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Quantitative assessment of a free trade agreement between MERCOSUR and the European Union

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Abstract

Using a GTAP CGE model/database, this paper assesses the possible effects of a free trade agreement (FTA) between the MERCOSUR and the European Union (EU). The study takes into consideration the most important recent free trade agreements signed among the Latin American countries, as well as the latest European Union enlargements. With a 2004+ benchmark base scenario where tariffs were updated by the addition of information on trade agreements just signed by Latin American countries, two different policy simulations are addressed: (i) full liberalization, (ii) liberalization excluding sensitive products. The global CGE model allows analyzing direct and indirect socio-economic impacts on subscriber countries as well as on other countries in the region.

From the point of view of the MERCOSUR countries, the results suggest that the FTA would be beneficial to foster their exports, especially in the case of *Light manufactures*. Imports to MERCOSUR from the EU would be increased, particularly in heavy manufactures sectors. In terms of GDP the results remain positive in the case of all the MERCOSUR countries in all simulated scenarios. However, welfare implications are unevenly distributed in favor of all the MERCOSUR countries in the simulated scenarios. The inclusion of sensitive products in the agreements seems to reduce the magnitude of the results but does not change the direction of the impacts. In any case, active public policies to mitigate the negative effects on sectors, enhance positive impacts and seize dynamic opportunities towards sustainable development must be undertaken. The main conclusion points out a potential complementary trade relationship among these two regions.

Introduction

There is a shared consensus that free trade agreements (FTA) increase exports and production levels in the short to medium term. However, this rise in exports might not lead to a subsequent increase in the product 's level, so additional policies could be useful to mitigate some possible negative effects to support the least competitive sectors, which are exposed a greater openness to the international competition.

In the short run, the net effect that will decide whether an FTA can benefit to a country is the impact on welfare, which is a combination of different factors, including: (i) the country's production specialization, (ii) winner and looser sectors, (iii) the distribution of added value amidst the different sectors, (iv) the evolution of the terms of trade and prices, (v) the levels of technology the sectors have and the qualification levels of employments, (vi) the evolution of tax revenues and their specific use.

Beyond gains in welfare coming from a better use of a country's comparative advantage, a range of dynamic effects could also be the result of liberalization, such as the ability to induce foreign direct investment, changes arising from a fluid access to high-tech capital goods and the increase in domestic competition due to the greater openness. These effects would increase countries' benefits.

The main purpose of this paper is to analyse the direct and indirect impacts of an FTA (free trade agreement) between MERCOSUR and the EU (European Union). MERCOSUR is a regional trade agreement between Brazil, Argentina, Paraguay and Uruguay, created in 1991. Venezuela signed a membership agreement in 2006, but it has not yet been ratified by the Brazilian and Paraguayan parliaments. In our study, we consider that Venezuela is not part of MERCOSUR. The aim of this regional treaty is to support free trade and the free movement of goods, people and currency. By European Union, we mean the 27 countries which are linked by their belonging to the European Communities.

The potential negotiation between the two regional blocs should be a result of a common expression of interest materialized by previous inter-regional agreements, and the international trade context, as Doha multilateral negotiations are frozen. The sluggish progress of multilateral discussions towards trade opening has resulted in a wave of bilateral agreements worldwide. By 2006, the Latin American countries had concluded around 70 FTAs, with countries within and outside the region.

MERCOSUR and the EU signed an inter-regional cooperation agreement in Madrid in 1995, which came into effect in 1999. The negotiations for an FTA started in 2000. In 2004, an offer detailing tariff modifications for each product line was made by both blocs, but was finally rejected. MERCOSUR did not accept the EU proposal on agricultural issues, whereas the EU was mainly concerned by the conditions on services and public markets access.

During a negotiation process, indigenous groups, famlily farmers, small-producer organizations, trade unions and many social movements use to move in order to halt the progress of process. The negotiations are viewed as a concession to economic and geopolitical interests. This is why we feel that it is appropriate to conduct as objective as possible a quantitative evaluation of the consequences of an agreement for the MERCOSUR and the EU. This study therefore analyses the macroeconomic and sectoral effects (GDP, exports, imports and intraregional trade), as well as their impact in terms of welfare. It uses the database of the Global Trade Analysis Project (GTAP version 6.2) and its computable general equilibrium (CGE) model. As the base year for the GTAP database version is 2001, the tariff data were updated to 2004 (+ other recent agreements) so as to take into account all the preferential agreements and tariff reductions in force in the region as well as the recent enlargement of the European Union.

It is important to note that, as with any application of the computable general equilibrium model, the simulation exercises in this study do not consider the possible effects of non-commercial aspects of a free trade agreement (such as investments, public procurement, intellectual property, infrastruture needs or competition policy), which for some countries are even more important than the merely commercial aspects. Furthermore, as they are static simulation exercises, their added value lies in identifying "winner" and "loser" sectors, regions and agents. These are therefore short to medium term results that do not allow growth paths to be deduced nor possible dynamic effects to be incorporated. Even though the model tries to reflect the system of prices and quantities, as well as the public policies applied (in this case free trade agreements), it does not incorporate the institutional, administrative, business, cultural and other elements that are also key to exploit the static and dynamic advantages of a trade agreement and to mitigate adverse effects. Although these limitations do not invalidate the results, they do limit the scope of interpretation and call for caution in the use of the model.

We will consider two scenarios. In the first one, MERCOSUR's countries and the EU fully liberalize their bilateral trade ("Full") by removing tariff barriers of all products. Then, one alternative scenario is simulated, which excludes sensitive products ("excluding sensitives").

Section 1 describes the trade relations between MERCOSUR and the EU putting focus on the reasons for negotiating and the recent trade relations between them. Section II describes the model, the country and product aggregations and the simulation scenarios. Section III details the main results. Section IV concludes the study and brings in some insight about the key outcomes and recommendations.

I. Recent trade trends between the two blocs and the motivations to sign an agreement

1. Trade between MERCOSUR and the European Union

According to the UN Comtrade database information, the European Union (EU) is MERCOSUR's[1] main trading partner. In 2006, the EU15[2] accounted for 20.1% of MERCOSUR total exports, and 18.9% of MERCOSUR total imports came from the EU15 (See Appendix 1). On the other side, the EU15 trade is dominated by intra-regional exchanges, as 59% of its exports were intra-bloc trade.

Even though it was criticized by various sectors, many analysts have considered that a free trade agreement (FTA) among both blocs could increase their mutual trade with a positive effect on the overall economic activity. Note that in 2006, MERCOSUR only represented 0.6% of EU15 total exports and 0.9% of its total imports. However, since 2004, the MERCOSUR biggest countries in terms of production, i.e Brazil and Argentina, encompass a positive trade balance with respect to the EU15.

[1] MERCOSUR is the Regional Trade Agreement among Brazil, Argentina, Uruguay and Paraguay, founded in 1991 by the Treaty of Asunción which was later amended and updated by the 1994 Treaty of Ouro Preto. Its purpose is to promote free trade and the fluid movement of goods, people, and currency.

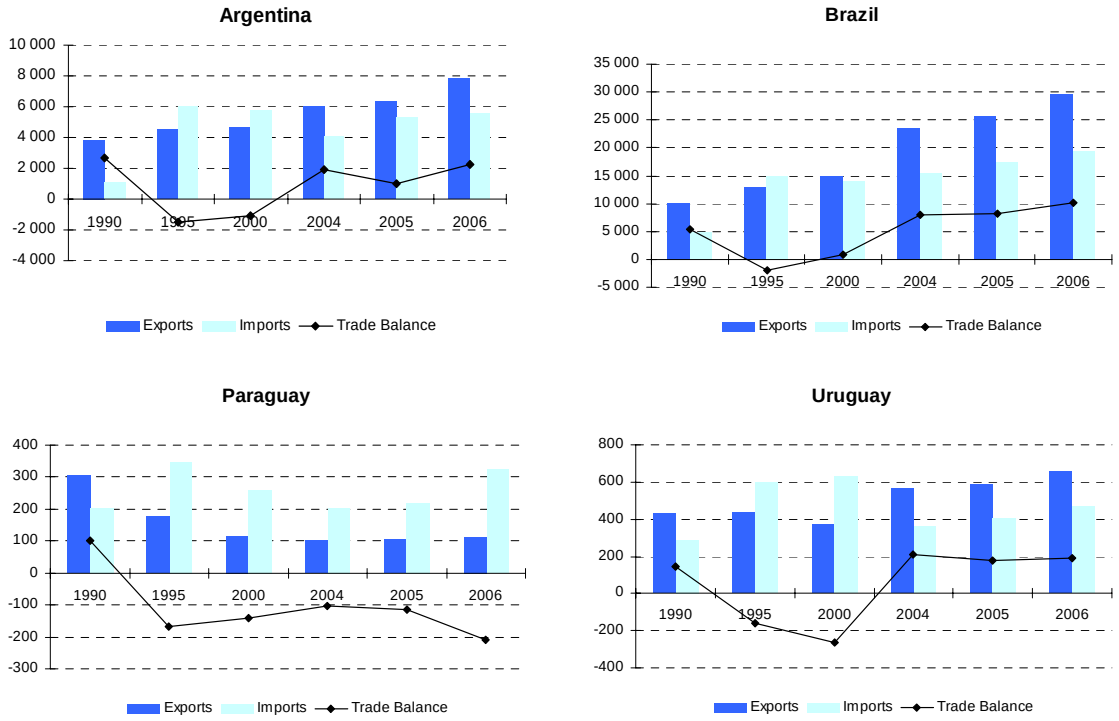
[2] The European Union (EU) is a political and economic union. It was established by the Maastricht Treaty in 1993 upon the foundations of the pre-existing European Community. The EU has developed a single market through a standardised system of laws which apply in all member states, guaranteeing the freedom of movement of people, goods, services and capital. We refer EU15 to the 15 countries of the European Union before the expansion on 1 May 2004. These countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Republic of Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

This is also the case for Uruguay, whereas Paraguay, the smallest economy, has had a negative trade balance with the EU15 for the last 12 years.

Commodities and natural-resource-based manufactures accounted for 73% of MERCOSUR exports to the EU15 during 2006, whereas medium and high-technology manufactures represented 70% of EU15 exports to MERCOSUR (see Figure 1 and Table 1). The main EU exports to MERCOSUR are concentrated in transport equipment, machinery and chemicals, whereas MERCOSUR mainly exports *Agricultural products* to the EU, more particularly crops, grains, processed food (Figure 2 and Table 1).

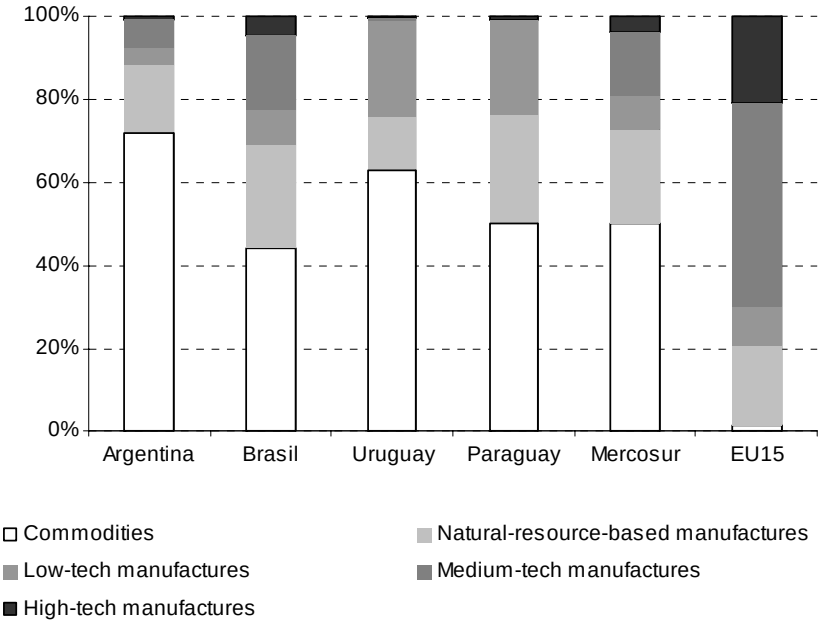
From an historical point of view, MERCOSUR exports to the EU15 grew 91% since 2000. This increase represents 17.2% of the total growth of MERCOSUR total exports since 2000. It is expected that a FTA between both blocs could maintain this trade growth trend. It is important to point out that although MERCOSUR is supposed to be a Custom Union facing unified tariffs lines, the EU still faces different tariffs from each of the four MERCOSUR countries for some products.

FIGURE 1
MERCOSUR: TRADE WITH THE EUROPEAN UNION (15), 1990-2006
(Millions dollars)



Source: ECLAC, Division of International Trade and Integration, on the basis of official figures from the United Nations Commodity Trade Statistics Database (UN Comtrade), DESA/UNSD.

FIGURE 2
MERCOSUR EXPORTS TO THE EU15 AS COMPARED TO EU15 EXPORTS TO MERCOSUR, 2006
(Millions of dollars)



Source: ECLAC, Division of International Trade and Integration, on the basis of official figures from the United Nations Commodity Trade Statistics Database (UN Comtrade), DESA/UNSD.

TABLE 1
MERCOSUR: TRADE WITH THE EUROPEAN UNION (15), 2006
(Millions of dollars)

Countries	X	M	X-M	Trade balance detailed by technological intensity					
				Commodities	Natural-resources-based manuf.	Low-tech manuf.	Medium-tech manuf.	High-tech manuf.	Others
Argentina	7 798	5 576	2 222	5 510	284	-194	-2 098	-1 222	-59
Brasil	29 573	19 412	10 161	12 633	3 455	890	-4 201	-2 628	13
Uruguay	659	469	190	386	5	105	-234	-71	-1
Paraguay	113	323	-210	55	-37	-24	-147	-50	-8

Source: ECLAC, Division of International Trade and Integration, on the basis of official figures from the United Nations Commodity Trade Statistics Database (UN Comtrade), DESA/UNSD.

2. Motivations behind establishing negotiations to sign a FTA between both blocs

In this section we point up the main motivations from both blocs to sign a FTA.

2.1 MERCOSUR's motivations

There are several factors, which can explain the possible MERCOSUR's motivation to sign an agreement with the EU:

- The limited size of the regional market. If an agreement is signed, it would become the largest free trade area in the world, including a population of more than 650 million people.
- The weakness of the regional integration. The negotiations with the EU would leverage MERCOSUR to talk as a single voice. The perspective of an agreement would increase the international influence of MERCOSUR and its worldwide integration.
- The skepticism concerning the WTO multilateral negotiation combined with the need to have stable and predictable trading relationship with its trading partners (remember the recent unsuccessful DOHA round discussions).
- The optimistic expectations of long term gains, such as the increase of FDI and productivity improvements resulting from liberalization by means of an increase in the capital stock as well as technological transfers.
- There are numerous non-tariff barriers which hinder the imports of agricultural products in Europe such as theanti-dumping and phytosanitary measures from the Common agricultural policy (CAP) and other rules of origin, for example. An agreement could improve MERCOSUR's access to the EU agricultural market.
- An agreement could reinforce MERCOSUR's negotiation position in the US trade liberalization initiatives as well as in the WTO multilateral process. Parallel talks tend to put pressure with the aim to obtain better concessions (Bulmer-Thomas, 2000).
- An agreement would be a further incentive to integrate MERCOSUR products in global production networks.

On the other hand, there would also be some possible negative impacts which, in the case of a FTA implementation, should be mitigated by other policies. We show details about them in the concluding remarks section of this study.

2.2 The European Union's incentives

For the EU, the relevance of an agreement with MERCOSUR is both economic as well as strategic. As explained in Doctor (2005), the EU wants to export its institutional and economic model, to promote its values, principles and norms definition and to ensure part of the market if the FTAA is concluded. An agreement can also be seen as a means to put the pressure on the European States to accept the Common agricultural policy (CAP) reform. MERCOSUR's main competitive advantage lies in exports of food and processed food, and lower EU agricultural tariffs would certainly lead to a rise in MERCOSUR's exports to the EU, thus pressing the primary sector to further reform so as to cope with an increased competition.

Santander (2005) underlines that the EU has a strategy for the entire LAC region only since the 90's. This strategy was brought about by the new international context, with the end of the Cold War, the emergence of regional powers, the debate on the US decline and the rise of the Indian and Chinese influence. One of the main objectives of what has been defined as a kind of "new regionalism" (Marchand et al., 1999) was to enable the EU to export its governance principles and norms and to

increase its reputation as a relevant international actor. Some political topics were included in the agreements, such as democratization, human rights, labor and environmental standards. The first agreements between the EU and the MERCOSUR have included inventive sections such as "democratic principles" and "future developments" with the purpose of allowing negotiating further than the mere trade talks.

Laïdi (2005) interestingly addresses the European preference for norms. The author explains that the EU is still a "soft power". It has not the characteristics of a "hard power" (the capacity to use strength, to raise apprehension) because the Europeans do not see themselves as the ultimate warrants of their security. Thus, the EU tries to convince others to accept its own preferences. Through agreements (such as the one we have studied in this paper) and conventions, it aims at producing norms to organize the world, determining the rules of the game, introducing predictability in economic as well as political behaviours. These norms for Europe comprise the implementation and strengthening of democracy, market economy, the rule of law, human rights, social justice and environmental deference. This preference for norms finds its origins in the internal functioning of the EU, which is always oscillating between States sovereignty and elements of supra-nationality. Norms allow Europe to overcome States sovereignty without abolishing it.

Trade openness is vital for Europe, as it is the world first exporter and second investor. The EU also attempts to improve its competitive advantage in services, which represent two thirds of European GDP and employment, but only 20% of world trade. It has thus an interest in strengthening services liberalization. Moreover, signing bilateral agreements is important for the EU so as to protect its social model. Emerging countries often have social and environmental norms not as developed as in the EU, and the purpose of Europe is to attempt to organize trade relations, ensure a transparent access to markets, guarantee protections against corruption, protect intellectual property rights and integrate environmental constraints and fair labor rules.

Another motivation to negotiate an agreement has been a response to the US aspirations in the region, symbolized by the FTAA process and the subsequent set of bilateral agreements that the US have signed with several Latin American countries.

The influence of multilateral talks can also be highlighted. The failure of WTO talks at Cancun in 2003 certainly was an incentive for the EU and the US to try to sign bilateral agreements. For instance, the US signed the DR-CAFTA (Domenican Republic and Central America Free Trade Agreement), and the recent bilateral agreements with Colombia and Peru to strengthen the FTAA process. The European Commission tried to sign an agreement before the Commission change in 2004. Such an agreement would also have facilitated the relations with the G20 at the multilateral level. It is relevant to adrress that nowadays the EU is also negotiating a posible FTA with the countries members of the Andean Community.

2.3 Recent trade history between the EU and MERCOSUR

This section analyzes why negotiations have failed so far, and what is the chance for such an agreement to be signed.

Since the creation of the MERCOSUR in 1991, the European Union (EU) has maintained a close relation with the regional bloc. In 1992, the MERCOSUR and the EU signed an inter-institutional agreement, and then an inter-regional cooperation agreement in Madrid in 1995. The latter came into effect in 1999, and considers several issues such as: political dialogue, cultural cooperation, communication and economic and trade cooperation. The purpose of this agreement was to prepare the negotiations for an inter-regional integration agreement including trade liberalization. The negotiations for a FTA started in 2000, and were halted in 2004, in spite of offers from both sides. The MERCOSUR offer encompassed the liberalization of 89% of tariff positions within twelve years, whereas the EU offer included 93% of positions within ten years.[3]

[3] See Trade Sustainable Impact Assessment of the Association Agreement under negotiation between the European Community and MERCOSUR, June, 2007.

The main reasons to discontinue the negotiations were an impossibility to agree on agriculture issues, and the European critics on MERCOSUR's proposal on services and public markets. Moreover, many of the topics under consideration were also part of WTO talks (Doctor, 2005). Among other factors which motivate negotiations, were also the EU enlargements, the failure of WTO and FTAA talks (Doctor, 2007). Another problem was the weak MERCOSUR's integration: there was no Common external tariff for products like computers, telecoms, capital goods and trade remained administrated in the case of cars and transport equipment.

Finally, stakeholders from the civil society were not convinced that potential losers would be compensated. Given its political influence, the worries of the European agricultural sector to experience high losses had an influence in decreasing the EU motivations.

The question that may come to mind is if there is still a possibility for this agreement to come into force. According to the MERCOSUR Chair of Sciences-Po, Paris, the MERCOSUR integration has been slowed and makes an agreement less attractive for the EU. There has been a lack of motivation than in previous negotiations. The inclusion of other topics such as immigration, infrastructure and energy or international cooperation could help advancing more quickly. Moreover, it is important to underline that all FTA signed by the MERCOSUR since 1995 have been with Southern countries (Vaillant 2005, 2006).

On the other side, an agreement could induce WTO talks on agriculture, as it would be showed as an achievement of important negotiations between emerging and developed countries on that topic. Some European industrial sectors are highly interested by a possible agreement, in particular in the energy, telecommunications and banking sectors. (Chaire MERCOSUR 2004). Another important factor is also the Brazilian will to strengthen its regional and international position.

The end of negotiations was not enough to definitively burry the hopes for the signature of an agreement. Doctor (2007) underscores that "*Interestingly, although, on the one hand, the EU was expected to gain more in concrete terms as a result of trade and investment liberalization, the inter-regional project as such was expected to change very little in the EU. On the other hand, while MERCOSUR was expected to gain relatively less (especially in terms of more exports), the inter-regionalism project could work wonders for the consolidation of MERCOSUR and the economic reforms undertaken in the region. It would also benefit along the lines of Lamy's ideal, where economic governance contributed to enhancing citizens' quality of life. Thus, the cumulative impact of such an agreement could actually transform the growth and development of the region. Finally, it is also worth pointing out that should multilateral talks fail, inter-regionalism, by default, might become the only viable option for expanding trade and securing investment.*"

3. Literature review

The following section describes the main results obtained in the literature concerning: (i) the possible and realistic impacts of Doha trade talks and (ii) the effects of an FTA between MERCOSUR and the EU.

It is widely recognized that multilateral agreements would have more positive effects than regional ones, because it would create less distortions, it would grant access to every country and allow more balanced and open talks. However, regional or bilateral agreements can be favored by countries when the multilateral talks are halted, as it is the case at the present time.

As noted in Vyborny (2006), plausible scenarios which provide a realistic outcome of Doha talks include the studies by the World Bank (2006), IFPRI (2006), CEPII (2006), and Carnegie Endowment for International Peace (2006). These references use models that estimate the global Doha welfare gains to be between $32 billion and $55 billion. Estimations vary from one study to another because of different assumptions about the models and the Doha round's possible conclusion. For example, the authors use different trade elasticities of substitution.

These outcomes are much smaller than those from earlier studies, which included outdated trade data that overstated the gains. For instance, earlier models did not include existing trade preference programs for developing countries. The simulations use to show that high-income countries are those who would benefit the most from the liberalization, followed by middle-income countries (which include MERCOSUR countries). Low-income countries would receive a smaller share of global gains. In the most realistic scenarios, most of the gains come from manufactures liberalization.

Other studies try to assess the possible impacts of bilateral or regional FTAs, including some papers on the agreement between MERCOSUR and the EU, as follows:

Calfat and Flores (2004) have concentrated on the liberalization of the trade in goods. Based on trade flows statistics, they select products for which prospective gains lie within the agreement. For each identified product, they produce a US dollar value that predicts the market access gains. This value results from adding up trade creation and trade diversion. They examine two scenarios: (i) a reduction of 50 % in the *ad valorem* tariff equivalent and (ii) a similar reduction of 100 %. They find that the sum of all gains under total liberalization amounts to $1,45 billion for MERCOSUR, and $1,2 billion for the EU. The first three top goods for MERCOSUR – orange juice, bovine cuts boneless, fresh or chilled and frozen – account for a little more than 50 % of the total. It represents around 8 % of annual exports; which is quite attractive for a preferential agreement. A fifty percent reduction in the tariffs results in a figure of $0,74 billion gains for MERCOSUR ($0,61 billion for the EU).

The Trade SIA (sustainability impact assessment) of the Association Agreement under negotiation between the European Community and MERCOSUR (2008) is a large scope study, which combines CGE and econometrical analyses. It has been commissioned by the European Commission, which negotiates trade agreements on behalf of EU countries. It investigates the impacts of an FTA for agriculture, industry and services and rules related measures (including investments, trade facilitation and government procurement). The impact of static gains under full liberalization on EU's GDP would reach 0,1%. Static gains in GDP for MERCOSUR would be 0,5% for Argentina, 1,5% for Brasil, 2,1% for Uruguay and 10% for Paraguay. Most of these gains stem from manufactures liberalization, few from services. MERCOSUR would have its agriculture production increased, whereas its manufactures production would decline. Welfare gain for the MERCOSUR would account for $9 billion, and $4 billion for the EU.

Monteagudo, Watanuki (2003) compare the impact on MERCOSUR of a FTA with the EU and of a free trade area in the Americas. They find economic gains for MERCOSUR in both cases, although somewhat higher in the case of an FTA with the EU. They use a multi-country, multi-sector, and comparative static CGE model benchmarked in 1997. They assume that all trade barriers are completely removed. They find a 2,95% static impact on MERCOSUR's real GDP (3,16% for Brazil and 2,43% for Argentina). MERCOSUR's exports would grow 7,9%, and its imports 6,4%. The sectors that display the most dynamic export growth are "meat products," growing by more than 30% above the average in Argentina, and "grains" which increase approximately 40% greater than the average in Brazil. In Brazil, exports of "meat products" also develop 20% above the average. The FTA reinforces MERCOSUR's specialization in "processed foods" exports.

François, J., McQueen, M, Wignaraja, G. (2005) build their quantitative analysis around the Global Trade Analysis Project (GTAP) computable general equilibrium model and database (version 5.0) with an aggregation of 29 regions and 24 sectors It presents a simulation of the effects of five European Union–developing partner FTAs (South Africa, Mexico, Chile, MERCOSUR and Egypt) and the customs union agreement in industrial products with Turkey. The global impact of the EU-MERCOSUR regional agreement on real income would amount to $2,3 billion for MERCOSUR and $3,95 billion for the EU.

Flores and Watanuki (2008) use the static CGE model known as AMIDA – Analysing Mercosur's Integration Decisions and Agrements – to study impacts of possible FTAs between Mercosur and its main trading partners. The model introduces economies of scale and imperfect competition in some sectors. It includes 25 sectors and 10 regions, and is benchmarked in 2001. They find relatively small but positive gains in case of a full liberalization with the EU. Mercosur would sharply reorient its

exports towards the EU, while increasing its imports from most other markets. Mercosur's agribusiness exports would be the most favorably affected, with a 62% increase. The rise in exports to the EU market takes place at the expense of generalised decreases in all other regions. On the other hand, imports increase almost everywhere. According with this study, the FTA with the EU favours demand for more traditional exports in which MERCOSUR has competitive advantages. At sectoral level, traditional products such as textiles and apparel, leather, wood and papers with expand exports to the EU, but the agreement induces a contraction on the sectors of heavy manufactures such as motor vehicles, other transport equipment and machinery.

II. Methodology

It is not easy to estimate ex-ante the impacts of a trade agreement, since many factors and conditions are involved. The expected impacts of an agreement between MERCOSUR and the EU will mainly depend on the static reallocation effects of productive factors as well as the dynamic effects resulting from the expected increase in competition within the integrated market, the potential investments flows and the technology transfers, among others. Moreover, complementary economic policies connected with FTAs can also have important consequences (e.g. development cooperation and "agreement-pushed" domestic reforms, stabilization policies and so on).

1. CGE modeling

Since the implementation of several FTAs in the early 1990s, applied CGE modeling has become one of the most important empirical tool to assess their impacts. Because of its systemic nature, the extensive economy-wide effects expected from policy shocks associated with trade openness require the use of general equilibrium analysis as one of the main used quantitative tools. Moreover, theoretical models and databases have been undertaking continual improvements over the recent years to match the broad use that CGE models have experienced.

Applied Computable General Equilibrium (CGE) models are numerical representations based on the neoclassical General Equilibrium Theory. The central idea behind the CGE models is turning the abstract representation of the Walrasian economic theory into a practical quantitative tool for ex-ante policy analysis and applied economic research.

CGE models are multisectoral, and in many cases, such as the model used in this study, they are multiregional. The behavior of economic agents is modeled explicitly throughout utility and profit maximizing behavior assumptions that capture the most important interdependences among different sectors of the economy and also with other related economies or countries. Economy-wide resources and budget constraints are rigorously enforced and, as a consequence, alterations in the economic systems will often have impacts beyond the sector in which they occur. This is the key difference between CGE representations and the traditional partial equilibrium models. Thus, simulations of CGE models are effective to capture the relevant direct and indirect effects of changes in trade policy as well as other type of shocks, because the outcomes of the policy interventions can be quantitatively examined within a consistent framework that takes into account the overall relevant market interrelationships.

2. The GTAP Model

The Global Trade Analysis Project (GTAP) is an international community network of established institutions and researchers that makes possible and promotes trade policy analysis by means of a fluid exchange of useful information and modeling frameworks. The most important aim of the project is to provide updated datasets of bilateral trade, import protection and transport data, substitution elasticities and other behavioral parameters, in combination with individual country based input-output databases which take account of the productive structure of the represented countries. The Project also provides a modeling framework, the GTAP model (Hertel, T. (1997) and Schuschny, Durán & de Miguel, (2006)), to conduct CGE static analysis of multi-region and economy-wide scenarios. It is internationally recognized and widely used, particularly for the study of problems linked to international trade at a global level. It is important to underline that the GTAP project is coordinated by a consortium of international and national institutions, among which the World Bank (WB), the Inter-American Development Bank (IDB), the Asian Development Bank (ADB), the World Trade Organization (WTO), the United Nations Conference on Trade and Development (UNCTAD), the International Food Policy Research Institute (IFPRI), the Environment Directorate of the OECD, the United Nations Economic Commission for Africa (UNECA), the European Commission (EU) and the Centre d'Etudes Prospectives et d'Information Internationales (CEPII), etc.

The GTAP model of global trade is a standard, multi-region, applied general equilibrium model that assumes constant returns to scale and perfect competition in production activities. This model is able to simulate the effects of trade policy interventions by means of a set of specific shocks which, affecting the comparative static equilibrium, ensue on a new equilibrium state which represents the medium-term pattern of the global production and trade creation and erosion.

The standard GTAP model uses a regional representative household simulated by a Cobb-Douglas function to assign constant expenditure shares to private consumption, public expenditure and savings. This representation allows us to perform an unambiguous indicator of welfare offered by the regional utility function, which accounts for the three sources of utility. Private household behavior is modeled by means of a Stone-Geary utility function where all subsistence shares are equal to zero. This specification allows for a well-defined intertemporal maximization between consumption and savings.

Firm behavior is modeled using a technology tree that depends mainly on the assumptions of separability in production. Decisions are being made at each level, without considering the variables at other levels. It is assumed that firms first choose between primary factors independently of the prices of intermediate inputs. In addition, constant returns to scale are also assumed. The combination of primary factors and intermediate inputs is assigned using a Leontief function. The model assumes that there is imperfect factor mobility, which is described with CET income functions. The design of the simulations assumes that there is full employment, although the use of slack variables allows the introduction of some sort of flexibility with regard to this assumption. The combination of intermediate domestic and foreign inputs is selected by means of CES (Constant Elasticity of Substitution) functions, the selection among foreign inputs is based on an Armington specification within CES functions and, finally, the mix

of factors is assigned also with CES functions. All the elasticities of substitution are held constant during the simulations.[4]

Aggregate investment is not explained within the standard GTAP model, because it doesn't take into account macroeconomic policies and monetary phenomena. In the GTAP model, investment follows the saving adjustment. Accordingly, the macroeconomic closure employed is the standard neo-classical and investment is enforced to adjust in line with regional changes in saving levels. In addition, a global closure is assumed and the current account deficits can be non-zero but they must be balanced in the global bank, where trade deficits must be compensated among regions.

The simulations are based on perfect competition (which implicates that firms have no benefits) and constant returns to scale hypotheses. Impecfect competition models used to record less volatile changes than in full perfect equilibrium execises and should be considered for a more detailed realistic analysis.

The model simulations are numerically implemented using the GEMPACK (General Equilibrium Modeling Package) software, developed by the Center for Political Studies of Monash University (Harrison and Pearson, 1996). We have used the Gragg extrapolation solution method, which allows us to deal with a significant list of shocks that are induced by the trade liberalization agreements considered in the study. Details of the model implementation can be seen in Hertel, T. (1997). A spanish review of the model can be see in Schuschny, Durán & de Miguel (2006). It is important to note that the simulation results include the full adjustment of the economy to the policy intervention shock and thus, can represent the medium-run effect of the considered FTA.

Before analyzing the results, it is also important to keep in mind that we are first using a static GTAP application that does not take into consideration the possible increases in foreign direct investment to the signing MERCOSUR's countries, as a response to the incentives provided by the bilateral liberalization.

3. Regional and Commodity Aggregation

The GTAP model cannot be thought separated from its database. The information available in this integrated GTAP database is used to calibrate the reference equilibrium and to set-up the behavioral equations and market clearing balances in order to carry out the required simulations. We have used the GTAP database version 6.2, which considers the year 2001 as its baseline. The GTAP database distinguished between 92 regions and 57 commodity groups that must be aggregated according to the analyst's interests with the purpose of making the model computationally tractable (see Dimaranan and McDougall, 2005). Appendix 2 and 3, respectively shows the product and regional aggregations used in the experiments considered in this article. The 57 commodities distinguished in GTAP 6.2 database were grouped into 33 aggregates (added also in five consolidated groups), which were selected by their importance in terms of trade flows, considering the relevant exporting and importing sectors for the LAC region and bearing in mind the convenience of disaggregating both *agricultural products* and manufactures (see Appendix 2). Because, the Economic Commission for the Latin America and the Caribbean (ECLAC-UN) is interested on the overall Latin American and Caribbean (LAC) regional impacts of trade policy interventions, the most important criterion to establish this countries' aggregation (21 regions) is based on the selection of all LAC available countries as well as those other countries that are either their largest trade partners or main actors in the international trade (see Appendix 3).

[4] A Systematic Sensitivity Analysis (SSA) was done over these elasticities because they are the most relevant parameters in connection with trade effects and terms of trade variability.

4. Benchmark equilibrium estimation

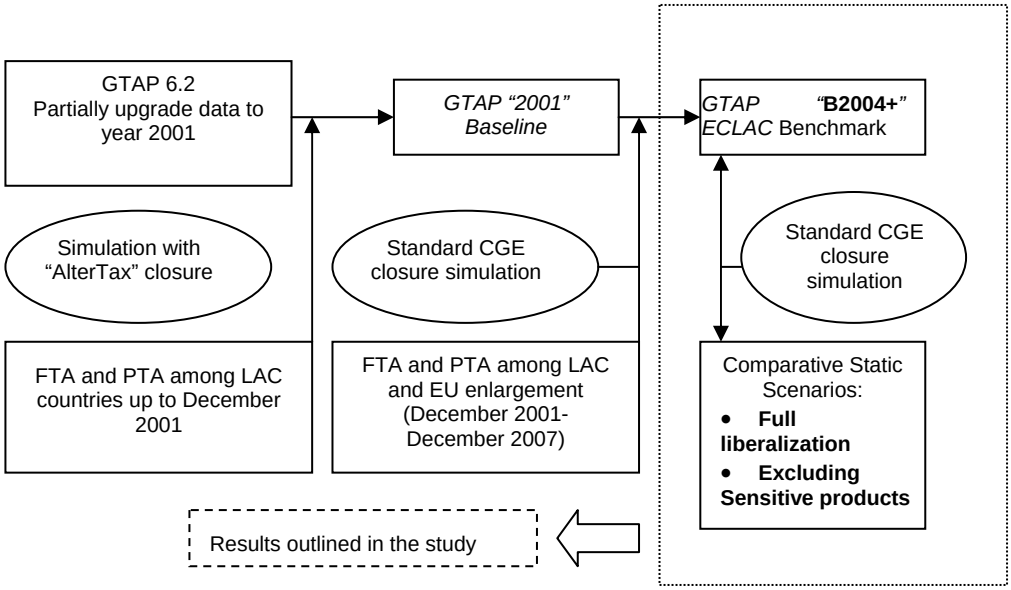
The GTAP 6.2 database uses 2001 as its reference year. The year 2001 cannot provide a good basis to analyze the FTA between MERCOSUR and the EU since lots of agreements were signed in the Latin American region between 2001 and 2004 plus other recent agreements such as the DR-CAFTA and the EU enlargement. During this period of time, Chile signed various agreements, in particular with the USA, the European Union and South Korea, and improved its preferential access with MERCOSUR and the Andean Community. The ALADI (Latin American integration association) members also extended their mutual preferential access, and the CAFTA-DR (Dominican Republic-Central America Free Trade Agreement) was signed on August 5th, 2004. Besides, on December 4th, 2001 expired the Andean Trade Preference Act (ATPA), which had been signed by the USA for the unilateral benefit of Colombia, Bolivia and, afterwards, Ecuador and Peru. This treaty were expanded from 2002 to June 31st, 2007 via the promulgation of the Andean Trade Promotion and Drug Eradication Act (ATPDEA). In addition, the European Union was enlarged twice between 2001 and 2007. On May 1st 2004 Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia acceded to the EU. Bulgaria and Romania joined the EU on January 1st, 2007.

Accordingly, the economic environment and the protection data have largely changed between 2001 and the present time. We performed some updates to the database, in order to bring the baseline to the year 2004 in which we added some other important agreements related with the countries under study. We have adjusted the protection data included in the original database. This database, which we call **"B2004+"**, includes Free Trade Agreements signed by LAC countries until 2004, as well as the benefits accorded unilaterally by the USA to the Andean Community, the DR-CAFTA and the European Union enlargements.

The goal of this effort to adjust the database protection structure is to seek the best possible coherence between this database and the registered commercial flows, so that the estimations of the impacts of the tariff cuts reflect with the best fidelity the effects of the changes in the protection structure. The technical specificities used for the upgrading of the database are schematized in Figure 3 which summarizes the implemented course of action to fill the gap between the years 2001 and 2004.

Following Malcolm (1998), we've used the 'Altertax' simulation closure and parameters with the purpose of improving the protection data by changing the LAC tariff's structure. This kind of adjustment of the tariff rates was chosen to minimize disturbances to the data base. However, it should be noted that the aim of this procedure is to improve the quality of the base year data (2001), where enhanced information, such as adjustments of the tariff rates with actual data, pertaining to that base year, becomes available (2001). This procedure is not appropriate for incorporating information that post-dates the base year. So, we include in the "AlterTax" simulation only those agreements signed and implemented before the end of the year 2001. Appendix 4a shows the list of FTA and PTA considered in this part of the upgrading process and Appendix 5a the average tariffs cuts.

FIGURE 3
PROCEDURE TO UPGRADE OF THE PROTECTION DATABASE AND LIST OF THE CONSIDERED SIMULATED SCENARIOS



Source: Authors, based on Schuschny, Durán & de Miguel, C. (2007).

In order to establish a new baseline year according with the recent liberalization agenda, we have performed a simulation that works as a benchmark equilibrium state. This "benchmark simulation", which include many FTA and PTA signed by some LAC countries during the recent years as well as the recent EU enlargement, was implemented using the standard CGE closure and is known as *GTAP "***B2004+***" ECLAC* benchmark. Appendix 4b shows the FTA and PTA included this part of the benchmark characterization process (see also the Appendix 5b which shows the average tariffs cuts). All other simulated scenarios that appear in this article include the same tariff shocks as the "**B2004+**" benchmark plus the new shocks that allow us to analyze the impacts of the FTA among the MERCOSUR and the European Union.

5. Description of the simulations

Once we performed the upgrading of the original protection database by establishing the benchmark equilibrium "B2004+", we proceeded to carefully study the possible impacts of a liberalization initiative between MERCOSUR and the EU. We've used the General Equilibrium (GE) Standard closure in which all prices are flexible, there is perfect competition (the firms make benefits equal to zero), full employment and all factors are mobiles into the countries/regions. The investment rate is determined by the savings rate. This closure, of neoclassical style, is reached when all markets are in equilibrium. This is a medium term closure. Two simulations were considered:

- **"Full": Full liberalization scenario:** In this case all traded products (see appendix 2) are opened between EU and MERCOSUR. That is to say that their tariffs were decreased to zero.
- **Scenario excluding sensitive products:** this scenario takes into account that some traded products are fully opened between both blocs but there is a short list of traded goods that don't take part of the liberalization process (see Appendix 6). The sensitive products that MERCOSUR do not open are: minerals, textiles, wearing apparel, leather products, pulp and paper products, publishing, chemicals, metal products, motor vehicles and parts, machinery and equipment, electronic equipment and other manufactures. On the other side, the EU open its economy to all tradable products excluding rice, meat and meat products, dairy products, beverages and tobacco products.

III. Results analysis

All scenarios' results were calculated as variations with respect to the base scenario generated and known as "**B2004+**". As it was explained in the previous section this scenario already takes into accounts several FTAs signed between 2001 and 2004 by most Latin American countries, as well as the DR-CAFTA and European Union enlargements of 2004 and 2007. Thus, since the baseline year of the GTAP database is 2001, the other scenarios which will be analyzed thereafter are cleaned from gains or losses stemming from any previous agreements. It is important to point out that Brazil an Argentina account for more than 97% of MERCOSUR's GDP, according to **B2004+** data (and 97.8% according to CEPALSTAT data). On the other hand, EU15 accounts for 95% of total EU GDP so the study focuses more extensively on the effects on EU15 than on PECOS12. This sub-region has a less significant trade relationship with MERCOSUR.

The study analyzes the following economic issues: (i) the macroeconomic effects on the product level as well as the components of final demand; (ii) the inter and intra regional trade changes; (iii) some impacts on the productive sectors, and (iv) the effects on welfare and its decomposition.

1. Macroeconomic impacts

1.1 Full liberalization scenario

In this section, we analyze the most important macroeconomic impacts of the first simulated scenario, in which the tariffs lines between MERCOSUR and the EU are fully eliminated. The FTA would have some positive results for the two blocs. It would induce an increase of trade, both imports and exports. (See Table 2).

TABLE 2
MACROECONOMIC IMPACTS OF THE "FULL" SCENARIO
(% variation with respects to the 2004+ baseline scenario)

	Consumption	Investment	Government	Exports	Imports	GPDI
Bolivia (Plurinational State of)	-0.45	-1.46	-0.50	-0.45	-1.11	-0.43
Colombia	-0.04	-0.14	-0.05	-0.03	-0.12	-0.04
Ecuador	-0.03	-0.13	-0.03	0.10	0.01	-0.03
Peru	-0.06	-0.20	-0.08	-0.12	-0.27	-0.06
Venezuela (Bolivarian Republic of)	-0.25	-0.46	-0.26	0.12	-0.15	-0.23
MERCOSUR	**4.62**	**8.24**	**5.53**	**7.41**	**13.69**	**4.58**
Argentina	0.94	2.30	0.91	2.71	5.70	0.86
Brazil	6.85	10.31	6.79	9.50	17.00	6.43
Uruguay	6.02	7.25	6.06	4.52	6.64	5.77
Paraguay	12.44	14.94	12.27	11.49	14.71	11.61
Mexico	-0.16	-0.27	-0.16	-0.03	-0.12	-0.15
USA	-0.14	-0.22	-0.15	-0.10	-0.25	-0.14
Canada	-0.05	-0.12	-0.06	-0.05	-0.08	-0.06
Chile	-0.23	-0.40	-0.29	-0.44	-0.58	-0.24
Central America	-0.11	-0.21	-0.12	-0.09	-0.16	-0.11
EU27	**-0.17**	**-0.25**	**-0.12**	**0.45**	**0.37**	**-0.15**
EU15	-0.16	-0.24	-0.12	0.49	0.42	-0.14
PECOS12	-0.33	-0.36	-0.31	-0.03	-0.11	-0.31
Rest of Europe	-0.13	-0.26	-0.13	-0.10	-0.17	-0.12
Ex USSR	-0.09	-0.21	-0.10	-0.06	-0.13	-0.09
Emerging Asia	-0.12	-0.22	-0.13	-0.06	-0.16	-0.13
Rest of Asia	-0.08	-0.18	-0.09	-0.13	-0.19	-0.09
Rest of the World	-0.15	-0.26	-0.16	-0.13	-0.21	-0.15
Total	-0.01	-0.04	0.01	0.24	0.24	-0.02

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

The MERCOSUR would benefit from this scenario. The trade growth induces a positive increase of public and private consumption, and a greater investment demand. However, the effect on MERCOSUR's trade balance is negative. At least in the short run, the region would import more than it would export. This fact takes place for all member countries, although Brazil and Argentina, the biggest ones, are not affected in the same way. Brazil is the country which increases it trade in the largest percentage, although the effect on its trade balance is negative. Paraguay has the best performance in terms of product growth so the FTA would be an opportunity to leverage its economy. In the case of

Argentina, the significant growth of exports and investments is mitigated by the rise in imports, resulting in a less significant product level growth.

The MERCOSUR GDP increase in 4.6% with respect to the B2004+'s baseline GDP. Note that the simulations include the loss of revenues given the tariff fall. MERCOSUR's GDP growth comes mainly from the positive variations in the production price indices given by the terms of trade improvements (see Table 3). Even though there is also a slight positive effect deriving from quantity variations. We observe that more than 45% of the GDP rise of these countries is explained by the consumption growth. The other important aspect for Brazil and Argentina is the investment component of the GDP, which accounts for 24% and 22.5% of the GDP growth of these countries, respectively.

In the case of the EU the aggregated GDP is slightly negative for the European Union representing -0.15% of the B2004+'s baseline GDP. However, exports would increase more than imports, at least for EU15. In absolute terms, exports increases are higher for EU15 countries than for MERCOSUR. This reflects the positive impact of the agreement on EU's exports to MERCOSUR. As it is expected, the rise in exports would be one of the most important reasons for the EU to sign an agreement and the simulation's results keep in line with their pro-agreement advocates. It is remarkable that the PECOS would benefit less from this agreement, all GDP components being negatively affected. This is because these new members compete with MERCOSUR in term of their trade and investment flows from the rest of the EU.

The other countries of the Latin American region show negative impacts on their product of this scenario. The most affected countries are Bolivia, Chile and Venezuela respectively. This can be explained by the loss of relative preferential access to the EU and the possible trade deviation that could happen as a consequence of the agreement. Note that Chile was the first country that signed an Economic Association Agreement with the EU in 2002. However, the effect on global trade would be positive, as both world exports and imports would be increased by a 0.24% with respect to the baseline year.

1.2 Comparison with the other scenario

As it is expected, a full liberalization scenario is not a realistic set-up to analyze an FTA. Countries used to exclude or postpone the treatment of some strategic sensitive sectors in the negotiation. So they considered a set of sensitive products/sectors that should be excluded from the negotiated bilateral tariff reduction schedule. Consequently, the tariffs for these products would remain constant. A list of sensitive products/sectors was established, using the proposals established in the negotiations by the two regions in 2004 (See Appendix 6). Other feasible scenarios have been discussed in the literature,[5] but in the absence of concrete negotiations since the 2004 standstill, we will only consider this alternative scenario.

In this other case, the results remain positive for the trade flows for both MERCOSUR and the EU; each country increases its imports and exports (see table 4). However, as it is expected, the GDP growth for MERCOSUR would be lower than in the full liberalization case in all of its components. Note that Argentina has a greater growth in this more constrained scenario than in the full liberalization one. These results can be explain by a higher rise in consumption (which explains 64% of Argentina's GDP increase) and a smaller relative decrease in imports than in exports as compared to the previous scenario. In this second simulation, Brazil shows results comparable to Argentina, whereas it benefited far more from the agreement in the first scenario. The relative reduction in Brazilian consumption and investment explains this result, while both exports and imports grow less than in the full liberalization simulation. Effects on Paraguay and Uruguay's products are slightly positive, but if a comparison is done, both countries would prefer to consider the full liberalization proposal.

The impacts on the EU are quite the same as in the first scenario simulated. While sensitive products are excluded, the other countries of the Latin American countries reduce their possible losses, in terms of GDP and trade with respect to the full liberalization scenario. World trade seems to be somewhat positively affected (See table 4 as well as figure 4). Just to sum up the results table 5 shows the GDP outcome in both simulated scenarios.

[5] Chaire MERCOSUR, 2006. Scenarios for a feasible Agreement.

TABLE 3
MACROECONOMIC IMPACTS OF THE FULL LIBERALIZATION SCENARIO SCENARIO, GDP DECOMPOSITION

(% variation with respects to the 2004+ base scenario)

	Quantum	Value	Price
Bolivia (Plurinational State of)	-0.01	-0.42	-0.42
Colombia	-0.01	-0.04	-0.03
Ecuador	-0.02	-0.03	-0.01
Peru	-0.02	-0.06	-0.04
Venezuela (Bolivarian Republic of)	-0.01	-0.24	-0.22
Argentina	0.03	0.86	0.83
Brazil	0.13	6.43	6.30
Uruguay	0.34	5.77	5.41
Paraguay	0.61	11.61	10.93
Mexico	-0.02	-0.15	-0.13
USA	0.00	-0.14	-0.14
Canada	0.00	-0.06	-0.06
Chile	-0.02	-0.24	-0.22
Central America	-0.01	-0.11	-0.10
EU15	0.07	-0.14	-0.21
PECOS12	0.01	-0.31	-0.32
Rest of Europe	0.00	-0.12	-0.12
Ex USSR	-0.01	-0.09	-0.08
Emerging Asia	-0.01	-0.13	-0.12
Rest of Asia	0.00	-0.09	-0.08
Rest of the World	-0.01	-0.15	-0.14

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

TABLE 4
MACROECONOMIC IMPACTS OF THE SCENARIO THAT EXCLUDES SENSITIVE PRODUCT

(% variation with respects to the 2004+ base scenario)

	Consumption	Investment	Government	Exports	Imports	GDP
Bolivia (Plurinational State of)	-0.04	-0.27	-0.05	0.01	-0.15	-0.03
Colombia	-0.02	-0.03	-0.03	-0.01	-0.03	-0.02
Ecuador	-0.10	-0.14	-0.11	-0.02	-0.08	-0.10
Peru	-0.03	-0.06	-0.04	-0.07	-0.10	-0.03
Venezuela (Bolivarian Republic of)	-0.05	-0.09	-0.06	0.03	-0.02	-0.05
MERCOSUR	**1.38**	**1.81**	**1.46**	**1.91**	**2.70**	**1.37**
Argentina	1.21	1.44	1.21	1.53	2.13	1.19
Brazil	1.55	2.00	1.57	2.10	3.04	1.51
Uruguay	0.08	0.07	0.08	0.89	0.70	0.08
Paraguay	1.80	0.96	1.78	2.51	2.42	1.70

(Continues)

TABLE 4 (concluded)

	Consumption	Investment	Government	Exports	Imports	GDP
Mexico	-0.03	-0.04	-0.03	0.00	-0.01	-0.03
USA	-0.02	-0.03	-0.02	0.00	-0.03	-0.02
Canada	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
Chile	-0.04	-0.06	-0.05	-0.03	-0.05	-0.04
Central America	-0.09	-0.11	-0.09	-0.05	-0.08	-0.08
EU27	**-0.09**	**-0.07**	**-0.07**	**0.06**	**0.05**	**-0.08**
EU15	-0.09	-0.07	-0.07	0.06	0.05	-0.08
PECOS12	-0.10	-0.02	-0.08	0.03	0.04	-0.09
Rest of Europe	-0.04	-0.05	-0.04	-0.04	-0.05	-0.04
Ex USSR	-0.03	-0.04	-0.03	-0.02	-0.03	-0.03
Emerging Asia	-0.02	-0.04	-0.03	-0.01	-0.02	-0.03
Rest of Asia	-0.03	-0.05	-0.03	-0.04	-0.05	-0.03
Rest of the World	-0.07	-0.09	-0.07	-0.07	-0.09	-0.07
Total	0.00	-0.01	0.00	0.04	0.04	0.00

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

FIGURE 4
MAIN MACROECONOMIC INDICATORS OF THE TWO SCENARIOS
(% variation with respects to the 2004+ base scenario)

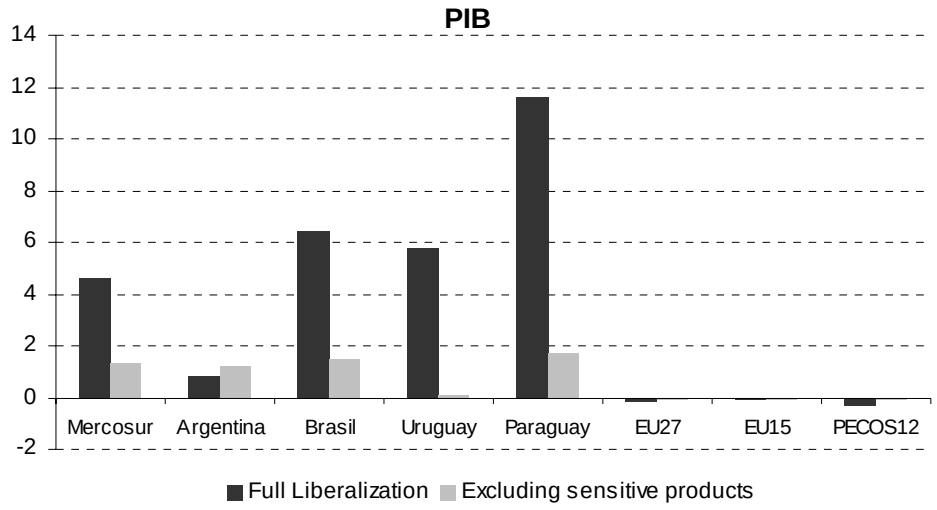


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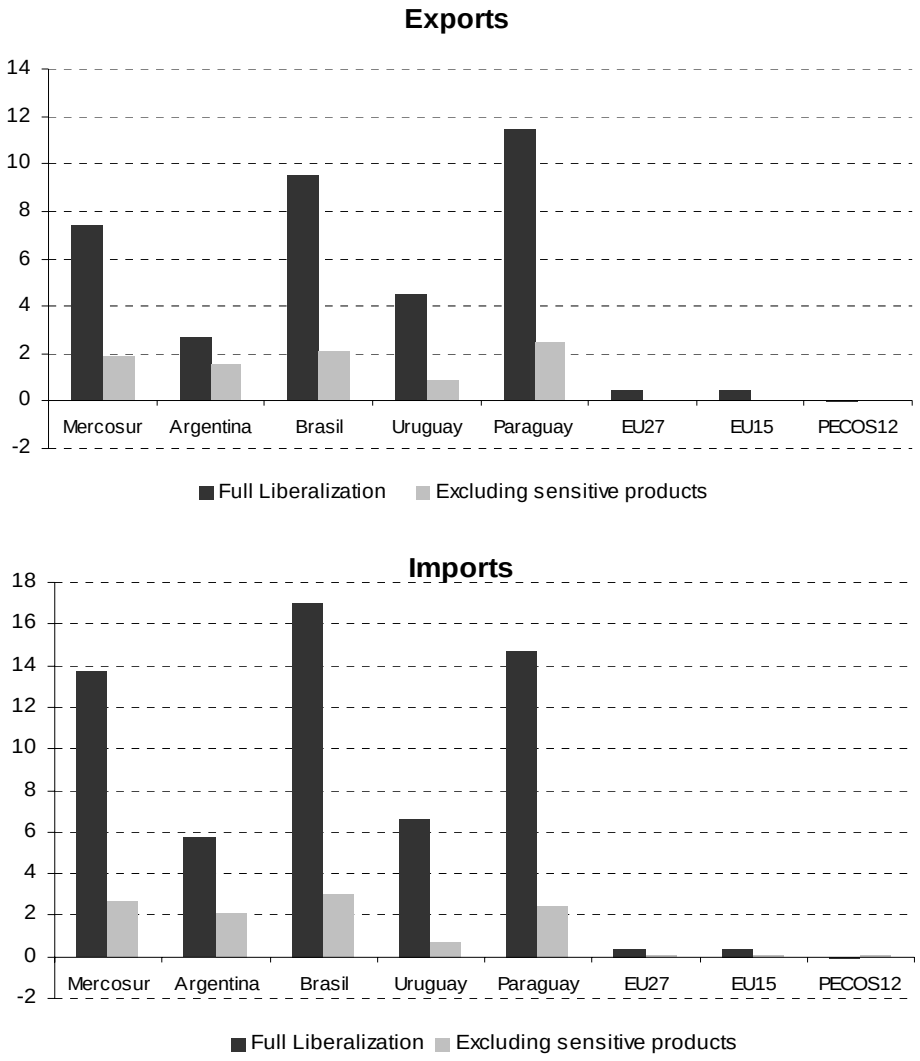
FIGURE 4 (concluded)



Source: Authors, on the basis of simulations with the GTAP 6.2 model.

TABLE 5
EFFECTS ON GDP AND TRADE IN THE TWO SCENARIOS
(% variation with respects to the 2004+ base scenario)

	GDP		Exports		Imports	
	Full Liberalization	Excluding sensitive products	Full Liberalization	Excluding sensitive products	Full Liberalization	Excluding sensitive products
Bolivia (Plurinational State of)	-0.43	-0.03	-0.45	0.01	-1.11	-0.15
Colombia	-0.04	-0.02	-0.03	-0.01	-0.12	-0.03
Ecuador	-0.03	-0.10	0.10	-0.02	0.01	-0.08
Peru	-0.06	-0.03	-0.12	-0.07	-0.27	-0.10
Venezuela (Bolivarian Republic of)	-0.24	-0.05	0.12	0.03	-0.15	-0.02

(Continues)

TABLE 5 (concluded)

	GDP		Exports		Imports	
	Full Liberalization	Excluding sensitive products	Full Liberalization	Excluding sensitive products	Full Liberalization	Excluding sensitive products
MERCOSUR	**4.58**	**1.37**	**7.41**	**1.91**	**13.69**	**2.70**
Argentina	0.86	1.19	2.71	1.53	5.70	2.13
Brazil	6.43	1.51	9.50	2.10	17.00	3.04
Uruguay	5.77	0.08	4.52	0.89	6.64	0.70
Paraguay	11.61	1.70	11.49	2.51	14.71	2.42
Mexico	-0.15	-0.03	-0.03	0.00	-0.12	-0.01
USA	-0.14	-0.02	-0.10	0.00	-0.25	-0.03
Canada	-0.06	-0.01	-0.05	-0.01	-0.08	-0.01
Chile	-0.24	-0.04	-0.44	-0.03	-0.58	-0.05
Central America	-0.11	-0.08	-0.09	-0.05	-0.16	-0.08
EU27	**-0.15**	**-0.08**	**0.45**	**0.06**	**0.37**	**0.05**
EU15	-0.14	-0.08	0.49	0.06	0.42	0.05
PECOS12	-0.31	-0.09	-0.03	0.03	-0.11	0.04
Rest of Europe	-0.12	-0.04	-0.10	-0.04	-0.17	-0.05
Ex USSR	-0.09	-0.03	-0.06	-0.02	-0.13	-0.03
Emerging Asia	-0.13	-0.03	-0.06	-0.01	-0.16	-0.02
Rest of Asia	-0.09	-0.03	-0.13	-0.04	-0.19	-0.05
Rest of the World	-0.15	-0.07	-0.13	-0.07	-0.21	-0.09
Total	-0.02	0.00	0.24	0.04	0.24	0.04

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

2. Impacts on regional trade

2.1 Full liberalization scenario

It has been shown that the full liberalization scheme between EU27 and the MEROCSUR would increase their imports and exports, and slightly reduce trade flows for other countries (table 5). The impacts on trade depend on the scope of each country's structure of trading partners' relationships. According to the **B2004+** simulation, MERCOSUR's main export destination is EU27, which accounts for 26% of its total exports, whereas intra MERCOSUR exports represent only 15% of the sub region's sales abroad. In fact, Brazil has quite different export destinations from the other MERCOSUR's partners. Its first exports' destinations are EU27 and the USA, whereas MERCOSUR only represents 9% of its exports. On the other side, Argentina, Paraguay and Uruguay are more concentrated on intra-MERCOSUR trade, i.e., the first export destination of these three countries is MERCOSUR but followed by EU27. The USA appears to be a far less important export destination for them than for Brazil. Paraguay is the country which exports the most to MERCOSUR in percentage of its total exports.

TABLE 6
DISTRIBUTION OF EXPORTS BY TRADING PARTNER
(Percentage of total exports, scenario B2004+)

	CAN + Venezuela	MERCOSUR	Others LatAm	USA	EU27	Emerging Asia	Rest of the World
Bolivia (Plurinational State of)	24	21	4	16	15	6	15
Colombia	19	2	10	39	20	5	5
Ecuador	14	2	10	37	20	9	7
Peru	6	3	7	28	27	18	11
Venezuela (Bolivarian Republic of)	5	3	13	48	10	18	3
MERCOSUR	**4**	**15**	**8**	**19**	**26**	**14**	**13**
Argentina	4	24	12	11	21	14	14
Brazil	4	9	7	24	29	14	13
Uruguay	4	29	6	12	25	11	13
Paraguay	4	43	7	3	24	6	12
Mexico	1	1	3	78	7	5	5
USA	2	3	14	0	30	25	27
Canada	0	1	2	75	11	8	4
Chile	7	7	5	17	24	23	16
Central America	2	1	11	43	23	9	11
EU27	**0**	**1**	**2**	**11**	**61**	**10**	**15**
EU15	0	1	2	11	60	10	15
PECOS12	0	1	1	7	74	5	12
Rest of Europe	0	1	2	13	60	11	12
Ex USSR	0	1	2	7	43	14	34
Emerging Asia	0	1	2	24	20	40	12
Rest of Asia	0	1	1	20	28	34	17
Rest of the World	0	2	1	16	37	25	19
Total	1	2	4	18	39	21	15

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

It is also relevant to analyze trade creation and deviation effects between trading partners, given the new preferential accesses and the change of costs structure. As expected, overall MERCOSUR's exports to EU27 could raise in a 75.5%, from 26% more than before in Argentina to 102% in Paraguay (See Table 7). Only Argentina increases more its exports to PECOS12 than to EU15.

It is clear that intra MERCOSUR trade is negatively affected. The exports of all its members to MERCOSUR decrease, although Argentina's exports are far less reduced (-5%) than Brazilian exports to MERCOSUR (-30%). This represents a 16% decrease in intra MERCOSUR exports, i.e. about 2.6 billion dollars. MERCOSUR's exports to the rest of the world also diminish, the decrease being more important for Brazil (-22.5%) than for Argentina (-3%). EU27 exports to MERCOSUR grow 66.6%, or 21.3 billion dollars, a bit more than its imports from MERCOSUR (21.2 billion dollars) (see Table 8). Note that EU27 exports could increase in more than 60% for all the MERCOSUR's countries. The intra European trade seems to be little affected, as well as the EU27 exports to the Rest of the World. PECOS12 also experience a sharp expansion of their exports to MERCOSUR (47.6%), and little change in their exports to other European countries and to the rest of the world.

TABLE 7
INTRA REGIONAL EXPORTS IN THE "FULL" SCENARIO
(% variation with respect to scenario B2004+. Origin = line, destination = column)

	MERCOSUR	Argentina	Brazil	Uruguay	Paraguay	**EU27**	EU15	PECOS12	ROW	Total
MERCOSUR	-16.0	-31.6	-5.9	-17.9	-3.5	75.5	78.2	20.2	-17.2	7.5
Argentina	-5.0		-5.6	-8.7	9.1	26.4	25.9	40.6	-3.2	2.7
Brazil	-30.3	-32.7		-31.4	-11.5	91.4	94.8	20.5	-22.5	9.6
Uruguay	-12.2	-24.7	-6.5		-0.9	68.9	72.3	13.2	-19.6	4.8
Paraguay	-10.9	-21.6	-7.9	-4.3		101.7	125.3	-16.8	-25.5	11.8
EU27	66.6	60.3	68.2	68.6	96.9	-0.6	-0.6	-0.2	0.1	0.5
EU15	67.4	61.0	68.9	69.9	97.9	-0.6	-0.6	-0.3	0.1	0.5
PECOS12	47.6	46.0	48.6	34.6	63.2	-0.7	-0.8	0.1	0.6	0.0

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

TABLE 8
INTRA REGIONAL EXPORTS VARIATIONS IN THE "FULL" SCENARIO
(In 2001 USD millions, values with respect to scenario B2004+, Origin = rows, Destination = columns)

	MERCOSUR	Argentina	Brasil	Uruguay	Paraguay	**EU27**	EU15	PECOS12	ROW	Total
MERCOSUR	-2598.7	-1832.4	-451.7	-270.9	-43.6	21173.6	20908.1	265.5	-10611.0	7963.8
Argentina	-373.2	0.0	-350.3	-62.5	39.6	1765.6	1672.0	93.7	-541.0	851.5
Brasil	-1965.3	-1680.8	0.0	-202.0	-82.4	18075.0	17888.4	186.5	-9518.2	6591.5
Uruguay	-114.6	-79.9	-33.9	0.0	-0.8	566.8	560.5	6.3	-295.6	156.4
Paraguay	-145.5	-71.6	-67.5	-6.4	0.0	766.1	787.2	-21.0	-256.2	364.3
EU27	21274.4	4637.5	15571.9	682.7	382.4	-9836.4	-9494.7	-341.6	893.2	12330.9
EU15	20688.3	4491.4	15150.3	670.8	375.8	-8894.3	-8533.3	-361.1	621.2	12415.0
PECOS12	586.1	146.1	421.6	11.8	6.6	-942.1	-961.5	19.4	272.0	-84.1

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

2.2 Comparison when sensitive products are excluded

When sensitive products are excluded, the impacts on trade between countries have the same trend as in the case of the full liberalization scenario, although the magnitude of the impacts is reduced. MERCOSUR's exports to the EU27 would raise 20%, though in this simulation, MERCOSUR's exports to PECOS12 increase more in percentage than those to EU15 (see Table 9).

The impacts on intra MERCOSUR's trade are slightly negative. In this scenario, Brazil is the MERCOSUR main country which decreases its exports to other MERCOSUR countries in percentage (-4.3%), whereas Uruguay increases its intra bloc exports by 0.5%. MERCOSUR's exports to the rest of the world would also diminish, less for Argentina than for Brazil. EU27 exports to MERCOSUR raise less in value (2.1 billion USD) and in percentage (6.6%) than MERCOSUR's exports to the EU27 (5.6 billion dollars, or a 20% increase). As opposed to the "Full" scenario, PECOS12 augment their exports to MERCOSUR more than EU27, in percentage. This is due to a major relative increase in PECOS12's exports of transport equipments and mineral products to the MERCOSUR. The intra European trade would be little affected, as well as the EU exports to the Rest of the World (see Tables 9).

3. Impacts of the different simulations on economic sectors

In this section we analyze, at the sector level, the impacts on the production value at market price, as well as on trade, for each of the scenarios.

3.1. Effects on the different sectors' production level

The impacts of the different scenarios on economic sectors will depend on the importance of each economic sector in the country's total production. To simplify the impact analysis, we aggregated the production structure into 5 analytical categories: (i) *Agricultural products*, (ii) *Oil and Mining*, (iii) *Light manufactures*, (iv) *Heavy manufactures* and (v) *Services*. Appendix 2 shows details of the GTAP sectors included for each category.

For an easier understanding of the following analyses, let us underline that *Light manufactures* encompass all food transformation sectors, which account for a significant part of MERCOSUR's production and exports. In Table 10, we represented the percentage of each of these sectors in the total production for every country and bloc, on the basis of the "Full liberalization" simulation. Both MERCOSUR and the EU27 have an important part of the economic activity specialized in services, which account for more or less 60% of the total production value in both blocs. The importance of *Heavy manufactures* is higher in the European Union production than in MERCOSUR, whereas MERCOSUR produces more *Agricultural products* and *Light manufactures* than the EU27 as a percentage of the total production level. Within MERCOSUR, Brazil and Argentina have rather similar production patterns, although Brazil produces relatively more *Heavy manufactures* and Argentina relatively more *Services*. On the other side, Uruguay and Paraguay, the two smallest economies, produce comparatively more *Agricultural products* and *Light manufactures* than their two bigger neighbors. It is important to notice that the baseline of the information about the structure of the MERCOSUR's economies is the year 2001, i.e. before the huge economic changes that occur after the Argentine's crisis which have also impacted on their neighbors. These changes should affect the economic structure of these economies.

TABLE 9
INTRA REGIONAL EXPORTS IN THE SCENARIO INCLUDING SENSITIVE PRODUCTS
(% variation with respect to scenario B2004+. Origin = line, destination = column)

	MERCOSUR	Argentina	Brazil	Uruguay	Paraguay	**EU27**	EU15	PECOS12	ROW	Total
MERCOSUR	-2.5	-4.1	-1.0	-4.5	-1.0	20.0	19.1	39.9	-5.1	1.9
Argentina	-1.4		-1.2	-3.6	-0.3	18.6	17.8	40.1	-3.9	1.5
Brasil	-4.3	-4.4		-6.1	-1.6	21.2	20.0	45.8	-5.8	2.1
Uruguay	0.5	0.1	0.8		0.1	4.7	3.2	29.1	-0.9	0.9
Paraguay	-1.6	-2.7	-1.3	-1.4		20.1	24.1	0.2	-5.0	2.6
EU27	6.6	6.8	6.4	8.2	10.5	-0.1	-0.1	-0.2	0.1	0.1
EU15	6.5	6.9	6.1	8.4	10.6	-0.1	-0.1	-0.2	0.1	0.1
PECOS12	10.4	5.2	12.7	4.2	3.7	-0.1	-0.1	-0.2	0.2	0.0

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

TABLE 10
PRODUCTION VALUE AT MARKET PRICES, BY SECTOR
(% with respects to total)

	MERCOSUR	Argentina	Brazil	Uruguay	Paraguay	**EU27**	EU15	PECOS12
Agricultural products	6.4%	6.1%	6.0%	12.0%	19.9%	2.3%	1.9%	6.8%
Oil and Mining	1.8%	2.1%	1.7%	0.3%	0.1%	0.4%	0.4%	1.4%
Light manufactures	15.4%	15.1%	15.2%	19.0%	24.2%	10.6%	10.0%	18.1%
Heavy manufactures	17.1%	12.8%	19.5%	9.0%	10.0%	25.0%	24.8%	27.3%
Services	59.4%	63.9%	57.6%	59.7%	45.8%	61.7%	62.9%	46.4%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: Author, on the basis of simulations with the GTAP 6.2 model (“Full” simulation).

If we check the effects of the two scenarios on MERCOSUR as a whole (using Table 11), it clearly appears that the *Agricultural products* sector is the one which benefits most from the agreement, followed by the *Light manufactures* sector. The most negatively affected sector is *Heavy manufactures*, in both liberalization scenarios.

All sub-sectors included into *Agricultural products* are positively affected by either the Full liberalization scenario or the scenario with sensitive products, with the exception of Oil seeds and Plant-based fibers (which lose 4.2% production in the "Full" scenario and less in the second scenario). The sector which benefits the most from an agreement is *livestock*,[6] whose production increases by 64% in the "Full" scenario, accounting for 86% of *Agricultural products* growth and for 26% of MERCOSUR total production growth. This growth can be understood as the effect of increased opportunities made available by the openness of European markets. It is followed by cereal grains; rice and vegetables, fruits, nuts, although gains are mitigated if we include sensitive products: the most outstanding example is *livestock*, whose production only grows by 0.5% in the second scenario, whereas the whole *Agricultural products* category raises by 3.2%. Furthermore, there is one sector, *Ocultivos*,[7] whose production increases more in the scenario which excludes sensitive products.

The sectors aggregated into *Light manufactures* are also generally positively affected by both scenarios. The sectors which show the highest production growth in the "Full" scenario are Meat production (+87%) and Sugar (+45%). As Meat production is considered as a sensitive product by the EU in the second scenario, its production is sharply cut (-0.5%), while Sugar production still raises (+53%). This is evident since the EU market access for Meat production should remain constant in this latter case. The production of paper products and publishing; leather products; textiles and wood products is reduced in the "Full" scenario. In the scenario excluding sensitive products, all of these sectors but wood products are considered as sensitive products by MERCOSUR. As a consequence, they have a slight production increase in this second simulation.

Given MERCOSUR's production structure, *Services* is the category explaining most of the global positive impact of the simulations on MERCOSUR's production levels. However this results should be considered with caution since the CGE model doesn't represent accurately the service sector. *Heavy manufactures* explicates most of the negative impact on MERCOSUR's production. Each sector of this category shows negative results, the most negatively affected in the "Full liberalization" scenario was machinery and equipments (-16%); metals (-13%); and transport equipments (-11%). The exclusion of machinery and equipments and metals as MERCOSUR's sensitive products reduces the losses in the second scenario. It is important to consider that these are strategic sectors with the highest value added over the economy so as the bloc would be worried about open them up and loose their competitiveness.

As we saw, the two scenarios do not necessarily implicate the same distribution of positive and negative effects among the five categories of sectors under consideration. Public sectoral policies should take into consideration the discrepancies between sectors and the possible resulting economic and social impacts.

On the basis of Table 11, a similar analysis by category is conducted for each MERCOSUR country, as follows:

[6] Which includes various GTAP sectors: ctl (Cattle, sheep, goats, horses), oap (Animal products nec), wol (Wool, silk-worm cocoons), rmk (Raw milk)

[7] Which includes GTAP sectors ocr (Crops nec) and c_b (Sugar cane, sugar beet)

TABLE 11
DECOMPOSITION PRODUCTION VALUE BY SECTOR, WITH DIFFERENT SIMULATIONS
(% variation with respects to the B2004+ scenario and contribution of each sector to the total)

	Full Liberalization		With sensitive products	
	Change	Contribution[a]	Change	Contribution[a]
MERCOSUR				
Agricultural products	25.5	1.4	3.2	0.2
Oil and Mining	-1.9	0.0	-0.4	0.0
Light manufactures	14.5	2.0	3.3	0.5
Heavy manufactures	-7.7	-1.5	-0.7	-0.1
Services	4.5	2.7	1.3	0.8
Total	4.5	4.5	1.3	1.3
Argentina				
Agricultural products	6.1	0.4	2.7	0.2
Oil and Mining	-0.4	0.0	-0.3	0.0
Light manufactures	2.7	0.4	1.6	0.2
Heavy manufactures	-3.7	-0.5	-0.2	0.0
Services	1.0	0.6	1.1	0.7
Total	0.9	0.9	1.1	1.1
Brazil				
Agricultural products	37.6	1.7	3.6	0.2
Oil and Mining	-2.8	-0.1	-0.5	0.0
Light manufactures	20.5	2.7	4.2	0.6
Heavy manufactures	-8.8	-2.0	-0.9	-0.2
Services	6.3	3.6	1.5	0.9
Total	6.1	6.1	1.4	1.4
Uruguay				
Agricultural products	17.5	1.9	1.1	0.1
Oil and Mining	3.5	0.0	-0.3	0.0
Light manufactures	6.2	1.2	0.0	0.0
Heavy manufactures	-6.1	-0.6	0.2	0.0
Services	5.0	3.0	0.1	0.0
Total	5.4	5.4	0.2	0.2
Paraguay				
Agricultural products	27.0	4.8	3.4	0.6
Oil and Mining	-1.8	0.0	0.0	0.0
Light manufactures	35.1	7.1	5.9	1.2
Heavy manufactures	-5.1	-0.6	0.0	0.0
Services	3.2	1.6	0.6	0.3
Total	12.8	12.8	2.1	2.1

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

[a] Percentage contribution of each sector to the total variation.

Argentina

Argentina is the country of the MERCOSUR which experiences the smallest production growth in the "Full" scenario. It is also the only country of the MERCOSUR which is more positively affected in the scenario which includes sensitive products, due to a relative smaller production decrease in *Heavy manufactures*, although the overall production difference between the two simulations is quite

negligible. In the second scenario, most of the production growth is explained by the growth in services production. In the case of a full liberalization, the production of *Agricultural products* would increase, with the exception of plant based fibers and forestry. *Light manufactures* production would also raise as well as sugar, meat and food products. However, textiles, wood products and vegetable oils and fats would be negatively affected by the free competition with products from the EU. All sectors included into *Heavy manufactures* would cut their production.

Brazil

Brazil is more positively benefited in the "Full" scenario in which the Brazilean's production growth explains 88% of MERCOSUR's total raise (72% in the simulation excluding sensitives). All sectors included into *Agricultural products* increase their production, with the exception of wheat, oil seeds and plant based fibers. As in Argentina, the growth of *Light manufactures* production comes from sugar, meat and food products, whereas leather products, paper, textiles and wood products reduce their production and all sectors included into *Heavy manufactures* would reduce their production. Almost 60% of Brazil's total production increase in this full liberalization scenario is explained by the growth in *Services* production. The impacts on Brazil's production are less significant when sensitive products are included, although each of the five categories contributes relatively in the same proportion as in the case of a full liberalization to the country's total production growth.

Paraguay

Paraguay is the country which experiences the highest growth percentage in its production level of the four MERCOSUR countries, in both scenarios. It is also the smallest economy, its production growth explains only 3% of the total MERCOSUR growth in the first "full" scenario, and about 2% in the second. In both simulations, *Light manufactures* explain the greatest amount of its growth, with meat and sugar production the most positively affected sectors in the Full scenario, and sugar in the scenario excluding sensitive products.

Uruguay

Uruguay is much more positively affected in the Full liberalization scenario. When sensitives are excluded, the country's production would remain approximately the same as without an FTA. Much of the production's growth in the Full scenario is explained by *Services* as well as *Agricultural products*. Among *Agricultural products*, rice and livestock benefit the most, whereas plant based fibers and forestry reduce their production. Most of the growth in *Light manufactures* is explained by the increase in meat production.

3.2. Effects on the different sectors' exports

Both scenarios would have a positive impact on MERCOSUR's exports, although the aggregated gains are greater in case of a full liberalization. In both cases, *Light manufactures* is the category which would induce more benefits, both in terms of percentage and contribution to the total impact. This rise is remarkable, as *Light manufactures* is the MERCOSUR's first export category, accounting more than 40% of total exports (See Table 12). *Heavy manufactures* is in both cases the category whose exports decrease more. In the Full simulation, all other categories' exports are also negatively affected; although this reduction does not overcome the important rise in *Light manufactures*' exports. In the scenario excluding sensitive products, all categories but *Light manufactures* and *Agricultural products* encompass a decrease in their exports.

TABLE 12
EXPORTS BY SECTOR
(% with respects to total)

	MERCOSUR	Argentina	Brazil	Uruguay	Paraguay	**EU27**	EU15	PECOS12
Agricultural products	11,1%	20,2%	6,6%	17,2%	17,1%	1,9%	1,9%	2,2%
Oil and Mining	6,2%	8,8%	5,7%	0,1%	0,0%	0,8%	0,8%	0,8%
Light manufactures	41,4%	31,6%	45,7%	44,1%	37,0%	14,7%	14,0%	23,2%
Heavy manufactures	29,3%	27,1%	32,2%	14,9%	1,7%	62,7%	63,1%	56,8%
Services	12,0%	12,3%	9,9%	23,7%	44,2%	20,0%	20,2%	17,1%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Source: Authors, on the basis of simulations with the GTAP 6.2 model ("Full" simulation).

While analyzing the sectors in more detail it can be shown that most of MERCOSUR's exports growth belongs to *Agricultural products* or processed *Agricultural products*, the latter being included into *Light manufactures* (Table 13). Within *Light manufactures*, the sectors with better exports growths are meat (+463%), sugar (+118%), rice (+76%) and food products (+15%) in the case of a full liberalization, while only sugar and food products show significant positive impacts on their exports when sensitives are excluded. Note that meat is a sensitive product by the EU in this second scenario. In both simulations, every sector included in *Heavy manufactures* reduces its exports, although the impact is much lesser when sensitive products are excluded. The aggregate impact on *Agricultural products* is negative in the first scenario, although rice; vegetables, fruits, nuts and cereal grains raise their exports. This negative impact is due to a decrease in oil seeds, crops and sugar cane, sugar beet exports. If we exclude sensitive products, the aggregate impact turns to be slightly positive, with relevant growth of vegetables, fruits, nuts and cereal grains; crops and sugar cane and a smaller decrease in oil seeds.

TABLE 13
DECOMPOSITION OF EXPORTS BY SECTOR, DIFFERENT SIMULATIONS
(% variation with respects to the B2004+ scenario and contribution of each sector to the total)

	Full Liberalization		With sensitive products	
	Change	Contribution[a]	Change	Contribution[a]
MERCOSUR				
Agricultural products	-11,6	-1,6	2,9	0,4
Oil and Mining	-1,1	-0,1	-0,5	0,0
Light manufactures	64,9	17,5	12,5	3,4
Heavy manufactures	-17,5	-6,7	-3,4	-1,3
Services	-11,5	-1,7	-3,3	-0,5
Total	7,5	7,5	1,9	1,9
Argentina				
Agricultural products	6,8	1,3	5,2	1,0
Oil and Mining	-0,8	-0,1	-0,8	-0,1
Light manufactures	11,6	3,4	5,1	1,5
Heavy manufactures	-5,6	-1,6	-1,7	-0,5
Services	-1,9	-0,2	-3,0	-0,4
Total	2,7	2,7	1,5	1,5
Brazil				
Agricultural products	-30,5	-3,2	1,1	0,1
Oil and Mining	-1,2	-0,1	-0,3	0,0
Light manufactures	93,2	24,1	16,7	4,3
Heavy manufactures	-21,0	-9,4	-4,0	-1,8
Services	-14,9	-1,9	-4,0	-0,5
Total	9,6	9,6	2,1	2,1
Uruguay				
Agricultural products	47,8	5,8	6,6	0,8
Oil and Mining	-4,3	0,0	0,6	0,0
Light manufactures	16,3	6,5	0,3	0,1
Heavy manufactures	-19,8	-3,9	0,6	0,1
Services	-12,9	-3,7	-0,3	-0,1
Total	4,8	4,8	0,9	0,9
Paraguay				
Agricultural products	-13,0	-2,8	-2,0	-0,4
Oil and Mining	2,5	0,0	2,5	0,0
Light manufactures	148,4	24,7	26,0	4,3
Heavy manufactures	-32,9	-0,9	-4,5	-0,1
Services	-15,7	-9,2	-2,0	-1,2
Total	11,8	11,8	2,6	2,6

Source: Authors, on the basis of simulations with the GTAP 6.2 model

[a] Percentage contribution of each sector to the total variation

Argentina

The impacts on Argentina's exports are positive in both scenarios, although slightly better in the full liberalization scheme. As in the case of production levels, Argentina is the MERCOSUR's country which shows the smallest exports growth in the "Full" scenario. *Agricultural products* and *Light*

manufactures exports grow in both scenarios, compensated by the negative impact on the other three categories, and in particular on *Heavy manufactures*. Meat and food products in the first scenario and only food products in the second, account for the most relevant expansion in *Light manufactures* exports. Vegetables, fruits, nuts and cereal grains explain the key increase in *Agricultural products* exports. Metals is the only sector included into *Heavy manufactures* which raises its exports in both simulations (+4.4% and +3%).

Brazil

Brazilean exports are more positively affected than Agrentina's ones. In fact, the increase in its exports explains 83% of MERCOSUR's total exports growth in the "Full" scenario, and 71% in the other one. Most of this growth is explained by the rise in *Light manufactures* exports, as all other categories show a negative or less significant impact. The rise in *Light manufactures* exports in the "Full" scenario comes mostly from meat exports (+553%). Sugar and food products exports also increase, accounting for most of this category's growth in the second scenario. All sectors included under *Heavy manufactures* are negatively impacted by both simulations, although the negative effect is modest when sensitive products are excluded. This analysis also stands for *Oil and mining* and *Services*. In the case of *Agricultural products*, all sectors reduce their exports in the first scenario, particularly in the case of oil seeds; crops and sugar cane, sugar beet and livestock. In the second scenario, the slight positive impact is due to the rise of crops and sugar cane, sugar beet; vegetables, fruits, nuts and cereal grains exports.

Paraguay

The economy of Paraguay is the country which undergoes the greatest percentage rise in exports of the four MERCOSUR countries, in both scenarios. Most of this growth is due to meat (+560%) and sugar (+2050%) exports in the "Full" scenario, and for sugar exports (+2470%) in theother scenario.

Uruguay

Uruguay's exports grow in both scenarios. As the Uruguyan economy is highly correlated with the Argentinian, this rise is also due to *Agricultural products* and *Light manufactures*, although the contribution of *Agricultural products* to the total impact is greater in Uruguay than in Argentina. All other categories are negatively affected in case of a full liberalization. *Heavy manufactures* and *Oil and Mining* are slightly positively affected when sensitive products are excluded. Within *Light manufactures*, the growth in the "Full scenario" comes only from meat exports, as all other sectors cut their exports. The rise in *Agricultural products* is mainly explained by rice exports in the "Full" scenario, and by rice and vegetables, fruits, nuts if sensitive products are excluded.

3.3. Effects on the different sectors' imports

In both scenarios under consideration, MERCOSUR total imports increase more in percentage than its exports. As it is expected, the growth in imports is much more significant in the "Full" scenario. All categories raise their imports in the two simulations, excepted the *Oil and Mining* sector. *Heavy manufactures* is the category with the most important contribution to the total impact on imports, in both scenarios, although it is not the category with the greater percentage increase. This important contribution is due to the fact that almost 63% of MERCOSUR's total exports fall under this category, as can be seen in Table 14. The growth in *Agricultural products* imports is important in percentage, but not in contribution to the total effect on imports, as *Agricultural products* only account for 3% of MERCOSUR's total imports.

TABLE 14
IMPORTS BY SECTOR
(% with respects to total)

	MERCOSUR	Argentina	Brazil	Uruguay	Paraguay	**EU27**	EU15	PECOS12
Agricultural products	3,2%	1,6%	3,5%	5,6%	3,5%	2,9%	2,9%	2,8%
Oil and Mining	3,8%	1,3%	4,7%	4,6%	0,6%	4,5%	4,3%	6,2%
Light manufactures	9,1%	12,8%	6,8%	20,8%	20,1%	16,0%	15,8%	17,7%
Heavy manufactures	62,8%	58,4%	64,8%	52,2%	64,4%	57,0%	56,6%	61,3%
Services	21,1%	25,9%	20,2%	16,8%	11,4%	19,7%	20,3%	12,0%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Source: Authors on the basis of simulations with the GTAP 6.2 model ("Full" simulation).

In both simulations, all sectors included in *Heavy manufactures*, *Light manufactures* and *Agricultural products* raise their imports (Table 15). For *Heavy manufactures*, whatever the simulation, the rise is particularly notable in machineries and equipments; manufactures, electronic equipments; chemical, rubber, plastic products and motor vehicles and parts. As these sectors are all sensitive sectors for the MERCOSUR, the growth in their imports is smaller in the second scenario. However, along with mineral products and transport equipments, they still account for most of the imports growth in *Heavy manufactures* in the second simulation. This highlights that *Heavy manufactures* imports from the European Union are still competitive in the MERCOSUR market, even if they are considered as sensitive products. This fact also reveals the limitated size of *Heavy manufactures* production in MERCOSUR. Within *Light manufactures*, the highest imports increase in value concern textiles, paper products, food products and wearing apparels in the "Full" scenario, and wood products; food products; dairy products; beverages and tobacco products when sensitive products are excluded. *Agricultural products* imports increase is mainly due to livestock; crops, sugar cane, sugar beet and wheat in the "Full" simulation, and to wheat; crops, sugar cane, sugar beet and vegetables, fruits, nuts when the simulation exclude sensitive products.

TABLE 15
DECOMPOSITION OF IMPORTS BY SECTOR, WITH DIFFERENT SIMULATIONS
(% variation with respects to the B2004+ scenario and contribution of each sector to the total)

	Full Liberalization		With sensitive products	
	Change	Contribution [a]	Change	Contribution [a]
MERCOSUR				
Agricultural products	23,7	0,7	6,2	0,2
Oil and Mining	-2,4	-0,1	-0,1	0,0
Light manufactures	21,0	1,8	6,7	0,6
Heavy manufactures	15,4	9,6	2,3	1,4
Services	8,0	1,8	2,4	0,5
Total	13,7	13,7	2,7	2,7
Argentina				
Agricultural products	7,5	0,1	5,8	0,1
Oil and Mining	-0,5	0,0	0,3	0,0
Light manufactures	8,1	1,0	5,0	0,6
Heavy manufactures	7,5	4,3	1,5	0,9
Services	0,9	0,3	1,9	0,5
Total	5,7	5,7	2,1	2,1

(Continues)

TABLE 15 (concluded)

	Full Liberalization		With sensitive products	
	Change	Contribution [a]	Change	Contribution [a]
Brazil				
Agricultural products	27,5	0,9	6,5	0,2
Oil and Mining	-2,7	-0,2	-0,1	0,0
Light manufactures	33,9	2,0	9,5	0,6
Heavy manufactures	18,7	11,9	2,7	1,7
Services	10,9	2,3	2,7	0,6
Total	17,0	17,0	3,0	3,0
Uruguay				
Agricultural products	8,9	0,5	1,3	0,1
Oil and Mining	-1,2	-0,1	0,1	0,0
Light manufactures	8,6	1,7	1,8	0,4
Heavy manufactures	4,9	2,6	0,4	0,2
Services	11,8	1,9	0,3	0,1
Total	6,6	6,6	0,7	0,7
Paraguay				
Agricultural products	41,9	1,2	10,7	0,3
Oil and Mining	-4,6	0,0	0,1	0,0
Light manufactures	19,2	3,7	3,6	0,7
Heavy manufactures	12,2	8,0	1,8	1,2
Services	16,0	1,8	2,2	0,3
Total	14,7	14,7	2,4	2,4

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

[a] Percentage contribution of each sector to the total variation.

Argentina

Argentina increases its imports in both scenarios, although it is the smallest of MERCOSUR's countries in the case of a full liberalization. The *Heavy manufactures* category mostly contributes to the rise in imports, followed by *Light manufactures*. All categories increase their imports in the two simulations, with the exception of *Oil and Mining* in the "Full" scenario. Within *Heavy manufactures*, machineries and equipments; chemical, rubber, plastic products; manufactures, electronic equipments and motor vehicles and parts are the sectors which boost their imports in the "full" simulation, whereas mineral products adds to the list when sensitive products are excluded. *Light manufactures* imports growth is explained mainly by paper products and wearing apparels in the "full" scenario, and by wood products and food products while excluding sensitives.

Brazil

Among all MERCOSUR countries and because of its size, Brazil induces the main imports growth, in both simulations, although the rise is almost six times higher in case of a full liberalization. All categories but *Oil and Mining* expand their imports, for the two simulations and for every sector included into each category. Most of the imports growth (70% in the "Full" scenario, 56% if sensitive products are excluded) comes from *Heavy manufactures*, although *Light manufactures* and *Agricultural products* increase their imports more in percentage than *Heavy manufactures*. Within *Heavy manufactures*, in the "Full" simulation, 87% of the imports growth is due to machineries and equipments; motor vehicles and parts; manufactures, electronic equipments and chemical, rubber, plastic products, in this order. Even if these sectors are considered as sensitive products in the second simulation, they still account for most of the imports growth in *Heavy manufactures*, along with mineral products and transport equipments. Within

Light manufactures, the sectors with the highest imports growth in value are textiles, papers and food products in the full liberalization, and food products, wood products, diary products and textiles in the "sensitive" scenario. Livestock, crops, sugar cane, sugar beet and wheat explain the greatest part of the rise in *Agricultural products* imports in the full liberalization case.

Paraguay

Paraguay shares the same patterns of imports increase as its MERCOSUR neighbors, i.e. a rise in every imports category excepted for *Oil and Mining*. The growth in imports value is principally due to *Heavy manufactures* (manufactures, electronic equipment; machineries and equipments; Chemical, rubber, plastic products) *Light manufactures* (textiles; food products; beverages and tobacco products) and *Services*.

Uruguay

In Uruguay too, imports raise, also the impact is almost annulled if sensitive products are excluded. The categories whose imports increase the most in value are *Heavy manufactures* (above all in the full liberalization, particularly manufactures, electronic equipments; machineries and equipments and metal products) *Services* and *Light manufactures* (food products, textiles, wearing apparels).

3.4. Effects on trade between MERCOSUR and the European Union by sector

As we have said in Section 1, the European Union is MERCOSUR's main trading partner. In 2006, the EU15 accounted for 20.1% of MERCOSUR total exports, and 18.9% of MERCOSUR total imports came from the EU15. According to the B2004+ simulation (see Table 16) MERCOSUR's exports to the EU27 are principally concentrated on *Light manufactures* (31%), *Heavy manufactures* and *Services* (22.6%), *Agricultural products* (17.4%). Food products (16%) and oil seeds (7.4%) are also significant exports, as well as minerals (5.8%), metals (5.4%) and crops, sugar cane, sugar beet (5.1%). On the other side, *Heavy manufactures* and *Services* represent more than 90% of MERCOSUR's imports from the EU27. Major imports include machineries and equipments (21.4%); chemical, rubber, plastic products (15.6%); motor vehicles and parts (7.1%) and manufactures, electronic equipments (6.7%).

TABLE 16
TRADE STRUCTURE BETWEEN THE MERCOSUR AND THE EUROPEAN UNION
(% of each category in the total exports / imports)

	B2004+	Full liberalization	With sensitive products
Exports to the EU			
Agricultural products	17.4	9.2	16.8
Oil and Mining	6.1	3.5	5.1
Light manufactures	31.3	64.1	40.1
Heavy manufactures	22.6	11.9	19.9
Services	22.6	11.3	18.1
Total	100.0	100.0	100.0
Imports from the EU [a]			
Agricultural products	0.6	0.7	0.7
Oil and Mining	0.1	0.1	0.1
Light manufactures	6.0	8.1	7.7
Heavy manufactures	60.6	69.7	59.9
Services	32.8	21.4	31.5
Total	100.0	100.0	100.0

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

[a] Imports from the European Union are calculated as exports from the European Union to MERCOSUR.

The signature of an agreement would have some clear effects on the characteristics of MERCOSUR's exports and imports to the EU27 (see Table 17). This is particularly relevant for MERCOSUR's exports in the "Full" simulation: this scenario would sharply increase the concentration of MERCOSUR's exports on *Light manufactures*, which would more than double in percentage, all other categories reducing their relative exports' share. The impact if sensitive products are excluded is the same, although less pronounced.

Sectors that would benefit the most in terms of exports growth are meat products (which explain 90% of MERCOSUR's exports to the EU27 increase in the full liberalization. However, this type of exports is declining in the second scenario), sugar and food products (accounting of 18% of MERCOSUR's total exports raise in the first scenario, and 82% if sensitive products are included), and, in the second simulation only; vegetables, fruits, nuts (6.3% of the total exports growth); metals (5.5%) and crops, sugar cane, sugar beet (5.3%). Other significant increases in terms of percentage – although they do not explain a great part of the total exports growth- are cereal grains (between 47% and 63% increase, depending on the simulation), textiles (between 23% and 41%) and wearing apparels (between 13% and 28%).

TABLE 17
TRADE BETWEEN MERCOSUR AND THE EU
(Structure of exports and imports and % change with respects to B2004+ scenario)

	Full Liberalization		With sensitive products	
	Change	Contribution	Change	Contribution
Exports to the EU				
Agricultural products	-6.7	-1.2	16.2	2.8
Oil and Mining	-0.7	0.0	-0.3	0.0
Light manufactures	259.4	81.2	53.6	16.8
Heavy manufactures	-8.0	-1.8	5.6	1.3
Services	-12.1	-2.7	-3.5	-0.8
Total	75.5	75.5	20.0	20.0
Imports from the EU[a]				
Agricultural products	111.6	0.6	43.4	0.2
Oil and Mining	-3.0	0.0	-1.6	0.0
Light manufactures	126.6	7.6	37.4	2.2
Heavy manufactures	91.6	55.5	91.6	3.3
Services	8.9	2.9	2.6	0.9
Total	66.6	66.6	6.6	6.6

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

[a] Imports from the European Union are calculated as exports from the European Union to MERCOSUR.

Table 17 shows that MERCOSUR's imports from the EU27 would be even more concentrated on Light and *Heavy manufactures*. On the other side, the scenario which excludes sensitive products does not clearly modify MERCOSUR's imports structure from the EU27. As it can be seen in Table 17, all categories would rise their imports from the EU27 except *Oil and Mining*. The increases in percentage are particularly notable for *Light manufactures*, *Heavy manufactures* and *Agricultural products* (more than 90% in case of a full liberalization). Nevertheless, as MERCOSUR's imports from the EU27 are highly concentrated on *Heavy manufactures* and *Services*, the change in the relative allocation of imports is remarkable only for these two categories.

In both scenarios, all sectors included in the categories expand their imports (except the sectors comprised into *Oil and Mining*). In the full liberalization scenario, the sectors which explain most of the imports' growth are machineries and equipments (33% of the total increase), chemicals (15%),

electronic equipments and manufactures (15%) and motor vehicles and parts (11%). These four sectors account for 74% of the total imports expansion. In the second scenario, five sectors explain more than 50% of the total imports growth from the EU27: mineral products (17%), machinery and equipments (10.5%), wood products (9.5%) and transport equipments (8%).

Argentina

According to the 2004+ base simulation (see Table 18), Argentina mainly exports *Light manufactures* (42.5%) and *Services* (24%) to the EU27. Its major exports are food products (32% of total exports); vegetables, fruits, nuts (6.5%), metals and chemicals (4% each). It principally imports *Heavy manufactures* (52%) and *Services* (39%) from the EU27. Its most important imports are machinery and equipments (19%); chemicals (15.5%) and motor vehicles and parts (6.5%).

Signing an agreement would raise exports. It would increase the relative importance of *Light manufactures* and *Agricultural products* in Argentina's total exports to the EU27, whatever the scenario. The three other categories would decrease their relative share in total exports, although exports of *Heavy manufactures* grow in both scenarios, in percentage with respects to B2004+ scenario. The main sectors in terms of the exports rise in both scenarios are food products (explaining between 40.5% and 58.5% of Argentina's exports total increase); vegetables, fruits, nuts (between 14% and 22% of the total exports growth) and metals (between 6.5% and 8%). In the full liberalization simulation only, meat and meat products exports explain 25% of Argentina's exports to the European Union.

TABLE 18
TRADE BETWEEN ARGENTINA AND THE EU
(Structure of exports and imports and % change with respects to B2004+ scenario)

	B2004+	Full Liberalization		With sensitive products	
	Structure [a]	Change [b]	Structure [a]	Change [b]	Structure [a]
Exports to the EU					
Agricultural products	15.7	38.8	17.2	41.2	18.7
Oil and Mining	2.6	0.2	2.0	-0.5	2.1
Light manufactures	42.5	44.5	48.6	27.1	45.6
Heavy manufactures	15.3	13.7	13.7	9.0	14.0
Services	24.0	-2.8	18.4	-3.2	19.5
Total	100.0	26.4	100.0	18.6	100.0
Imports from the EU [c]					
Agricultural products	0.7	48.6	0.6	31.1	0.8
Oil and Mining	0.1	8.0	0.0	-0.9	0.1
Light manufactures	8.4	114.6	11.3	33.7	10.5
Heavy manufactures	51.9	95.7	63.4	5.7	51.4
Services	38.9	1.7	24.7	2.1	37.2
Total	100.0	60.3	100.0	6.8	100.0

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

[a] Structure of exports and imports in percentage of total.
[b] % change with respects to B2004+Scenario
[c] Imports from the European Union are calculated as exports from the European Union to MERCOSUR.

Argentinian imports from the European Union would increase for all categories whatever the simulation, except *Oil and Mining* when sensitive products are out of the shock simulation. However, the overall percentage increase is much greater in case of a full liberalization scheme. When the distribution of imports between categories would be modified towards a higher concentration of *Heavy manufactures* imports (from 52% to 63.5% of total imports), and, to a lesser extent, of *Light manufactures*, whereas the share of *Services* would decline (from 39% to 25%). When sensitive

products are excluded, the only notable effect on the allocation of imports within categories is an increase of the share of *Light manufactures* in the total.

The main sectors which would benefit in terms of imports growth in the "Full" scenario are machinery and equipments (31% of the total imports rise); chemicals (19% of the total growth); electronic equipments and manufactures (12%) and motor vehicles and parts (10%). In the other simulation scenario, increases are noteworthy for mineral products (explaining 17.5% of the total increase); wood products (15.5%), food products and meat (8% each).

Brazil

Brazilean exports to the European Union (see Table 19) are quite proportionaly distributed between *Light manufactures* (28.5%), *Heavy manufactures* (26.5%), *Services* (19%) and *Agricultural products* (18%) (Table 19). Major exports include food products (11.5% of total exports); oil seeds (8.5%); minerals (7.3%) and crops, sugar cane, sugar beet (6.5%). Brazil essentially imports *Heavy manufactures* and *Services* from the EU27. As for the Argentinian case, its most important imports are machinery and equipments (22%); chemicals (15.5%) and motor vehicles and parts (7%).

A FTA between MERCOSUR and the EU27 would boost Brazil's *Light manufactures* exports to the EU27. The share of this category as percentage of all exports would be dramatically increased, in particular in the first simulation (from 28.5% to 68% of all exports), in contrast with all other categories. In the first simulation, all other categories would also reduce their exports in value. In case of a full liberalization, meat export account for 97% of the total exports increase to the EU, followed by sugar products (11%) and food products (5%). Sectors which reduce the most their exports include crops, sugar cane, sugar beet (-33.5%) and oil seeds (-25.5%). Sugar products and food products explain 87% of the exports rise when sensitive products are excluded.

TABLE 19
TRADE BETWEEN BRAZIL AND THE EU
(Structure of exports and imports and % change with respects to B2004+ scenario)

	B2004+	Full Liberalization		With sensitive products	
	Structure [a]	Change [b]	Structure [a]	Change [b]	Structure [a]
Exports to the EU					
Agricultural products	17.9	-25.2	7.0	9.4	16.2
Oil and Mining	7.8	-0.8	4.1	-0.3	6.4
Light manufactures	28.6	356.7	68.2	66.3	39.2
Heavy manufactures	26.5	-12.0	12.2	5.0	22.9
Services	19.2	-14.9	8.5	-4.0	15.2
Total	100.0	91.4	100.0	21.2	100.0
Imports from the EU [c]					
Agricultural products	0.4	141.5	0.6	44.8	0.6
Oil and Mining	0.1	-5.4	0.1	-1.4	0.1
Light manufactures	4.8	134.5	6.7	39.6	6.3
Heavy manufactures	63.8	90.0	72.1	5.3	63.2
Services	30.8	11.7	20.5	3.0	29.8
Total	100.0	68.2	100.0	6.4	100.0

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

[a] Structure of exports and imports in percentage of total
[b] % change with respects to B2004+Scenario
[c] Imports from the European Union are calculated as exports from the EU to MERCOSUR.

The impact of a FTA with the European Union on Brazil's imports looks like the effect on Argentina. Brazil's imports from the European Union would rise for all categories in both simulations, except *Oil and Mining*. Nevertheless, the total percentage increase is much larger in case of a full liberalization. In this case, the allocation of imports between categories would be modified towards a higher concentration of *Heavy manufactures* imports (from 64% to 72% of total imports), and, to a smaller extent, of *Light manufactures*, whereas the share of *Services* would decline (from 31% to 20.5%). When sensitive products are excluded from the agreement, the only remarkable effect on the distribution of imports within categories is an increase of the share of *Light manufactures* in the total.

In the full liberalization simulation, imports' increases would be particularly relevant in the case of machinery and equipments (34% of the total imports rise); electronic equipments and manufactures (15%); chemicals (14% of the total growth); and motor vehicles and parts (12%). When sensitive products are taken into account, increases are important in the case of mineral products (17.5% of total growth), machinery and equipments (12%), transport equipments (9.5%) food products (8%) and wood products (7%).

4. Evaluation of the trade structure, taking into account environmentally sensitive industries

Lots of studies try to link environmentally sensitive industries (ESI) with the international trade patterns or Foreign Direct Investments (FDI) (Low and Yeats, 1992; Hettige et al., 1994; Mani and Wheeler, 1997; Schaper 1999; Smarzynska and Wei, 2001, Schuschny, Durán Lima and de Miguel, 2008, etc.). Generally this type of industries can be defined by two criteria: (i) the ones that incur the greatest operating cost in control and reduction of industrial emissions and pollution and (ii) the ones that present the greatest intensity of polluting emissions towards air, water and soil. In both cases they are related to the level of production or sales of the industries. The reference classifications used to study the information vary with the type of data used, whether national production or international trade data (i.e. ISIC, CPC, SITC, in their different revisions). In any case there are five industries that are invariably considered as sensitive: paper, chemicals, non metallic minerals, iron and steel, and non iron metals (Gallager and Ackerman, 2000).[8]

In this paper we use the ESI definition from Low and Yeats (1992) and Schaper (1999), which identify 40 industries at the CUCI Rev. 1 three digits level (see Appendix 7). Subsequently, these industries were adapted to CUCI Rev. 2 to identify the GTAP equivalences. According to our adapted GTAP classification used in this study, there would be 11 sectors containing ESI: Forestal, Mineria, Oaliment, Madera, Papel, Dpetrol, Quimica, ProdMineral, Melal, ProdMetal, Omanu. The necessity to aggregate -sometimes ESI with other industries which are not ESI- requires caution in analyzing the figures coming from the general equilibrium model. It is required to study in detail the export structure, the destination partners and the tariff distribution, establishing thus with clarity if the proportion of ESI exports would augment or diminish as a result of the FTA. On the other hand, it is necessary to consider that, within the GTAP sectors linked to environmentally sensitive industries, there could be disparities depending on the export partner.

With this in mind the following analysis provide us only a general view about how the FTA could affect the structure of environmentally sensitive industries. Because of the limitated scope of the analysis we have only considered the full liberalization scenario.

[8] The classification of an industry as environmentally sensitive does not imply that the industry does not use the best technology to avoid externalities, but that the characteristics of the sector make this industry relatively dirtier.

TABLE 20
IMPACTS OF A FULL LIBERALIZATION ON MERCOSUR'S EXPORTS OF ENVIRONMENTALLY SENSITIVE INDUSTRIES
(% variation with respects to the 2004+ baseline scenario)

Environmentally sensitive sectors	World	EU27	EU15	PECOS12
Forestry	-10.7	-10.2	-10.1	-27.6
Mining	-0.9	-0.5	-0.5	-0.5
Other food	15.2	36.5	34.9	73.1
Wood	-20.6	-18.1	-18.3	8.8
Pulp and paper	-16.9	-16.6	-16.5	-17.7
Oil products	-2.5	-2.9	-3.3	4.5
Chemical	-15.7	-8.9	-10.6	30.3
Mineral products	-13.5	-9.2	-9.9	11.0
Metal	-12.6	6.2	6.3	1.9
Metal products	-23.3	-17.4	-20.3	30.1
Other manufactures	-24.3	-18.4	-19.9	-0.3
Total ESI	-7.7	10.6	9.8	30.2
Total other sectors	26.2	198.8	206.3	37.6
Total Xs Goods	10.8	101.0	104.0	33.8

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

The share of environmental sensitivity of MERCOSUR's exports to the world would decrease. While MERCOSUR's total exports to the world would rise 10,8%, environmentally sensitive exports would diminish 7,7%. The participation of ESI in the total exported by MERCOSUR would be reduced from 45,6% to 38%. Almost every sectors containing ESI would lessen their export level, thus cutting their participation in the total. The *Chemicals* sector is the one that most reduces its participation in value. It represents 35% of the decrease of the ESI participation, followed by *Metal* (28%) and *Other manufactures* (27). The only environmentally sensitive sector which would expand its exports to the world is *Other food*. However, this expansion does not compensate the cut in other ESI exports.

As opposed to MERCOSUR's exports to the world, the region's ESI exports to the EU27 would rise in case of a full liberalization between the two blocks. Nevertheless, this percentage variation would be largely smaller than the total rise of MERCOSUR's exports to the EU27. Consequently, the participation of ESI in the total exported to the European Union would also be decreased. Thus, the FTA with the EU would contribute to reduce the weight of ESI in MERCOSUR's exports structure. The percentage increase in ESI exports to the EU27 is almost exclusively due to the *Other food* sector. In the case of exports to PECOS12, it is interesting to notice that the percentage rise in ESI exports almost matches the rate of increase of total exports, though remaining somewhat lower.

5. Welfare effects

5.1. Welfare effects of the FTA between MERCOSUR and the European Union

As in most CGE studies, the estimation of the changes in the welfare levels is made through the computing of the Equivalent Variation (EV). Details about its calculation can be seen in Schuschny, Durán y de Miguel (2006). The calculation of the Equivalent Variation allows to disaggregate the value at a country level into several components associated with the variations of the variables due to the application of tariff shocks in: (i) efficiency changes, due to improvements in the intersectoral resources allocation, (ii) effects due to changes in the terms of trade, (iii) changes in the savings-investment balance.

Since the 2004+ baseline scenario is also a simulation that includes many processes of trade liberalization undertaken in the LAC region between 2001 and 2004, as well as the EU enlargement and the DR-CAFTA, it is necessary to filter their welfare impacts in order to calculate accurately the net estimation of welfare connected directly to the simulation of the MERCOSUR-EU27's FTA. Accordingly, we analyze the equivalent variation (in million of 2001 dollars and as percentage of GDP) obtained at the benchmark (2004+) and in the other simulated scenarios, with the purpose of calculating the net effects that each scenario could cause. Estimations of welfare impacts are complemented with a systematic sensitivity analysis.

In the case of a full liberalization scheme, welfare effects would turn out to be positive for MERCOSUR countries. However, these improvements in welfare would be different for the four countries in terms of GDP. Argentina would have an increase in welfare which represents 0.1% of its GDP, far below Brazil and Uruguay (1.2%) as well as Paraguay (3.7%) (Table 21). This figures represent a $7.1 billions gain for MERCOSUR as a whole, $6,2 billions for Brazil and 358 millions of 2001 dollars for Argentina. Changes in terms of trade (see Table 22) explain most of these outcomes. All other Latin American countries would be negatively affected in terms of welfare. Chile (-1.40%) and Central America (-0.61%) show the highest negative effects, also stemming from changes in exchange rate terms. Welfare effects are positive for EU15, but negative for PECOS12, although these impacts are not significant as a percentage of the overall EU GDP. In the case of EU15, the effect due to a better allocation of resources outweighs the negative effect on terms of trade. It is not the case for PECOS12 since the impact are negative in all the equivalence variation components.

TABLE 21
IMPACTS ON WELFARE OF THE DIFFERENT SIMULATIONS
(Comparison of equivalent variations, in million USD 2001 and % of the GDP 2004)

	B2004+		Full liberalization (net B2004+)		Excluding sensitive products (net B2004+)	
	Million USD (2001)	% of GDP	Million USD (2001)	% of GDP	Million USD (2001)	% of GDP
Bolivia (Plurinational State of)	9	0.12%	-30	-0.38%	-20	-0.26%
Colombia	65	0.08%	-93	-0.11%	-28	-0.03%
Ecuador	11	0.06%	-18	-0.10%	-7	-0.04%
Peru	96	0.18%	-131	-0.24%	-34	-0.06%
Venezuela (Bolivarian Republic of)	-37	-0.03%	-39	-0.03%	-77	-0.06%
MERCOSUR	-244	-0.03%	7120	0.85%	6887	0.83%
Argentina	-85	-0.03%	358	0.13%	273	0.10%
Brasil	-159	-0.03%	6228	1.17%	6080	1.14%
Uruguay	-13	-0.07%	232	1.18%	220	1.11%
Paraguay	12	0.17%	301	3.73%	313	3.87%
Mexico	-62	-0.01%	-186	-0.03%	-248	-0.04%
USA	484	0.00%	-1677	-0.02%	-1194	-0.01%
Canada	-167	-0.02%	233	0.03%	66	0.01%
Chile	845	1.23%	-958	-1.40%	-111	-0.16%
Central America	1,351	0.57%	-1423	-0.61%	-71	-0.03%
EU27	1,826	0.03%	12	0.00%	1839	0.02%
EU15	648	0.01%	1429	0.02%	2077	0.03%
PECOS12	1,178	0.28%	-1417	-0.34%	-238	-0.06%

(Continues)

TABLE 21 (concluded)

	B2004+		Full liberalization (net B2004+)		Excluding sensitive products (net B2004+)	
	Million USD (2001)	% of GDP	Million USD (2001)	% of GDP	Million USD (2001)	% of GDP
Rest of Europe	180	0.04%	-249	-0.05%	-70	-0.01%
Ex USSR	-195	-0.05%	73	0.02%	-123	-0.03%
Emerging Asia	-1,548	-0.02%	264	0.00%	-1286	-0.02%
Rest of Asia	-296	-0.03%	58	0.01%	-238	-0.02%
Rest of the World	-246	-0.03%	6	0.00%	-241	-0.02%
Total	2071	0.01%	2960	0.01%	5045	0.02%

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

When sensitive products are excluded from the agreement, the impacts on welfare are less positive for MERCOSUR, except in the case of Paraguay, and become positive for the EU. The other Latin American countries are less negatively affected in this scenario. In general, the negative impacts are reduced in this simulation and lose significance in terms of GDP. However, there are some discrepancies among our two blocs of interest, which could let us conjecture that, in case of an agreement, the negotiation would not be easy between the supporters of the two possible scenarios since the negative effect on PECOS12 seems to disappear in the second scenario. The decision about which type of agreement could be signed would probably be the result of a meticulous negotiation process in which the sectoral interest of the two blocs (but also of countries belonging to the same blocs) would be considered. So, it is important to complement this outcomes with other metodologies such as partial equilibrium models.

TABLE 22
DECOMPOSITION OF THE WELFARE IMPACTS OF THE B2004+ AND "FULL" SCENARIOS
(In millions USD 2001)

	B2004+				Full liberalization (net B2004+)				Excluding sensitive products (net B2004+)			
	Equivalent variation	Resources allocation	Terms of Trade	Savings-Investment	Equivalent variation	Resources allocation	Terms of Trade	Savings-Investment	Equivalent variation	Resources allocation	Terms of Trade	Savings-Investment
Bolivia	9	1	7	2	-30	-1	-26	-2	-20	-1	-20	0
Colombia	65	11	52	2	-93	-22	-69	-2	-28	-11	-17	0
Ecuador	11	8	2	1	-18	-11	-7	-1	-7	-3	-5	0
Peru	96	23	72	1	-131	-34	-96	-1	-34	-11	-23	0
Venezuela	-37	12	-49	0	-39	-30	-12	3	-77	-18	-61	2
MERCOSUR	-244	-63	-170	-10	7120	878	5966	276	6887	824	5798	264
Argentina	-85	-23	-68	6	358	95	275	-13	273	74	207	-7
Brasil	-159	-39	-106	-14	6228	672	5283	274	6080	640	5180	259
Uruguay	-13	-3	-8	-2	232	67	139	26	220	65	131	24
Paraguay	12	2	11	-1	301	43	270	-11	313	45	280	-12
Mexico	-62	119	-181	0	-186	-258	63	9	-248	-138	-120	10
USA	484	316	297	-129	-1677	-532	-837	-308	-1194	-216	-539	-439
Canada	-167	-12	-152	-4	233	9	214	11	66	-3	62	7
Chile	845	55	829	-39	-958	-67	-932	41	-111	-9	-103	2

(Continues)

TABLE 22 (concluded)

	B2004+				Full liberalization (net B2004+)				Excluding sensitive products (net B2004+)			
	Equivalent variation	Resources allocation	Terms of Trade	Savings-Investment	Equivalent variation	Resources allocation	Terms of Trade	Savings-Investment	Equivalent variation	Resources allocation	Terms of Trade	Savings-Investment
Centr.America	1351	390	723	238	-1423	-415	-754	-254	-71	-23	-32	-16
EU27	1826	933	1008	-114	12	4524	-4564	53	1839	5459	-3560	-60
EU15	648	434	357	-143	1429	4977	-3670	122	2077	5411	-3313	-21
PECOS12	1178	499	650	29	-1417	-453	-894	-70	-238	48	-247	-39
Rest of Euroe	180	755	-603	27	-249	-759	521	-11	-70	-17	-68	15
Ex USSR	-195	-48	-172	25	73	3	79	-9	-123	-45	-93	16
Emerg. Asia	-1548	-341	-1234	27	264	-160	256	168	-1286	-502	-979	196
Rest of Asia	-296	-19	-264	-13	58	2	45	11	-238	-18	-219	-2
ROW	-246	-48	-183	-15	6	-14	9	11	-241	-62	-175	-4
Total	2071	2090	-18	-1	2960	3112	521	-7	5045	5206	-153	-7

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

5.2. Robustness of the effects on welfare

A Systematic Sensitivity analysis (SSA) on the Armington substitution elasticities (between domestic and imported goods) was done with the purpose of supporting the main outcomes. We chose to establish the SSA over these elasticities because they are the most relevant parameters linked with trade effects and terms of trade variability (see Pearson and Arndt, 2000 or a spanish review in Schuschny, Durán, de Miguel, 2006). The SSA represents a key element in order to understand the most significant effects on welfare and its robusteness.[9]

The results of the sensitivity analysis tell us about the mean and the standard deviation of the results of the model. The mean value over the 66 simulations tell us how different are the model's outcomes when the elasticities change with regard to its pre-established values. The standard deviation allows us to identify those variables, regions and/or products that have greater variability when these parameters change, thus establishing the robustness of the simulated results.

The results reinforce our conclusions on the welfare impacts of the FTA between MERCOSUR and the EU. Under the full liberalization scenario, Table 23 shows the outcomes of the SSA on welfare as well as a calculation of the confidence intervals under normality assumptions. We have substracted the welfare value of the B2004+ benchmark scenario showed in the first column of Table 21. In the case of MERCOSUR, the obtained confidence intervals for Argentina, Brazil and Uruguay are positive values. This means that, under normality conditions, we can be 95% confident that the welfare impact remains positive for these countries even when Armington elasticities vary. The only doubt concerns Paraguay, where the effects on welfare could happen to be negative but with the most important part of the interval in the positive zone.

The outcomes for the EU27 are not decisive since the confidence interval is approximately centered at the origin of the real axis (-1753, 1596) . However, in the case of the EU15 countries, most of the interval lays on the positive region, reaching a magnitude of 2828 USD 2001 million. The eastern european countries (PECOS12) show an unambiguous result since both interval limits have negative

[9] Armington elasticities vary, *ceteris paribus,* according to an uniform distribution over a 50% range of their means values (by excess and defect). The outcomes of the SSA consist on the mean and the standard deviation of the endogenous variables of the model calculated over 66 consecutive simulations.

welfare values. Table 23 also confirms the negative impact on welfare for the other Latin American countries as a consequence of the full liberalization scheme.

TABLE 23
SENSITIVITY ANALYSIS FOR WELFARE, FULL LIBERALIZATION SCENARIO
(Net welfare value after taking away the B2004+ scenario results, in million 2001 USD)

			Normality hypothesis	
	Simulation	Mean	Inferior limit	Superior limit
Bolivia (Plurinational State of)	-30	-30	-40	-20
Colombia	-94	-94	-106	-82
Ecuador	-18	-18	-21	-16
Peru	-130	-130	-140	-121
Venezuela (Bolivarian Republica of)	-40	-39	-81	3
Argentina	358	359	168	550
Brasil	6229	6317	1692	10942
Uruguay	233	253	99	406
Paraguay	302	331	-41	704
Mexico	-185	-183	-303	-63
USA	-1678	-1683	-2066	-1300
Canada	233	231	181	281
Chile	-958	-957	-986	-927
Central America	-1423	-1424	-1451	-1398
EU15	1429	1325	-179	2828
PECOS12	-1417	-1403	-1574	-1232
Rest of Europe	-250	-248	-289	-207
Ex USSR	72	76	49	104
Emerging Asia	263	269	-252	791
Rest of Asia	58	66	12	120
Rest of the World	5	6	-67	78

Source: Authors, on the basis of simulations with the GTAP 6.2 model.

IV. Conclusions

The purpose of this study was to highlight the potential impacts of a FTA between MERCOSUR and the EU for the economies of the two blocs. The importance of this study was to identify by means of a CGE analysis big sectors where things can go better or worse. A detailed quantification of the benefits and losses should be made at a greater level of detail, eventually with the support of partial equilibrium models.

As empirical evidence has shown, the FTAs would have very limited effects on GDP (Markusen's Law, see Francois and McDonald, 1996) and, as in any comparative static exercise, the effect would be one time only. However, the impacts on trade are fairly relevant. We have shown that welfare impacts for MERCOSUR would be positive and lead to about $7.1 billion static gains (0.83% GDP) in case of a full liberalization, and $1.8 billion for the EU27 (0.02% GDP).

According to the simulations, it would be significant for MERCOSUR as a whole to sign an agreement, and even more if it reduces most of the tariffs since we have found a more positive impact in the full liberalization scenario. MERCOSUR, as a less competitive region could reach benefits or welfare gains in its traditional sectors which are related with the richness of its natural resources. However, in the case of more value-added sectors, the situation couldn't be very clear.

Trade would rise in both simulation exercises (but imports more than exports) and the major explanation for the GDP growth would be an increase in consumption levels. Welfare impacts would be positive but not significant for EU15 but remain somewhat negative for the new member States from Central and Eastern Europe. GDP Impacts are slightly negative in the case of the EU27 but positive for the MERCOSUR.

The new member States from Central and Eastern Europe (PECOS 12) would lose since their trade would compete with MERCOSUR's products, although the figures obtained are not quite considerable. However, signing an agreement could still represent an opportunity for the EU because of the strategic reasons explained in Section 1, specially the competition with the US influence in the Latin American region and the increase in the participation in the global market. Furthermore, trade effects would be positive for the European Union in both scenarios, since the increase in exports resulting from the agreement would be greater than the rise in imports.

Although potential welfare gains could be positive for both blocs, negotiations are stalled due to a lack of political motivation combined with some worry that potential losers would not be fairly compensated. While it is true that the outcomes would not be significant in terms of aggregate welfare, this masks important sectoral effects which, as history and economics have shown, cannot be easily offset by means of transfers from winners to losers (whose sectoral identification justifies studies like this). When we look more in detail into potential impacts on sectors, we can state that:

- Most of MERCOSUR production increase in case of a full liberalization essentially stems from *Services, Agricultural products* (livestock, cereals, and fruits) and *Light manufactures* (meat production, sugar). The production of *Heavy manufactures* (machinery, metals, transport equipments) would decline. The rise in exports would be primarily due to *Light manufactures* (meat, rice, sugar, food products), whereas *Heavy manufactures* (machineries and equipments; electronic equipments; chemical products and motor vehicles and parts) is the category which contributes the most to imports growth. MERCOSUR would thus specialize even more on *Light manufactures* exports and *Heavy manufactures* imports.

- Brazil would benefit far more from the deal than Argentina, and such differences in possible impacts could lead to an unability for MERCOSUR to speak with one single voice and to find common interests. For instance, Argentina is the country of the MERCOSUR which experiences the smallest production, imports and exports growth in the "Full" scenario, and the only one which would benefit more from a deal including sensitive products (although the impact remains small in terms of GDP).

- Intra-MERCOSUR trade is negatively affected, with a 16% decrease in intra MERCOSUR exports in case of a full liberalization (and a 2,5% reduction in the second simulation). Besides, some Latin American countries would have their GDP slightly reduced in case of a complete tariff liberalization. The most affected countries would be Bolivia, Chile and Venezuela. These results show that the FTAs would reduce subregional trade and increase trade with the EU. A number of countries in the region would suffer some erosion of their trade preferences in the European market. To work along the "open regionalism" lines promoted by ECLAC, bilateral agreements must not clash with processes of Latin American integration and multilateral efforts.

As for other bilateral or bi-regional agreements,[10] part of the stakeholders has expressed its apprehensions to the agreement. Social movements inside MERCOSUR have expressed concern[11] that the FTA would only benefit some agro-export sectors, opening key sectors –such as industrial goods, insurance, financial services, telecommunications, public procurement- to an "unequal" competition with European firms, and imposing stricter standards in terms of intellectual property that would impede technology transfer. According to MERCOSUR adversaries to the agreement, tariff cuts in agriculture would also endanger family farming in sectors which currently have a high entry tariff in MERCOSUR, such as milk. By promoting export farming, they express concern that the agreement could put their food security at a risk. They criticise the maintaining of high European quotas on meat imports in the 2004 offers, which they claim are even higher than previous ones. They would like safeguards to be implemented by the governments to protect small and subsistence farmers. Another concern is the

[10] For instance the FTA between the USA and Perú, Colombia or the DR-CAFTA.

[11] Declaration of the social movements and organizations from Mercosur, October 1st, 2004: "EU-Mercosur agreement: some gains for a minority, a threat for the majority".

perpetuation of an international labour division which compels the region to be an exporter of "only" raw materials.

This study confirms that the consequences from an FTA would strongly differ across MERCOSUR countries and sectors. It is also true that important effects on sectors cannot be easily mitigated by transfers from winners to losers. Trade agreements set new rules of the game at the sectoral level, which establish, to some extent, the countries' development paths. The magnitude of impacts would also depend on which effective tariff cuts and quantitative -and/or qualitative- restrictions are included in the agreement. Furthermore, the signature of an FTA incorporates numerous elements that are hard to quantify, such as gains in productivity stemming from greater access to technological improvements, or the beneficial effects of a possible improvement in the legal security of contracts or in the prospects of economic agents.

The results have been obtained through a widely used model, both by academics and other institutions. However, these simulations have limitations and do not take into account many aspects involved in the political economy taking place during this kind of negotiations. One key issue are the rules of origin. There are many studies that have emphasizing the role played by the rules of origin in concessions and preferential agreements, like Generalized System of Preferences (GSP) Agreement or North American Free Trade Agreement (NAFTA) for instance, Brenton and Manchin (2002) pointed out that two-thirds of the products eligible to preferences of different forms, which entered the EU from devoloping countries, did so under the most-favoured-nation (MFN) tariff, thanks to the appallingly cumbersome and costly bureaucracy needed to prove that one complied with the specific rules of origin (Flores and Watanuki, 2008). Also, dynamic gains are also hard to quantify, such as the effect of a modification in the expectations of economic agents, capital accumulation or gains in productivity triggered by an enlarged access to high-technology. This study would certainly benefit from other "complementary analysis", which would use a different modelling methodology, such as econometrical and partial equilibrium analyses.

Nevertheless, we have not examined the economic changes that could be promoted by other active public policies (including institution building, promotion of competitiveness, improvement of infrastructure, training of human resources and protection of the environment and natural resources). While these policies could (and should) be implemented even in there are no FTA, their effect would be greater if free trade agreement is signed. In other words, it is important to address that the negotiation and implementation of free trade agreements are not substitute for active development policies, and that doubts remain about the level of synergy that could be established between the application of such policies and the signature of free trade agreements. These are the areas on which public debate on free trade agreements should focus. This article helps to show that it is in those areas and in sectoral impacts, rather than in changes in the level of economic activity associated with tariff changes, that justification should be found for adopting a specific stance on the agreements and for identifying the characteristics that should be pursued when negotiating them, rather than solely the admittedly important issue of special treatment for sensitive products.

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Annexes

Annex 1

TABLE A.1
MAIN EXPORT PARTNERS, 2006
(Millions of dollars)

	CAN	MERCOSUR	Chile	Mexico	Rest of LAC	USA	EU15	Rest of the World	Total
MERCOSUR	11 729	25 625	8 584	6 033	5 593	29 412	38 143	64 967	190 087
% in the total	6.2	13.5	4.5	3.2	2.9	15.5	20.1	34.2	100
Argentina	2 734	9 780	4 374	1 435	944	4 034	7 798	15 324	46 423
% in the total	5.9	21.1	9.4	3.1	2.0	8.7	16.8	33.0	100
Brazil	8 794	13 986	3 914	4 458	4 547	24 774	29 573	47 760	137 806
% in the total	6.4	10.1	2.8	3.2	3.3	18	21.5	34.7	100
Uruguay	128	942	165	134	99	537	659	1 288	3 952
% in the total	3.2	23.8	4.2	3.4	2.5	13.6	16.7	32.6	100
Paraguay	73	917	131	6.6	3.4	67	113	595	1 906
% in the total	3.8	48.1	6.9	0.3	0.2	3.5	5.9	31.2	100
EU15	9 654	25 780	5 080	27 782	12 735	328 425	2 388 446	1 248 297	4 046 199
% in the total	0.2	0.6	0.1	0.7	0.3	8.1	59.0	30.9	100

Source: ECLAC, Division of International Trade and Integration, on the basis of official figures from the United Nations Commodity Trade Statistics Database (UN Comtrade), DESA/UNSD.

Annex 2

TABLE A.2
DETAIL OF PRODUCT AGGREGATION WITH GTAP 6.2

Num.	Code	Description in GTAP 6.2	Sector groups
1	Arroz	pdr (Paddy rice), pcr (Processed rice)	Agricultural products
2	Trigo	wht (Wheat)	
3	Ocereales	gro (Cereal grains nec)	
4	FrutasVeg	v_f (Vegetables, fruit, nuts)	
5	Semilloil	osd (Oil seeds)	
6	FibrasVeg	pfb (Plant-based fibers),	
7	Ocultivos	ocr (Crops nec), c_b (Sugar cane, sugar beet)	
8	Livestock	ctl (Cattle,sheep,goats,horses), oap (Animal products nec),wol (Wool, silk-worm cocoons), rmk (Raw milk)	
9	Forestal	frs (Forestry)	
10	Pesca	fsh (Fishing)	
11	ExtEnergía	coa (Coal), oil (Oil), gas (Gas)	Oil and Mining
12	Minería	omn (Minerals nec)	
13	Carne	cmt (Meat: cattle,sheep,goats,horse), omt (Meat products nec)	Light manufactures
14	AceiteVeg	vol (Vegetable oils and fats)	
15	Lácteos	mil (Dairy products)	
16	Azúcar	sgr (Sugar)	
17	Oaliment	ofd (Food products nec=	
18	BeyTa	b_t (Beverages and tobacco products)	
19	Textil	tex (Textiles)	
20	Confección	wap (Wearing apparel)	
21	CueroCalz	lea (Leather products)	
22	Madera	lum (Wood products)	
23	Papel	ppp (Paper products, publishing)	
24	Dpetrol	p_c (Petroleum, coal products)	Heavy manufactures
25	Química	crp (Chemical,rubber,plastic prods)	
26	ProdMineral	nmm (Mineral products nec)	
27	Metal	i_s (Ferrous metals), nfm (Metals nec)	
28	ProdMetal	fmp (Metal products)	
29	Autop	mvh (Motor vehicles and parts)	
30	Etransp	otn (Transport equipment nec)	
31	MaquiEqui	ome (Machinery and equipment nec)	
32	Omanu	ele (Electronic equipment), omf (Manufactures nec),	
33	Servicios	ely (Electricity), gdt (Gas manufacture, distribution), wtr (Water), cns (Construction), trd (Trade), otp (Transport nec), wtp (Sea transport), atp (Air transport), cmn (Communication), ofi (Financial services nec), isr (Insurance), obs (Business services), ros (Recreation and other services), osg (PubAdmin/Defence/ Health/Educat), dwe (Dwellings).	Services

Source: Authors, on the basis the GTAP 6.2 database.

Annex 3

TABLE A.3
DETAIL OF COUNTRY AGGREGATION WITH GTAP 6.2

Num.	Code	Description in GTAP 6.2
1	Bolivia	Bolivia
2	Colombia	Colombia
3	Ecuador	Ecuador
4	Peru	Peru
5	Venezuela	Venezuela
6	Argentina	Argentina
7	Brasil	Brasil
8	Uruguay	Uruguay
9	Paraguay	Paraguay
10	Mexico	Mexico
11	USA	USA
12	Canada	Canada
13	Chile	Chile
14	Rest of America	Rest of North America, Rest of South America, Central America, Rest of FTAA, Rest of the Caribbean
15	EU15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Holland, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden and the United Kingdom
16	PECOS12	Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia
17	Rest of Europe	Switzerland, Rest of EFTA, Rest of Europe, Albania, Croatia
18	Ex USSR	Russian Federation, Rest of Former Soviet Union
19	Emerging Asia	China, Hong Kong, Japan, Korea, Taiwan, Indonesia, Malaysia, Philippines, Singapore, Thailand, Viet Nam, India
20	Rest of Asia	Rest of East Asia, Cambodia, Rest of Southeast Asia, Bangladesh, Pakistan, Sri Lanka, Rest of South Asia, Turkey, Iran, Rest of Middle East
21	Rest of the World	Australia, New Zealand, Rest of Oceania, Egypt, Morocco, Tunisia, Rest of North Africa, Botswana, South Africa, Rest of South African Customs, Malawi, Mauritius, Mozambique, Tanzania, Zambia, Zimbabwe, Rest of Southern African Devel, Madagascar, Nigeria, Senegal, Uganda, Rest of Sub-Saharan Africa

Source: Authors, on the basis the GTAP 6.2 database.

Annex 4a

TABLE A.4
LIST OF PREFERENTIAL AGREEMENTS CONSIDERED IN THE ALTERTAX SIMULATIONS UP TO DECEMBER 2001

Nº	Agreements	Date of Signature	Come into force
1	Chile - Canadá	5-Dec-1996	5-July-97
2	Chile - MERCOSUR	1996	1-10-96
3	Chile - Bolivia	1993	7-07-93
4	Chille - Ecuador	1994	1-01-94
5	Chile – Perú	1998	1-07-98
6	Chile - Venezuela	1993	1-07-93
7	Chile - México	1991 y 1998	1-08-99
8	Chile - MCCA	…	18-10-99
9	Chile - Colombia	1993	1-Jan-94
10	MERCOSUR (Arg+Bra+Uru+Par)	March 1991	1991
11	AC (Bol+Col+Ecu+Per+Ven)	1969	1969
12[a]	MCCA (Cri+El Salv+Hon+Gua+Nic)	1960	1960
13	México - Colombia - Venezuela (G-3)	1995	1-Jan-95
14	México-European Unión	2000	1-June-00
15	México-Asociación Europea de Libre Comercio (AELC)	2001	1-Jun-01
16	México –Triángulo del Norte (El Salvador, Guatemala y Honduras)	29-June-00	15-Mar-01
17	México – Nicaragua	18-Dec-97	1-July-98
18	México - Costa Rica	5-April-94	1-Jan-95
19	México – Bolivia	…	1-Jan-95
20	México – Uruguay (ACE)[a]	1994	1994
21[a]	México – Israel	10-04-00	1-June-00
22[a]	México – Panamá (ACE) [a]	…	22-April-96
23	México - EE.UU. - Canadá	1994	1-Jan-94

Source: Schuschny, Durán, de Miguel (2007).

[a] Not considered in simulations because of data is not available.

Annex 4b

TABLE A.5
LIST OF PREFERENTIAL AGREEMENTS CONSIDERED IN THE SIMULATIONS TO DEFINE THE B2004+ BENCHMARK SCENARIO

Nº	Agreements	Date of signature	Come into force
1	Chile – EE.UU	6-June-03	1-Jan-04
2	Chile – European Union	18-Nov-02	1-Feb-03
3	Chile – AELC	26-July-03	1-Dec-04
4	Chile – Corea	2003	1-Apr-04
5	México - Uruguay	1994 y 2004	15-Nov-03
6	México - Japón	2004	1-Mar-05
7	EE.UU. - Australia	2004	1-Apr-2005
8	ATPDEA Preferentes	6-Aug-2002	6-08-2002
9	Enlargment of the UE15 a UE25	2004	May 2004
10	DR-CAFTA (Dominican Republic – Central America Free Trade Agreement),	Jan-2004	2007
11	Enlargment of the UE25 a UE27	1-Jan-2007	2007

Source: Schuschny, Durán, de Miguel (2007).

Annex 5a

TABLE A.6
TARIFFS UPGRADED IN THE ALTERTAX SIMULATION

Origin country	Destination conutry	NMF 2001	Pref 2001*	Target rate	Change rate	Date of the agreement
Canada	Chil	8.00	0.980	0.16	-98.00	1997
Chil	Canada	4.20	0.950	0.21	-95.00	1997
Chil	Bra	13.20	0.845	2.05	-84.50	1996
Bra	Chil	8.00	0.775	1.80	-77.50	1996
Chil	Arg	11.80	0.785	2.54	-78.50	1996
Arg	Chil	8.00	0.925	0.60	-92.50	1996
Uru	Chil	8.00	0.732	2.14	-73.20	1996
Chil	Uru	12.30	0.681	3.92	-68.10	1996
Bol	Chil	8.00	0.908	0.74	-90.80	1993
Chil	Bol	9.30	0.732	2.49	-73.20	1993
Ven	Chil	8.00	0.415	4.68	-41.50	1993
Chil	Ven	12.40	1.000	0.00	-100.00	1993
Ecu	Chil	8.00	0.370	5.04	-37.00	1994
Chil	Ecu	11.30	1.000	0.00	-100.00	1994
Per	Chil	8.00	0.834	1.33	-83.40	1998
Chil	Per	13.00	0.705	3.84	-70.50	1998
Mex	Chil	8.00	0.901	0.79	-90.10	1991 / 8
Chil	Mex	16.40	0.999	0.02	-99.90	1992 / 8
CyC	Chil	8.00	0.850	1.20	-85.00	2000
Chil	CyC	11.50	0.850	1.73	-85.00	2000
Arg	Bol	9.30	1.000	0.00	-100.00	1996
Bol	Arg	11.80	0.800	2.36	-80.00	1996
Bra	Bol	9.30	0.998	0.02	-99.80	1996
Uru	Bol	9.30	1.000	0.00	-100.00	1996
Bol	Bra	13.20	0.171	10.94	-17.10	1996
Bol	Uru	12.30	0.730	3.32	-73.00	1996
Col	Chil	8.00	0.912	0.70	-91.20	1993
Chil	Col	11.60	0.901	1.15	-90.10	1993
UE15	Mex	16.40	0.687	5.13	-68.71	2000
Mex	UE15	4.80	0.900	0.48	-90.00	2000
Col	Mex	16.40	0.664	5.51	-66.40	1995
Mex	Col	11.60	0.910	1.04	-91.00	1995
Ven	Mex	16.40	0.964	0.59	-96.40	1995
Mex	Ven	12.40	1.000	0.00	-100.00	1995
CyC	Mex	16.40	0.973	0.44	-97.30	1998 / 01
Mex	CyC	11.50	0.380	7.13	-38.00	1998 / 01
Uru	Mex	16.40	0.988	0.20	-98.80	1994 / 04
Mex	Uru	12.30	0.344	8.07	-34.40	1995 / 04
Reuro	Mex	16.40	0.800	3.28	-80.00	2001
Mex	Reuro	3.30	0.800	0.66	-80.00	2001
CyC	Col	11.60	0.850	1.74	-85.00	1994
CyC	Ven	12.40	0.970	0.37	-97.00	1994
Col	CyC	11.50	0.750	2.88	-75.00	1994
Ven	CyC	12.40	0.750	3.10	-75.00	1994

Source: Schuschny, Durán, de Miguel (2007).

Anexo 5b

TABLE A.7

TARIFFS CHANGES SIMULATED IN THE B2004+ BENCHMARK SCENARIO

(Percentage change between the 2001 simulation and December 2004+)

País Origen	País Destino	NMF 2004	Pref 2004*	Target rate	New change 2001-07	Change rate	Date of the agreement
Chil	EE.UU.	3.90	0.940	0.23		-94 000	2003
EE.UU.	Chil	6.00	0.900	0.60		-90 000	2003
Chil	UE15	6.00	0.950	0.30		-95 000	2002
UE15	Chil	4.40	0.950	0.22		-95 000	2002
Chil	Reuro	3.30	0.950	0.17		-95 000	2003
Reuro	Chil	6.00	0.950	0.30		-95 000	2003
Chil	Bra	12.00	0.850	1.80	0.12	-12 023	1996
Bra	Chil	6.00	0.850	0.90	0.50	-50 000	1996
Chil	Arg	11.80	0.850	1.77	0.30	-30 233	1996
Arg	Chil	6.00	0.925	0.45	0.25	-25 000	1996
Uru	Chil	6.00	0.850	0.90	0.58	-58 022	1996
Chil	Uru	12.00	0.850	1.80	0.54	-54 125	1996
Bol	Chil	6.00	0.908	0.55	0.25	-25 000	1993
Chil	Bol	9.30	0.850	1.40	0.44	-44 030	1993
Ven	Chil	6.00	0.850	0.90	0.81	-80 769	1993
Chil	Ven	13.00	1.000	0.00	0.00	0 000	1993
Ecu	Chil	6.00	0.850	0.90	0.82	-82 143	1994
Per	Chil	6.00	0.850	0.90	0.32	-32 229	1998
Chil	Per	10.90	0.850	1.64	0.57	-57 366	1998
Mex	Chil	6.00	0.901	0.59	0.25	-25 000	1991 y 1998
Chil	Mex	17.30	0.999	0.02	-0.05	5 488	1992 y 1998
CyC	Chil	6.00	0.850	0.90	0.25	-25 000	2000
Chil	CyC	11.80	0.850	1.77	-0.03	2 609	2000
Corea	Chil	6.00	0.667	2.66		-66 700	2003
Chil	Corea	9.40	0.405	2.66		-40 500	2003
Arg	Bol	9.30	1.000	0.00	0.00	0 000	1996
Bol	Arg	11.80	0.850	1.77	0.25	-25 000	1996
Bra	Bol	9.30	0.998	0.02	0.00	0 000	1996
Uru	Bol	9.30	1.000	0.00	0.00	0 000	1996
Bol	Bra	12.00	0.850	1.80	0.84	-83 551	1996
Bol	Uru	12.00	0.850	1.80	0.46	-45 799	1996
Col	Chil	6.00	0.912	0.53	0.25	-25 000	1993
Australia	EE.UU.	4.40	0.930	0.31		-93 000	2004
EE.UU.	Australia	4.30	0.930	0.30		-93 000	2004
UE15	Mex	16.40	0.850	2.46	0.35	-34 597	2000
PECOS	Mex	16.40	0.850	2.46		-85 000	2000 y 2004
Mex	PECOS	4.40	0.800	0.88		-80 000	2000 y 2004
Chil	PECOS	6.00	0.950	0.30		-95 000	2001 y 2004
PECOS	Chil	4.40	0.950	0.22		-95 000	2002 y 2004
Col	Mex	17.30	0.850	2.60	0.53	-52 907	1995
Mex	CyC	11.50	0.600	4.60	0.35	-35 484	1998 y 2001
Mex	Uru	12.00	0.900	1.20	0.85	-85 128	1995 y 2004
Reuro	Mex	17.30	0.800	3.46	-0.05	5 488	2001
CyC	Ven	13.00	0.970	0.39	-0.05	4 839	1994
Col	CyC	11.50	0.800	2.30	0.20	-20 000	1994
Ven	CyC	11.50	0.800	2.30	0.26	-25 806	1994
Bol	EE.UU.	0.00	1.000	0.00		-100 000	ATPDEA
Ecu	EE.UU.	0.00	1.000	0.00		-100 000	ATPDEA
Col	EE.UU.	0.00	1.000	0.00		-100 000	ATPDEA
Per	EE.UU.	0.00	1.000	0.00		-100 000	ATPDEA
CyC	USA					-6.8	DR-CAFTA
USA	CyC					-3.3	DR-CAFTA
EU 15	PECOS12				0.00	0.00	EU-Enlarg.
PECOS12	EU 15				0.00	0.00	EU-Enlarg.

Source: Schuschny, Durán, de Miguel (2007).

Annex 6

TABLE A.8
DETAIL OF SENSITIVE PRODUCTS

	N	Included products	Sensitive products for the European Union	Sensitive products for Mercosur
Agricultural products	1	pdr (Paddy rice), pcr (Processed rice)	X	
	2	wht (Wheat)		
	3	gro (Cereal grains nec)		
	4	v_f (Vegetables, fruit, nuts)		
	5	osd (Oil seeds)		
	6	pfb (Plant-based fibers),		
	7	ocr (Crops nec), c_b (Sugar cane, sugar beet)		
	8	ctl (Cattle,sheep,goats,horses), oap (Animal products nec),wol (Wool, silk-worm cocoons), rmk (Raw milk)		
	9	frs (Forestry)		
	10	fsh (Fishing)		
Oil and Mining	11	coa (Coal), oil (Oil), gas (Gas)		
	12	omn (Minerals nec)		X
Light manufactures	13	cmt (Meat: cattle,sheep,goats,horse), omt (Meat products nec)	X	
	14	vol (Vegetable oils and fats)		
	15	mil (Dairy products)	X	
	16	sgr (Sugar)		
	17	ofd (Food products nec)		
	18	b_t (Beverages and tobacco products)	X	
	19	tex (Textiles)		X
	20	wap (Wearing apparel)		X
	21	lea (Leather products)		X
	22	lum (Wood products)		
	23	ppp (Paper products, publishing)		X
Heavy manufactures	24	p_c (Petroleum, coal products)		
	25	crp (Chemical,rubber,plastic prods)		X
	26	nmm (Mineral products nec)		
	27	i_s (Ferrous metals), nfm (Metals nec)		X
	28	fmp (Metal products)		X
	29	mvh (Motor vehicles and parts)		X
	30	otn (Transport equipment nec)		
	31	ome (Machinery and equipment nec)		X
	32	ele (Electronic equipment), omf (Manufactures nec),		X
Services	33	ely (Electricity), gdt (Gas manufacture, distribution), wtr (Water), cns (Construction), trd (Trade), otp (Transport nec), wtp (Sea transport), atp (Air transport), cmn (Communication), ofi (Financial services nec), isr (Insurance), obs (Business services		

Source: Authors, on the basis of the 2004 official offers by Mercosur and the European Union.

Annex 7

TABLE A.9
ENVIRONMENTALLY SENSITIVE INDUSTRIES

CUCI Rev.1	Descripción
251	Pulpa y desperdicios
332	Prod. Derivados del petróleo
512	Productos químicos orgánicos
513	Productos químicos inorgánicos
514	Otros Productos químicos inorgánicos
515	Materiales radiactivos
521	Alquitrán mineral
561	Abonos manufacturados
599	Insecticidas, fungicidas, etc
631	Chapas y maderas terciadas
632	Manufacturas de madera, n.e.p.
641	Papel y cartón
642	Artículos pulpa, papel y cartón
661	Cal, cemento y otros mat. Constr
671	Hierro en bruto
672	Lingotes de hierro y acero
673	Barras de hierro y acero
674	Planchas de hierro y acero
675	Fletes de hierro y acero
676	Rieles de hierro y acero
677	Alambre de hierro y acero
678	Tuberías de hierro y acero
679	Accesorios tub . Hierro y acero
681	Plata y platino
682	Cobre
683	Níquel
684	Aluminio
685	Plomo
686	Zinc
687	Estaño
688	Uranio
689	Otros minerales no ferrosos
691	Piezas estructurales acabadas
692	Envases de metal para transp
693	Otros artículos de alambre y cercas
694	Clavos, pernos, tuercas, etc
695	Herramientas
696	Cuchillería
697	Enseres domésticos
698	Manufac. Metales comunes, n.e.p.

Source: Low y Yeats (1992), Schaper (1999).

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