Impact of Agricultural Reform in the Western Hemisphere and the European Union on Latin America: Bright Prospects or Distant Illusions?[1]

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Abstract

Over the last decade, Latin America has made progress in agricultural liberalization in a two-tier reform process: at the multilateral level and at the regional level. On the multilateral front, the Uruguay Round Agreement in Agriculture made significant progress as agriculture was brought under the disciplines of GATT for the first time. At the regional level, integration in the region has liberalized agriculture progressively within blocs. Despite these achievements, agriculture is still the most protected sector in the world economy, especially in industrialized countries. The paper examines the costs for Latin America of the continued high protection in agriculture by developed countries, and the gains from reform and liberalization in the sector, using a multi-region, multi-sector comparative static CGE model with trade-linked externalities and scale economies. Two scenarios are examined: a Western Hemisphere liberalization and a liberalization between Mercosur and the EU, that can be considered a proxy of the formation of a free trade area in agriculture delivered by the ongoing talks along the Western Hemisphere for a Free Trade Area of the Americas (FTAA), and between Mercosur and the EU. The model considers the three pillars of agricultural policy distorting world prices and restricting trade flows—tariffs, domestic support and export subsidies—and simulates their elimination individually and simultaneously. The results show that, for Latin American countries, tariffs are the most trade-restrictive policy measure, while the elimination of domestic support has small positive effects on exports. The elimination of export subsidies hardly affects Latin American exports. Protectionism in developed countries depresses world prices of agriculture in which Latin American has strong exports competitiveness. For Mercosur, full liberalization with the European Union generates greater trade gains than hemispheric liberalization.

JEL Classification: C68, D58, D62, F15, O54, Q17
Key Words: CGE model, Agricultural reform, Trade-linked externality

1. Introduction

Agricultural policy reform in the Western Hemisphere (WH) has been undertaken as a two-tier liberalization process: at the multilateral level and at the regional level. In the multilateral arena, the Uruguay Round Agreement on Agriculture (URAA) made significant progress toward less distorted agricultural trade and, for the first time, agriculture was brought under the disciplines of the General Agreement on Tariff and Trade (GATT).[2] Following the URAA, member countries committed

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[2] The Agreement states specific commitments to improve market access and to reduce trade-distorting measures. In the area of market access, all non-tariff barriers are prohibited and converted into the corresponding tariffs, through a process called "tariffication". Tariffs are to be reduced by 36 percent (24 percent for developing countries), domestic support by 20 percent (13 percent), and export subsidies by 36 percent (24 percent). The minimum tariff cut per product is 15 percent for developed countries and 10 percent for developing countries. In the export subsidies, the reduction of subsidied quantities is

themselves to reduce agriculture-distorted measures over six years for developed countries (1995-2000) and 10 years for developing countries (1995-2004) in three main disciplines: market access, domestic support and export subsidies.

Despite moving toward agricultural reform under the URAA, crucial barriers to trade remain intact, or at best, slightly improved. Tariffs in agriculture are still very high: the global unweighted average bound tariff rate is 62 percent, and that of developed countries is 45 percent.[3] Regarding domestic support, while some countries converted domestic support measures into less trade-distorting programs permitted under the URAA, others, especially developed counties, did not follow in the same direction and recently have even increased protection.[4] The new Doha round of negotiations launched in 2001 will provide a great opportunity for developing countries to successfully achieve agricultural reform in the industrialized countries.[5]

At the regional level, integration initiatives have proliferated in the WH over the last decade and a half, as renewed regionalism has gained momentum (Devlin and Ffrench-Davis, 1998, Devlin and Estevadeordal, 2001). Latin America and the Caribbean (LAC) have launched more than 20 free trade agreements (FTAs) or customs unions in the 1990s. In that decade, NAFTA was launched between a developing country (Mexico) and developed countries (the United States and Canada), and Mercosur between four developing countries (Argentina, Brazil, Paraguay and Uruguay). In these agreements, agriculture has been progressively liberalized within each bloc. Countries in the Western Hemisphere are now steadily moving forward to create a hemisphere-wide free trade area (Free Trade Area of the Americas, FTAA). This is an historic event that poses unprecedented challenges for all partners. The agenda of the negotiations involves longstanding but nonetheless still contentious topics including agriculture reform. In the meantime, some LAC countries are involved in trade negotiations with the European Union (EU), their most important extra-hemispheric partner. Mercosur and the EU agreed to initiate free trade talks at the 1999 Rio de Janeiro Summit. The talks are moving slowly, but the EU expressed its desire to accelerate the negotiations in view of the progress of the FTAA process.[6]

One of the key, and most contentious, issues in both the FTAA and the transatlantic negotiations is the liberalization of agriculture. In the WH, agricultural trade amounts to $200 billion and this represents some 30 percent of the global agricultural trade and around 7 percent of hemispheric total trade. Agriculture has a high share in GDP—around 15 percent in Mexico and Brazil and 20 percent in Central America/Caribbean and Argentina— and represents leading exports for most LAC countries. Because the sector absorbs a significant portion of the workforce, it is also politically sensitive in LAC. However, trade in agriculture is restricted by a number of barriers including high tariffs, non-tariff measures such as tariff rate quotas, technical regulations and quantitative restrictions, domestic

21 percent for developed countries and 14 percent for developing countries. Least-developed countries are not required to reduce tariffs or subsidies. Refer to the WTO secretariat for more details.

[3] USDA, (2001) "Agricultural Policy Reform in the WTO: the Road Ahead".

[4] The recently enacted "Farm Security and Rural Investment Act of 2002" (hereafter Farm Bill) nearly doubles transfers to farmers.

[5] Deadeline is set by January 2005.

[6] An important aspect of the Mercosur-EU relationship is that in light of the growing US trade dominance and the ongoing hemispheric negotiations, Mercosur views the EU as a counterbalance to the US, particularly in the FTAA negotiation process. For the EU, Mercosur is an important extra-regional trade partner: it absorbs some 50 percent of its exports to Latin America, and represents half of total exports from Latin America to the EU market. Mercosur has been a traditional stronghold in the Americas, and is now an increasingly important partner to block US dominance and to restore the lost share in Latin America by strengthening trade relations.

support, export subsidies, sanitary and phytosanitary measures. Most of these policy measures are essentially active in both the US and the EU. Given LAC global competitiveness in agriculture, the agricultural reform in the WH and the EU will definitely bring about large opportunities and sizable gains to LAC countries.

In order to prepare for the negotiations and to prepare the economy for the structural adjustment that the liberalization process will generate, LAC will greatly benefit from having an *a priori* estimation of the potential economic impact of such reform. Important questions include: (i) What will be the impact of the agricultural reform in developed countries on Latin America, specifically on sectoral production, export patterns and resource allocation; (ii) Which countries will gain and lose, and which sectors will be more affected as a consequence of the agricultural reform at the hemispheric level; and (iii) To what extent the effects of agricultural liberalization with the EU differ from those from the FTAA for Mercosur countries.

To answer the above questions, we use an applied general equilibrium model that quantifies the impact of liberalizing agriculture as a result of the FTAA and of the Mercosur-EU agreements. The model is a multi-region, multi-sector, Computable General Equilibrium (CGE) Model. The analysis focuses on the effect on LAC countries of the elimination of three policy instruments distorting world prices and restricting trade flows in agriculture: tariffs (*ad valorem*, as well as *ad valorem* equivalent estimations), domestic support and export subsidies. In order to evaluate the effect of agricultural reform, the simulations assume that only the agricultural sector is completely liberalized; trade barriers in non-agricultural sectors remain unchanged.[7] Under this assumption, we are able to measure the cost that agriculture protection in the developed world has on LAC countries.

For the two trade agreements considered, we estimate the impact of each policy variable reform individually, as well as the effect of moving toward liberalization simultaneously in the three areas. It may seem unlikely that regional trade agreements negotiations will go beyond tariff elimination to include domestic support and export subsidies, since it has been argued that these non-tariffs issues should be addressed at the multilateral level. However, many LAC countries are pushing for the inclusion of these topics in the regional negotiations. No matter what the final result of the negotiations may be, to assess the cost for LAC of the protectionism in the developed world is a relevant economic and policy question.

The model is benchmarked in 1997 and given that many countries have reduced trade barriers since then—although less than agreed under the URAA—the analysis may overestimate the potential impact of agricultural liberalization. However, because countries also have non-tariff barriers in place not covered in the model such as sanitary and phitosanitary measures (SPS), and a handful of countries including the US have recently raised trade protection, the results may underestimate the impact of a comprehensive agricultural reform.

Our results show that the elimination of tariffs in the WH increases LAC's agricultural exports by 11 percent. The removal of domestic support has a small positive effect on LAC's exports, and eliminating export subsidies alone do not appear to enhance exports. The results also show that the US will benefit from opening up its agricultural market, as its agricultural exports expand by 12 percent. For Mercosur countries, the impact of the agreement with the EU is quite different from that of the

[7] This is a hypothetical situation since trade negotiations include both agriculture and non-agriculture sectors.

hemispheric agreement and generates larger positive effects and more heterogeneous impact across sectors. The elimination of tariffs between the two blocs increases Mercosur's exports to the EU by 37 percent. The EU's removal of domestic support increases Mercosur's agricultural exports by 8 percent. As in the WH scenario, the abolishment of the EU's export subsidies does not boost Mercosur's exports. For the EU, agricultural reform reduces agricultural exports by around 3 percent.

Thus, LAC will benefit from agricultural reform in developed countries, being that the elimination of tariffs is the main factor behind the trade gains. This is due largely to the more extensive use of tariffs across countries compared to domestic support and export subsidies, and to the discriminatory nature of tariffs, compared to the non-discriminatory effects across countries of the other two policy instruments. This fact is reflected in the gains that third parties outside the agreements experience by the elimination of domestic and export support.

The rest of the paper is organized as follows. Section 2 describes the structure of the model, focusing on the extensions beyond standard static CGE models. Section 3 analyzes the benchmark data with particular emphasis on the structure of the trade-distorting measures used in agriculture. Section 4 presents the policy simulations, discussing policy variables and simulation results. Finally, section 5 summarizes the main conclusions.

2 The CGE Model

The model used for this study is a multi-country, multi-sector and comparative static general equilibrium model that follows the standard specifications of trade-focused applied general equilibrium models. The model is highly nonlinear and simulates a decentralized market economy. It deals with the real side of the economy, and does not consider financial or monetary markets. The model comprises 10 regions or countries: Canada, US, Mexico, Central America/Caribbean, Andean Community, Argentina, Brazil, Chile, EU, and the Rest of the World. All regions are fully endogenized, and linked through trade. Since the paper focuses on agricultural reform, we incorporate 16 agriculture-related sectors, including processed food industries.[8] The other 10 sectors in the model are: mining, manufactures (4 light and heavy industries each), utilities, and services. The base year of the model is 1997. Table 1 summarizes the main features and assumptions underlying the model.

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The model extends beyond standard static CGE models in three areas. First, it incorporates trade-linked externalities that lead to efficiency gains in the production process as a result of increased trade. It is widely acknowledged that a greater liberalization or the creation of FTAs has dynamic effects resulting from economies of scale, technological spillovers, access to inputs, specialization and increased investment (Lewis, Robinson and Wang, 1995; Lopez-Cordoba and Moreira, 2002). Several studies show that developing countries can boost domestic productivity through technological spillovers by importing a variety of intermediate and capital goods that embody foreign knowledge (Coe and Helpman, 1995; Coe, Helpman and Hoffmaister, 1997). Today this is an extremely important

[8] The 16 agricultural sectors are: grains, wheat, other cereal grains, vegetables and fruits, oilseeds and soybeans, sugar, plant-based fibers, coffee and tea, bovine cattle, other animal products, bovine meat, poultry meat, vegetable oils, dairy products, beverages and tobaccos, and other food products. Sector classification is based on the GTAP (Global Trade Analysis Project) classification. GTAP is a consortium of international and national agencies and academic institutes.

element in LAC, where trade, especially exports, has become a key policy variable as a source of growth and foreign currency earnings.

In order to capture some of these dynamic effects, the model includes three types of trade-productivity links.[9] The first externality is a sectoral export externality, linked to sectoral export performance: higher export growth leads to an increase in productivity at the sectoral level. The second externality is an import externality associated with imports of intermediate inputs and capital goods, with the degree of efficiency gains depending on the import share of intermediate products and capital goods in production. The last externality is an aggregate export externality: an increase in aggregate exports raises the physical productivity of capital leading to economy-wide efficiency gains in the domestic production process. The three externalities are expressed in equations (1)-(3). E_i^k is sectoral exports where i represents the sector and k the region, $ETOT^k$ and $MTOT^k$ correspond to the aggregate exports and imports in each region. The exponents ηe^k, ηm^k and ηk^k are the externality elasticities, and n_i is the import share of intermediate products and capital goods. The subscript 0 refers to the benchmark.

(1) Sectoral export externality: $$SEE_i^k = \left(E_i^k / E_{0i}^{\ k}\right)^{\eta e^k}$$

(2) Import externality: $$SME_i^k = n_i \cdot \left(MTOT^k / MTOT_0^{\ k}\right)^{\eta m^k} + (1 - n_i)$$

(3) Aggregate export externality: $$AEE^k = \left(ETOT^k / ETOT_0^{\ k}\right)^{\eta k^k}$$

The externality elasticities are key parameters that will influence the simulation results. We use direct estimations from the work of Moreira and Najberg (2000) on productivity analysis of Brazilian manufacturing industries. These values are then applied to other regions in LAC, adjusted with trade flows.[10]

The second extension of the model is the inclusion of economies of scale in manufacturing industries. The degree of economies of scale is specified with one parameter, the cost disadvantage ratio (*CDR*), defined by the difference between average cost (*AC*) and marginal cost (*MC*) over average cost for the industry or representative firm in each sector, namely the ratio of fixed cost (*FC*) over total cost (*TC*).[11] Thus, scale economies are modeled by introducing a fixed cost component in the cost function, where the fixed cost component is directly estimated by multiplying the *CDR* by the total cost.[12]

[9] De Melo and Robinson (1992) first formalized and modeled the linkage between productivity and externalities in an applied general equilibrium analysis, and applied it to the export-led growth experimented by Korea. The introduction of externalities in our model follows Hinojosa-Ojeda, Lewis and Robinson (1995, 1997).

[10] The estimations come from Roberts (2000) and Stiroh (2001) for the US. For Canada and the EU, we follow esimations by Lewis, Robinson and Wang (1995), Hinojosa-Ojeda, Lewis and Robinson (1997), Giordano and Watanuki (2000) and Monteagudo and Watanuki (2002) with some sectoral adjustments.

[11] See Francois and Roland-Holst (1997) for a detailed disccusion.

[12] Industrial data to estimate the CDR, including direct estimations from the literature, are available for six countries: Brazil, Chile, Mexico, Venezuela, the US, and the EU. Estimated values for the other LAC countries in the model are averages from the available values of the WH countries.

(4) Cost disadvantage ratio: $CDR_i^k = \frac{AC_i^k - MC_i^k}{AC_i^k} = \frac{FC_i^k}{TC_i^k}$

We use a contestable market structure for manufacturing industries. The specification is analogous to perfect competition in the presence of constant returns to scale. It assumes low-cost entry or exit and that the threat of entry drives the incumbent firms to behave competitively so that they set the price at average costs. Thus, the average cost pricing under the contestable market implies that no firm will enter or exit from the industry. Since the number of firms in each industry remains constant, the efficiency gains are directly influenced by two elements: (i) industry outputs, as total costs of each firm moves down along its average cost curve, and (ii) by the trade externalities arising from increased trade.

The third extension of the model is the inclusion of domestic farm programs in place in the WH and the EU. Since evaluating agricultural policy reform is the main objective of this paper, this is a key element of the analysis. In addition to tariffs and export subsidies, we incorporate producer support estimate (PSE) from the OECD. In the model, PSEs are modeled either as price wedges, which directly affect output decisions—coupled measures—or lump-sum income transfers to farmers—decoupled measures—that do not directly affect production decision but influence the household's purchasing power. Following Diao, Somwaru and Roe (2001) and Burfisher, Robinson and Thierfelder (2001), the model specifies fixed, per unit *ad valorem* subsidies to inputs and output for coupled measures. The lump-sum income transfer is treated as an exogenous direct payment to farm households in the model.

The rest of the model follows the standard trade-focused CGE models. It includes three factors of production: labor, capital and land. Factors do not necessarily receive uniform returns across sectors, as the model imposes factor market rigidities or distortions. Regarding factor mobility, it is assumed that all factors are mobile across sectors, but immobile internationally. The aggregate supply of each factor is exogenously fixed in each region. Land is used only in agriculture.

The model traces the circular flow of income from producers to households and firms through factor payments, and back to demand of goods for use as intermediate and final goods in private and public consumption plus investment. The representative household in each region receives factor income plus exogenous foreign remittances, and spends it on goods following a fixed sectoral expenditure share function. Firms receive factor income as well as foreign capital, but do not consume goods. Government revenues include sectorally differentiated indirect and commodity taxes, household and corporate income taxes and social security taxes; there are also import tariffs and export taxes (or subsidies). Its expenditures include public consumption, income transfers and foreign payments.

Regarding the treatment of international trade, exports are modeled using a constant elasticity of transformation (CET) function, differentiated by destination country. Following the "Armington" assumption, imports—modeled by a CES function—are differentiated by country of origin. Since the model only determines relative prices, the aggregate consumer price index in each region is defined as the *numeraire*.

There are three key macro closures in the model: saving-investment identity, balanced trade, and balanced public budget. Since the model is of a comparative static nature, investment needs to be

completely financed by savings within each region. Savings by government and households are modeled as the difference between its revenues and its expenditures. Trade is also balanced for each region valued at world prices. In other words, the initial trade balance in goods and services remains constant, and the exchange rates adjust to achieve the equilibrium. The government also maintains a balanced budget. On the revenue side, taxes from various sources are endogenous, while foreign borrowing is treated as an exogenous variable. On the expenditure side, the government consumption is held constant in real terms, while nominal expenditures are enodogenized. The government also allocates fixed income transfers to household and firms plus exogenous amortization payments abroad. Government saving is then derived as a residual to maintain the balanced budget.

Finally, like any other static CGE model, the model focuses on the medium- to long-run horizon, allowing factor and commodity markets to clear. Thus, the model does not explicitly mention how long it takes for an economy to reach a new equilibrium, but considers it to be long enough for factors and prices to adjust fully.

3. Economic Structure: Trade Flows and Structure of Trade-distorting Measures

The CGE model is constructed on the basis of individual country/regional Social Accounting Matrix (SAM) for each region, benchmarked in 1997. SAM displays a comprehensive snapshot of each economy at the base year. The SAM-based analysis provides an overview of the economic structure of the respective economies and linkage among partners, and its close examination *ex ante* gives a crucial understanding of the simulation results reported later. Below are presented the agricultural trade flows and the structure of protection by sector, two key elements in determining the sectoral and aggregate impact of the policy shocks under study.

Trade Flows in Agriculture

Table 2 presents the pattern of agricultural exports among partners. The EU is by far the largest world supplier of agricultural goods, selling 40 percent of the world exports. Since intra-EU exports account for approximately 70 percent of its agriculture exports, the world share of extra-EU agricultural exports is approximately the same as Latin America's. For the EU, neither LAC nor the WH as a whole is an important destination market. With a share of 46 percent, the US is the largest agricultural exporter in the WH, whereas its share in world exports is 13.8 percent. LAC is also a significant world supplier of agricultural goods with a share of 12.6 percent. Within LAC, Brazil is the leading exporter with a share of 24.4 percent, followed by the Andean countries and Argentina with a share of 21 percent each.

Only 16 percent of US agricultural exports go to LAC, while the US accounts for 24 percent of LAC's exports and its importance varies from a low 6 percent for Argentina to a high 72 percent for Mexico. The EU, which buys 28 percent of LAC agricultural exports, is the largest market for the Andean Community, Argentina and Brazil. For Mexico and Chile, it occupies the second position after the US. For Central America and the Caribbean countries (hereafter Central America), both the US and the EU have an equal share of 34 percent. Most LAC countries have a surplus in agricultural trade with the EU, which coupled with the high trade barriers and massive domestic support in the EU, suggest that LAC will considerably benefit from agricultural reform in the EU, possibly more than from the reform

in the US. Finally, while bilateral trade within LAC countries remains relatively low, LAC as a whole absorbs 18 percent of the region's agricultural exports.

<INSERT TABLE 2>

Structure of Trade-distorting Measures in Agriculture

As policy measures, we consider the three pillar-policy instruments reported to the Uruguay Round Agreement on Agriculture (URAA): market access, domestic support and export subsidies. On market access, we focus on tariffs, including *ad valorem* tariffs for all countries, and *ad valorem* equivalents of specific, mixed tariffs and tariff rate quotas (TRQs) levied by Canada, the US and Mexico. Unlike in the North American countries, trade barriers in the rest of the WH are mostly *ad valorem* tariffs. For the EU, we incorporate *ad valorem* tariffs plus *ad valorem* equivalents of specific and mixed tariffs, but we do not include tariff equivalents of TRQs.[13] For single countries, the Most Favored Nation (MFN) *ad valorem* tariff equivalents are estimated as simple average of the tariff line schedules in each sector. For regional blocs, they are estimated as simple averages of the tariff lines across countries. Tariffs are estimated on the basis of the 8-digit tariff line schedule of the Harmonized System.

<INSERT TABLE 3>

Table 3 presents the MFN *ad valorem* tariff equivalents applied by the countries and regions in the model. The tariff information shows a complex protection structure in a highly protected sector, where domestic political economy considerations are also in place. Weighted by trade, processed foods are more protected than primary agricultural products, especially in the EU where the protection of processed foods is 2.5 times higher than that of primary agricultural products. Import-sensitive products are heavily protected, although the degree of protection varies considerably across countries. Canada has, by far, the most heterogeneous protection structure showing the higher degree of tariff dispersion. It has a relatively modest protection on most agricultural products, but imposes extremely high tariffs on selected import-sensitive products such as dairy products (133.4 percent) and poultry meat (66.2 percent). Although the US has a low weighted average tariff of 11.1 percent, it levies high protection on dairy products (22.2 percent), oilseeds and soybeans (19.3 percent) and beverage and tobaccos (17.6 percent). Mexico, which has the highest average tariff (26.4 percent) and the second most heterogeneous protection structure, imposes very high tariffs on sugar (89.8 percent), poultry meat (68.3 percent) and wheat (67.0 percent). The other LAC countries have a different tariff structure with a lower dispersion. The extreme case is Chile with a uniform tariff rate of 11 percent. The Central America region has the second highest trade-weighted MFN tariffs (18.2 percent) after Mexico. With a relatively high average protection (14.5 percent), the Andean Community has the second lowest protection deviation after Chile. Mercosur is still an incomplete customs union, as the applied MFN tariffs between Argentina and Brazil differ slightly. Like other hemispheric partners, the two countries have higher protection on processed foods, except for sugar. In the EU, the agriculture sector is heavily protected under the Common Agricultural Policy (CAP). The tariff data shows a high level of dispersion and high protection levels on wheat (68.5 percent) and rice (62.1 percent), followed by bovine meat (55.4 percent) and dairy products (40.7 percent).

[13] The EU agricultural protection was estimated by J.C. Bureau with data from WTO General List and Comext: industrial protection from UNCTAD (Indicators of Tariff and Non-Tariff Trade Barriers, 2000).

In addition to the MFN tariffs, the model incorporates the main preferential trade arrangements in place in the WH. This is an important improvement in protection data compared with other studies that do no incorporate preferential treatment arrangements. We include seven regional trade agreements: NAFTA, the Central America and Caribbean Common Markets (CACM and CARICOM, respectively), Andean Community (AC), Mercosur, G-3 (Mexico, Colombia and Venezuela) and the EU; three bilateral agreements: Mercosur-Chile, Canada-Chile, and Mexico-Chile; and four unilateral agreements: three US preferential trade arrangements (Generalized System of Preferences, GSP; Andean Trade Preference Act, ATPA; and Caribbean Basin Initiatives, CBI) and Canada's preferential trade arrangement (General Preferential Tariff, GPT).[14] Regarding the status of some of these agreements, NAFTA trade is yet to be completely liberalized, although intra-bloc barriers are fairly low: the US has the lowest average intra group tariffs, but Canada and Mexico still maintain between 2 and 3 percent average intra-group protection. Mercosur's intra-regional trade barriers are nearly completely removed, except for dairy products, beverage/tobaccos and other food products, all of which have a less than 1 percent tariffs on intra-bloc trade. The EU has no intra-bloc trade barriers on agriculture products.

Table 4 presents agriculture domestic support for Canada, US, Mexico and the EU measured by the OECD Producer Support Estimate (PSE).[15] The EU spends US$33 billion, nearly 60 percent of the world domestic support, followed by the US with spending of US$15 billion, which accounts for 20 percent of the total world support. Grains, including wheat and other cereal grains, receive the largest subsidies, representing over 64 percent of the total agricultural producer support in the United States, 93 percent in Mexico and 43 percent in the European Union. Bovine meat in the European Union receives the largest amount of subsidies, accounting for 41 percent of the EU's total outlays. In terms of the PSE rate, grains record the highest rates in the WH: wheat in Canada (14.9 percent) and in the US (24.8 percent), and other cereal grains in Mexico (21.8 percent).[16] In the EU, grains also record high PSE rates: 29.3 percent for wheat and 27.1 percent in other cereal grains. The high PSE rate (34.6 percent) in oilseeds and soybeans is due to a small production value.

<INSERT TABLE 4>

Finally, table 5 reports export subsidies by country based on the WTO notifications in 1997. The EU is by far the world largest export subsidizer, accounting for 85 percent of the global export subsidies, an amount 15 times larger than that of the WH. In the EU, processed food industries, especially dairy products and bovine meat, receive approximately two thirds of the bloc's total export subsidies. The two sectors rank among those with the highest export subsidy rates: 58.6 percent for bovine meat and

[14] Data for the WH agremeents come from the FTAA database.

[15] The OECD PSE comprises two componets: Market Price Support (MPS), and budgetry outlays. MPS measures the gap between domestic market prices and border prices, and thus incorporates the effects of trade policy: import protection and export support. Since the model uses applied tariffs and export subsidies to evaluate the wedge between domestic and border prices as separate policy instruments, we exclude MPS in the estimation of domestic support to avoid double-counting. Budgetary outlays in OECD PSE consist of government expenditures on farm programs, including measures exempted from reductions (green box), nonexempted (amber box) and an exemption from general rule about subsidies (blue box), according to the WTO classification. We focus on the amber box programs, following USDA (2001) for the concordance between OECD PSE and WTO boxes.

[16] PSE rates are the ratios of the domestic support budgetary outlays over the value of the production in each sector, as reported to the OECD.

28.2 percent on dairy products, although sugar (52.2 percent) and cereal grains (38.8 percent) also have a high export subsidy rates.[17] Most countries in the WH provide export subsidies in a small group of selected agricultural products. The US allocates almost all subsidies in dairy products, which have a subsidy rate of 15 percent. In Mexico, the targeted sector is sugar with a 33.1 percent rate, and in Central America the targeted sectors are vegetables and fruits with a 5.8 percent rate. The Andean Community allocates export subsidies over a variety of agricultural sectors, although their subsidy rates are 1 percent or less.

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4. POLICY SIMULATIONS

A. Agricultural Policy Reform

The protection measures described in the previous section distort world prices, restrict trade and can inflict real costs on both home countries, mostly developed countries, and their trade partners, largely developing countries. Trade barriers hinder trade by making domestic prices higher than world prices; this lowers demand for imports inducing a supply reduction from exporting countries. At home, consumers are worse off, since trade barriers raise domestic prices of imports above world prices. Domestic support may cause an oversupply of agricultural products, lowering global market prices and inducing unfair competition. Export subsidies allow high-cost producers to be competitive in international markets and may lead to an excess world supply. The measures could allow inefficient domestic producers to be in operation and hinder an efficient allocation of domestic resources, which could otherwise be utilized more efficiently in other industries.

In order to evaluate the economic costs that these trade-distorting policies have on LAC and the potential gains of a comprehensive agricultural reform by developed countries, we quantify the effects of completely eliminating the three support measures: tariffs, domestic support, and export subsidies. We simulate two important scenarios for LAC: (1) agricultural reform in the WH that measures the impact of a comprehensive FTAA in agriculture; and (2) agricultural reform between Mercosur and the EU on the basis of the ongoing free trade negotiations between the two blocs. In the simulations, only the agricultural sectors are liberalized, whereas trade barriers in non-agriculture remain intact; thus providing an estimation of the cost that agriculture protectionism in developed countries, mainly the US and the EU, has on LAC. For the two scenarios, we simulate the complete elimination of each one of the trade-distorting barriers separately as well as simultaneously.[18]

The model captures different effects of the policy shocks on the economy: production, government revenue, welfare, and trade effects. The elimination of tariffs reduces the price of imports and causes

[17] Measured by the amount of export subsidies received by each sector over the value of exports in that sector.

[18] These scenarios may not be realisitc in actual negotiations. First, due to its non-discriminatory nature, domestic support and export subsidies may not be issues discussed at the regional, but rather would be addressed at the multilateral level. Second, the complete elimination of tariffs in import-sensitive agricultural products may be politically infeasible, especially in the US and the EU. In fact, in most trade agreements, these products are either excluded from the agreements or phased out in a certain period. Although these concerns are true, our results should be interpreted as evaluations of the economic costs in which LAC incurs from high protectionism in agriculture in the developed world.

domestic firms to adjust production along their production possibility frontier. While tariff elimination reduces government revenue, it raises household real income, as domestic prices decline. Regarding domestic support, the elimination of the *ad valorem* subsidies raises prices of domestic production directly affecting the farmers' production decision, while the elimination of the lump-sum transfers directly affect the households' income. Regarding export subsidies, its elimination lowers the domestic price of exports and lead domestic producers to loose price-competitiveness in global markets. As a result, exports decrease. The elimination of domestic support and export subsidies reduces government expenditures to farm households and firms, and reduces households' real income as domestic prices rise.

B. Simulation Results

In analyzing the effects of agricultural reforms, we essentially focus on the external sector—in particular export growth and changes in the economies' international specialization—and on the production structure change.

There are two major factors contributing to the observed trade effects: (i) the initial level of protection in the countries involved in the trade agreements, especially in the US and the EU; and (ii) the countries' initial trade linkages. The higher the initial protection and the smaller the trade linkage at benchmark, the larger the impact will be. Given the number of countries, sectors and scenarios considered, what follows is a summary of the main results. To make the analysis easier, the 16 agricultural sectors are aggregated into 2 macro-sectors—primary agriculture and processed foods.[19]

Western Hemispheric Agricultural Reform

Simulation 1: Tariff Elimination

Tariff elimination increases Latin America's agricultural exports to the WH by 11 percent. In part because they are more protected within the hemisphere, processed foods sectors enjoy a faster export growth than primary agricultural goods: 15 percent, compared to 7 percent. By product, LAC expands exports of poultry meat and beverage/tobaccos by more than 20 percent. In the primary sector, exports of sugar jump by 19 percent, and oilseeds/soybeans by 16 percent. In contrast, wheat exports show the lowest growth rate (2.3 percent), followed by bovine cattle (3.2 percent). Figure 1 presents Latin America's sectoral export growth to the hemispheric market decomposed by policy shock.

In terms of exports growth, all countries in the WH benefit from the creation of a free trade area in agriculture. Brazil and Chile experience the largest export growth rate to the hemisphere—20 percent and 19 percent, respectively. The US exports expand by 12 percent, largely to non-NAFTA partners. Mexico is the least benefited country—a 5.4 percent export growth—due to the already freer access to the US and Canadian markets. Central America and Andean countries, that enjoy preferential access to the US market under the CBI and ATPA programs, also increase exports hemispheric-wide, including to the US market. The exclusion of some key agricultural sectors from the preferential programs and the different export structure compared to the new competitors in the US market, mainly the southern

[19] Primary agriculture includes grains, wheat, other cereal grains, vegetables and fruits, oilseeds and soybeans, sugar, plant-based fibers, coffee and tea, bovine cattle, other animal products. Processed foods include bovine meat, poultry meat, vegetable oils, dairy products, beverages and tobaccos, and other food products.

cone countries, are the main factors behind this finding. Exports decrease only in a couple of sectors in their respective subregional markets. Figure 2 shows the impact on exports to the hemispheric market by policy shock.[20]

Figure 3 reports the impact on exports by macro-sector and country. Table 1 in the appendix shows a more detailed analysis by sector and country. In all countries, processed food industries enjoy booming exports relative to primary sector exports that have a more moderate export growth, and relative to non-agricultural goods, which on average decrease. Chile experiences the greatest export growth on processed food (9.7 percent), followed by Central America (9 percent). Primary goods exports increase at slower rates ranging from 2 percent in the United States to 7 percent in Chile.[21]

The intensity of the change in the exports' structure varies across countries, with Canada and the US being the countries with the more uniform export composition shift, and Chile and Central America those with the largest composition change.[22] The change in the production structure is the combination of the differentiated sectoral impact on external demand, internal demand—final and intermediate goods—given the domestic resources constraint. In most LAC, production of processed foods grows faster than primary agriculture, the main exception being Central America. While the structural changes in production are not as strong as those that are observed in exports, there is significant heterogeneity in sectoral growth. The more heterogeneous numbers are observed in Chile and in Central America countries, whereas Andean countries have the least heterogeneous impact. The countries with the smallest dispersion in sectoral production growth are the NAFTA countries.

Simulation 2: Elimination of Domestic Support

The elimination of domestic support enhances Latin America's agricultural exports to the WH by only 0.1 percent, with a mixed impact of -0.2 percent for primary agriculture and 0.6 percent for processed foods (Figure 1). Mercosur countries benefit the most—with agricultural exports increasing by 0.7 percent—followed by the Andean Community with a marginal increase of 0.1 percent, while the US and Mexico, the two largest users of domestic support in the WH, suffer a slight export decline.

We might expect that LAC exports of the now-unprotected goods to the NAFTA region will increase, as production prices in this market rise due to the domestic support elimination. This is, in general, what happens. However, no LAC country increases exports of wheat, a highly protected good in NAFTA countries, to this market, while Canada increases exports to the US and Mexico. There are several reasons behind this result. First, LAC countries do not seem to have a strong *ex-ante* comparative advantage in wheat exports except Argentina, while Canada does.[23] Second, any of the NAFTA countries might gain price competitiveness in the other two markets due to the different degree of protection applied prior to liberalization.

For Latin America, the most positively affected products are oilseeds and soybeans, a sector in which export growth to the WH increases by 5 percent. Among processed food sectors, Latin America exports to the WH of bovine and poultry meat also increase by 1.5 percent. Countries in the Southern

[20] The EU, excluded from the agreement, suffers a slight export decline in agriculture (-0.1 percent).
[21] Central America show a high export growth in processed food mainly due to the small export share at benchmark.
[22] Measured by the dispersion (standard deviation) of the growth rates across macro-sectors.
[23] The share of wheat in world exports is around 9 percent in Argentina and 20 percent in Canada.

Cone expand exports of other cereal grains by 10 percent to the US market. As observed in Figure 3, domestic support elimination does not cause much change in export composition for non-NAFTA countries. The reform leads to a slight export specialization in primary agricultural exports in Argentina and Brazil, while Central America and the Andean countries' export specialization increases in processed foods. In NAFTA countries, primary agriculture is the most negatively affected sector.

Regarding the effects on production, the patterns follow the impact on exports. For LAC countries the effect on the production structure is less heterogeneous than in the elimination of tariffs scenario. However, for the NAFTA countries, the dispersion of growth rates across macro-sectors and the sectoral impact is higher than in the first scenario. For these countries, agriculture sector production shrinks and resources move away to the non-agricultural sectors.

The simulation exercises show the non-discriminatory effects associated with the elimination of domestic support, also benefiting partners outside the agreement. Particularly, the reform leads to an increase in US wheat imports from the rest of the world by 40 percent, paddy rice by 15 percent, and oilseeds by 19 percent. Likewise, the EU also benefit from the non-discriminatory effects, as its exports to NAFTA increase by 0.8 percent.

Simulation 3: Elimination of Export Subsidies

The elimination of export subsidies has a small negative impact on Latin America's exports. This is due to the fact that non-user countries are not much affected, while exports for Central American and Andean Community—the users in LAC—decrease, as domestic producers reduce exports along their supply curve in face of the decline in the price of exports.

While the region's exports as a whole are barely affected, the impact varies by sector and by country/region. Processed foods exports marginally increase (0.1 percent) and exports of primary agriculture decline by 0.3 percent. The most affected goods are vegetables and fruits followed by sugar. In Central America, vegetable and fruits suffer a total export decline of 2 percent (3.9 percent to the WH). Similarly, in the Andean Community, total sugar exports drop by 0.8 percent and vegetables and fruits by 0.5 percent (1.3 percent and 1.2 percent to the WH). Dairy products exports from the US and sugar in Mexico decrease by 6 percent (16 percent to the WH). Production also declines in these sectors and domestic resources are reallocated, either within agriculture or to non-agricultural industries. The impact on production by sectors is small and presents the smallest growth dispersion across scenarios.

Simulation 4: Elimination of All Agricultural Protection and Support

The effects of the full agricultural-reform in the WH are nearly the sum of the individual policy reform effects. LAC expands agricultural exports to the WH by 10.7 percent. Processed foods sharply increase exports by 16 percent, a rate more than twice as high as that of the primary exports. Among processed foods, poultry meat enjoys the highest export growth (24 percent), followed by beverage plus tobaccos (20 percent) and dairy products (19 percent). Among primary exports, LAC expands exports of oilseeds/soybeans (23 percent) and sugar (18 percent).

The reform activates agricultural trade among blocs in the WH: Mecosur increases exports to NAFTA

by 21 percent and to the Andean Community by 32 percent. NAFTA and the Andean Community raise exports to Mercosur by 21 and 11 percent, respectively. Processed foods are the leading commodities between Mercosur and NAFTA, and from Mercosur to the Andean Community.

Booming agricultural sectors boost agricultural production in Mercosur and Chile, absorbing domestic factors displaced from non-agricultural sectors. Due mostly to the elimination of domestic support, production in agriculture dampens in sensitive key agricultural sectors in NAFTA countries. For instance, the US loses production of wheat by 9 percent and of oilseeds/soybeans by 6 percent. Central America and the Caribbean experience the most heterogeneous impact on production. In this sub-region, while wheat expands output by 7 percent, poultry meat industries suffer a production loss of more than 7 percent.

Agricultural Reform between Mercosur and the European Union

Simulation 1: Tariff Elimination

EU and Mercosur reciprocal tariff elimination in agriculture has a big impact on inter-bloc trade: Mercosur's total exports to the EU market increase by 19 percent, and while agricultural exports grow by 37 percent, exports in non-agricultural sectors slightly decline. EU's total exports to Mercosur also rise by 4 percent; all sectors increase exports, in the case of agriculture by more than 50 percent. Figure 4 shows the impact on Mercosur's agricultural exports to the EU by policy shock, and Figure 5 the impact on total exports by country and macro-sector, also decomposed by policy measure. Table 2 in the appendix presents more detailed sectoral results.

Among agricultural products, Mercosur exports to the EU of rice, wheat and bovine meat—the goods with the highest tariff protection in the EU—jump by more than 200 percent. Other products that also benefit, with growth rates above 100 percent, are dairy products, cereal grains, and sugar. The products with the lowest export growth are those facing the smallest tariff protection in the EU market: oilseeds and soybeans (0.2 percent) and plant-based fibers (0.6 percent). In value terms, processed food products led by bovine meat accounts for 80 percent of Mercosur's increased exports to the EU. Regarding the EU's exports to Mercosur, the fastest growing exports are beverage and tobacco (70 percent), dairy (67 percent) and other food products (49 percent). These are the agricultural products in which the EU shows the highest agricultural export specialization and that have the highest tariff protection in Mercosur.[24] For these three products, the export growth to Mercosur slightly compensates for the decline in exports to non-Mercosur countries; for the other agricultural products total exports decline. Exports of non-agricultural products increase, as domestic resources move away from agriculture, but the overall export growth is negligible (0.1 percent).

Impact on total exports to the EU is larger for Argentina than for Brazil as agricultural exports to the EU market grow by 60 percent and 26 percent, respectively. This result reflects the fact that Argentina shows a strong export specialization in three of the most protected products in the EU market—wheat, cereal grain and bovine meat, while Brazil only presented a strong export specialization in one highly protected sector, sugar. Most agriculture exports to third countries decrease due to trade diversion.

[24] Export specialization in a sector is synonymus here to a high sectoral export share. The indicator is measured prior to reform and using total exports minus exports to the other bloc in order to minimize the effect of the protection measures.

Exports of non-agricultural products drop not only to the EU market, but also to most destinations as resources shift away from non-agriculture to the booming agriculture sectors. Given the resources constraint that the countries face and Mercosur's international competitiveness in agricultural, the sector liberalization will force a change in the countries' export specialization pattern.

Many would argue that specializing in agriculture is not an optimal outcome, since manufactures are likely to be more technologically advanced goods and tend to bring more positive externalities to the countries in terms of backward linkages and spillovers. But, as seen, both countries increase their international specialization in processed foods that involve more technology and skilled labor than primary agricultural goods, thus mitigating the negative effects of increased specialization in agricultural goods.[25]

Turning to the impact on the production structure, the increase in external demand pulls internal demand—intermediate and final—in practically all sectors in the economy, leading to an increase in production across sectors (including small changes in manufactures). The different dynamism across sectors leads to a concentration of production in agricultural goods (processed products driven largely by external demand and non-processed by internal demand). In both countries bovine meat and cattle enjoy the highest production rate growth (the first drags the second one). Along with the expansion of production, domestic resources (labor and capital) are also mobilized toward agricultural sectors, displaced mainly from manufacturing industries. For example, in Argentina bovine meat industries increase labor force by 7 percent and bovine cattle by 13 percent.

Simulation 2: Elimination of Domestic Support

Under this scenario, Mercosur increases total exports to the EU by 4 percent and agricultural exports by 8 percent—11 percent Argentina and 6.4 percent Brazil. There is also a very small negative effect on non-agricultural exports to the EU. Total exports grow only by 1% in Argentina and 0.7% in Brazil, as exports to the extra-EU market either stagnate or slightly decrease, especially in Argentina.

The uneven impact across sectors shown in Figure 4 reflects the heterogeneous distribution of the EU's domestic support. Mercosur's bovine meat exports to the EU increase by 53 percent, followed by wheat (26 percent) and other cereal grains (22 percent). Oilseeds and soybeans also increase exports to the EU by 17 percent. In value terms, bovine meat and oilseeds account for 78 percent of the increased exports to the EU market.

As Figure 5 summarizes, total exports of primary and processed food increase in Mercosur countries, while total exports of non-agricultural goods suffer a slightly decrease of less than 1 percent. As a consequence of these different export dynamisms, the countries' relative export specialization in agricultural goods increase and, compared with the first scenario, the bloc's export specialization in primary agriculture increases.[26] The elimination of the EU's domestic support increases EU agricultural prices. Total EU exports increase by 0.3%, due to a combination of the growth in non-

[25] This result contrasts with the new export specialization pattern after a full FTA with the EU (the results not shown). While Argentina will continues to specialize in processed foods (87 percent), Brazil will strongly expand exports of non-agriculural products (31 percent).

[26] The main reason is the fact that domestic support is more concentrated in primary agriculture goods in the EU market, compared with tariff protection.

agricultural exports (0.5 percent) and a decline of 1 percent in agricultural exports. Imports of the most protected products increased: bovine meat by 20 percent, oilseed and soybeans by 14 percent, wheat and sugar by 10 percent each. An interesting observation is that extra-EU agricultural exports are strongly affected, as expected. However, intra-EU trade values in the most protected sectors—wheat, cereal grains and bovine meat—slightly increases due to a higher increase in prices than a decrease in volumes.

The impact on production and factors reallocation is moderate in both blocs. External demand drives the increase in production in bovine meat and grain in Argentina and oilseeds and soybeans in Brazil. For instance, bovine meat production in Argentina is up by 2.5 percent and the production of Brazilian oilseeds increases by 2.1 percent. In the EU, production in practically all agricultural sectors declines—bovine meat by 19 percent and oilseeds by 11 percent—while production in non-agricultural sectors increases.

As with the WH reform simulations, when comparing the results on Mercosur's exports to the EU under domestic support and tariff elimination scenarios, one can be inclined to conclude that domestic support elimination in the EU is a measure with a relatively little effect on countries compared to tariff elimination. However, we should bear in mind that tariff elimination is a discriminatory measure that favors only member countries, while the elimination of domestic support is a non-discriminatory measure that also benefits non-member third countries. In fact, other LAC countries expand agricultural exports to the EU: 4.5 percent for Mexico, 3.6 percent for the Andean Community, 2.1 percent for Central America, and 2.1 percent for Chile. Moreover, the real gains associated with domestic support elimination may not be related to trade effects, but rather to the impact on prices.

Simulation 3: Elimination of Export Subsidies

Since the elimination of exports subsidies directly affect the EU's export prices and most EU agricultural exports are intra-regional, the effect of this measure on Mercosur's exports is small. The reform causes the EU to lose competitiveness in external markets, and EU agricultural exports goes down by 2 percent—decline in 2.7 percent for primary agriculture and 1.7 percent for processed foods. In the EU, the most affected sectors are the most protected sectors and those for which extra-EU market represents a considerable share: sugar, –21 percent; other cereal grains, –9.5 percent; and dairy, –7.8 percent. These are also the sectors in which extra-EU countries experience a positive, but small, increase of exports to third markets.

The impact on production and resources is small for Mercousur and other LAC countries. The negative effects are significant on highly protected sectors in the EU: sugar slashes production by 6 percent and dairy and other cereal grains by 2.3 percent each.

Simulation 4: Elimination of All Agricultural Protection and Support Measures

A complete reform of the agricultural sector generates a sizable impact on Mercosur's exports: total exports increase by 7.5 percent in Argentina and 4.1 percent in Brazil; agricultural exports expand by 15.9 percent in Argentina and 13.6 percent in Brazil.

Mercosur's bovine meat exports to the EU market jump by 400 percent, due largely to the elimination

of trade protection and to the bloc's small export base, but also to the complementary effects of the reforms. The same happens with wheat that expands exports by 370 percent and paddy by 290 percent. Total export growth is 3.1 percentage points higher than the sum of the impact of the individual policy reforms in Argentina, and 1.2 percentage points higher for Brazil. The complementary effects are larger in those sectors heavily protected by the three measures in the EU. Bovine meat shows the biggest complementary effect (120 percentage points), followed by wheat (60 percentage points) and paddy rice (18 percentage points). Other sensitive goods such as dairy and sugar show complementary effects of 19 and 15 percentage points, respectively.

While non-agricultural exports modestly decrease in Argentina, they slightly increase in Brazil. The compound result is an export specialization in processed foods, especially in Argentina; its share in total exports goes up from 29 percent to 36 percent, while non-agricultural share drops from 50 percent to 46 percent. In Brazil, its share increases from 13 percent to 15 percent, while the non-agricultural share declines from 71 percent to 68 percent. For the EU, the reform process increases total exports by 0.2 percent, due mainly to a small 0.7 percent increase in non-agricultural exports as agricultural exports decrease by 2.7 percent.

The impact on production follows the pattern observed under the tariff elimination scenario for Mercosur economies and the pattern observed under domestic support elimination for the EU economy.

Effects on World Prices of Agricultural Products

Figure 6 shows the impact of agricultural reform policies analyzed in the paper in the WH and in the EU and Mercosur markets on global agricultural prices.

In the WH reform case, the elimination of tariffs leads to an increase in average agricultural prices by only 0.2 percent. World prices for rice rise by 0.5 percent, followed by sugar and other cereal grains by 0.4 percent. The elimination of hemispheric domestic support increases world agricultural prices by 0.3 percent, but the impact is greater on some agricultural products than in the tariff elimination case. World prices of oilseeds/soybeans increase by 3 percent, the price of wheat jumps by 2.3 percent, and that of other cereal grains by 1.7 percent. The elimination of export subsidies has almost no effect on world prices. The elimination of the three trade-distorting barriers in agriculture increases world prices by 0.5 percent.

Agricultural reform between Mercosur and the EU generates a stronger impact on global agricultural prices. The effect of tariff elimination is small, except for bovine meat whose prices increase by 2 percent. The elimination of domestic support is the primary factor in raising global agricultural prices with a very heterogeneous impact across sectors. World prices of bovine meat jump by 9 percent, and those of dairy rise by 4.2 percent. Other products—wheat, other cereal grains, poultry meat and sugar— experience price increments above 2 percent. The removal of exports subsidies in the EU increases world prices for all subsidized goods, and especially for sugar (1.6 percent) and bovine meat (1.5 percent).

The simulation exercises indicate that the EU's trade-distorting policies in agriculture lower world agricultural prices. This discourages production and exports of agricultural products in which Mercosur and other Latin American countries have a strong competitiveness in world markets.

5. Summary and Conclusions

The Uruguay Round Agreement on Agriculture (URAA) brought agriculture under the disciplines of the General Agreement of Tariffs and Trade (GATT) for the first time. The URAA created multilateral rules for global trade and agriculture trade is now governed within the multilateral trade system. Despite the commitments for reducing trade-distorting barriers on agriculture by WTO members, agriculture continues to be the most protected sector. By and large, developed countries have not complied with their commitments, while countries in Latin America have greatly reduced import duties a well as export subsidies and trade-distorting domestic support. The new Doha round of multilateral negotiations launched last year provides a great opportunity for developing countries in general—and LAC in particular—to push for a true liberalization of the sector in industrialized countries. The region is also immersed in an intense negotiation for the creation of a hemispheric free trade area (FTAA) for which agriculture poses a large challenge, since the US, the country with the most distorted agricultural market in the WH, seems reluctant to make concessions in this area, as the recently approved Farm Bill indicates. Furthermore, Mercosur countries are also negotiating a free trade agreement with the EU, the region with the most protected agriculture sector in the world. Negotiations for liberalizing agriculture pose a major challenge and obstacle in both trade agreements. The domestic sensitivity of the sector in industrialized countries slows down the progress in the area. Given Latin America's competitiveness in agriculture, freer access to the large hemispheric and EU markets will offer promising opportunities and economic gains for the region.

In this paper, we evaluate the impact of agricultural liberalization on LAC economies, using a multi-region, multi-sector, comparative static CGE model that includes trade-linked externalities and scale economies. We focus on the three pillars of agricultural policies distorting world prices and restricting trade flows—tariffs, domestic support, and export subsidies—and examine the individual and complementary effects of eliminating these policy measures within the Western Hemisphere and between Mercosur and the EU. Thus, the paper considers four scenarios each for the creation of an FTAA in agriculture and for an FTA in agriculture between Mercosur and the EU. To the extent that the elimination of domestic and exports subsidies might end up being negotiated at the multilateral level, the scenarios can be considered as hypothetical cases. However, they provide an estimation of the cost that the protectionism of the sector by industrialized countries has for LAC.

Regarding the structure of protection, LAC countries apply neither domestic support nor export subsidies, with the exception of Mexico, while NAFTA countries and the EU use all three distorting measures. Tariff protection across all sectors is applied by all countries. This fact and the discriminatory nature of tariff elimination (excludes third parties) explains the bigger impact on LAC countries of the removal of tariffs, compared to the removal of domestic and exports subsidies. Subsidies are concentrated in a few sectors and are not being used by all countries, but mainly industrialized countries, and its elimination necessarily takes place in a non-discriminatory way.

In the WH, the elimination of tariffs increases Latin America's agricultural exports to the hemispheric market by 14 percent. The removal of domestic support has a small positive effect on Latin America's exports, while eliminating export subsidies marginally affects LAC's exports. The effects of the EU reform on Mercosur's exports show a similar pattern: the bloc´s agricultural exports to the EU increase by 37 percent under the tariff elimination scenario, around 8 percent under the elimination of domestic

support, while the EU's elimination of exports subsidies hardly affects Mercosur exports.

With regard to hemispheric reform, all countries in the WH benefit from tariff elimination. Exports to the US accounts for 40 percent of LAC' s increased exports to the hemispheric market. Brazil and Chile are the most largest beneficiaries. Due to the high initial protection in processed foods across countries, the sector experiences the highest export growth leading to an export specialization in these products. The Southern cone countries, with a strong competitiveness in processed foods relative to other LAC countries, realize the greatest benefits.

For Mercosur, trade gains from the agricultural reform of the EU are larger than those from the WH reform. The high initial protection in the EU, the Mercosur's strong international competitiveness in agriculture and strong trade linkages with the EU are the main factors behind the results. The reform process leads to an export specialization in the processed foods sectors, which tend to use more highly skilled labor and more sophisticated technology than primary agriculture, factors which tend to moderate the negative effects of a traditional agriculturally oriented export sector. Still, we should keep in mind that our simulations do not consider reform in the non-agricultural sectors and therefore the results are surely biased against manufactures.

Trade-distorting measures in agriculture keep world agricultural prices below the level otherwise anticipated. While the hemispheric agricultural policy reform slightly increases world prices, the EU reform raises the agricultural prices by 2 percent. The effect is heterogeneous across sectors. Prices of oilseeds and soybeans increase by 3 percent under the WH reform, and bovine meat and dairy prices increase by 13 and 5 percent, respectively, under the EU-Mercosur reform. In both cases, domestic support elimination is the policy shock with the highest impact on prices.

The results show the cost that the distorted agricultural sector—mainly in industrialized countries—has on LAC. It is advised, however, to interpret the results with caution when evaluating the effects of the FTAA or the FTA between Mercosur and the EU. First, because we evaluate the impact of reform only in the agricultural sector and the liberalization of the whole economy will generate larger gains and a less heterogeneous impact between agriculture and manufactures. Second, because the model simulates the complete elimination of the trade-distorting barriers in agriculture that may not be the case in real negotiations, which often exclude sensitive products or agree a phase out period for them. Third, because while tariff elimination is an issue being negotiated at the regional level, domestic and export subsidies may be topics that end up being discussed at the multilateral level.

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Table 1. Main Features and Assumptions of the CGE Model

Items	Description
1. Production Sectors	All regions produce 26 goods using primary inputs and intermediate goods with a CES production technology. The 26 sectors in ROW are fully endogenized. Manufacturing industries have an IRS technology, while the other sectors have a CRS technology.
2. Market Structure	Manufacturing industries face a contestable market structure, while the other sectors face a perfectly competitive market structure.
3. Demand	Final private demand in each country or region is derived from the households' utility maximizing behavior subject to their budget constraint. Intermediate demand is determined by the fixed input-output coefficients.
4. Trade	Exports are specified by a CET function, and differentiated by market of destination. Imports are modeled with a CES specification, and differentiated by market of origin.
5. Factors	Sectorally mobile, but immobile internationally. Total supply in each country or region is fixed.
6. Trade-linked Externalities (i) Sectoral export externality (ii) Import externality of intermediate inputs and capital goods (iii) Aggregate export externality	
7. Major Assumptions (i) Saving-Investment Identity: Current amount of savings are fully utilized for investment. (ii) Balanced Trade: Trade remains balanced for each country and region. In other words, initial balance of trade in goods and services remains constant. (iii) Balanced Budget: Government balances revenues and expenditures including fixed income transfers and exogenous foreign transactions. (iv) No Financial Market: The model deals with the real side of the economy.	

Table 2. Agricultural Exports by Destination Market (1997)

(percent)

Exporting Countries/Regions	Agricultural Exports ($million)	Canada	United States	Mexico	Central America	Andean Community	Argentina	Brazil	Chile	European Union	Rest of World
Canada	17,935.5	-	52.0	1.9	1.2	1.9	0.0	1.1	0.3	7.8	33.7
United States	65,717.5	10.3	-	8.1	3.9	2.5	0.5	0.8	0.2	14.8	58.9
Mexico	6,541.7	1.9	71.5	-	3.1	1.1	0.2	1.0	0.4	10.1	10.6
Central America	9,120.3	3.0	34.4	1.0	8.9	1.3	0.0	0.1	0.8	34.2	16.3
Andean Community	12,736.9	1.4	25.3	0.7	1.8	8.1	2.4	8.3	1.6	29.4	21.1
Argentina	12,627.3	0.5	5.8	0.6	1.9	8.0	-	18.8	4.1	22.8	37.4
Brazil	14,660.7	1.6	10.1	0.4	0.5	4.1	3.0	-	0.4	38.5	41.3
Chile	4,440.7	2.3	23.2	1.9	1.3	8.8	3.0	3.7	-	19.3	36.6
European Union	189,159.5	0.6	4.4	0.3	0.5	0.4	0.1	0.4	0.1	69.4	23.7
Rest of World	143,669.6	1.2	8.5	0.3	0.3	0.3	0.1	0.7	0.1	26.5	62.1
Total	476,609.5	2.2	9.3	1.5	1.2	1.4	0.3	1.3	0.3	41.4	41.2

Source: IDB's CGE model database.

Note: All rows sum to 100%.

Table 3. MFN *Ad Valorem* Tariffs (1997)

(percent)

Description	Canada	United States	Mexico	Central America	Andean Community	Argentina	Brazil	Chile	European Union
Rice	0.4	4.7	15.0	28.6	16.4	12.1	13.9	11.0	62.1
Wheat	34.8	3.9	67.0	1.2	11.6	6.5	6.5	11.0	68.5
Cereal Grains	8.6	0.8	38.4	9.7	12.0	6.6	6.6	11.0	38.5
Vegetables and Fruits	4.2	5.7	17.9	18.1	15.0	11.1	11.1	11.0	8.5
Oilseeds and Soybeans	0.0	19.3	3.1	4.7	10.6	5.9	5.9	11.0	0.0
Sugar	6.9	10.4	89.8	29.8	14.4	19.0	17.2	11.0	32.2
Plant-based Fibers	0.9	2.1	10.8	6.9	9.6	8.5	8.2	11.0	0.3
Coffee and Tea	2.7	14.9	10.3	9.7	9.8	9.3	9.4	11.0	3.5
Bovine Cattle	0.3	1.5	8.3	7.9	8.8	2.6	2.6	11.0	17.3
Other Animal Products	13.7	0.6	13.0	12.5	11.6	9.2	9.3	11.0	5.8
Primary (weighted)	**4.3**	**8.2**	**9.4**	**12.4**	**11.9**	**7.1**	**8.2**	**11.0**	**8.1**
Bovine Meat	15.6	5.6	34.7	17.5	16.5	12.0	12.0	11.0	55.4
Poultry Meat	66.2	3.7	68.3	34.3	17.3	13.9	13.9	11.0	15.3
Vegetable Oils	11.1	4.7	19.2	12.9	14.9	12.2	11.9	11.0	10.9
Dairy Products	133.4	22.2	41.5	37.3	17.9	18.2	19.9	11.0	40.7
Beverage and Tobaccos	13.6	17.6	32.3	22.6	17.3	21.0	21.1	11.0	20.0
Other Food Products	15.8	10.1	19.9	16.2	16.2	15.2	15.3	11.0	17.1
Processed (weighted)	**22.4**	**12.3**	**32.9**	**21.9**	**16.5**	**14.4**	**16.9**	**11.0**	**20.3**
Average (weighted)	**16.0**	**11.1**	**26.4**	**18.2**	**14.5**	**10.9**	**12.7**	**11.0**	**13.2**

Sources: FTAA Hemispheric Database, IDB, for the countries and regions in the WH.

Note: EU agricultural protection prepared by J.C. Bureau with data from WTO General List and Comext: industrial protection from UNCTAD (Indicators of Tariff and Non-Tariff Trade Barriers, 2000). Sectoral *ad valorem* protection rates are estimated as the simple average of the corresponding tariff line schedules. For countries and regions in the WH, data includes *ad valorem* tarifs, and tariff equivalents of specific, mixed and TRQs. EU data includes *ad valorem* , specific and mixed tariff equivalents. For Central America and the Andean Community, the MFN rates are estimated as the simple average of all partners for the corresponding tariff lines. Tariff rates for Primary, Processed and Average are weighted by trade flows.

Table 4. Domestic Support from the OECD Producer Support Estimate (1997)

Description	PSE ($million)				PSE Rate (%)			
	Canada	United States	Mexico	European Union	Canada	United States	Mexico	European Union
Rice	-	244.0	9.1	44.4	-	10.8	9.9	4.5
Wheat	186.0	3,623.7	59.4	8,213.1	14.8	24.8	9.6	29.3
Cereal Grains	154.6	5,978.8	992.6	5,941.7	6.6	17.5	21.8	27.1
Vegetables and Fruits	-	-	-	-	-	-	-	-
Oilseeds and Soybeans	282.6	1,449.7	7.7	2,710.9	5.5	3.2	7.0	34.6
Sugar	-	125.0	6.5	290.5	-	4.7	0.5	4.9
Plant-based Fibers	-	2.0	-	-	-	3.4	-	-
Coffee and Tea	-	-	-	-	-	-	-	-
Bovine Cattle	-	-	-	-	-	-	-	-
Other Animal Products	7.5	200.8	6.6	118.8	2.0	3.4	0.5	2.0
Bovine Meat	292.9	1,995.0	29.9	13,762.0	5.0	3.7	0.8	25.6
Poultry Meat	24.0	756.9	10.2	257.0	2.0	3.4	0.5	2.4
Vegetable Oils	-	-	-	-	-	-	-	-
Dairy Products	170.4	1,086.0	12.7	1,762.2	5.7	4.0	0.6	4.6
Beverage and Tobaccos	-	-	-	-	-	-	-	-
Other Food Products	-	-	-	-	-	-	-	-
	1,118.0	15,461.7	1,134.7	33,100.7				

Source: OECD Agricultural Database CD-ROM, 2001.

Note: Producer Support Estimate (PSE) in the table does not include Market Price Support (MPS). PSE rates are estimated on the basis of the budgetary outlays over production values in each sector reported to the OECD. Concordance between WTO criteria identified in "color" box and the OECD PSE classification follows USDA (2001).

Table 5. Export Subsidies by Sector: WTO Notification (1997)

Description	Subsidies ($million)					Subsidy Rate (percent)				
	United States	Mexico	Central America	Andean Community	European Union	United States	Mexico	Central America	Andean Community	European Union
Rice					36.8					22.4
Wheat					200.8					16.0
Cereal Grains	1.2				308.7	0.02				38.8
Vegetables and Fruits			104.7	16.5	29.4			5.8	0.86	1.1
Oilseeds and Soybeans										
Sugar		36.0		4.9	880.1		33.1		1.05	52.2
Plant-based Fibers										
Coffee and Tea				3.0					0.09	
Bovine Cattle										
Other Animal Products					14.7					0.6
Bovine Meat					1,033.9					58.6
Poultry Meat	0.9				86.0	0.02				2.0
Vegetable Oils				1.2	8.8				0.25	0.25
Dairy Products	110.2				1,535.7	15.0				28.2
Beverage and Tobaccos				1.0	161.2				0.48	1.1
Other Food Products				0.6	6.4				0.02	
	112.2	36.0	104.7	27.2	4,302.5					

Sources: WTO Notifications.

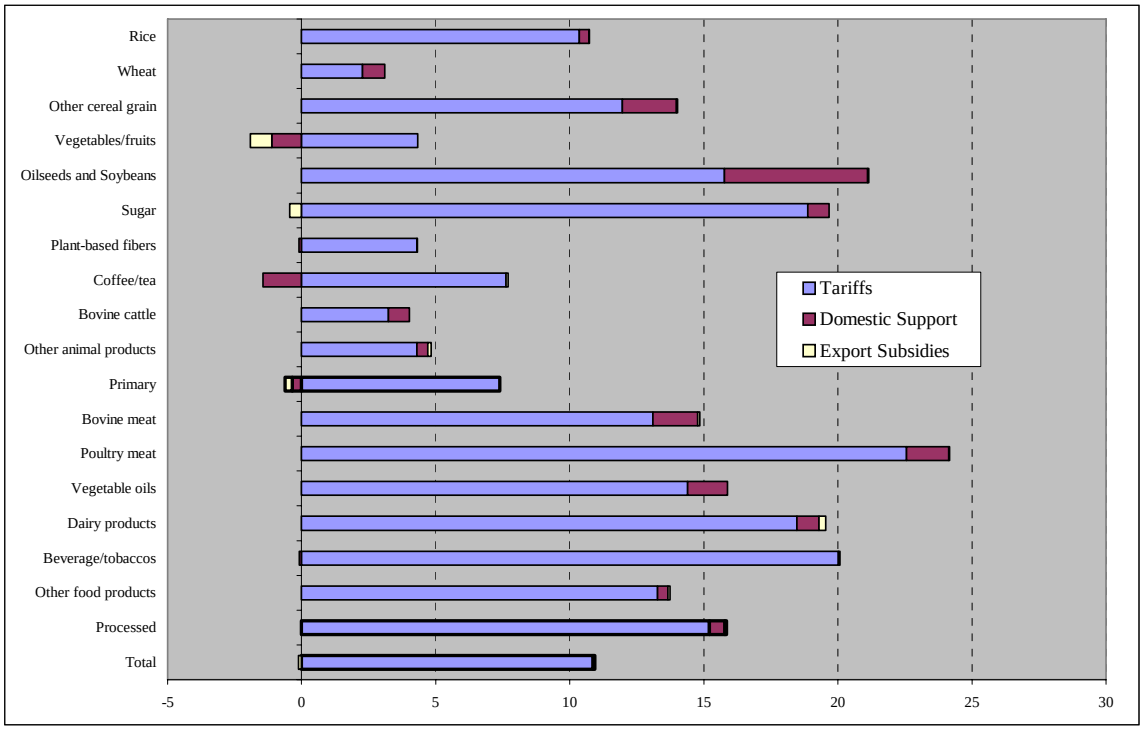

Figure 1. Impact of WH Agricultural Reform on LAC's Exports to the WH (percentage change from the base)

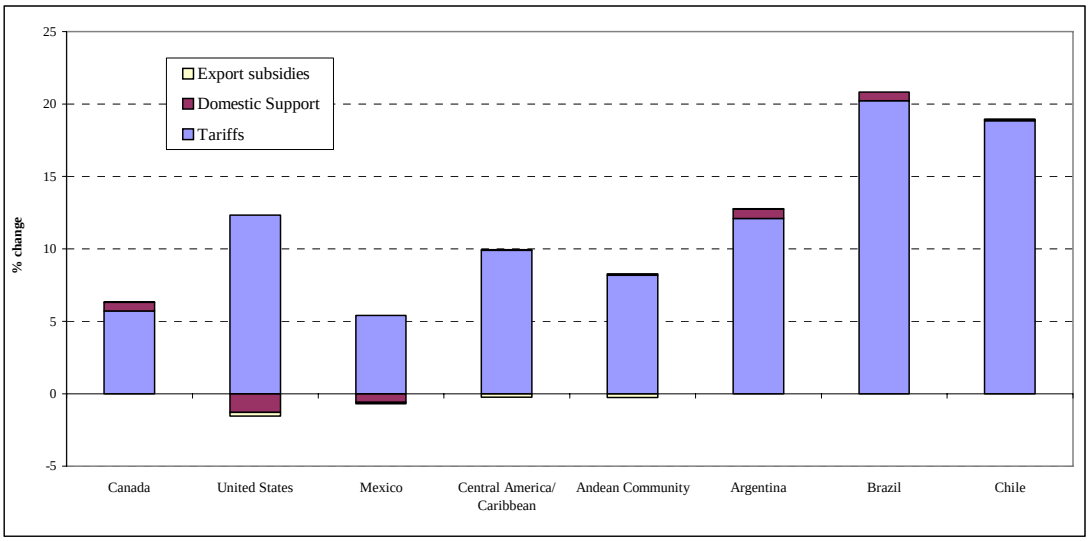

Figure 2. Impact of WH Agricultural Reform on Exports to the WH (percentage change from the base)

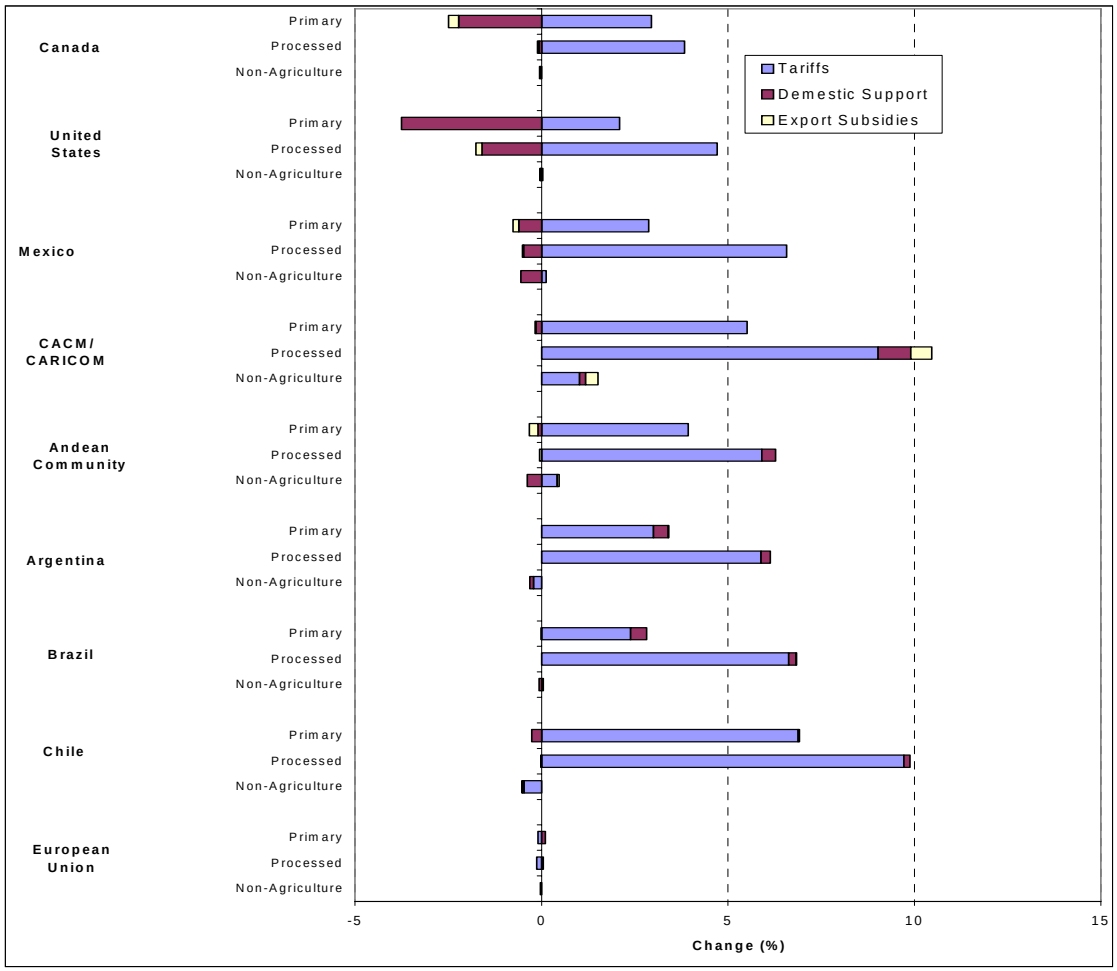

Figure 3. Impact of WH Agricultural Reform on Total Exports by Macro-sector (percent change from the base)

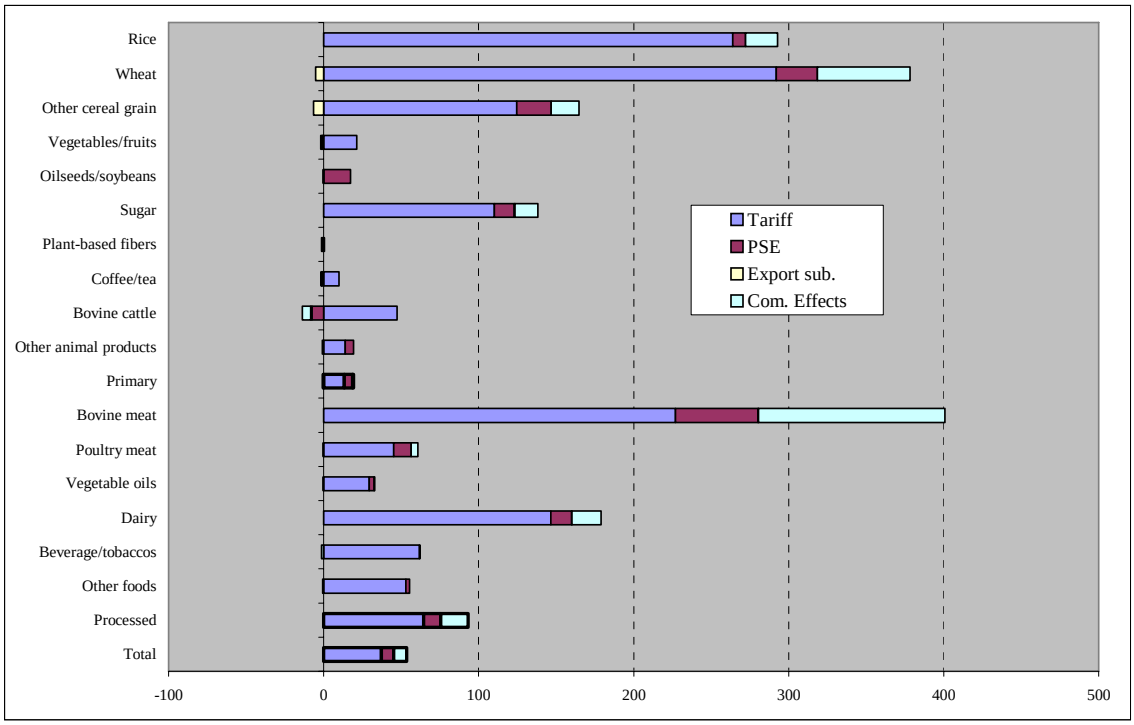

Figure 4. Impact of Agricultural Reform in Mercosur and the EU on Mercosur's Exports to the EU Market (percentage change from the base)

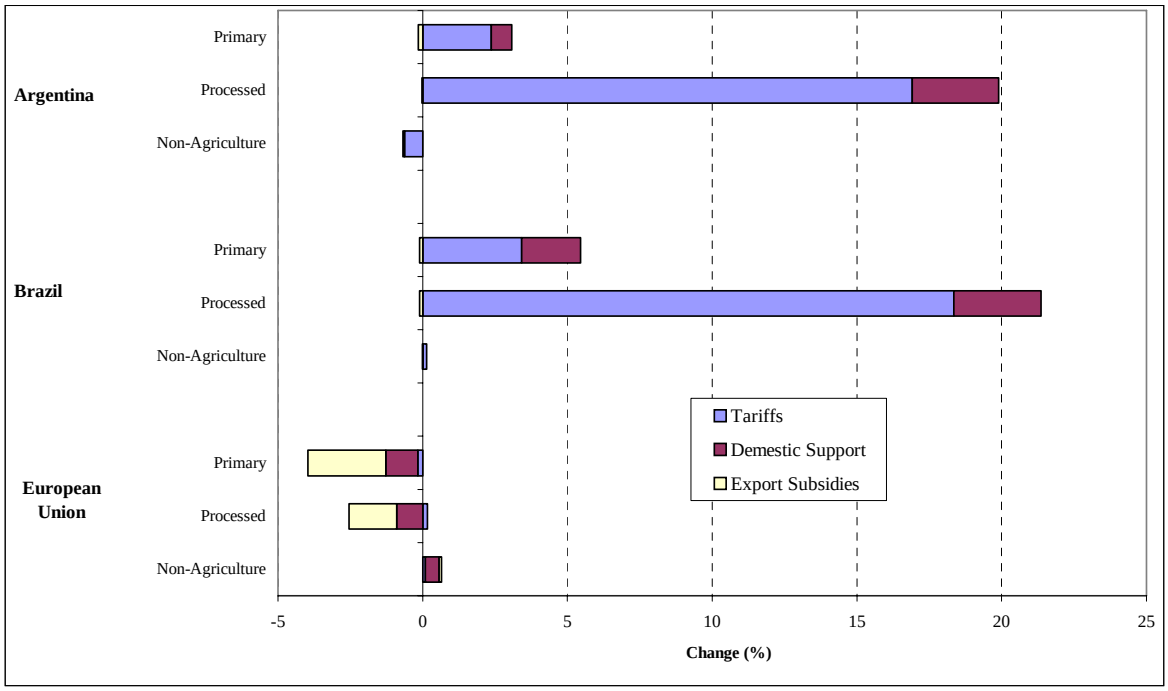

Figure 5. Impact of Agricultural Reform in Mercosur and the EU on Total Exports by Macro-sector (percent change from the base)

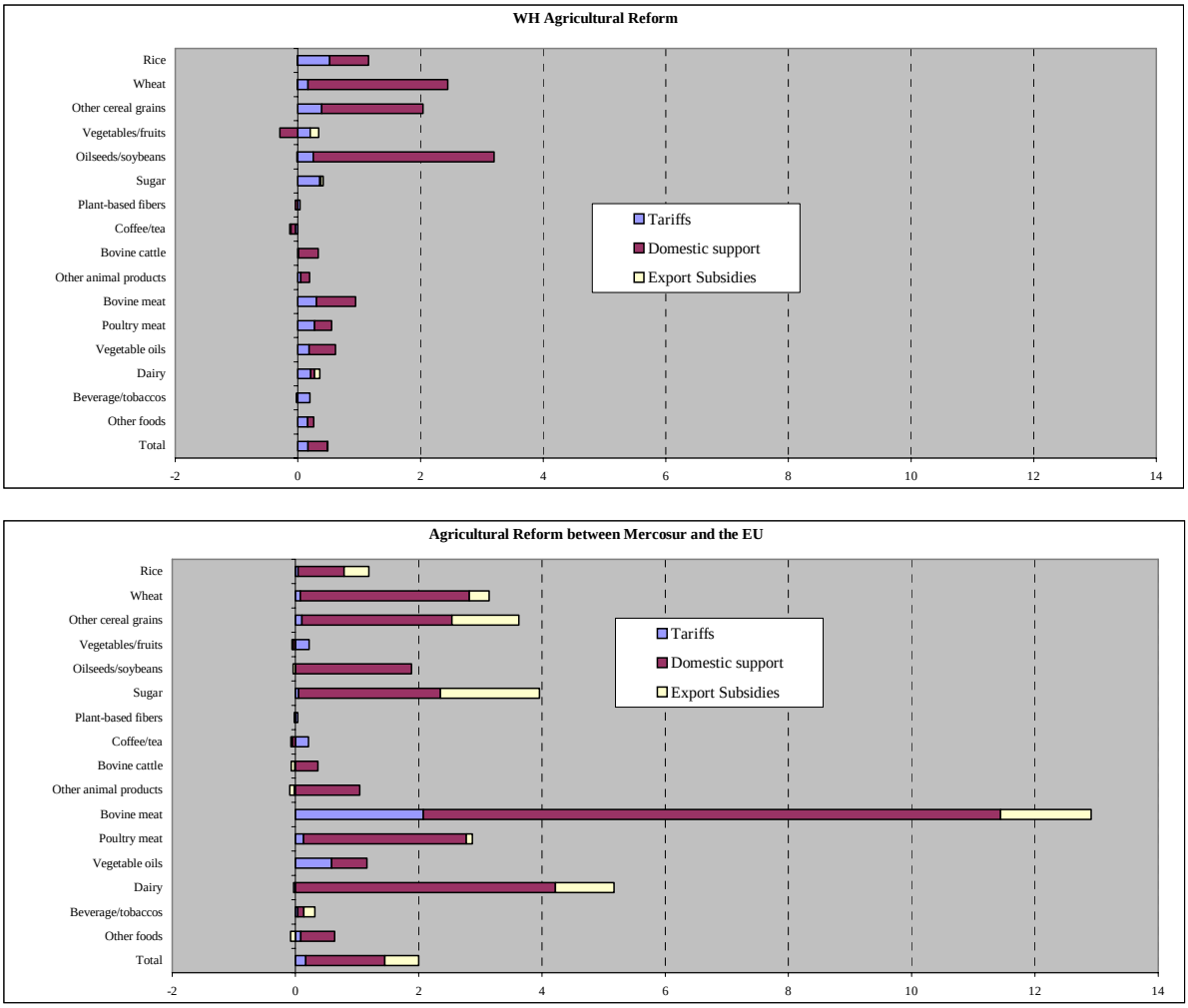

Figure 6. Impact of Agricultural Policy Reform on Global Commodity Prices (percentage change from the base year)

Appendix Table 1. Impact of the Agricultural Reform in the WH on Total Exports (percentage change from base)

SIM-1: Tariff Elimination

Commodities	Canada	United States	Mexico	Central America	Andean Community	Argentina	Brazil	Chile	European Union
Rice	0.00	17.24	63.99	2.06	9.10	6.56	0.01	0.00	-0.17
Wheat	3.13	1.25	1.41	1.89	9.06	0.52	-0.06	0.00	-0.11
Other Cereal Grains	0.41	2.76	6.19	-5.02	8.37	3.70	5.05	0.55	-0.03
Vegetables and Fruits	5.93	2.01	1.46	2.66	2.62	1.48	4.29	7.11	-0.07
Oilseeds and Soybeans	5.88	0.75	30.28	13.15	4.16	4.50	1.78	33.33	-0.17
Sugar	20.11	24.91	10.10	9.00	12.93	16.96	3.22	-0.74	-0.11
Plant-based Fibers	2.13	1.73	3.03	3.04	2.73	1.45	3.34	0.07	-0.01
Coffee and Tea	3.18	0.89	5.21	5.67	2.60	11.99	2.18	20.01	-0.27
Bovine Cattle	0.67	0.97	0.27	2.19	6.28	10.95	14.58	18.53	0.00
Other Animal Products	0.14	2.35	0.22	4.78	4.31	0.49	1.58	2.89	-0.01
Primary	**2.96**	**2.10**	**2.87**	**5.51**	**3.94**	**3.01**	**2.39**	**6.89**	**-0.10**
Bovine Meat	5.56	3.72	0.06	7.89	8.36	4.02	0.65	7.89	-0.01
Poultry Meat	3.10	6.49	2.65	5.09	21.54	6.89	2.46	21.25	-0.04
Vegetable Oils	0.16	6.18	4.58	13.53	5.72	3.53	0.53	19.18	-0.09
Dairy Products	14.38	18.87	37.76	14.85	17.79	12.24	8.06	34.88	-0.11
Beverage and Tobaccos	3.54	2.53	4.03	15.36	16.49	16.31	35.01	19.57	-0.24
Other Food Products	3.62	4.40	7.97	6.23	3.88	9.71	14.48	6.94	-0.10
Processed	**3.84**	**4.72**	**6.58**	**9.03**	**5.91**	**5.89**	**6.63**	**9.72**	**-0.12**
Agriculture	**3.36**	**3.29**	**4.45**	**6.53**	**4.74**	**4.70**	**4.24**	**8.67**	**-0.11**
Non-Agriculture	**0.00**	**-0.03**	**0.12**	**1.02**	**0.42**	**-0.22**	**0.04**	**-0.41**	**0.01**
Total	**0.30**	**0.22**	**0.30**	**1.95**	**1.15**	**2.12**	**1.05**	**1.57**	**0.00**

SIM-2: Elimination of Domestic Support

Commodities	Canada	United States	Mexico	Central America	Andean Community	Argentina	Brazil	Chile	European Union
Rice	0.00	-7.44	-3.59	1.35	0.29	0.11	0.08	0.00	0.52
Wheat	-2.58	-12.97	-3.02	2.02	2.24	0.40	0.06	0.00	0.51
Other Cereal Grains	-2.26	-4.69	-4.74	4.96	0.98	0.40	0.61	8.54	0.43
Vegetables and Fruits	-0.77	0.97	-0.79	-0.77	-0.49	-0.13	-0.88	-0.69	-0.08
Oilseeds and Soybeans	-6.57	-6.55	7.94	7.40	1.87	3.72	2.11	9.97	2.68
Sugar	1.20	-1.39	-0.52	0.74	0.28	0.45	0.05	0.00	-0.02
Plant-based Fibers	-0.51	0.55	0.15	0.39	0.03	-0.05	-0.11	-0.06	-0.05
Coffee and Tea	-0.77	1.77	-0.68	-0.70	-0.51	-0.86	-0.08	-1.14	-0.17
Bovine Cattle	-0.19	-2.85	1.08	0.62	0.20	0.10	-0.17	0.74	0.12
Other Animal Products	-0.26	-1.02	-0.43	0.79	0.41	0.23	0.17	0.27	0.00
Primary	**-2.22**	**-3.76**	**-0.61**	**-0.15**	**-0.10**	**0.39**	**0.43**	**-0.25**	**0.10**
Bovine Meat	-3.26	-3.19	-0.71	4.06	0.91	0.05	-0.01	0.46	0.04
Poultry Meat	0.75	-2.60	-0.66	1.16	0.35	1.23	0.19	0.16	0.05
Vegetable Oils	2.46	-4.60	0.34	4.30	0.74	0.28	0.25	0.04	0.34
Dairy Products	-3.10	-1.70	-1.58	0.85	0.34	0.08	0.01	-0.04	0.11
Beverage and Tobaccos	0.13	0.07	-0.23	0.43	0.00	-0.11	-0.18	-0.11	-0.04
Other Food Products	0.20	-0.83	-0.60	0.56	0.28	0.19	0.25	0.22	0.03
Processed	**-0.06**	**-1.59**	**-0.48**	**0.88**	**0.37**	**0.25**	**0.20**	**0.16**	**0.05**
Agriculture	**-1.25**	**-2.77**	**-0.55**	**0.15**	**0.09**	**0.31**	**0.33**	**0.01**	**0.07**
Non-Agriculture	**-0.04**	**0.04**	**-0.55**	**0.17**	**-0.37**	**-0.09**	**-0.06**	**-0.05**	**-0.03**
Total	**-0.15**	**-0.06**	**0.00**	**0.26**	**-0.27**	**0.04**	**-0.02**	**-0.01**	**-0.02**

SIM-3: Elimination of Export Subsidies

Commodities	Canada	United States	Mexico	Central America	Andean Community	Argentina	Brazil	Chile	European Union
Rice	0.00	-0.05	-0.18	0.51	0.00	0.00	0.00	0.00	-0.01
Wheat	-0.18	-0.01	-0.03	0.78	0.03	0.00	0.01	0.00	0.00
Other Cereal Grains	-0.40	-0.01	-0.01	0.84	0.03	0.00	0.00	-0.05	0.00
Vegetables and Fruits	0.16	0.06	0.10	-1.90	-0.49	0.02	0.06	0.06	0.01
Oilseeds and Soybeans	-1.36	0.01	-0.07	0.70	0.02	-0.03	-0.01	0.01	0.01
Sugar	0.09	0.07	-6.27	0.70	-0.81	0.21	0.01	0.02	-0.01
Plant-based Fibers	0.03	-0.02	-0.04	0.68	0.02	0.00	0.00	-0.01	0.00
Coffee and Tea	0.05	-0.04	-0.08	0.75	-0.12	-0.01	-0.02	-0.02	-0.02
Bovine Cattle	0.02	0.00	-0.03	0.43	0.02	0.01	0.01	-0.01	0.00
Other Animal Products	0.02	-0.02	-0.03	0.57	0.00	-0.01	0.00	-0.02	0.00
Primary	**-0.27**	**0.00**	**-0.15**	**-0.01**	**-0.22**	**0.01**	**-0.01**	**0.04**	**0.00**
Bovine Meat	-0.08	-0.01	-0.02	0.50	0.01	0.00	0.00	-0.01	0.00
Poultry Meat	0.00	-0.02	-0.02	0.49	0.01	-0.01	0.00	-0.01	0.00
Vegetable Oils	-0.15	0.00	-0.01	0.56	-0.26	0.00	0.00	0.11	0.01
Dairy Products	-0.67	-6.25	0.24	1.22	0.12	0.05	0.04	0.13	0.01
Beverage and Tobaccos	0.01	-0.01	-0.03	0.67	-0.56	0.03	0.09	-0.02	0.00
Other Food Products	0.02	-0.01	-0.04	0.51	-0.01	0.00	0.00	-0.01	0.00
Processed	**-0.04**	**-0.16**	**-0.03**	**0.57**	**-0.05**	**0.00**	**0.01**	**-0.01**	**0.00**
Agriculture	**-0.17**	**-0.07**	**-0.10**	**0.15**	**-0.15**	**0.00**	**0.00**	**0.01**	**0.00**
Non-Agriculture	**0.00**	**0.00**	**0.01**	**0.37**	**0.04**	**0.00**	**0.01**	**-0.01**	**0.00**
Total	**-0.01**	**-0.01**	**-0.01**	**0.40**	**0.03**	**0.00**	**0.01**	**-0.01**	**0.00**

SIM-4: Elimination of All Agricultural Support and Protection

Commodities	Canada	United States	Mexico	Central America	Andean Community	Argentina	Brazil	Chile	European Union
Rice	0.00	8.52	58.75	3.09	9.53	6.75	0.08	0.00	0.37
Wheat	0.69	-11.80	-1.57	3.36	11.69	0.98	-0.02	0.00	0.40
Other Cereal Grains	-1.53	-1.98	1.12	-0.65	9.54	4.14	5.73	9.07	0.41
Vegetables and Fruits	5.32	3.15	0.84	-1.20	1.65	1.36	3.42	6.44	-0.13
Oilseeds and Soybeans	0.81	-5.91	41.83	21.93	6.16	8.80	4.12	48.09	2.48
Sugar	21.79	23.59	1.72	9.32	12.36	17.92	3.31	-0.72	-0.12
Plant-based Fibers	1.55	2.31	3.18	2.89	2.75	1.39	3.20	-0.03	-0.07
Coffee and Tea	2.29	2.74	4.49	4.45	1.51	10.84	2.11	18.44	-0.43
Bovine Cattle	0.41	-1.88	1.34	2.42	6.52	10.98	14.35	19.33	0.12
Other Animal Products	-0.17	1.33	-0.22	5.20	4.73	0.68	1.74	3.13	-0.01
Primary	**1.03**	**-1.69**	**2.14**	**4.18**	**3.44**	**3.46**	**2.88**	**6.61**	**0.02**
Bovine Meat	2.21	0.50	-0.66	11.72	9.43	4.07	0.63	8.33	0.03
Poultry Meat	3.83	3.78	1.98	5.80	22.10	8.19	2.67	21.45	0.01
Vegetable Oils	2.15	1.37	4.85	18.31	6.31	3.87	0.78	19.29	0.24
Dairy Products	11.96	7.76	36.40	16.53	18.49	12.46	8.12	35.11	0.01
Beverage and Tobaccos	3.67	2.62	3.80	15.04	15.91	16.20	34.86	19.42	-0.27
Other Food Products	3.81	3.56	7.31	6.24	4.13	9.93	14.85	7.17	-0.06
Processed	**3.75**	**2.85**	**6.06**	**9.41**	**6.25**	**6.19**	**6.87**	**9.89**	**-0.06**
Agriculture	**2.25**	**0.38**	**3.81**	**5.70**	**4.58**	**5.06**	**4.63**	**8.67**	**-0.04**
Non-Agriculture	**-0.05**	**0.01**	**-0.47**	**0.82**	**-0.01**	**-0.32**	**-0.02**	**-0.48**	**-0.02**
Total	**0.15**	**0.15**	**0.06**	**1.83**	**0.83**	**2.17**	**1.03**	**1.55**	**-0.02**

Appendix. Table 2. Impact of Agricultural Reform between Mercosur and the EU on Mercosur's Total Exports (Percentage change from base)

SIM-1: Tariff Elimination

Products	Argentina	Brazil	European Union
Rice	-1.53	67.61	-0.03
Wheat	0.34	-2.11	-0.28
Other Cereal Grains	5.04	0.32	-1.13
Vegetables and Fruits	7.19	9.90	-0.02
Oilseeds and Soybeans	-2.78	-0.54	-0.48
Sugar	-1.58	0.25	-0.06
Plant-based Fibers	-1.12	0.65	0.25
Coffee and Tea	0.36	6.09	-0.14
Bovine Cattle	0.39	13.02	-0.89
Other Animal Products	2.81	4.82	0.08
Primary	**2.37**	**3.42**	**-0.17**
Bovine Meat	116.98	162.73	-1.50
Poultry Meat	13.29	11.57	0.00
Vegetable Oils	3.01	12.27	-0.33
Dairy Products	1.94	21.59	0.24
Beverage and Tobaccos	11.18	0.64	0.68
Other Food Products	9.22	17.48	0.18
Processed	**16.91**	**18.35**	**0.16**
Agriculture	**10.89**	**9.95**	**0.07**
Non-agriculure	**-0.63**	**0.13**	**0.09**
Total	**5.14**	**3.00**	**0.08**

SIM-2: Elimination of Domestic Support

Products	Argentina	Brazil	European Union
Rice	-0.21	1.67	-3.98
Wheat	-0.06	-0.76	0.80
Other Cereal Grains	0.80	-0.01	0.18
Vegetables and Fruits	-0.48	-0.31	0.23
Oilseeds and Soybeans	10.02	11.20	-4.48
Sugar	-0.42	-0.48	-3.56
Plant-based Fibers	-0.27	-0.44	0.47
Coffee and Tea	-0.58	-0.97	-0.03
Bovine Cattle	-0.92	-1.11	-10.29
Other Animal Products	1.52	1.82	-1.72
Primary	**0.71**	**2.04**	**-1.10**
Bovine Meat	27.64	38.12	-3.01
Poultry Meat	3.49	2.69	-0.99
Vegetable Oils	-0.02	1.94	-0.88
Dairy Products	0.27	2.21	-1.78
Beverage and Tobaccos	-0.34	0.11	0.27
Other Food Products	-0.07	0.72	-0.96
Processed	**2.98**	**3.01**	**-0.90**
Agriculture	**2.04**	**2.46**	**-0.96**
Non-agriculure	**-0.05**	**0.00**	**0.47**
Total	**1.00**	**0.72**	**0.29**

SIM-3: Elimination of Export Subsidies

Products	Argentina	Brazil	European Union
Rice	0.03	-0.04	-4.51
Wheat	0.02	-0.02	-5.51
Other Cereal Grains	-0.48	0.08	-9.50
Vegetables and Fruits	-0.03	-0.06	-0.65
Oilseeds and Soybeans	-0.15	-0.19	-0.05
Sugar	0.00	0.03	-21.49
Plant-based Fibers	-0.01	-0.08	0.13
Coffee and Tea	-0.03	-0.13	0.07
Bovine Cattle	0.04	-0.12	-0.87
Other Animal Products	-0.27	-0.27	-0.25
Primary	**-0.15**	**-0.11**	**-2.70**
Bovine Meat	0.19	0.24	-3.91
Poultry Meat	-0.12	-0.09	-0.60
Vegetable Oils	-0.06	-0.16	-0.13
Dairy Products	0.41	0.25	-7.82
Beverage and Tobaccos	0.06	0.17	-0.67
Other Food Products	-0.10	-0.18	-0.02
Processed	**-0.03**	**-0.12**	**-1.65**
Agriculture	**-0.08**	**-0.11**	**-1.95**
Non-agriculure	**0.00**	**-0.02**	**0.10**
Total	**-0.04**	**-0.04**	**-0.17**

SIM-4: Elimination of All Agricultural Protection and Support

Products	Argentina	Brazil	European Union
Rice	-2.34	74.37	-8.16
Wheat	0.25	-3.45	-4.45
Other Cereal Grains	5.57	0.36	-9.52
Vegetables and Fruits	5.78	9.31	-0.43
Oilseeds and Soybeans	6.56	10.36	-4.94
Sugar	-2.37	-0.43	-23.41
Plant-based Fibers	-1.98	-0.17	0.87
Coffee and Tea	-0.84	4.56	-0.05
Bovine Cattle	-2.09	10.79	-11.94
Other Animal Products	3.32	6.40	-1.91
Primary	**2.65**	**5.06**	**-3.74**
Bovine Meat	206.89	287.01	-8.15
Poultry Meat	16.89	15.21	-1.60
Vegetable Oils	1.70	14.01	-1.36
Dairy Products	2.40	27.45	-8.81
Beverage and Tobaccos	9.84	0.69	0.28
Other Food Products	7.99	18.16	-0.81
Processed	**25.34**	**24.64**	**-2.30**
Agriculture	**15.94**	**13.63**	**-2.71**
Non-agriculure	**-0.96**	**0.16**	**0.66**
Total	**7.51**	**4.09**	**0.22**