The Costs of the FTAA for the European Union with and without an Agreement with Mercosur

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Chapter 3

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Introduction

Since 1995, the US has been holding negotiations with Latin American countries in order to achieve a free trade agreement by 2005. In this context, the Free Trade Area of the Americas (FTAA) may cause significant trade diversions and weaken economic relations between the European Union (EU) and the Common Market of the Southern Cone of the Americas (Mercosur) in the same way as the creation of the North American Free Trade Area (NAFTA) has marginalised the EU in Mexico's pattern of trade. Indeed, the EU and the US appear to have strong production and trade complementarities with Mercosur, while these first two areas produce substitute products. Nevertheless, relations between Western Europe and South American countries are based on strong foundations: a common history, the role played by immigration and European culture, the dynamism of economic exchange, the intensity of political dialogue and the will to co-operate.

The first step in an integration process between the EU and Mercosur was taken soon after the latter's establishment in 1991. The European Commission signed an inter-institutional agreement with Mercosur in 1992, which was followed by the EU-Mercosur Interregional Framework Co-operation Agreement signed in December 1995. Its objectives are to increase economic co-operation, enhance political dialogue and prepare for the bilateral liberalisation process. These have formed the basis of a continuing political dia-

logue, which remains the underpinning of the EU/Mercosur relationship, and on which conclusions were reached in the first round of negotiations in April 2000. A summit of Heads of State and Government of the EU and Mercosur held in Rio de Janeiro on 28 June 1999 decided to launch negotiations "aiming at bilateral, gradual and reciprocal trade liberalisation, without excluding any sector and in accordance with WTO rules".

Although both sides recognise the importance of creating a Free Trade Association, one of the major challenges lies in the negotiations on agriculture where Mercosur has a strong comparative advantage, while the EU maintains a highly protectionist policy (the Common Agricultural Policy or CAP). This issue is increasingly dominating the agenda of the trade negotiations, and the possibilities of deepening and balancing trade links between the two blocs will largely depend on progress in this area. Moreover, there is strong evidence that agriculture will prove critical to the success or failure of the Doha Round of WTO trade negotiations. The EU and the Mercosur countries are key actors in this area too, so that an agreement between these two blocs is liable to foreshadow the outcome of the Doha Round, and lack of agreement will signal that the Doha process is at risk of failing.

Trade relations between the two regions are complex, reflecting a long shared history. There are many areas of complementarity. As the Mercosur market has grown, it has become more attractive to European exports. Mercosur has also been an important recipient of European investment. Since the two parties began political dialogue, trade between them has increased substantially, and the EU is currently Mercosur's prime trade partner.

In this context, this chapter will investigate the consequences of the FTAA and the interest the EU has in countering them by deepening its economic integration with Mercosur. Three potential future scenarios are studied: a possible Free Trade Area of the Americas; a potential agreement between Mercosur and the European Union; and both of these agreements occurring simultaneously.

Trade theory is ambivalent about the welfare implications of regional trade agreements (RTAs) and their impact on the global economy. One school of thought (Bhagwati and Panagariya, 1996, Bhagwati and Krueger, 1995, Srinivasan, 1998, Panagariya, 1998, 1996) considers that an RTA is a harmful process which may reduce welfare for its members and impede multilateral trade liberalisa-

tion. According to these authors, because of preferential treatment, RTAs divert trade from non-members and generate a welfare loss. De Melo and Panagarya (1993) and DeRosa (1998) consider an analytical model in which an RTA creates trade (total imports increase) and diverts trade from the lowest-cost supplier. They conclude that "the higher the initial tariff on a given sector, the larger the benefits and the smaller the costs of an RTA", and that the greater the complementarity in demand for imports between the partners, the greater the gains from an RTA.

On the other hand, Johnson (1965) argues that multilateral liberalisation with a non-discrimination clause is such a complex issue that achieving free trade is almost impossible. In contrast, concluding an RTA is much easier, since it is possible to estimate precisely the trade impact of each concession. Ethier (1998) presents an RTA as a new regionalism, a kind of complement to multilateralism. A different issue is the domino theory of regionalism (Baldwin and Venables, 1995): countries join an RTA because they are afraid of being excluded from the integration process. Krugman (1993) stresses the importance of proximity; low transport costs generate welfare gains in the case of the creation of an RTA.

Hence, from our point of view, in order to answer precisely the question *–Do RTAs increase welfare?–* it is necessary to use a general equilibrium approach. This is the only practical way of integrating the main economic mechanisms of traditional and recent trade theory. But constructing a multilateral Computable General Equilibrium Model (CGEM) has to tackle a number of issues.

First, it is necessary to have a certain measure of protection because the impact of liberalisation on trade and welfare is mainly dependent on the initial level of the tariff. The EU is protectionist in agriculture and provides almost completely free market access for the industrial sectors. The structure of protection is more balanced in the US. Thus, as a result of this kind of process, there could be a high growth of agricultural exports (relative to the increase in industrial exports) from Mercosur to the EU, and a more balanced increase in sectoral trade in the case of the FTAA.

Secondly, the creation of an RTA could imply a deterioration in the terms of trade (trade diversion effect) because foreign suppliers are granted different tariffs on the same product. This means that in order to estimate the consequences of the creation of a discriminatory regime, it is essential to take into account all trade preferences

and existing RTAs. For example commodities exported by the Mercosur countries enter the EU under the Generalised System of Preferences which concedes a minor tariff advantage relative to MFN duties. Other groups of countries like the Least Developed Countries (LDCs), or the African Caribbean and Pacific countries (ACP) are benefiting from much smaller duties on their products exported to the EU. An empirical study of the trade impact of a Free Trade Area between the EU and Mercosur (FTAEUM), should obviously take account of all these different tariff regimes.

Thirdly, the recent literature has pointed out that the trade effects of preferential regimes are only minor, because of the imposition of rules within the agreement which regulate reciprocal market access, and the conditions under which preferences are granted. Rules of origin define the conditions under which a product is eligible for preferential access to a market because it originated in a partner country. They are imposed in order to avoid trade deflection, and could be so restrictive as to make the impact of preferential regimes on trade only minor. Of course, it is extremely difficult to check whether these rules are legitimate or are imposed with a protectionist objective.

The subject of this chapter is an estimation of the impact of the FTAA and the FTAEUM, in order to evaluate the European interests (welfare gains and losses under each scenario; variation in sectoral production and trade flows). We use a Static Computable General Equilibrium (CGE) model, with perfect and imperfect competition. Several methodological options are fundamental:

– We use a highly disaggregated database from a sectoral point of view, as the welfare impact of a protectionist structure depends on the average and the dispersion of tariffs.

– The CGE model is multinational and we measure protection from a bilateral point of view: our protection data include all free trade areas and preferential regimes because the impact of an RTA largely depends on the existing network of trade preferences.

– We try to assess the impact of rules of origin by integrating this kind of agreement into the CGE model. Exports are eligible for preferences when containing less than a fixed level of imported intermediate commodities.

We demonstrate that:

(i) the macroeconomic impact of these agreements is only minor; this conclusion confirms the ambivalence of trade theory as far as RTAs are concerned;

(ii) variations in the production of the Mercosur sectors are unbalanced in the case of a free trade area with Europe (strong increase in agricultural production, significant decrease in industrial production) while they are balanced in the case of the FTAA;

(iii) the rules of origin have a significant negative trade impact.

The chapter is structured as follows. Section 2 summarises the conclusions from recent empirical studies of an RTA including Mercosur. Section 3 describes the basic structure of our multi-regional computable general equilibrium model. Section 4 contains the empirical implementation, including a description of the benchmark data set, the calibration of the model and the data on protection. Section 5 introduces the analysis of rules of origin. Section 6 presents the results of the simulations. Section 7 offers some concluding remarks.

Expected Effects in CGE Models: Empirical Evidence

There is now a large empirical literature using multi-country CGE models in order to estimate the effects of an RTA. The studies often differ in terms of country and sectors covered, assumptions about market structure, policy simulations and macroeconomic closure. In spite of these differences, these models come to very similar conclusions:[1]

– the trade-creation effect far outweighs the trade-diversion effect;

– RTAs frequently, but not always, imply welfare (measured in terms of real Gross Domestic Product) increases for member countries. These increases are modest.

Furthermore, there are bigger welfare gains when models incorporate aspects of "new trade theory" (increasing returns, imperfect competition), and these gains are even bigger when trade externalities and dynamic effects are taken into account. Nevertheless, most of the empirical studies and CGE models have concluded that "trade creation occurred in Europe, but its size and the precise contribution of the RTAs relative to other factors is unclear" (Srinivasan *et al.*, 1993).

1. For a survey, see Robinson and Thierfelder (1999).

Table 1. *Summary of selected empirical studies on regionalism*

Study	Countries & Sectors Coverage	Model Description	Scenarios	Key results
Bchir, Decreux, Guérin (2001)	**7 regions:** EU, Rest of Europe, ALENA, Mercosur, Rest of Americas, Developed Asia. **19 sectors:** 7 agriculture, 7 manufacturing, 5 services	Dynamic model **(**MIRAGE**)** + GTAP 5 +Mac Maps Base year : 1997 5 factors of production: skilled and unskilled labour (completely mobile across the sectors but immobile internationally) , capital (immobile across sectors),natural resources and natural resources (specific factor in agriculture) **Foreign Direct Investment** **Monopolistic competition in manufacturing sectors**	(1) diminution of trade barriers between EU-Mercosur (2) diminution of trade barriers between ALENA, Latin America and Mercosur (3) combination of these two scenarios	**(1)** Rise of Mercosur's trade (almost 13 %) and EU's trade (1.6 %). Simulations predict exports from EU to Mercosur a rise by 69 % and imports by 66 %. ALENA's exports to Mercosur should diminish by 17 %. Wages should rise in Mercosur by 2 % for skilled workers and by 3 % for unskilled. FDI decreases by 1% and utility increases by 1%. **(2)** +50% for the various flows between the third parties, but the global creation of trade up by 11% for imports and 11.3% for exports. Impacts on wages are lower than 1% for all partners and utility gains are four times lower for Mercosur than in the EU-Mercosur agreement. **(3)** Combination of these two agreements gives some interesting results as the impacts on Mercosur are partially additive.
Bchir, Decreux, Fontagné, Guérin and Jean (2002)	**7 regions:** AELE, EU, Mercosur, Asia developed, Rest of America, Rest of Europe, Rest of World. **17 tradable products:** (5 agriculture, 8 manufacturing, 4 services)	Dynamic model **(**MIRAGE**)** + GTAP 5 +Mac Maps Base year : 1997 **5 factors of production** **FDI** **Monopolistic competition in manufacturing sectors**	**Scenario A:** Mercosur EE (1) industry liberalisation (2) scenario 1 + partial agriculture liberalisation (3)complete liberalisation **Scenario B: FTAA**	**A(1)** Global Trade gain (+0.08%). This agreement was lightly beneficial to EU (welfare increases + 0.5%) and negative for Mercosur. **A(2)** For EU, welfare rises (+0.12%). For Mercosur: negligible gains. Global Trade increases (+0.7%) **A (3)** For EU, welfare rises (+0.14%). Trade increases (+1.7%) agricultural sectors are the main source of gains from trade. **B:** trade-diversion effects for EU and deterioration in terms of trade, with a negligible loss of utility
Monteagudo and Watanuki (2001)	12 countries/regions: Argentina, Brazil, Chile, Canada, United States, Mexico, Central America and the Caribbean, Colombia, Venezuela, Rest of the Andean Community, EU, Rest of world. 15 sectors: 5 Primary Sectors, 4 Light Manufactures, 4 Heavy Manufactures, 2 Services.	**Static CGE model** Base year: 1997 **3 factors of production:** labour, capital (completely mobile across the sectors but immobile internationally) and natural resources (sector-specific factor only used in agriculture)	**Scenarios:** **(1)** the creation of the FTAA, **(2)** the formation of FTA between Mercosur and the EU and **(3)** both simultaneously	**(1)** The FTAA induces a growth in Mercosur's real GDP of 2.8%. **(2)** The FTAEUM generates substantial economic gains (2.8% in real GDP). More precisely, the FTAEUM induces a greater impact on Mercosur's export performance than the FTAA especially in the agricultural sector (total exports grow an additional 1,4 percentage points). **(3)** The simultaneous approach almost generates important gains for Mercosur. It doubles the bloc's aggregate trade and GDP gains when compared to the FTAA.

(2002)	**12 regions:** Canada, United States, Mexico, Central America and the Caribbean, Colombia, Venezuela, rest of the Andean community, Argentina, Brazil, Chile, European Union and the rest of the world. 15 Sectors: 7 agricultural, 8 manufacturing and one tertiary**.**	**3 types of trade productivity links:** – sectoral export externality – import externality of intermediates and capital goods – aggregate export externality **Economies of scale in manufacturing industries** (with the cost disadvantage) **Domestic farm programs**	**(1)** the creation of the SAFTA encompassing MERCOSUR, Chile and the Andean community, **(2)** the FTA between the Andean Community and the United States, **(3)** a FTA between Latin America's regional groups and the European Union, **(4)** the formation of the FTAA.	**(1)** The SAFTA generates modest economic gains for members countries. Real GDP grows 0.3 percent in Columbia and 0.4 in Venezuela and the exports increase by 2 percent in the Andean Community and 1.7 percent in Mercosur. **(2)** The North-South integration has considerably differentiated impact on Latin America, depending on the partner. Integration with the United States expands exports of light manufactures in most American countries. **(3)** The integration with the European Union increases Latin America's agricultural exports, products Latin America has a strong comparative advantage and the European Union heavily protects. For Mercosur, this integration is the best option, superior to the FTAA (an increase by 4.7 percent 10 percent total imports and Mercosur increases imports from the European Union by marked 30 percent) **(4)** For most hemispheric countries except Mercosur, FTAA is the best option (an increase Latin America's combined GDP, 12.8 percent total exports, and Exports by 11 percent and a strongest export growth of light manufactures in all members except Mexico).
Diao, Diaz-Bonilla and Robinson (2002	**29 countries:** USA, Canada, Mexico, Central America and Caribbean, Colombia, Peru, Venezuela, Rest of Andean Pact, Argentina, Brazil, Chile, Uruguay, Rest of South America, Australia and New Zealand, Japan and Korea, EU, China, Indonesia, Philippines, India, Asia agricultural exporting, Rest of Asia, East European and Rest of Europe, Turkey, North Africa and rest of middle East, South Africa, Africa mainly importing from the EU, Africa diverse trading partners, RoW. **38 products:** 22 agricultural, 13 manufacturing, 3 Tertiary.	**Static world CGE model** Base year: 1998 (GTAP 5) 5 factors of production : **Cash-in-advance technology** **Rigidities in wages** (nominal and real) and unemployment **Exchange rates**	**Scenarios:** **(1)** a Free Trade Area of the Americas (FTAA) **(2)** a Free Trade agreement between Mercosur and the EU (FTMEU).	The results show that the two alternative regional integration scenarios are good for the participants while having little impact on the non-participants. Both scenarios are net trade-creating. **(1)** The FTAA induces a trade-creation effect at the world level (for 0.7 % of total world trade). For the non-participants, a decrease of 0.02% total trade. **(2)** Positive changes in real GDP for US, Canada and EU (almost 1%). The effect of the FTAEUM on world trade is about half that of the FTAA. The simulations show small increases in real wages for both skilled and unskilled labour after FTAA for USA and Canada. For the Latin American countries, whose labour markets are modelled in an unemployment mode with rigid real wages, the equilibrating variable is employment, where the increase is about 5 million jobs. The FTAEUM creates strong employment effects in the Mercosur members (3 million jobs), with the largest increases for Argentina and the smallest for Chile.

Table 1 summarises the insights from five studies of multi-country CGE models focusing on the consequences of the FTAA and the FTAEUM (but also of the creation of the Southern America Free Trade Area – SAFTA). Some models used the Global Trade Analysis Project (GTAP) model. In general, the FTAA induces a trade-creation effect for third parties, but has negative effects for the EU in terms of trade. The FTAEUM generates economic gains for Mercosur and the EU, and is more profitable for both partners than the FTAA. Both agreements simultaneously generate important gains for Mercosur, with doubled gains in the bloc's aggregate trade and GDP when compared with the FTAA.

The Structure of the CGE Model

Our framework is a *general equilibrium model with a multi-regional and multi-sectoral specification* that follows the standard theoretical specifications of trade-focused CGE models with an original handling of the rules of origin issue.[1]

The Supply Side

The model includes four factors of production: unskilled labour, skilled labour, capital and natural resources. Labour and capital are completely mobile across sectors, but immobile internationally. Natural resources are sector-specific and are used only in agriculture and mining activities.

At the first level, intermediate goods and value-added are assumed to be perfectly complementary, as reflected by the use of a Leontieff function. At the second level, value-added is obtained by combining specific factors and the aggregate of skilled labour, capital and unskilled labour. The combination of production factors is represented in three stages with Constant Elasticity of Substitution (CES) functions, which allow characterising the degree of substitution between factors. A first CES function combines unskilled labour and the aggregate of skilled labour and capital, the latter aggregate being represented though a similar function with a lower

1. This CGE model has been developed in the CATT by Antoine Bouët, Estelle Dhont-Peltrault, Sophie Tarascou and Anne Yapaudjian-Thibaut. David Laborde has constituted all the social accounting matrices.

elasticity of substitution. It aims to reflect the relative complementarity between capital and skilled labour.

Composite intermediate inputs are a fixed share of total intermediate consumption. Each sector uses intermediate inputs which come from domestic and foreign sources according to a CES function. As with primary factors, demands for intermediate products are the result of profit maximisation and reflect substitution possibilities between domestic and imported intermediates. A Constant Elasticity of Transformation (CET) function reflects substitution possibilities in sales between domestic and export markets. Exports are differentiated according to their destination. Two nested CET functions allow us to capture the imperfect substitution between the different components of the representative firm's supply in each sector.

Chamberlin's monopolistic competition is assumed for manufacturing sectors characterised by increasing return to scale. Firms adopt a mark-up pricing behaviour and their perceived price elasticity is equal to the elasticity of substitution between domestic varieties in the industry.

The Demand Side

There is a single private household in each country that saves a constant proportion of disposable income and buys consumer goods. It owns capital, labour and all natural resources such that it receives all factor remunerations.

In each country, the preferences of the representative household are supposed to be homothetic and the representative consumer behaviour is modelled in four stages. The first level describes the distribution of demand between the composite agricultural good and all final industrial commodities and service sectors. Referring to Armington (1969), domestic and foreign goods are distinguished by their origin. The second and third levels highlight the choice between products from different geographical origins through CES functions.

The last level of this nesting is a Dixit-Stiglitz formulation for products coming from only one country. The consumer chooses between horizontally-differentiated varieties of each good with a constant elasticity of substitution.

Equilibrium of the model and closure

Once the model has been specified, an equilibrium solution can be computed. It is given by a set of goods and factor prices for which all markets clear. Hence, the general equilibrium is reached if the following conditions are satisfied:

– equilibrium in the domestic good's market in every country;
– equilibrium in factor markets in every country;
– equilibrium between import demand and export supply in the bilateral trade of each good;
– equilibrium of the world current account.

The model's numeraire is the domestic price of services in the rest of the world.

Data, Calibration and Numerical Resolution

Benchmark Data Set

The framework of analysis is a general equilibrium model with a multi-regional and multi-sectoral specification that follows the standard theoretical specifications of trade-focused CGE models.

The base year is 1997 and most of the data come from the database of the Global Trade Analysis Project (GTAP), version 5.2. Several comparative static analyses are carried out from this benchmark. Protection data come from Mac Maps (see sector 4.3).

There are 41 products and 8 regions (Australia and New Zealand, Mercosur, the EU, NAFTA, rest of American countries, rest of the developed countries, rest of the developing countries and rest of world). Regions are linked through trade. We assumed a European Union of 25 countries, since we wish to take account of the integration process of the Eastern and Central European countries. The disaggregation for the agricultural and agri-food products includes 20 sectors. There are four factors of production: skilled labour, unskilled labour, capital, and natural resources. We built a social accounting matrix (SAM) for each zone, using input-output tables and trade data for each area.

Elasticities

The key elasticities in our model are the skilled-unskilled substitution elasticity, and the elasticity of substitution between capital and the aggregate labour input. The degree of substitutability

between skilled and unskilled labour determines the change in relative wages induced by a policy change. We use elasticities of factor substitution based on those used by Hamermesh (1993) and Cortes and Jean (1996). Because of the lack of detailed regional data our elasticities are identical across regions. We therefore set the elasticity of substitution between unskilled labour and the skilled labour-capital aggregate using previously quoted sources.

On the demand side of the model, the most important elasticities are those controlling substitution between imports coming from different partners and summing up in a composite, and those controlling substitution between domestic goods and aggregate imports. They are derived from the GTAP database.

Data on protection

The impact of a discriminatory trade agreement depends crucially on the existing tariff structure and the current network of trade preferences. For example, creating a free trade area between the EU and Mercosur is a central issue for Latin American countries because Europe is a major trade destination and its global trade policy is very disadvantageous for them.

As illustrated by Reis Castilho (2002) and Vaillant and Ons (2002), the comparative advantage of Argentina, Brazil, Paraguay and Uruguay is located in the agricultural and agri-food sectors. Europe is an open area, except in these sectors, where the Common Agricultural Policy is extremely protective. In order to estimate the impact of a free trade area between Mercosur and Europe, it is therefore very important to base our estimation on the precise data of protection.

A second negative point for Latin American countries is the European hierarchy of trade preferences. These countries are granted a trade preference called the Generalised System of Preferences (GSP), which gives them a preferential margin as compared with WTO countries receiving MFN treatment. But this trade preference is only minor with regard to agricultural and agri-food activities. Bouët (2003) estimates that it is only 1.0% on average in these sectors. Moreover, the EU has conceded other more substantial trade preferences to developing countries; the least developed countries receive a 5% preferential margin, as compared with MFN duties, and the ACP countries a 10% preferential margin, in the agricultural and agri-food sectors (Bouët, 2003).

This means that the quality of data on protection is a central issue in the process of estimating the impact of a free trade area, especially from the Mercosur-EU perspective. Data should be disaggregated and should include precisely all regional agreements and trade preferences. This is the reason why we use Mac Maps. It is a database on market access constructed in order to integrate the major instruments of protection (ad valorem tariffs,[1] specific tariffs, tariff quotas, anti-dumping duties, trade prohibitions) at the most detailed level (HS10) and *including all discriminatory regimes*. It is derived from TRAINS source files, combining these files with data from the COMTRADE and AMAD databases, and integrating notifications obtained from member countries of the WTO regarding their anti-dumping regimes. Mac Maps measures the market access of 223 exporting countries into 137 countries at the HS 10 (or HS8 or HS6) level for the year 1999. It has been applied to the GTAP sectoral and geographical disaggregation. Mac Maps for GTAP is available on the GTAP website. (http://www.gtap.agecon.purdue.edu/).

Let us illustrate Mac Maps for GTAP Tables 2 and 3, showing protection in Europe and in Mercosur for several products. As far as instruments are concerned, ad valorem and specific tariffs, tariff quotas, prohibitions and anti-dumping duties are thus included in this estimation. As far as trade regimes are concerned, all regional agreements and all trade preferences are taken into account. As Mac Maps is a measure of bilateral protection, estimates are given for each importing and exporting zone, and for each product. Europe imposes a 38.9% protective tariff on wheat from Australia/New Zealand, and one of 48.7% for wheat coming from Mercosur.

The structure of protection in the two importing zones is quite different. In the EU, protection is very high in agriculture and agrifood activity, but very low in industry. In Mercosur, protection is not very dispersed, but rather concentrated around an average of 12%.

1. Applied tariffs are used.

Table 2. *EU Bilateral protection for 12 products*

(%)

	Wheat	Cereals grains (nec)	Crops (nec)	Meat: cattle, sheep	Dairy products	Sugar cane, Sugar beet	Processed rice	Sugar	Textile	Wearing apparel	Metal products	Motor vehicles and parts
Austr./N.-Z.	38.9	46.0	4.9	88.3	60.3	19.4	49.6	133.9	7.0	11.0	5.5	9.9
Mercosur	48.7	54.1	14.2	84.8	55.6	19.4	51.1	92.2	6.9	9.1	3.6	7.3
NAFTA	42.2	57.5	9.7	70.1	60.8	19.1	39.3	37.4	8.7	10.5	5.0	8.9
Rest of America	24.1	7.3	4.7	110.1	66.3	37.2	24.6	82.9	9.1	10.4	4.2	7.4
Rest of developed countries	44.6	22.7	5.0	35.3	52.3	0.5	48.7	81.4	9.7	13.1	5.7	10.9
Rest of developing countries	76.6	33.6	5.5	105.5	48.2	34.4	44.8	112.5	9.7	13.4	6.9	6.5
RoW	44.4	24.6	4.8	77.4	39.4	5.8	39.6	65.6	8.6	9.7	5.0	12.0

Source: Mac Maps for GTAP.

Table 3. *Mercosur Bilateral protection for 12 products*

(%)

	Wheat	Cereals grains (nec)	Crops (nec)	Meat: cattle, sheep	Dairy products	Sugar cane, Sugar beet	Processed rice	Sugar	Textile	Wearing apparel	Metal products	Motor vehicles and parts
Austr./N.-Z.	6.3	9.0	1.5	12.4	19.7	19.4	13.5	15.4	12.1	18.0	18.4	26.2
Mercosur	6.3	8.8	8.2	12.9	19.4	19.4	13.5	24.7	15.5	19.2	17.9	22.7
NAFTA	6.3	8.9	10.0	12.4	19.1	19.1	13.5	22.9	14.9	18.0	18.2	20.6
Rest of America	3.3	2.7	11.6	4.5	18.8	37.2	13.4	19.4	15.7	17.5	17.7	25.6
Rest of developed countries	6.3	8.6	7.2	12.1	20.0	0.5	13.5	17.0	15.6	18.6	18.5	22.8
Rest of developing countries	6.3	8.4	12.5	14.2	19.3	34.4	13.5	16.8	15.9	18.7	18.9	20.9
RoW	6.3	8.3	12.8	13.2	19.4	5.8	13.5	22.4	15.3	18.5	17.5	25.7

Source: Mac Maps for GTAP.

Moreover, due to the multiplication of regional agreements and trade preferences, EU trade policy is extremely discriminatory: in the case of sugar, European protection ranges from 37.4% when the product comes from NAFTA, to 133.9% when it comes from Australia/New Zealand. This is the result of discrimination between exporters *plus* high variation in protection at a disaggregated level (HS10). Estimating an average EU protection for a group of products coming from a specific zone, Mac Maps takes into account the composition of exports from this zone to a group of countries similar to Europe. Thus, if protection varies from one tariff line to another, and if the breakdown of the two zones' exports is quite different, the average protection for this group of products varies from one exporting zone to another.

Using these data and other behaviour parameters found in the literature, we calibrated the other parameters in order to replicate the base data. The calibration process and the numerical resolution of the model follow classic procedures used in most static CGE models. We then solve the model numerically with GAMS (General Algebraic Modelling Systems) softward and the solver Conopt3.

Estimating the impact of rules of origin

The recent expansion of reciprocal preferential trading agreements has focused increasing attention on rules of origin and their importance.

Rules of origin (RoO) are used to determine the nationality of products**.** Once the origin of a good is known, the importing country can apply specific trade preferences to its imports (such as duty-free entry for goods originating in a free trade area). RoO remained a neutral device so long as the parts of a product were manufactured and assembled primarily in one country. However, the growth of international trade in goods not manufactured in a single country has brought into prominence the rules for determining the origin of traded products. In a situation where goods are produced from parts from around the world, there is no single definition of origin. Indeed, the origin of a product depends on the formulation and applications of preferential rules of origin.

When a product is wholly produced in a single country, it is easy to determine its origin. Difficulties arise when it is manufactured in, assembled in, or uses materials originating in more than one

country. Indeed, where two or more countries have been involved in the manufacture of a product, the general concept applied in formulating RoO is that the product's origin is where the last "substantial transformation" took place. In practice, there are three main methods of determining whether substantial transformation has occurred. The one we adopt is a valued-added percentage test[1] which defines the degree of transformation required to confer origin of the good in terms either of a minimum percentage of value that must come from the originating country, or a maximum amount of value that must come from the use of imported parts and materials. It requires that the last production process has created a certain percentage of value-added. Hence, if the floor percentage is not achieved or the ceiling percentage is exceeded, the last production process will not confer the origin.

In summary, application of this test generally takes one or more of three forms:

– a maximum allowable percentage of imported parts and materials;

– a minimum percentage of local value-added;

– a minimum percentage of originating parts relative to the total value of the good.

RoO are therefore modelled as imposing a constraint on the national origin of the intermediate goods compared with value-added.

We model RoO as follows: the EU and Mercosur are applying a value-added percentage test such that, in each sector, two categories of exports are defined: those respecting the maximum allowable percentage of imported (from zones other than Europe in the case of Mercosur, and other than Mercosur in the case of Europe) intermediate goods in regard to value-added, and those which do not meet this criterion. In the first case, a preferential tariff (0%) is

1. The second method is a change in tariff classification. This determines the origin of a good by specifying the change in tariff classification of the Harmonised System of Tariff Nomenclature required to confer origin. It confers origin if the activity in the exporting country is classified under a different heading of the customs tariff classification from its intermediate inputs. The third method is a technical test which sets out certain production activities that may (positive test) or may not (negative test) confer originating status. These tests can be applied singly or in combination.

applied to products coming from the FTA's partner. In the second case, the initial tariff is applied.

The GTAP database gives, for each sector j and each zone r, data on imported intermediate goods and on value-added, in such a way that it is possible to calculate a RoO coefficient a_{jr}. We assume a symmetrical and triangular distribution of this coefficient from $\frac{a_{jr}}{2}$ to $\frac{3a_{jr}}{2}$ and use the comparison of this distribution to the test level in order to evaluate the part of exports respecting the RoO criterion and receiving preferential treatment.

According to Figure 1, from the GTAP database, the calculation of imported intermediate goods divided by value added gives a coefficient a_{jr} greater than the test level. As we assume a distribution of this coefficient around a_{jr}, the fraction of exports in this sector respecting the RoO and receiving preferential treatment is not 0%, but the part of the distribution under the test level.[1] Thus, we assume that, inside a sector, firms do not have exactly the same configuration of costs; this may due to a spatial distribution of firms in the country such that the cost of access to imported intermediate goods differs from one firm to another.

We do not assume a reaction of firms to the imposition of RoO. Firms which are not granted preferential treatment because of insufficient local value-added do not change their technology in order to respect the criterion. Indeed, despite the substitutability between domestic and imported intermediate consumption allowed by the Armington assumption, firms' demands result from cost-minimising behaviour and they do not anticipate the consequences of input choices on market access conditions. In reality, a firm may act strategically by deciding to buy more expensive, but domestic, inputs in order to obtain preferential treatment. Thus, our way of modelling RoO could be interpreted either as a short-term model, or a consequence of the existence of rigidities in production.

1. If S is the test level, in this case, this fraction is given by the formula: $\frac{2}{a_{jr}^2}\left(S-\frac{a_{jr}}{2}\right)^2$. If a_{jr} is lower than *S*, it is given by $\frac{2}{a_{jr}^2}\left(\frac{3a_{jr}}{2}-S\right)^2$.

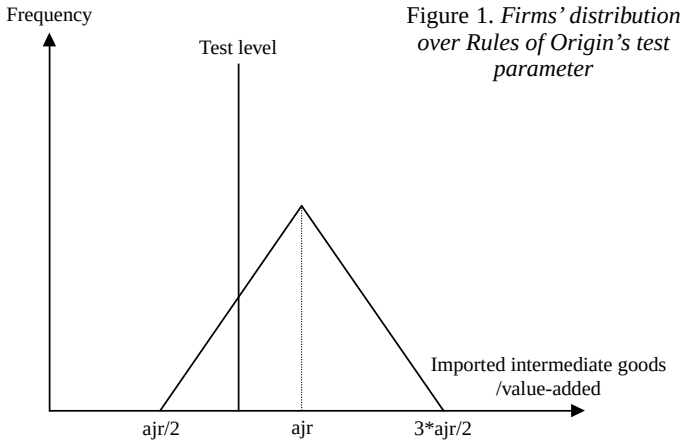

Figure 1. *Firms' distribution over Rules of Origin's test parameter*

In our study, we assume that both zones are applying a criterion of 10% of the imported volume of intermediate goods divided by value-added. In the light of European rules, this corresponds to a very restrictive level of rules of origin.

Policy Simulations and Results

We simulate three scenarios of trade liberalisation:

Scenario 1 examines the creation of an FTA between Mercosur and the EU. First, we study full market access for all sectors across the EU and Mercosur, *with and without Rules of Origin*.

Scenario 2 simulates the creation of the FTAA: countries of the Western Hemisphere eliminate all tariff barriers to intra-hemispheric trade. Thus, both North and South American blocs eliminate all tariff barriers while keeping their individual protection structures with third parties.

Scenario 3 is designed to measure the impact on the EU of creating simultaneously the FTAA and the FTA between the EU and Mercosur.

For each scenario, we study macroeconomic and sectoral effects.

The FTA between Mercosur and the EU

The creation of such a free trade area is positive for the EU as its national income is increased by 0.02%, and negative for Mercosur

as its national income is reduced by 0.05%. In the first case trade creation effects are greater than trade-diversion effects while the opposite is true in the second case.

On this subject, the economic literature (since Viner, 1950) reveals that regional agreements could not be beneficial. Opening an economy to international trade implies an expansion of activity in some sectors, while reducing production in others. Along with these production effects, economic efficiency could be increased, especially in the case of multilateral liberalisation: industries and consumers are able to buy cheaper (intermediate) commodities, in such a way that real income is increased. This could not be the case when the liberalisation is regional: a trading partner in the agreement may lose from the fact that its protection is reduced in favour of uncompetitive exporters, and the regional agreement forces it to buy commodities from an expanding supplier.

It should be noted that we do not integrate into our modelling certain dynamic effects which could be very positive: for example, an assumption of technological externalities of international trade, such that it is possible to assume that global factor productivity increases with trade openness. In this case, the same kind of free trade area shows evidence of a much more positive effect. As empirical studies do not completely confirm this kind of effect, we prefer to model a free trade area without this assumption and present only strongly confirmed results, which are the minimum positive effects that could be implied by this kind of agreement.

For Mercosur, integration with the EU without rules of origin (see Table 4) generates a great impact on export performance. Mercosur's global exports increase by 5.8% while European exports increase by only 0.8%. This reflects the asymmetric size of the two blocs, and the level of protection in European agriculture. The creation of an EU-Mercosur free trade area is slightly negative for global exports from all other blocs, which are reduced by less than 0.5%. The impact on GDP is close to 0%: this reflects the fact that protection is low in a large part of European activity and that Mercosur is not a major stake for European producers. Moreover, liberalisation is not multilateral, but discriminatory: thus, trade diversion, in Viner's sense, is quite possible, such that partners to the agreement could experience a deterioration in their terms of trade.

The impacts on real returns represent less than 0.1 % for each factor of production in the EU. For Mercosur, the variations are

similar: +0.1 % for unskilled labour, –0.05 % for skilled labour and +0.3 % for capital.

Table 4. *Macroeconomic impact of scenario 1: Mercosur-EU FTA without RoO*

(%)

	EU	Mercosur
GDP	0.02	– 0.08
Total exports	0.80	5.80
Total imports	0.40	6.40
Real remunerations		
Unskilled Labour	0.08	0.10
Skilled Labour	0.07	– 0.05
Capital	0.04	0.33
Tariff revenues	– 6.20	– 45.00

The effects on trade flows and GDP are reduced if rules of origin are included in the agreement. The creation of the FTA becomes positive for Mercosur as its national income is increased by 0.07% instead of reduced by 0.08 % without RoO. The imposition of rules of origin has a substantial protectionist effect (see Table 5): if they are imposed, global exports from Mercosur increase by only 4.2% (instead of 5.8% without RoO) and exports from the EU increase by 0.08% with RoO (instead of 0.8% without RoO).

With rules of origin, the effects on Mercosur's unskilled and skilled labour are negative (respectively –0.15 % and –0.8 %, instead of +0.1 % and – 0.05 % without RoO).

Table 5. *Macroeconomic impact of scenario 1: Mercosur-EU FTA without RoO*

(%)

	EU	Mercosur
GDP	0.007	0.07
Total exports	0.04	4.20
Total imports	0.35	0.35
Real remunerations		
Unskilled Labour	0.04	– 0.15
Skilled Labour	0.08	– 0.80
Capital	0.03	0.35
Tariff revenues	– 5.60	– 2.50

Tariff revenues decrease in both cases on account of the liberalisation of trade, but for Mercosur the variation is much higher with-

out RoO (–45 %) than with RoO (–2.5 %). This can be explained by the smaller proportion of exporters respecting the RoO. Many firms do not respect the rules of origin, and do not receive preferential treatments. Thus, the decrease in tariff revenues is of less consequence and ultimately the national income of Mercosur increases.

Table 6 illustrates the geographical breakdown of the variations in trade flows following the creation of a FTA between Mercosur and the EU (Table 7 with the imposition of rules of origin). Mercosur expands its exports to the EU market by 20.6%, mainly in the agricultural sectors[1] (due to the initial highly protected European market for agricultural goods). Modification of the EU's high protection in agriculture is obviously the key parameter, leading to the bloc's sharp rise of exports in those sectors where Mercosur has a distinct comparative advantage and strong competitiveness. Under this FTA, Mercosur's most dynamic exports to Europe are sugar (up by 340%), meat (170%), wheat (153%), milk (148%), other crops (142%), processed rice (132%) and beverages and tobaccos (98%). Compared with the agricultural sectors, exports of manufactured goods also rise but at a relatively moderate rate: apparel (27%), textiles (16%), leather (23%), motor vehicles and parts (25%).

Table 6. *Geographical breakdown of variations in trade flows following EU-Mercosur FTA without RoO (exporting countries in columns, importing in rows)*

(%)

	NAFTA	Aus/NZ	Mer	RoA	RoW	ODC	Emerg	EU
NAFTA		0.11	–4.85	0.11	0.11	0.10	0.094	–0.035
Aus/NZ	0.010		–2.09	0.07	0.04	0.019	0.039	–0.57
MER	–0.41	–0.30		–0.61	–0.76	–0.59	–0.25	20.6
RoA	0.07	0.07	–2.34		0.09	0.097	0.068	–0.36
RoW	–0.0	0.039	–2.76	0.061		0.026	0.020	–0.12
ODC	–0.01	0.025	–4.60	0.021	0.02		0.009	–0.07
Emerg	–0.017	0.013	–3.73	–0.015	0.02	0.023		–0.12
EU	–0.14	–0.11	26.1	–0.108	–0.08	–0.095	–0.10	

The imposition of RoO could be prejudicial to bilateral exports. Global exports from Mercosur to the EU increase by 17% instead of 20.6%, and European exports to Mercosur by 1.33% instead of

1. See Appendix Table A1 for sectoral breakdown.

26.1%: the rules of origin have a more restrictive impact on European exports because of the way we define our rules has a much larger impact in the case of industrial products.

Table 7. *Geographical breakdown of variations in trade flows following EU-Mercosur FTA with RoO (exporting countries in columns, importing in rows)*

(%)

	NAFTA	Aus/NZ	Mer	RoA	RoW	ODC	Emerg	EU
NAFTA		0.03	–0.3	0.11	0.03	0.01	0.02	–0.02
Aus/NZ	0.03		–0.3	0.15	0.04	0.02	0.04	–0.6
MER	–1.3	–1.07		–1.3	–1.5	–1.4	–1	17
RoA	0.02	–0.001	0.01		0.01	0.02	–0.014	–0.47
RoW	0.006	0.02	0.06	0.08		0.01	0.004	–0.12
ODC	0.008	0.03	–0.2	0.1	0.03		0.01	0.02
Emerg	0.007	0.02	–0.17	0.06	0.03	0.007		–0.07
EU	–0.01	–0.0002	1.33	0.06	–0.01	–0.014	–0.01	

Even if the exports of the two zones' to the rest of the world are reduced (Mercosur's exports to NAFTA are reduced by 1.3% and to the rest of the world by 1.5%, while European exports to NAFTA decrease by only 0.01%), the creation of a free trade area between Mercosur and the EU has a positive effect on production where each of the two zones has its comparative advantage (see Appendix Table A1). These are essentially the agricultural and agri-food sectors in Mercosur (Mercosur's production in the meat products sector is increased by 6.5%, by 5.7% in the cattle, horses, sheep, and goats sector, and by 5.0% in the crops sector) and the industrial sectors in the EU (European production of motor vehicles and spare parts increases by 0.7%, of machinery and equipment by 0.34%, of textiles by 0.15%). On the other hand, production is reduced in sectors where a zone has a trade disadvantage. For Mercosur, this is the case for motor vehicles and spare parts (–4.2%), machinery and equipment (–1.7%) and textiles and apparel (–0.15%). In Europe, in all agricultural and agri-food sectors, except beverages and tobaccos, production is reduced, especially in the cattle, horses, sheep and goats sector (–0.85%) and in sugar (–0.77%).

Obviously, the imposition of rules of origin has a dampening effect on variations in production (see Appendix Table A2). Expansions in Mercosur's agricultural activity are the same for meat products, for example, and lower for other sectors (the production of miscellaneous crops rises by 4.6% instead of 5%). The reduc-

tion in industrial activity is also less important (motor vehicles: –0.72% instead of –4.2%); there is an increase in apparel and textiles of 0.1% instead of –0.15 % without RoO in both cases. Moreover, in a few cases, such as apparel and textiles, the shrinking of production turns into a slight increase (from –0.15% to +0.1%). The picture is the same as far as Europe is concerned.

The Free Trade Area of the Americas

The formation of a Free Trade Area of the Americas (FTAA) is extremely positive for intra-America trade flows. From a global point of view, the creation of the FTAA increases Mercosur exports by 6.6% (see Table 8) and NAFTA exports by only 1.7%, while European exports are reduced by 0.23%. Nevertheless, variations in national income due to the creation of an FTAA are not significantly different from zero.

Table 8. *Macroeconomic impact of scenario 2: FTAA*

(%)

	EU	Mercosur
GDP	–0.01	– 0.02
Total exports	–0.23	6.60
Total imports	–0.10	5.00
Real remunerations		
Unskilled Labour	–0.01	0.28
Skilled Labour	–0.004	0.04
Capital	–0.01	0.30
Tariff revenues	–0.11	–38.5

The effects on real wages are negligible in the EU but substantial in Mercosur (+0.3 % for unskilled labour and capital and +0.04 % for skilled labour). The cost of the FTAA is not very important for Europe: if the EU does not form an FTA with Mercosur and the FTAA is created, the trade flows decrease but only slightly (–0.2 % for total imports and –0.1 % for total exports).

Trade flows inside America are accelerated by the agreement: Mercosur's exports to NAFTA and the rest of the Americas see a substantial increase of 20.5 % and 21.1% respectively, while NAFTA's exports to Mercosur and the RoA go up by 22.3% and 16.6% respectively. Finally, RoA's exports to Mercosur and NAFTA increase by 12.4% and 12.3% respectively (see Table 9). Countries which are outside the agreement see their exports to America fall, while exports between them increase. European exports to Merco-

sur and RoA are significantly affected by the FTAA: this is the cost of the FTAA for Europe.

Sectoral results show that the FTAA generates a more homogeneous export growth across sectors than the FTA between Mercosur and the EU. As a consequence, in terms of production, under the FTAA**,** Mercosur's most dynamic sectors are leather (+5.5% –see Appendix Table A1), sugar and other crops (+1.7%), beverages and tobacco products (+1.5%) and transport equipment (+1.0%). On the other hand, activity declines in machinery and equipment (–0.9%), and non-ferrous metals (–0.6%). The creation of the FTAA leads to a more balanced increase of sectoral production, on account of the bilateral levels of protection.

NAFTA's production increases slightly in all industrial sectors except apparel (–0.1%), wood products (–0.1%) and transport equipment (–0.1%).

The EU's production decreases in all sectors (by –0.1 %) except for a few sectors where it rises very slightly (0.05 % for paddy rice, 0.06 % for transport equipment).

Table 9. *Geographical breakdown of variations in trade flows following FTAA (exporting countries in columns, importing in rows)*

(%)

	NAFTA	Aus/NZ	Mer	RoA	RoW	ODC	Emerg	EU
NAFTA		–0.34	22.3	16.6	–0.33	–0.31	–0.23	–0.27
Aus/NZ	–0.57		–1.32	–3.65	0.07	0.05	0.07	0.04
MER	20.46	–1.04		21.06	–0.87	–0.91	–0.64	–0.97
RoA	12.34	–0.95	12.43		–0.83	–0.83	–0.62	–1.03
RoW	–0.38	0.09	–2.11	–3.88		0.06	0.08	0.07
ODC	–0.26	0.07	–3.56	–3.91	0.05		0.09	0.06
Emerg	–0.70	–0.05	–3.61	–5.12	–0.04	–0.05		–0.06
EU	–0.15	0.12	–4.22	–4.42	0.10	0.10	0.16	

Simultaneous creation of FTAA and EU-Mercosur FTA

The simultaneous creation of a Free Trade Area of the Americas and of a free trade zone between Mercosur and the EU is extremely beneficial for Mercosur's exports since it gains free access to the two biggest world markets. They increase globally by 12.3%, while Mercosur's imports rise by about 11%. The EU also experiences an increase in trade flows, but to a much smaller extent. Total exports rise by 0.55 % instead of decreasing by 0.2 % in the case of the FTAA on its own. The impacts on GDP are close to zero. The

effects on real wages are negligible in the EU but substantial in Mercosur: increases of 0.4 % for unskilled labour, and 0.6 % for skilled labour.

Table 10. *Macroeconomic impact of scenario 3: FTAA and Mercosur-EU FTA*

(%)

	EU	Mercosur
GDP	0.007	– 0.06
Total exports	0.55	12.34
Total imports	0.28	10.90
Real remunerations		
Unskilled Labour	0.06	0.37
Skilled Labour	0.06	– 0.06
Capital	0.03	0.64
Tariff revenues	–6.20	–77.50

For Mercosur, exports rise especially to the Rest of America (+20.3% –see Table 11) and Europe (+19.4%). The increase of European exports to Mercosur is quite substantial (+21.1%), while the two agreements are also positive for NAFTA exports to Mercosur (+16.14%) and to the Rest of America (+16.75%). Here, the EU-Mercosur FTA induces a shift between EU and NAFTA products on the Mercosur market. Nevertheless, NAFTA producers offset this effect by increasing their sales to the other American countries by a greater amount than in the simple FTAA case.

Table 11. *Geographical breakdown of variations in trade flows after the simultaneous creation of an FTAA and an EU-Mercosur FTA (exporting countries in columns, importing in rows)*

(%)

	NAFTA	Aus/NZ	Mer	RoA	RoW	ODC	Emerg	EU
NAFTA		–0.21	16.14	16.75	–0.20	–0.19	–0.12	–0.29
Aus/NZ	–0.57		–3.14	–3.60	0.11	0.07	0.11	–0.54
MER	19.94	–1.33		20.31	–1.62	–1.50	–0.91	19.37
RoA	12.41	–0.88	9.68		–0.74	–0.74	–0.55	–1.39
RoW	–0.39	0.13	–4.48	–3.82		0.08	0.10	–0.06
ODC	–0.27	0.10	–7.53	–3.89	0.07		0.10	–0.02
Emerg	–0.73	–0.04	–6.86	–5.13	–0.02	–0.03		–0.19
EU	–0.29	0.01	21.11	–4.51	0.02	0.01	0.07	

In terms of impact on production, for Mercosur, economic activity increases strongly in meat products (+7.0% –see Appendix Table A1), leather (+7.3%), other crops (+6.6%) and cattle, horses,

sheep and goats (+6.1%). Increases in activity are also significant but to a smaller extent for processed sugar, sugar cane and cereals. The decline in Mercosur's activity is especially important in motor vehicles and spare parts (–3.9%), metals (–1.5%), metal products (–1.2%), and machinery and equipment (–2.5%). While in most cases, the EU-Mercosur agreement and FTAA have cumulative effects on production levels, it is noteworthy that the fall in production in the vehicle industry is smaller in this case than under the straightforward EU-Mercosur FTA: American integration allows the demand for Mercosur products in this sector to rise, while the sector benefits simultaneously from cheaper inputs.

In Europe, activity is significantly affected in cattle, horses, sheep and goats (–0.8%), sugar (–0.8%), and in motor vehicles and spare parts (+0.6%). In NAFTA, the production of sugar falls by more than 1.5%, while activity increases in all industrial sectors except apparel, wood products, and transport equipment, where production is slightly reduced.

Conclusion

Our objective in this paper has been to examine the potential costs of an FTAA for the European Union with and without an agreement with Mercosur. Using a world computable general equilibrium model, we simulated three scenarios of trade liberalisation: an FTA between Mercosur and the EU, the formation of an FTAA, and both agreements simultaneously. A second objective has been to measure trade preferences and estimate the potential impact of rules of origin.

From a global point of view and in terms of GDP, the creation of a free trade area between Mercosur and the EU has a very small impact –positive for Europe and negative for Mercosur. Nonetheless, integration with the EU without rules of origin generates a big impact on export performance that may be the source of important dynamic gains for Mercosur. With rules of origin, the effects on trade flows and GDP are reduced: the impact on GDP becomes positive. EU exports to Mercosur increase in both cases, but only slightly with rules of origin, which have a strong restrictive impact on trade flows.

The formation of a Free Trade Area of the Americas (FTAA) is extremely positive for intra-America trade flows but not for Merco-

sur's GDP. If there is not an agreement between Mercosur and the EU, and if the FTAA is formed, trade flows decrease but only slightly. There is a cost for Europe, but the consequences are not very serious.

The simultaneous creation of a Free Trade Area of the Americas and of a regional agreement between Mercosur and the EU is extremely beneficial for Mercosur exports. The EU also experiences an increase in trade flows, but to a much smaller extent.

In both these scenarios, the macroeconomic impact on GDP remains close to zero. If an FTAA is created, European production is negatively affected in almost every sector. The best scenario for Europe is the creation of a free trade area with Mercosur; in this case European production is increased in almost every industrial sector while activity is negatively affected in the agriculture and agri-food sectors. Moreover, while a regional agreement with Mercosur is always attractive for the EU, it seems particularly relevant in view of the implementation of an FTAA since it allows the fending off of its negative effects on the EU's industrial activity.

As for Mercosur, while an agreement with the EU is preferred to the FTAA, the dynamic implementation of both agreements appears to be the best solution.

The principal extension of this chapter will be to improve the modelling of rules of origin, for example by integrating the reaction of producers.

The EU and Mercosur are fully aware of the importance of creating a Free Trade Association, but one of the major challenges lies in the negotiations on agriculture where Mercosur has a clear comparative advantage, while the EU maintains a protectionist policy. Our study focuses on market protection issues and does not include a specific analysis of the CAP. Thus, the Doha Round negotiations on export subsidies and, above all, the internal supports to agriculture may have an effect on some of our results.

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GLOSSARY

CES:	Constant elasticity of substitution
CET:	Constant elasticity of transformation
CGE:	computable general equilibrium model
EU:	European Union
EMERG:	Emerging economies
FTAA:	Free Trade Area of the Americas
FTAEUM:	Free trade agreement between Mercosur and the EU
GAMS:	General Algebraic Modelling Systems
GTAP:	Global Trade Analysis Project
LAC:	Latin American countries
NAFTA:	North American Free Trade Association
ODC:	Others developed countries
RoA:	Rest of Americas
RoO:	Rules of origin
RoW:	Rest Of World
RTA:	Regional Trade Agreements
SAFTA:	South American Free Trade Area
SAM:	Social Accounting Matrix

APPENDIX

A1. *Changes in production in the three scenarios (no RoO)*

	Production							
	Benchmark ($ million)		EU-Mercosur FTA (%)		FTAA (%)		FTAA + FTA EU-Mercosur (%)	
Commodities	EU	Mercosur	EU	Mercosur	EU	Mercosur	EU	Mercosur
Paddy rice	1443.23	5852.59	–0.13	0.22	0.05	0.49	–0.07	0.73
Wheat	29790.22	7392.91	–0.14	1.57	–0.005	0.30	–0.14	1.85
Cereal, grains nec	27842.38	9158.28	–0.39	2.95	–0.004	0.81	–0.39	3.70
Vegetables, fruit, nuts	55114.64	49141.98	–0.17	0.19	0.0004	0.02	–0.17	0.22
Oils seeds	19895.68	17133.05	–0.06	0.44	0.01	0.19	–0.05	0.62
Sugar cane, sugar beet	8695.47	7817.66	–0.53	1.57	–0.02	0.80	–0.55	2.37
Plant-based fibres	2603.16	2797.70	0.12	–0.09	–0.08	0.25	0.03	0.19
Crops nec	47352.89	10137.97	–0.58	5.00	0.01	1.75	–0.57	6.56
Cattle, sheep, goats, horses	47683.42	11341.90	–0.50	5.72	0.01	0.46	–0.49	6.15
Animal products nec	68193.80	13146.85	–0.13	1.54	–0.01	0.37	–0.14	1.90
Raw milk	181494.26	45473.74	–0.10	0.59	–0.03	0.14	–0.13	0.73
Wool, silk-worm cocoons	805.21	1040.16	–0.09	0.22	–0.02	–0.02	–0.11	0.21
Forestry	23089.37	5341.00	–0.01	0.04	0.01	0.03	–0.01	0.07
Fishing	37194.57	1715.74	–0.08	0.26	0.003	0.09	–0.07	0.35
Coil, oil, gas, minerals nec	69960.53	28553.51	0.00	–0.07	–0.0005	0.60	0.00	0.51
Meat (cattle, sheep, goats, horses)	71919.09	24753.94	–0.85	6.50	0.01	0.50	–0.84	6.96
Meat products nec	113853.20	19506.09	–0.16	2.22	–0.01	0.46	–0.17	2.68
Vegetables	61499.98	19640.62	–0.15	0.89	–0.04	0.84	–0.19	1.73
Processed rice	3673.09	7972.14	–0.11	–0.38	–0.07	0.36	–0.18	0.01
Sugar	28323.70	11229.64	–0.77	2.54	–0.02	1.68	–0.78	4.21
Food products nec	304600.21	82190.91	–0.03	0.59	–0.03	0.45	–0.06	1.06
Beverages and tobacco products	174266.91	26157.08	0.03	–0.38	–0.10	1.49	–0.07	1.16
Textiles	156744.19	66928.06	0.15	–0.15	–0.08	0.16	0.07	0.04
Apparel	122725.68	34394.57	0.06	–0.15	–0.02	0.07	0.04	–0.04
Leather products	59497.76	18793.68	–0.03	1.69	–0.01	5.53	–0.05	7.34
Wood products	160422.29	27688.90	–0.01	0.12	0.004	0.31	0.00	0.41
Paper products, publishing	355661.63	47125.44	0.07	–0.29	–0.03	–0.17	0.04	–0.43
Petroleum, coal	112309.49	19618.24	0.01	–0.02	–0.03	0.07	–0.02	0.05
Chemical, rubber, plastic prods	774487.62	144750.2	0.26	–0.53	–0.09	–0.28	0.15	–0.74
Mineral products nec	236564.88	32565.81	0.06	–0.46	–0.02	–0.10	0.04	–0.57
Ferrous metal	212367.84	57017.20	0.27	–1.38	–0.07	0.77	0.20	–0.57
Metals nec	117089.85	20151.38	0.23	–0.87	–0.03	–0.61	0.19	–1.45
Metal products	314967.44	46081.65	0.17	–1.02	–0.01	–0.24	0.17	–1.24
Motor vehicles and parts	514232.47	71273.40	0.71	–4.19	–0.06	–0.07	0.63	–3.88
Transport equipment nec	88973.71	10517.52	–0.11	0.62	0.06	1.06	–0.04	1.55
Electronic equipment	386090.89	22818.30	0.05	0.85	0.001	–0.25	0.05	0.45
Machinery and equipment nec	739374.77	76997.66	0.34	–1.66	–0.07	–0.86	0.26	–2.53
Manufactures nec	217914.95	24006.10	0.08	–0.67	–0.02	–0.08	0.06	–0.71
Electricity, gas manufacture, distribution, water	266312.60	33778.21	0.03	–0.18	–0.01	–0.02	0.01	–0.17
Pub admin/defence/health/education, housing	3805513.00	452486.8	–0.09	0.15	0.03	–0.16	–0.06	–0.08
Other services	5316880.00	493646.8	–0.01	–0.12	0.01	–0.10	–0.01	–0.21

A2. *Changes in production in the scenario EU-Mercosur FTA (with rules of origin)*

	Production			
	Benchmark ($ million)		EU-Mercosur FTA (%)	
Commodities	EU	Mercosur	EU	Mercosur
Paddy rice	1443.23	5852.59	–0.22	0.34
Wheat	29790.22	7392.91	–0.18	1.54
Cereal, grains nec	27842.38	9158.28	–0.43	2.86
Vegetables, fruit, nuts	55114.64	49141.98	–0.25	0.25
Oils seeds	19895.68	17133.05	–0.08	0.09
Sugar cane, sugar beet	8695.47	7817.66	–0.61	1.6
Plant-based fibres	2603.16	2797.70	–0.04	0.08
Crops nec	47352.89	10137.97	–0.64	4.59
Cattle, sheep, goats, horses	47683.42	11341.90	–0.6	5.72
Animal products nec	68193.80	13146.85	–0.23	1.59
Raw milk	181494.26	45473.74	–0.2	0.63
Wool, silk-worm cocoons	805.21	1040.16	–0.14	0.25
Forestry	23089.37	5341.00	–0.01	–0.03
Fishing	37194.57	1715.74	–0.12	0.18
Coil, oil, gas, minerals nec	69960.53	28553.51	–0.03	–0.41
Meat (cattle, sheep, goats, horses	71919.09	24753.94	–0.96	6.5
Meat products nec	113853.20	19506.09	–0.28	2.29
Vegetables	61499.98	19640.62	–0.21	0.17
Processed rice	3673.09	7972.14	–0.24	–0.22
Sugar	28323.70	11229.64	–0.86	2.55
Food products nec	304600.21	82190.91	–0.18	0.78
Beverages and tobacco products	174266.91	26157.08	–0.08	–0.19
Textiles	156744.19	66928.06	–0.02	0.13
Apparel	122725.68	34394.57	–0.01	0.1
Leather products	59497.76	18793.68	–0.05	0.79
Wood products	160422.29	27688.90	0.01	–0.18
Paper products, publishing	355661.63	47125.44	0.01	–0.14
Petroleum, coal	112309.49	19618.24	–0.01	–0.1
Chemical, rubber, plastic prods	774487.62	144750.2	–0.01	0.004
Mineral products nec	236564.88	32565.81	0.05	–0.59
Ferrous metal	212367.84	57017.20	0.03	–0.61
Metals nec	117089.85	20151.38	0.03	–0.77
Metal products	314967.44	46081.65	0.08	–0.66
Motor vehicles and parts	514232.47	71273.40	0.06	–0.72
Transport equipment nec	88973.71	10517.52	0.05	–0.94
Electronic equipment	386090.89	22818.30	0.07	–0.97
Machinery and equipment n	739374.77	76997.66	0.07	–1.17
Manufactures ne	217914.95	24006.10	0.01	–0.29
Electricity, gas manufacture, distribution, Water	266312.60	33778.21	–0.01	–0.05
Pub admin/defence/health/ education, housing	3805513.00	452486.80	0.04	–0.53
Other services	5316880.00	493646.80	0.001	–0.06

A3. *Sectoral aggregation*

Sector abbreviation	GTAP 5 classification
Pdr	Paddy rice
Wht	Wheat
Gro	Cereal grains nec
v_f	Vegetables, fruit, nuts
Osd	Oil seeds
c_b	Sugar cane, sugar beet
Pfb	Plant-based fibbers
Ocr	Crops nec
Ctl	Cattle, sheep, goats, horses
Oap	Animal products nec
Rmk	Raw milk
Wol	Wool, silk-worm cocoons
f_r	Forestry
Fsh	Fishing
Min	Coal, Oil, Gas, Minerals nec
cmt	Meat: cattle, sheep, goats, horse
omt	Meat products nec
Vol	Vegetable oils and fats
Mil	Dairy products
Pcr	Processed rice
Sgr	Sugar
Ofd	Food products nec
b_t	Beverages and tobacco products
Tex	Textiles
wap	Wearing apparel
Lea	Leather products
Lum	Wood products
ppp	Paper products, publishing
p_c	Petroleum, coal products
Crp	Chemical, rubber, plastic prods
nmm	Mineral products nec
i_s	Ferrous metals
Nfm	Metals nec
fmp	Metal products
mvh	Motor vehicles and parts
Otn	Transport equipment nec
Ele	Electronic equipment
ome	Machinery and equipment nec
omf	Manufactures nec
ene	Electricity, Gas manufacture, distribution, Water
Nts	PubAdmin/Defence/Health/Educat, Dwellings
Trs	Trade, Sea transport, Air transport, Communication, Financial services nec, insurance, Business services nec, Recreation and other services

A4. *Geographical aggregation*

	Country Coverage
Australia and New Zealand	Australia, New Zealand
Mercosur	Argentina, Brazil, Uruguay
European Union	Austria, Belgium, Denmark, Finland, France, Germany, United Kingdom, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, Hungary, Poland, Rest of Central European Association.
NAFTA	Canada, United States and Mexico**.**
Rest of America	Central America, Caribbean, Colombia, Peru, Venezuela, Rest of Andean Pact, Chile, Rest of South America.
Rest of developed countries	Hong Kong, Japan, Korea, Taiwan, Singapore, Switzerland, Rest of EFTA, Former Soviet Union.
Rest of developing countries	China, Indonesia, Malaysia, Philippines, Thailand, Vietnam, Bangladesh, India, Sri Lanka, Rest of South Asia, Turkey.
Rest of World	Botswana, Rest of SACU, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, Other Southern Africa (Angola, Mauritius, Uganda), Rest of Sub-Saharan Africa.

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