] On the opposite side, also a small part of the population experiences very significant increases in welfare: above 10 percent. They represent 1.3 percent of the total population and have high income per capita at the initial level. Most of them are landowners (richest households), but some of these households have a high percentage of their income from unskilled agricultural labor.

[25] On average, the consumer price index in Uruguay increases 5.1 percent under the FTA scenario.

Figure 4.5—Impact on welfare in Uruguay by household group: Comparison between FTA and FTA with sensitive products scenarios, percentage change 2020



Source: MIRAGE results.
Note: The gray line is defined by x = y.

Gains from the agreement are significantly attenuated when sensitive products are included. Welfare increases no more than 2 percent for any household. A higher number of household groups lose from the agreement, but they weigh less in total population: they represent only 0.6 percent of total population. They are usually nonpoor households, with an average income per capita above the average and with income from mostly skilled labor and capital. A small proportion of the population is better off under an FTA with sensitive products; in Figure 4.5, these are households located to the left of the x = y line. These few households experience welfare losses under an FTA but small welfare gains under an FTA with sensitive products, because their consumption capacity expands: their income is not highly affected (remuneration to nonagricultural unskilled labor does not change much under this scenario) while consumer prices fall.

The impact of the FTA on income and consumption by household type is presented in Table 4.8. Under a full FTA scenario, income and consumption show a more significant increase for all household groups. In this case, poor households benefit the least from the agreement in terms of factor income gains. Increase in income is lower than for other households because transfers represent a higher proportion of income for these households. Their consumption, however, increases more than their factor income, as transfers received from other households increase. Thus, as long as net transfer providers experience an increase in income, private transfers help improve income distribution. Income increases more among vulnerable households, as their main source of income is unskilled labor. Nonpoor households, even though they experience an increase in income from land and unskilled labor revenue, rely more on capital and skilled labor and therefore experience a lower gain in terms of income. Besides, their transfers to poor households increase, and their consumption increases less than their income.

Table 4.8—Effects on real income and real consumption by household type, percentage variation, 2020

	FTA		FTA with Sensitive Products	
	Real Factor Income	Real Consumption	Real Factor Income	Real Consumption
Poor	4.04	4.05	0.31	0.31
Vulnerable	4.97	4.42	0.33	0.31
Nonpoor	4.38	4.33	0.25	0.25

Source: MIRAGE results.

This does not happen under the scenario of an FTA with sensitive products, as nonpoor households benefit less from the agreement; under this scenario, wages paid to skilled labor do not increase. Thus, the increase in factor income is higher among poor and vulnerable households.

The evaluation of poverty and income distribution indicators, for total population and for sociodemographic groups, is possible thanks to the application of a microaccounting approach as described in Section 3. Table 4.9 shows the change in poverty headcount, poverty gap, and income distribution indicators in the baseline and under an FTA and an FTA with sensitive products.[26]

In the baseline (between 2012 and 2020), poverty falls 30 percent (or 6 percentage points) for total population, but income distribution worsens, and the Gini coefficient increases 1.5 percent. This is consistent with long-term estimations of these indicators for Uruguay. Under an FTA scenario, the decrease in poverty is reinforced. The decline is more pronounced among male-headed households and urban households not located in Montevideo. These results are consistent with the above analysis: under an FTA, returns to all factors increase; and as most households increase revenue and welfare, poverty falls. Because the increase is less pronounced for unskilled wages in the nonagricultural sectors, poverty falls less among women—who are typically employed in the service sector—and among households located in Montevideo.

Poverty decreases also under the FTA scenario with sensitive products. In this case, a higher proportion of households lose welfare, but they are mostly nonpoor households with income from skilled wages, and thus poverty still falls.

Poverty declines in rural areas in both scenarios, and the gap between the poor and the nonpoor in rural areas reduces more. Poverty rates in Uruguay are higher in these areas, so this is an important result. However, we should keep in mind that most of Uruguay's population lives in urban areas. The poverty gap falls in urban areas also. Among female-headed households, the fall in the poverty gap is the least pronounced. This fact points out the fact that women are least benefited from the trade liberalization agreement.

Income inequality also falls as a consequence of the agreement, both with and without sensitive products. However, in rural areas income distribution worsens. This is due to the high increase in land revenue among rich households. This happens despite the fact that agricultural unskilled-labor wages in rural areas improve as a consequence of the agreement, and thus poverty reduces. Again, we should keep in mind that the rural population is a small part of the total population in Uruguay. For the country as a whole, an agreement with the EU reduces poverty and inequality, even when sensitive products are included in negotiations.

[26] For an income distribution indicator we present the Theil index, because the Gini coefficient, the most used indicator, is not decomposable. See footnote 20 for the Theil index formula.

Table 4.9—Impact on poverty headcount and income distribution, base year values and percentage variation, 2020

	Base Value	Baseline	FTA	FTA with Sensitive
		Poverty Headcount		
Total population	0.2052	–30.6	–7.6	–0.5
Male-headed households	0.2092	–33.5	–10.0	–0.8
Female-headed households	0.1990	–26.1	–4.1	–0.1
Montevideo	0.2029	–30.8	–6.1	0.0
Rest of urban areas	0.2055	–29.4	–9.3	–1.0
Rural areas	0.2111	–34.1	–6.7	–0.6
		Poverty Gap		
Total population	0.0741	–35.0	–9.6	–0.6
Male-headed households	0.0700	–37.9	–11.2	–0.8
Female-headed households	0.0804	–31.1	–7.7	–0.5
Montevideo	0.0748	–33.3	–9.1	–0.6
Rest of urban areas	0.0745	–36.0	–9.4	–0.6
Rural areas	0.0706	–37.3	–11.6	–0.8
		Inequality (Theil Index)		
Total population (Gini coefficient)	0.4559	1.5	–0.6	–0.1
Total population	0.3855	3.5	–1.1	–0.1
Male-headed households	0.4032	4.5	–1.3	–0.1
Female-headed households	0.3584	2.0	–0.8	–0.1
Montevideo	0.3825	3.7	–1.1	–0.1
Rest of urban areas	0.2974	3.7	–1.5	–0.1
Rural areas	0.3263	0.1	3.7	0.2

Source: MIRAGE and microsimulation results.

Table 4.10 presents the decomposition of inequality indexes among subgroups (defined by geographic location and gender of household head), so as to analyze whether changes in income inequality are explained mostly by changes within groups or between groups. In the benchmark, groups are highly heterogenous in terms of income distribution, and income inequality within groups explains almost total inequality. Groups according to geographic location are slightly more homogenous than according to sex of household head. In the baseline, as inequality increases, groups become more homogenous. However, as inequality falls as a consequence of an FTA, intragroup income heterogeneity increases again. We should keep in mind that we are not assuming changes in employment in the CGE model or in the microsimulations, so the impact on income distribution may be underestimated.

Table 4.10—Decomposition of inequality indexes by subgroups: Base year values and percentage variation, 2020

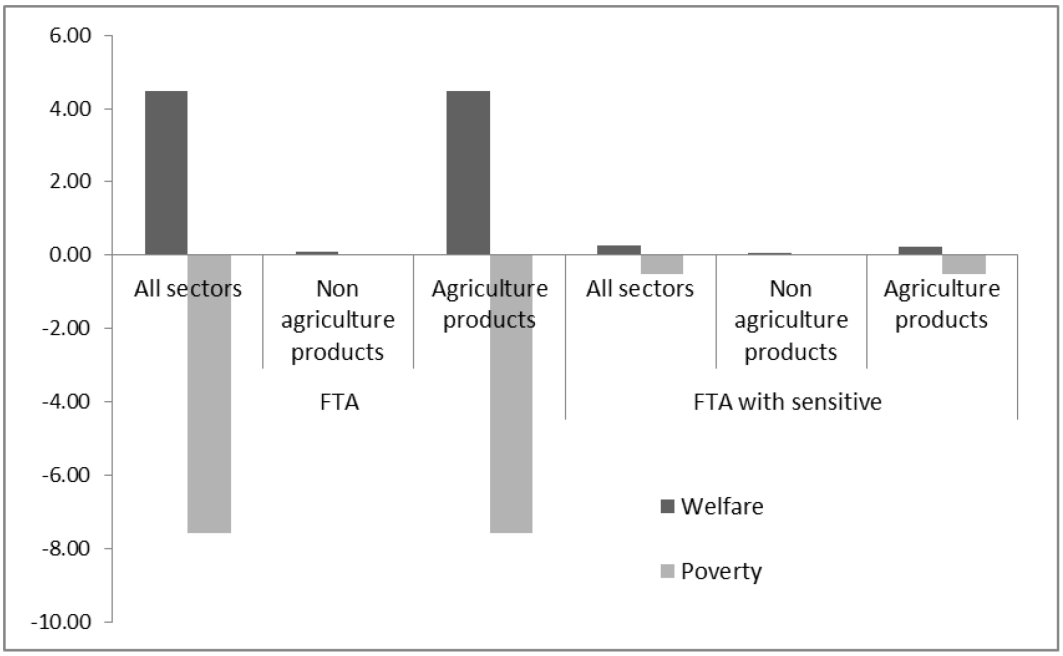
	Benchmark	Baseline	FTA	FTA with Sensitive
Total inequality	0.3855	3.5	–1.1	–0.1
Within rural and urban areas	0.3794	3.4	–0.9	–0.1
Between rural and urban areas	0.0061	11.8	–11.0	–0.9
Within female- and male-headed households	0.3846	3.5	–1.1	–0.1
Between female- and male-headed households	0.0009	6.8	–8.5	–1.1

Source: MIRAGE and microsimulation results.

Which Sectors Drive the Results?

The analysis made above compares the impact of an FTA between MERCOSUR and the EU with and without excluding sensitive products from tariff removal. We find that welfare gains are high for Uruguay and are driven mainly by an increase in exports of agricultural products. In this subsection, we disentangle the impact on welfare and poverty of agricultural liberalization on one side and nonagricultural liberalization on the other side. Figure 4.6 shows the impact on welfare and poverty under an FTA scenario and an FTA scenario with sensitive products, in each case including all sectors, only nonagricultural sectors, and only agricultural sectors. Results show what we have already concluded in our analysis: major gains from the FTA with the EU for Uruguay come from agricultural-sector liberalization in the EU. In fact, if nonagricultural sectors are not included in the negotiations, gains for Uruguay are higher, as the country does not lose nonagricultural preferences in the region.

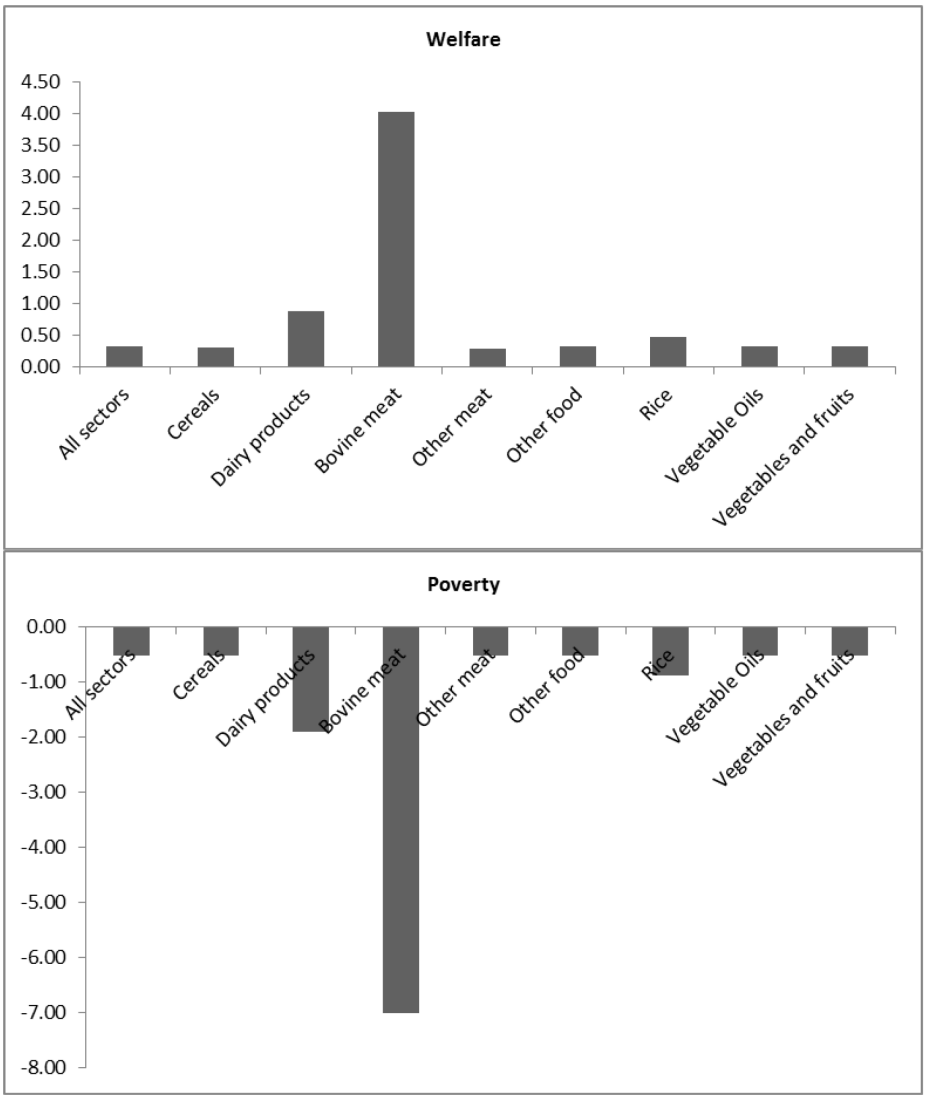
Figure 4.6—Impact on welfare and poverty: FTA and FTA with sensitive products scenarios; all sectors, nonagricultural sectors, and agricultural sector in percentage with respect to baseline, 2020



Source: Author's own elaboration from MIRAGE and microsimulation results.

Figure 4.7 shows the effects on welfare and poverty when we disentangle which categories in the agricultural sector are more important in the negotiations with the EU. In this case, we focus on the scenario with sensitive products for the EU (SENS3), and we analyze the impact on private welfare and poverty from removing one product at a time from the sensitive products list. Getting full access to bovine meat to the European market has a significant impact on welfare and poverty. Welfare increases of almost 4 percent, a figure very close to the welfare gains from a full FTA, and poverty falls significantly. The second most important product in terms of impact on welfare is dairy, with welfare gains near to 1 percent and poverty decrease of almost 2 percent. In the case of bovine meat, dairy and rice, the effect on poverty is explained by the relatively higher positive impact on factor remuneration, especially among unskilled workers. These results highlight the importance of carefully negotiating the products included in the sensitive lists, because excluding some key products might have a very significant effect on welfare. They also highlight the need to complement the analysis of this paper with a sector-specific analysis, such as the one carried out by Ramos, Bureau, and Salvatici (2010) focusing on EU imports of beef from MERCOSUR.

Figure 4.7—Impact on welfare and poverty: FTA with sensitive products for EU scenario (SENS3) in percentage with respect to baseline, 2020



Source: Author's own elaboration from MIRAGE and microsimulation results.

5. CONCLUDING REMARKS

In 2010, after several years of being stalled, negotiations between MERCOSUR (the Common Market of the Southern Cone) and the European Union (EU) to build a free-trade agreement (FTA) were resumed. This FTA is expected to have an important impact on MERCOSUR economies, especially if both blocs reach an agreement regarding the agricultural sector. For Uruguay, one of the two smaller economies of MERCOSUR, the conclusion of this agreement may have an important impact on the economy and also on income distribution and poverty, as the FTA will have differentiated impact on the different sectors of the economy.

This paper analyzes the impact of an FTA between MERCOSUR and EU, with a special focus on distributional impacts on Uruguay. Previous evaluations of this agreement do not focus on the effects on poverty and income distribution. In doing so, we apply an improved version of MIRAGE with household heterogeneity. This methodological tool consists in a multiregion, multisector general equilibrium model of the world economy, in which we split the representative agent into a private and a public agent for all regions, and into a large number of households for Uruguay. To the best of our knowledge, it is the first global general equilibrium model with household disaggregation.

Results show that the potential gains of an agreement between MERCOSUR and the EU are high: MERCOSUR countries would potentially increase exports by $38 billion and the EU by $43 billion. Welfare gains are also potentially high and particularly important for the small MERCOSUR countries, Paraguay and Uruguay, where welfare increases by 6.3 and 4.4 percent, respectively. Gains of the agreement are associated with an increase of trade flows between both countries. MERCOSUR exports specialize in the agrofood sector, while EU exports to MERCOSUR are mainly in the manufacturing sector. This has important consequences on production structure and returns to factors. The manufacturing sector in MERCOSUR is eroded, and wages paid to both skilled and unskilled workers in the urban sector fall, especially in the two bigger MERCOSUR countries. On the other hand, the agricultural sector in the EU is negatively affected.

However, these figures are a result of a full liberalization scenario. Most likely, countries will include sensitive products for which liberalization is not granted or not complete. Under such a scenario, gains are smaller, and even not significant for most countries. If some key products for Uruguay are excluded from the sensitive products list, welfare gains are almost as high as under a full liberalization scenario. This fact emphasizes the importance of negotiating carefully the terms of the agreement, especially for small countries, where one sector can have a strong effect on the whole economy.

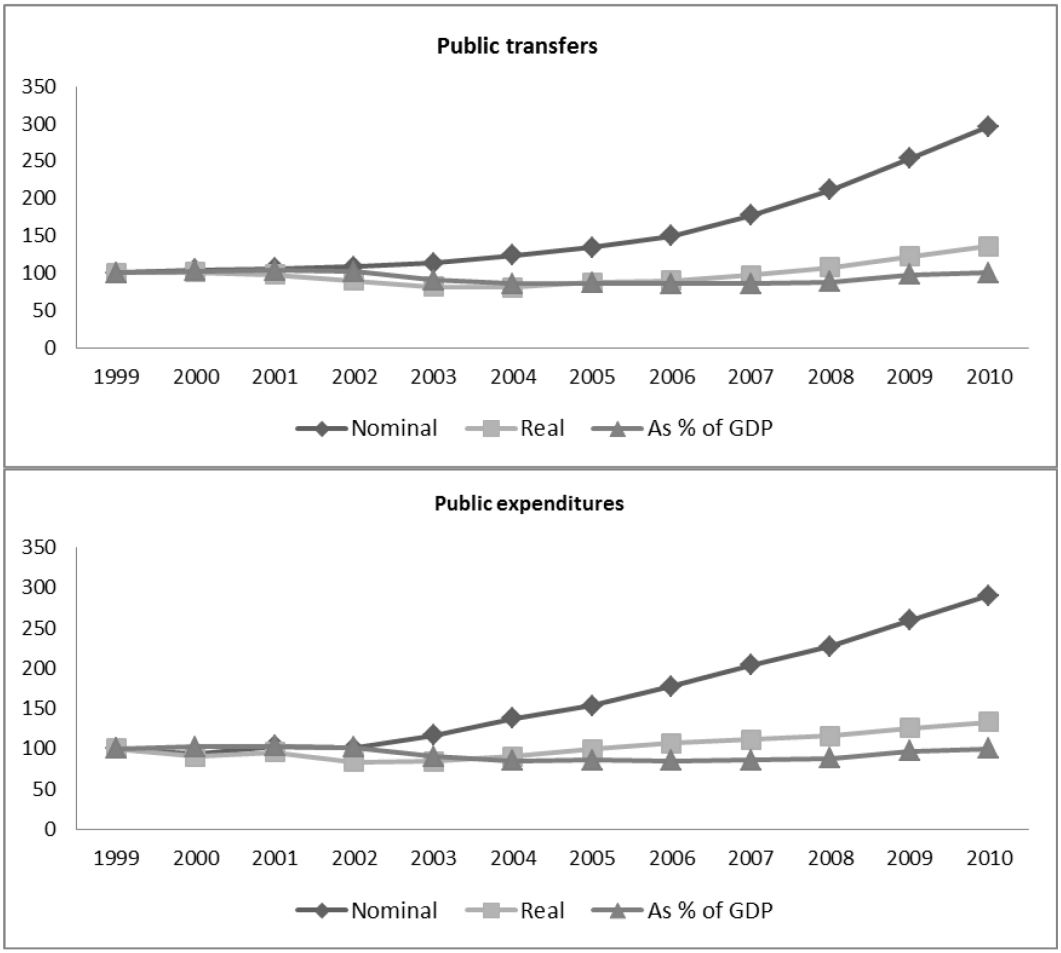
The new version of the MIRAGE model applied in this paper allows us to analyze with higher detail the differentiated impact on households in one of the small countries of MERCOSUR, Uruguay. Households that receive their income mainly from land are benefited, as well as those that receive income from unskilled labor in the agricultural sector. Real income and real consumption increases for all types of households. Thus, we might expect a fall in poverty rates as a result of the trade agreement. Income distribution, on the other hand, also improves if we consider total population, but it deteriorates in rural areas, where richer households gain more from the agreement. These results emphasize the fact that gains from a trade agreement are not distributed equally among the population, and that it is extremely important to count with a methodological tool that allows accounting for this differentiated impact and helps policymakers take the potential impacts into account during negotiations.

APPENDIX A: CLOSURE OF PUBLIC TRANSFERS AND EXPENDITURES

Choice of Closure

Figure A.1 shows the evolution of public transfers and public expenditures in the last decade in nominal terms, in real terms, and as percentage of national gross domestic product (GDP). We can see that the assumption of considering public expenditures as percentage of GDP, which is the closure adopted in the model, is the most pertinent one in the case of Uruguay.

Figure A.1—Uruguay: Public transfers and expenditures, 1999–2010



Source: Author's elaboration with data from Ministry of Economics and Finance (2012), Uruguay.
Note: index 1999 = 100

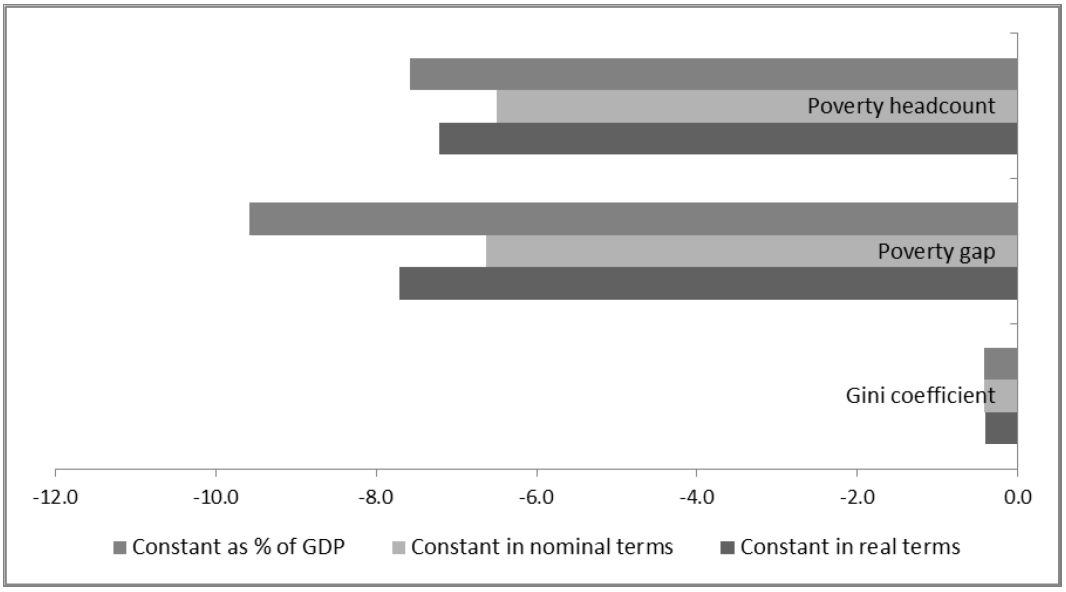
Sensitivity Analysis to Changes in Closure

Public Transfers Closure

Results presented in this paper are slightly sensitive to changes in the closure of public transfers and public deficit. Even though the main conclusions remain, under the chosen closure—public transfers and public deficit constant as a percentage of GDP—we obtain the highest impact on poverty and income distribution indicators. Indeed, under this closure, public transfers increase more, and so does private income, thus having the strongest reduction on poverty. On the other hand, assuming transfers and public

deficit are constant in nominal terms leads to the slightest impact. Impact on macroeconomic variables is slightly different under the three closures, but not significantly, and the main conclusions remain (Figures A.2 and A.3).

Figure A.2—Sensitivity of results on poverty and income distribution to public closure



Source: MIRAGE and microsimulation results.

Figure A.3—Sensitivity of results on macroeconomic impact to public closure

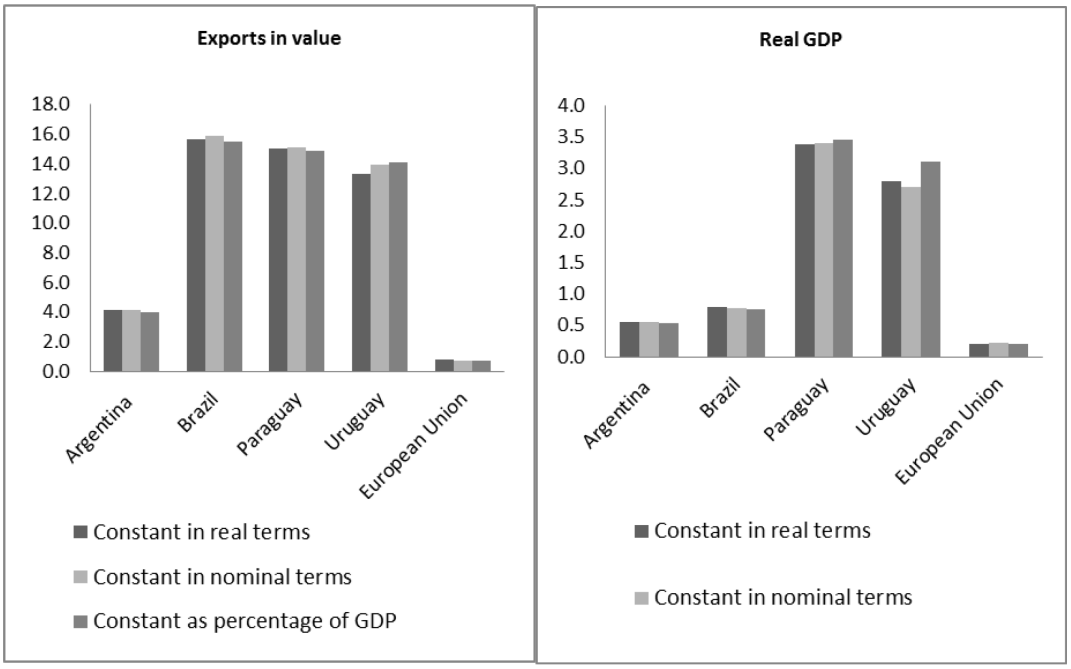
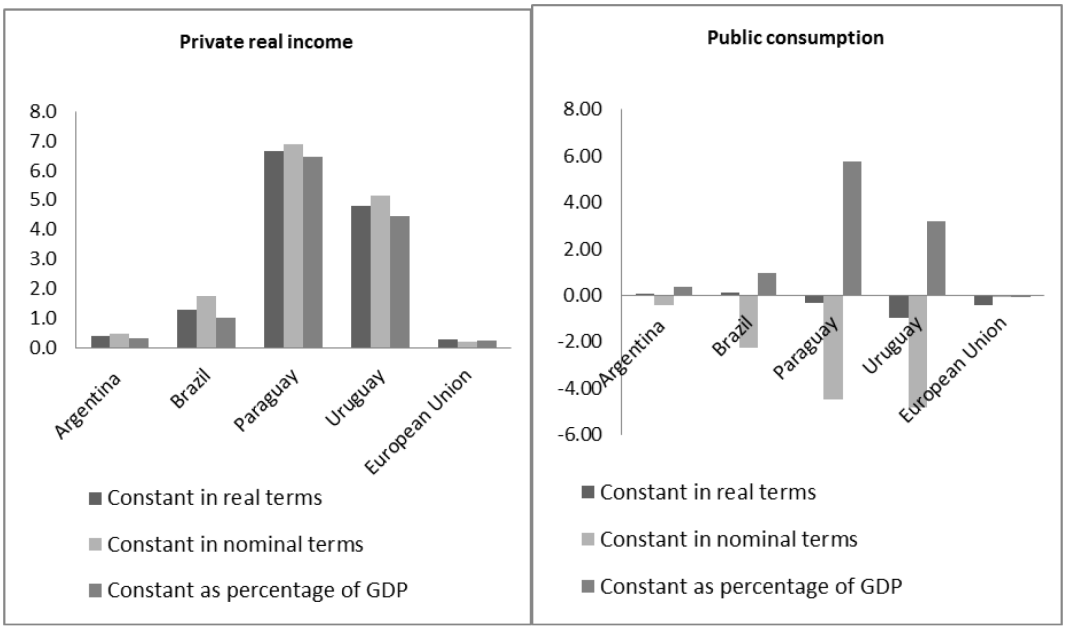


Figure A.3—Continued



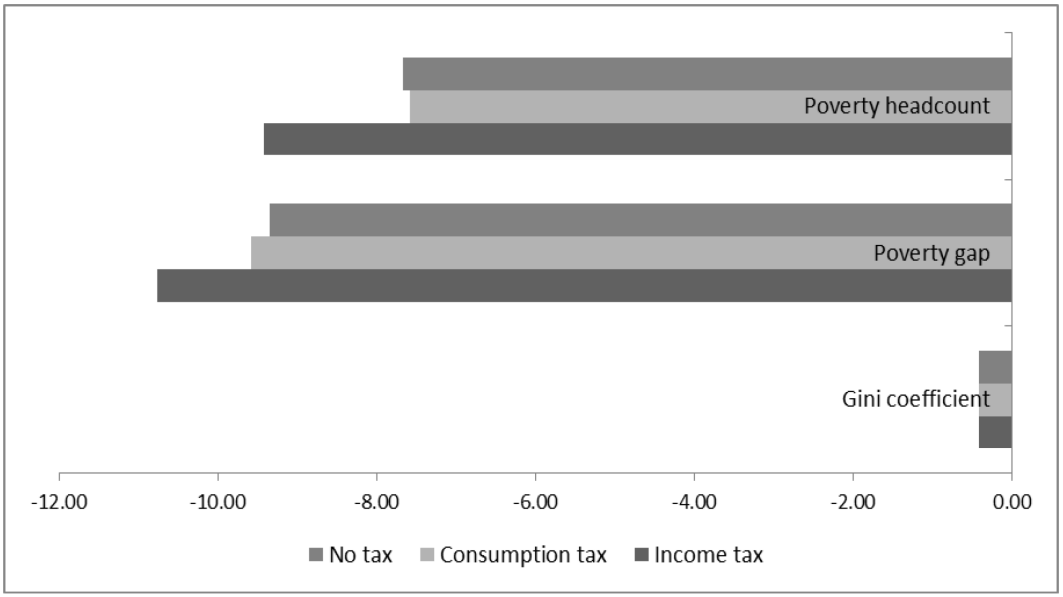
Source: MIRAGE results.

Compensation Tax Closure

In this subsection we present how results on poverty and macroeconomic indicators vary when we change the tax implemented to compensate for fiscal revenue loss from tariff revenue (see Figures A.4 and A.5). The core closure implemented is a consumption tax, which affects all households equally. Alternative closures are to implement an income tax, which affects households greater the more they earn, or to not implement any compensatory tax and let the fiscal deficit grow.[27] The closure that affects poverty the most is income tax, which does not impose any further taxation on poor households, as a consumption tax does. No compensatory tax, on the other hand, implies a lower fall in poverty, as GDP increases less and so do public transfers (which leads us back to the core closure about public transfers, which are constant in terms of GDP). GDP is affected as public consumption increases less under this closure. In spite of these differences, the impact on the main variables is similar.

[27] We also tested a lump-sum tax, but its effects on income distribution are enormous.

Figure A.4—Sensitivity of results on poverty and income distribution to compensating tax



Source: MIRAGE results.

Figure A.5—Sensitivity of results on macroeconomic impact to compensating tax

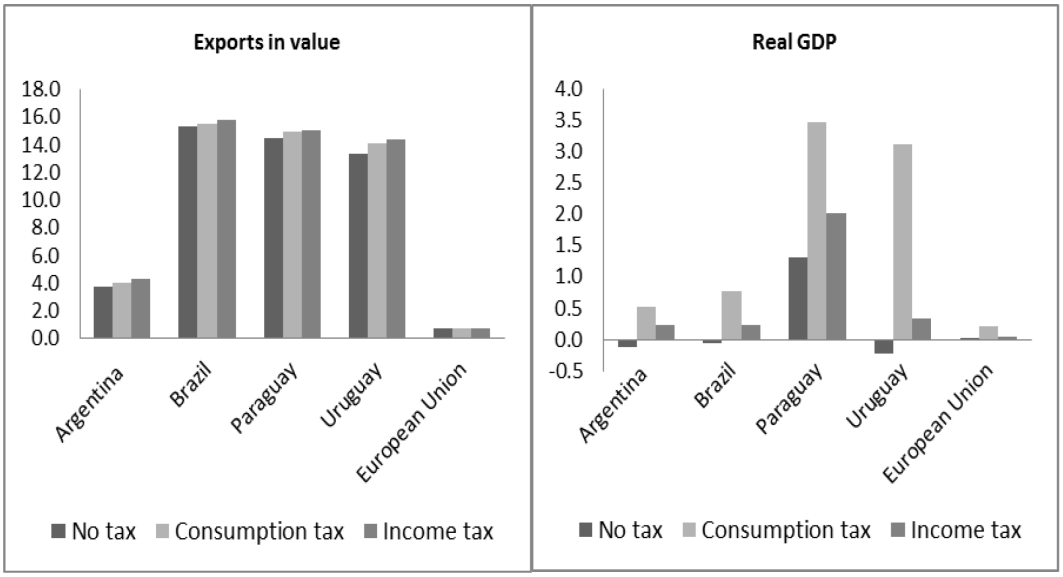
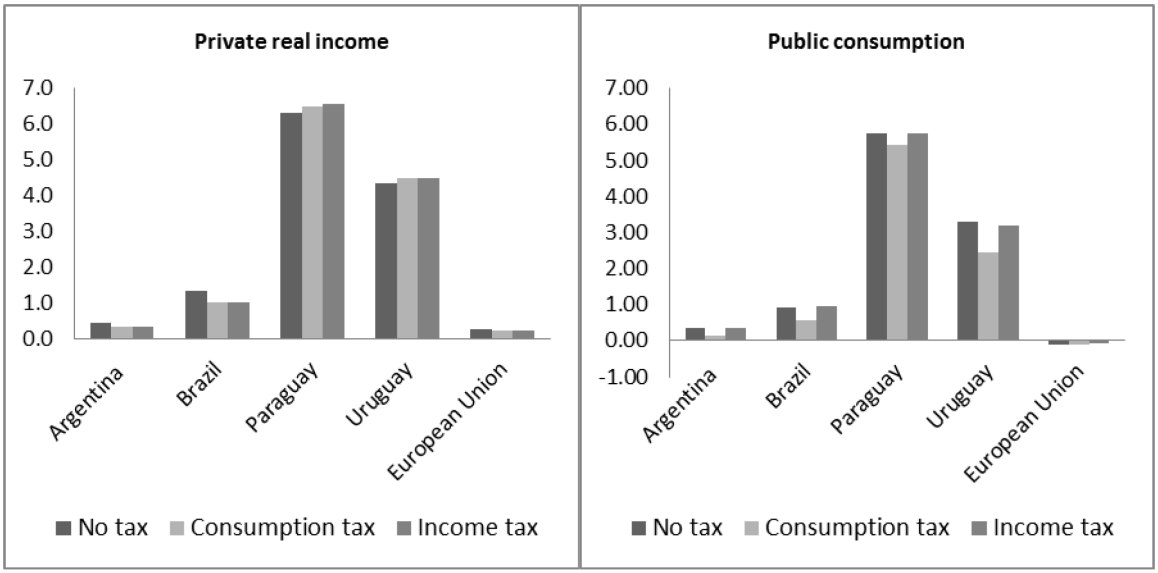


Figure A.5—Continued



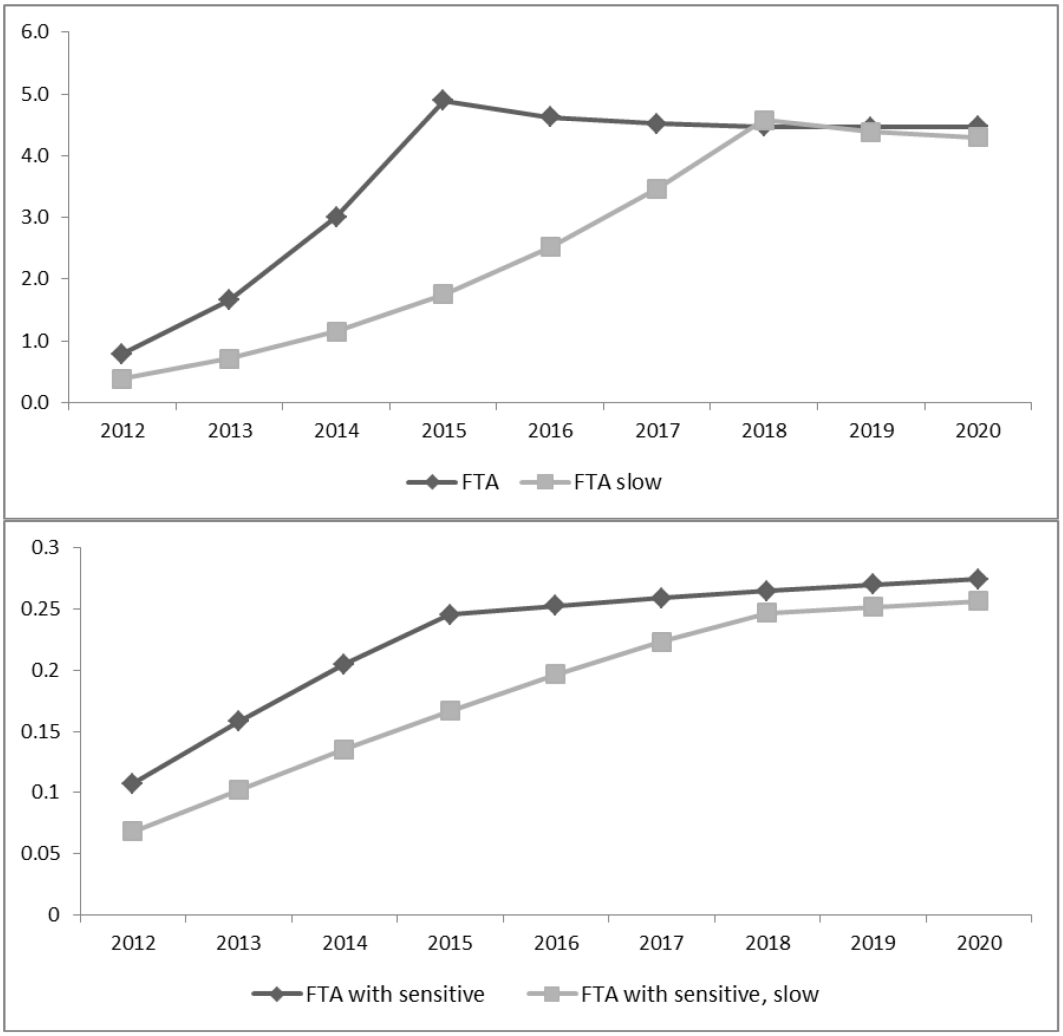
Source: MIRAGE results.

Sensitivity of Results to Liberalization Pace

In this section we analyze the impact of the pace of the liberalization process on welfare. Figure A.6 shows private welfare variation for each year up to 2020. We present results for FTA and FTA with sensitive products scenarios, with the base liberalization pace and under a slower pace. In the base scenarios, full liberalization is completed in 2015. Under the slow liberalization pace, full liberalization is reached in 2018. Under both FTA scenarios, the highest variation in welfare with respect to baseline is reached the year the liberalization process is completed. Welfare increases up to that year and falls slightly in the following years. A faster liberalization process seems to be a better option in terms of welfare impact.

In the case of FTA with sensitive products, welfare gains are always lower when the liberalization process takes place at a slower pace. Under this scenario, as opposed to a full FTA, welfare gains are higher after the adjustment process takes place—that is, under an FTA scenario with sensitive products, welfare continues to increase after the liberalization process is completed.

Figure A.6—Uruguay: Variation in welfare, FTA and FTA with sensitive, base scenario, and scenario with slow liberalization time; percentage variation with respect to reference, 2012–2020



Source: Author's own elaboration from MIRAGE results.

APPENDIX B: LIST OF SENSITIVE PRODUCTS FOR THE EU AND MERCOSUR

Table B.1—List of sensitive products for the European Union

HS6	Description
020120	Bovine cuts bone in, fresh or chilled
020130	Bovine cuts boneless, fresh or chilled
020220	Bovine cuts bone in, frozen
020230	Bovine cuts boneless, frozen
020311	Swine carcasses and half carcasses, fresh or chilled
020312	Swine hams, shoulders and cuts bone in, fresh or chilled
020319	Swine cuts, fresh or chilled, nes
020321	Swine carcasses and half carcasses, frozen
020322	Hams, shoulders and cuts, of swine, bone in, frozen
020329	Swine cuts, frozen nes
020610	Bovine edible offal, fresh or chilled
020629	Bovine edible offal, frozen except livers and tongues
020711	Fowls (cocks and hens), domestic, not cut
020712	Fowls (cocks and hens), domestic, not cut frozen
020713	Fowls (cocks and hens), domestic cuts and offal, fresh or chilled
020714	Fowls (cocks and hens), domestic cuts and offal, frozen
020724	Turkeys, not cut, fresh
020725	Turkeys, not cut, frozen
020726	Turkey cuts and offal fresh
020727	Turkey cuts and offal frozen
020732	Ducks, geese, not cut fresh
020733	Ducks, geese, not cut frozen
020735	Poultry cuts and offal, fresh
020736	Poultry cuts and offal, frozen
040210	Milk powder ≤ 1.5% fat
040221	Milk and cream powder unsweetened > 1.5% fat
040229	Milk and cream powder sweetened > 1.5% fat
040291	Milk and cream unsweetened, concentrated
040299	Milk and cream nes sweetened or concentrated
040510	Butter
040520	Dairy spreads ≥ 39% < 80% Fat
040590	Other milk fats and oils
040610	Fresh cheese, unfermented whey cheese, curd
040620	Cheese, grated or powdered, of all kinds
040630	Cheese processed, not grated or powdered
040640	Cheese, blue veined
040690	Cheese except fresh, grated, processed or blue veined
070320	Garlic, fresh or chilled
080300	Bananas, including plantains, fresh or dried
100190	Wheat except durum wheat, and meslin
100510	Maize (corn) seed
100590	Maize except seed corn
100620	Rice, husked (brown)

Table B.1—Continued

HS6	Description
100630	Rice, semimilled or wholly milled
100700	Grain sorghum
110423	Maize (corn), hulled, pearled, sliced or kibbled
160232	Fowls (cocks and hens), meat and meat offal
160241	Swine hams and cuts thereof, prepared or preserved
160249	Swine meat or offal nes, prepared, preserved, not liver
220710	Undenatured ethyl alcohol > 80% by volume
220720	Ethyl alcohol and other spirits, denatured
230910	Dog or cat food (retail)
230990	Animal feed preparations nes
151710	Margarine, except liquid margarine
151790	Edible mix and preparations of animal and vegetable fat, oil nes

Source: Author's elaboration.
Note: Nes = not elsewhere specified.

Table B.2—List of sensitive products for MERCOSUR countries

HS6	**Description**
220421	Grape wines nes, fortified wine or must, pack < 2l
220830	Whiskies
252810	Natural sodium borates and concentrates
291535	2-ethoxyethyl acetate
300490	Medicaments nes, in dosage
380820	Fungicides, packaged for retail sale
580124	Woven warp pile cotton, epingle (uncut), except terry
840734	Engines, spark-ignition reciprocating, over 1,000 cc
840820	Engines, diesel, for motor vehicles
840991	Parts for spark-ignition engines except aircraft
840999	Parts for diesel and semidiesel engines
853710	Electrical control and distribution boards, < 1kV
870210	Diesel-powered buses
870290	Buses except diesel powered
870323	Automobiles, spark ignition engine of 1,500–3,000 cc
870324	Automobiles, spark ignition engine of >3,000 cc
870332	Automobiles, diesel engine of 1,500–2,500 cc
870390	Automobiles nes including gas turbine powered
870510	Mobile cranes
870530	Fire-fighting vehicles
870829	Parts and accessories of bodies nes for motor vehicles
870839	Brake system parts except linings for motor vehicles
870899	Motor vehicle parts nes
903289	Automatic regulating/controlling equipment nes
950632	Golf balls

Source: Author's elaboration.

REFERENCES

Agénor, P. R., D. Chen, and M. Grimm. 2003. Linking Representative Household Models with Household Surveys for Poverty Analysis: A Comparison of Alternative Methodologies. Policy Research Working Paper 3343. Washington, DC: The World Bank.

Bouët, A., C. Estrades, and D. Laborde. 2010. "A Poverty Module of the MIRAGE Model of the World Economy." Presented at the 13th Annual Conference on Global Economic Analysis, Penang, Malaysia, 9-11 June.

_____. 2012. Households' Heterogeneity in a Global CGE Model: An Illustration with the MIRAGE Poverty Module. Discussion Paper. Washington, DC: International Food Policy Research Institute, forthcoming.

Bouët, A., D. Laborde, S. Tarascou, and A. Yapaudjian-Thibaut. 2003. The Costs of the FTAA for the European Union with and without an Agreement with MERCOSUR. Chaire MERCOSUR de Sciences Po, 1–32.

Centre for the International Economy (CEI) 2012. Buenos Aires: Ministry of Foreign and Cultural Affairs (Argentina).

Eurostat. 2012. Luxembourg: European Comission

Guillaume G., S. Zignago. 2010. "BACI: International Trade Database at the Product-level. The 1994-2007 Version", Working Paper 2010-23. Paris: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

Jean, S., D. Laborde, and W. Martin. 2010. "Formulas and Flexibility in Trade Negotiations: Sensitive Agricultural Products in the World Trade Organization's Doha Agenda." *World Bank Econ Review* 24(3):500–519.

Kutas, G. 2006. "Still the Agriculture Knot." In EU-MERCOSUR Relations and the WTO Doha Round: Common Sectoral Interests and Conflicts, edited by A. G. Valladão and P. Guerrieri. Chaire MERCOSUR de Sciences Po, Paris.

Laborde, D. 2012. "Trade Restrictions Analytical Database (TRAD)." Technical Paper. Washington, DC: International Food Policy Research Institute, forthcoming.

Laborde, D., and P. Ramos. 2008. "The Ongoing on the EU-MERCOSUR Bi-Regional Negotiations: A CGE Assessment." Working Paper. CEPII.

Laens, S., and M. Terra. 2006. The External Agenda of the MERCOSUR: The Impact of Negotiations with FTAA, EU and WTO. Working Paper 05-06. Montevideo: Mercosur Economic Research Network.

Löfgren, H., S. Robinson, and M. El-Said. 2002. Poverty and Inequality Analysis in a General Equilibrium Framework: The representative Household Approach. Tool Kit for Evaluating the Poverty and Distributional Impact of Economic Policies. Washington, DC: The World Bank.

Lucas, E. B. and O. Stark. 1985. "Motivations to Remit: Evidence from Botswana." *Journal of Political Economy* 93(5):901–918.

Ministry of Economics and Finance (Uruguay) 2012. Montevideo. www.mef.gub.uy/indicadores.

Monteagudo, J., and M. Watanuki. 2002. Regional Trade Agreements for MERCOSUR: The FTAA and the FTA with the European Union. Integration and Trade 17. Washington, DC: Intal, Inter-American Development Bank.

Nagarajan, N. 1998. "On the Evidence of Trade Diversion in MERCOSUR." *Integration & Trade* 6: 3–30.

Narayanan, B., and T. L. Walmsley, eds. 2008. Global Trade, Assistance, and Production: The GTAP 7 Data Base, Center for Global Trade Analysis. Lafayette, IN, US: Purdue University.

National Statistics Institute (Uruguay) 2007. Income and Expenditure National Household Survey 2005/2006. Montevideo. www.ine.gub.uy

Ramos, M. P., J-C. Bureau, and L. Salvatici. 2010. "Trade Composition Effects of the EU Tariff Structure: Beef Imports from Mercosur." *European Review of Agricultural Economics* 37(1):1–26.

Veiga, P. M. and S. P. Rios. 2007. The MERCOSUR–European Union Negotiations Three Years after the Impasse: What to Expect. OBREAL/EULARO policy brief. Barcelona: European Union–Latin America Relations Observatory.

UN Comtrade. 2012. New York: United Nations.

World Bank. 2005. "Introduction to Poverty Analysis." Poverty Manual, Mimeo.

_____. 2012. World Development Indicators 2012. Washington, DC: The World Bank.

Yeats, A. J. 1998. "Does Mercosur's Trade Performance Raise Concerns about the Effects of Regional Trade Agreements?" *The World Bank Economic Review* 12(1):1–28.

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