Andean Countries and USA: how much can be expected from FTAs?

José E. Duran Lima[1]
Carlos J. de Miguel[2]
Andrés R. Schuschny[3]

Economic Commission for Latin America and the Caribbean (ECLAC)

United Nations
(UN)

The authors thank André Hofman, Osvaldo Rosales, José Luis Machinea, Hubert Escaith, Francisco Villarreal, Martín Cicowiez, Christian Sepúlveda and Graciela Moguillansky for their comments and continuous support.

Keywords: General equilibrium model, FTA, Regional Integration, Andean Community

[1] International Trade and Integration Division, ECLAC, UN, jduran@eclac.cl
[2] Office of the Deputy Executive Secretary, ECLAC, UN, cdemiguel@eclac.cl
[3] Economic Projections Center, Statistics and Economic Projections Division, ECLAC, UN
andres.schuschny@cepal.org

Table of Contents

ABSTRACT

Using the GTAP Computable General Equilibrium (CGE) model/database this manuscript assesses the effects of simultaneous bilateral FTAs between Colombia, Ecuador and Peru and the United States of America. Using 2004 data and a benchmark base scenario where tariffs are updated by the addition of information regarding trade agreements recently signed by Latin American and the Caribbean (LAC) countries, three different types of policy intervention are simulated: full liberalization, liberalization excluding sensible products, and no FTAs scenario with reversal of preferences given by the Andean Trade Promotion and Drug Eradication Act (ATPDEA). The global CGE model allows us to analyze direct and indirect socio-economic impacts on subscriber countries as well as on other countries in the region.

The results suggest that the FTAs would be beneficial to improve trade between subscribers. Nevertheless, welfare implications are unevenly distributed in favor of United States and Peru. These FTAs also divert trade from those Andean Countries not signing the agreement with the USA; particularly, Bolivia and Venezuela record losses in terms of GDP and exports due to trade deviation and further competition within intraregional markets. Additionally, some countries in the region undergo erosions in their benefits from trade preferences with USA, such as Chile and Mexico. The exclusion of sensible products in the agreements improves the outcomes for the signing Andean countries, giving some insights for policy makers. On the other hand, the case of unsuccessful negotiations and ATPDEA expiration seems to be, in general, the worst scenario. Finally, the possibility of adding Bolivia and Venezuela to the USA-FTAs process, also simulated, does not improve results for the Andean countries. In any case, active public policies to mitigate the potential negative effects, enhance positive impacts and seize dynamic opportunities towards sustainable development must be undertaken.

Red Queen Answer to Alice
"... If you want to get somewhere else,
you must run at least twice as fast as that!"
Lewis Carroll
Alice in Wonderland

1.- Introduction

The aim of this article is to contribute, using the GTAP (Global Trade Analysis Project) Computable General Equilibrium (CGE) model, to the assessment of economic and welfare impacts emerging from trade goods liberalization policies in Latin America and the Caribbean. In particular, we address the Bilateral Free Trade Agreement (FTA) negotiations that three Andean countries (Colombia, Ecuador and Peru) have been developing with the United States of America. Since these three countries are members of the Andean Community (AC) as well as Bolivia and Venezuela[4], the analysis also includes the case in which FTA are signed by all five with the USA.

The manuscript examines impacts of FTAs on macroeconomic and sectoral variables (GDP, exports, imports, and intra-regional trade), as well as welfare effects. We simulate the situation in 2004 to be used as a baseline scenario for the trade-policy exercises. To do so, we adjust data on trade-protection in the original 2001 GTAP database to replicate the 2004 situation (the beginning of the Andean-USA negotiations), capturing the current conditions on preferential tariffs and protection data in Latin America and the Caribbean as well as computing the accumulated impacts of FTAs signed in the region during this period.

From the side of the global "politics" on trade, the coordination failures of the multilateral trading system, which show sluggish progress towards the completion of the international negotiations, has led to a wave of preferential trade agreements (PTAs) worldwide, under the form of regional, bilateral and multilaterals Free Trade Agreements (FTAs). Countries of Latin America and the Caribbean (LAC) have kept on with the negotiation of a web of bilateral and plurilateral PTAs, including the Free Trade Area of the Americas (FTAA),[5] with countries both within and outside the region. About 68 trade agreements intra and extra regional now exist in the hemisphere, as well as other arrangements that are now being negotiated or that will be negotiated before 2007[6]. These agreements and their negotiation processes have generated both centripetal and centrifugal forces that tend to unify and divide the regional integration process.

In fact, as a political consequence of FTAs negotiations between the three Andean countries (Colombia, Ecuador and Peru) and United States, and the completion of negotiations in the cases of Peru (2005) and Colombia (April, 2006), Venezuela has decided to withdraw from the Andean bloc[7].

[4] Venezuela has recently announced its intention to leave the Andean Community.
[5] With a population of 800 million people and a GDP of almost US$ 11 trillion, FTAA is one of the most ambitious projects ever proposed by the Latin American and Caribbean countries (excepting Cuba), along with Canada and the United States. If it is created, it will become the world's largest free trade area. Now this project is stalled (Kuwayama, Duran & Silva, 2005).
[6] This number includes intraregional trade schemes (Andean Community, Central American Common Market, Caribbean Community and South American Common Market); the "partial scope" agreements negotiated under the Latin American Integration Association (ALADI), and all the mushroomed extra regional FTAs signed for every country in the region, especially Mexico and Chile.
[7] When the set-up of this manuscript was conceived, Venezuela was part of Andean Community of Nations.

Since the very beginning of the negotiations, FTA discussions were marked by domestic confrontational situations. Indigenous people, farmer's organizations, labor unions and other social movements have been very active to stop them. The FTA "negotiations" have been seen as a kind of concession to the U.S. economic and geopolitical interests. In Colombia, Ecuador and Peru, different sectors have pushed for national referenda on the FTA in their respective countries.

This social debate and the political and socioeconomic sensitivities, reinforce the necessity of making quantitative assessments of the possible impacts of FTAs under consideration. Therefore, one of the objectives of this paper is to inform and give insights for this debate.

This manuscript examines the socio-economic effects of different trade-policy situations based on the result of the current negotiation process of three simultaneous bilateral FTAs between Colombia, Ecuador and Peru (AC3)[8] and the United States; in particular, we simulate three alternative scenarios: (a) Full AC3-USA liberalization; (b) AC3-USA liberalization excluding sensible products; (c) No FTA / No ATPDEA. In order to deal with the situation of Bolivia and Venezuela, two more scenarios are simulated where both countries also sign FTA with USA: (d) Full AC-USA liberalization; and (e) AC-USA excluding sensible sectors.

The organization of the paper is as follows: next section addresses the main issues related to the trade policy in Andean Community countries and the incentives to follow negotiations with the USA. It also includes a brief review of relevant literature. The third section describes the GTAP model and database, as well as the characteristic of the benchmark and trade-policy simulated scenarios. Section four provides the outcomes of the simulations, assessing impacts on macroeconomic, trade, sectoral and welfare variables. The final section presents main conclusions and policy implications.

2.- Andean countries: Trade policy and motivations for accept USA proposal to initiate FTA negotiations.

a) Trade policy strategies

The opening-up policies of the Andean countries have been implemented by means of three directions towards trade liberalization, i.e., unilateral, regional and multilateral-like agreements. Between the mid-1980s and the end of the 1990s, the Andean sub-region unilaterally reduced its average external tariff from high levels to 12%. The dispersion of tariff rates within countries was also significantly reduced.

The other guideline of liberalization was regional integration. In 1969, Andean countries signed the Cartagena Pact with the aim to achieve trade and industry integration. This initiative was inspired in policies of Import Substitution Industrialization (ISI)[9]. But integration stalled without tangible results

[8]AC3 will be used to define the three Andean Community countries that participate in the negotiation processes of the FTAs (Colombia, Ecuador and Peru). AC will be used when all Andean Community countries (5) are considered.

[9] Import substitution industrialization is a trade and economic policy based on the premise that a developing country should attempt to substitute products, mostly manufactured goods, which it imports. The policy has three major tenets: an active industrial policy to subsidize production of strategic substitutes, tariffs barriers to trade, and a monetary policy that keeps the domestic currency overvalued (Bielschowsky, 1998).

until 1991. In the 80's, the sub-region had many problems with its tariff implementation. In response to South American Common Market (MERCOSUR) initiative, launched in 1991, the Andean Pact members agreed to reinvigorate their sub-regional agreement. Trade liberalization among Colombia, Ecuador, Bolivia, and Venezuela effectively started in 1992, and it was reinvigorated with a Free Trade Agreement signed by Colombia and Venezuela during those years. A free trade area has been operational since 1993 and a customs union, albeit imperfect, started operating in 1995. The new challenges posed by globalization have made necessary to deepen the trade integration by improving the free trade area and adopting a common tariff policy.

Trade among the AC countries has risen steadily since the Andean Free Trade zone began to operate in 1993, with an average annual growth rate between 1990 and 2005 amounting to 13.5%. But, intraregional trade is still low compared to what is being seen in Asia and the European Union, for example. While in Andean Community this figure amounts to 10% of exports (Duran and Maldonado, 2005; Rosales, Durán and Saez, 2006), in Asia it is just over a third, and it is nearly two-thirds in the European Union. For each Andean country, trade with the United States is more significant than intra-group trade (see Annex 1).

The region also participated actively in the Uruguay Round and made substantial commitments to dismantle import barriers by binding practically all tariff lines. The Andean countries have been active members in multilateral negotiations, too. There are some issues within the World Trade Organization's (WTO) sphere of competence that are crucial for the development strategies of these countries. Therefore, they consider important to participate jointly and in coordination in the activities that are carried out within the framework of this Organization, particularly in agricultural liberalization where the main objectives are: elimination of export subsidies, reduction of domestic support and market access improvements. Countries are also interested in negotiations on market access for non-agricultural products. The problem here is timing. On average, a multilateral round concludes every 6 years[10] and countries need to open faster more markets for trading.

The slow progress of the multilateral trading system, as mentioned before, has led to a wave of preferential trade agreements (PTAs) worldwide. Some countries of the region continue negotiating a web of bilateral and plurilateral PTAs to achieve market access with countries both within and outside the region. More than 68 trade agreements exist in the hemisphere now; in addition to other arrangements that are now being negotiated or that will be negotiated before 2007 (ECLAC, 2006). These considerably increase of agreements is very recent. From 2001 to the end of April 2006, countries of the region signed at least 12 new extra-regional FTAs. Outward oriented policies gave place to a myriad of trade accords directly or indirectly affecting Andean countries[11]. The proliferation of bilateral and plurilateral FTAs have, in a sense, reflected frustration of many governments with regard to the multilateral system and its approach (Kuwayama, Durán y Silva, 2005).

[10] The time required to conclude a multilateral Round is an increasing function of the enlargement of the areas under discussion and also on the number of participant countries in the negotiation tables. Tokyo Round (102 countries and 3 subjects) (1973-1979); Uruguay Round (more than ten subjects and 123 countries) (1986-1994); and The Doha Round has deals with numerous topics, and include 149 countries (2001-2006 or 2007) (http:www.wto.org).

[11] In 1994, Colombia and Venezuela signed a bilateral FTA with Mexico (the G-3 FTA). During the 1990s, most Andean countries signed bilateral FTAs with Chile, and attempted to deepen the old partial scope trade agreements with several Latin American countries, that were put in place in LAIA framework. Mexico, the second largest single-country US trading partner, has a FTA with USA and Canada, the North American Free Trade Agreement (NAFTA), since 1994; Central American countries (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua) and Dominican Republic focuses largely on FTA negotiations with USA and now have the Central American Free Trade Agreement – Dominican Republic (DR-CAFTA), which is in the implementation phase during 2005 and early 2006. Additionally, Chile signed a FTA with United States during 2003, in force since January 1, 2004.

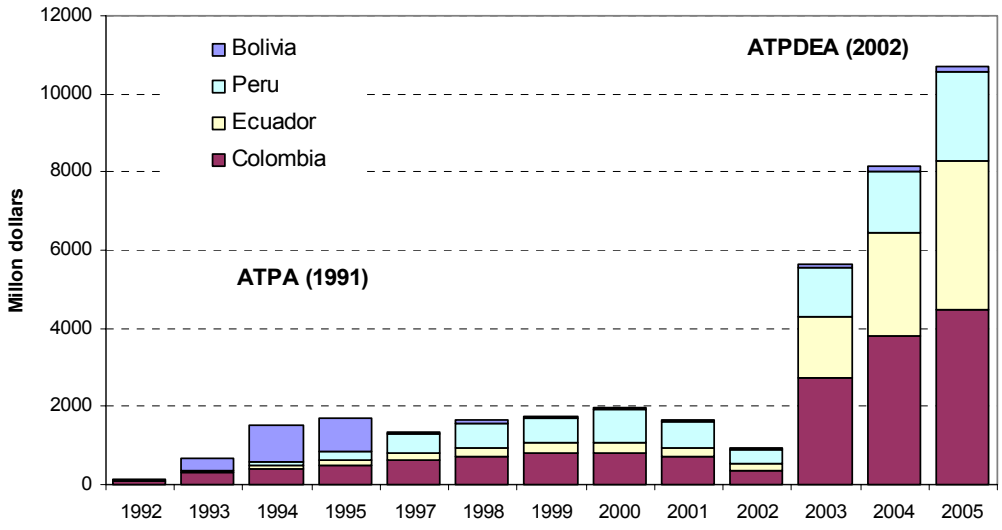
b) United States' Andean Trade Preferences

Another issue that influences Andean Community relationships with the United Stated is the Andean Trade Preferences given by the U.S. government. For a long time, former or "original" ATPA (Andean Trade Preference Act) and the expanded ATPDEA (Andean Trade Promotion and Drug Eradication Act) have been at the center of trade policy issues between the US and the three Andean countries that are negotiating bilateral free trade agreements with the northern country. In 1991, the U.S. Congress enacted the ATPA to induce a reduction of drug crops and production by the Andean countries (Bolivia, Colombia, Ecuador and Peru) throughout granting tariff preferences to qualifying Andean products and fostering trade, which included the production and exports of non-traditional products. ATPA expired on December 2001, but it was renewed retroactively and amended on August 6, 2002, by the ATPDEA. The new Act also extended duty-free treatment to some products which were not eligible for preferences under the original APTA. As a consequence of market access improvements, from 1992 to 2005, trade exports from Andean beneficiary countries to U.S. grew faster, particularly raw materials and their by-products, agricultural and horticultural products, seafood, and apparel (see figure and table 1).

Figure 1

U.S. ATPA AND ATPDEA TOTAL IMPORTS FROM ANDEAN COUNTRIES, 1992-2005

(Million dollars)



Source: Authors' calculation based on United States International Trade Commission (USIT)) trade on-line database (http://dataweb.usitc.gov/scripts/user_set.asp).

During 2005, U.S. ATPDEA imports grew even faster than in 2003 and 2004, with a surprising increase of Ecuador's share, which rose with special speed, from 13.1% of all imports under the original ATPA in 2001, to 35.7% of those under the expanded ATPA in 2005. Bolivia also recorded an increase in total ATPDEA exports to U.S. in absolute value, but its share in total U.S. imports under ATPDEA fell from 3.3% to 1.5% in relative term. A similar path was followed by Peru (see table 1). In general, ATPA preferences represent a higher value in total exports to the United States for each country individually considered.

Table 1

U.S. IMPORTS FOR COMSUMPTION UNDER ATPA AND ATPDEA BY SOURCES IN ANDEAN SUBREGION, 2001 AND 2005

(Percentages)

Countries	Main products by country	Share in total	Share in total export by each country		Country contribution in total ATPA exports	
			2001	2005	2001	2005
Bolivia	Gold jewelry , Gold necklaces, sweaters, pullovers, sweatshirts, shirts, knitted or crocheted, of cotton	95%	41.1%	53.7%	3.3%	1.5%
Colombia	Petroleum oils an oils from bituminous mineral, roses, fresh cut, naphtha's, textiles and apparels	96%	50.5%	50.6%	43.1%	41.8%
Ecuador	Petroleum oils an oils from bituminous mineral, roses, fresh cut, cut flowers, naphtha's	98%	77.3%	64.2%	13.1%	35.7%
Peru	Cathodes of refined cooper, men's or boy's shirts, T-shirts, singles, asparagus.	91%	43.5%	43.9%	40.6%	21.0%
4 countries		**92%**	**56.2%**	**53.0%**	**100%**	**100%**

Source: Authors' calculation on the basis of USITC trade basis on-line (http://dataweb.usitc.gov/scripts/user_set.asp).

c) Andean Community – United State trade

The U.S. is the main trading partner of all the Andean Community (AC) members. In 2004, 41.4% of the AC's exports went to the United States, which was also responsible for 26 percent of its imports. In the opposite, Andean Community countries only represent 1.6% of U.S. total imports (see Annex 1). By 1999, Colombia, Ecuador and Peru started recording trade balance surpluses (see figure 2). This positive result is based on primary products and natural resources based sectors; meanwhile there is a trade balance deficit if we only consider intermediate and high technology activities like electrical machinery, parts and accessories for motor vehicles, nuclear reactors, boilers, machinery and mechanical appliances, organic chemicals, transmission apparatus, fertilizers, polyethylene, etc. In general, in the AC about 63% of total imports from U.S. are capital and intermediate goods (USITC, 2005).

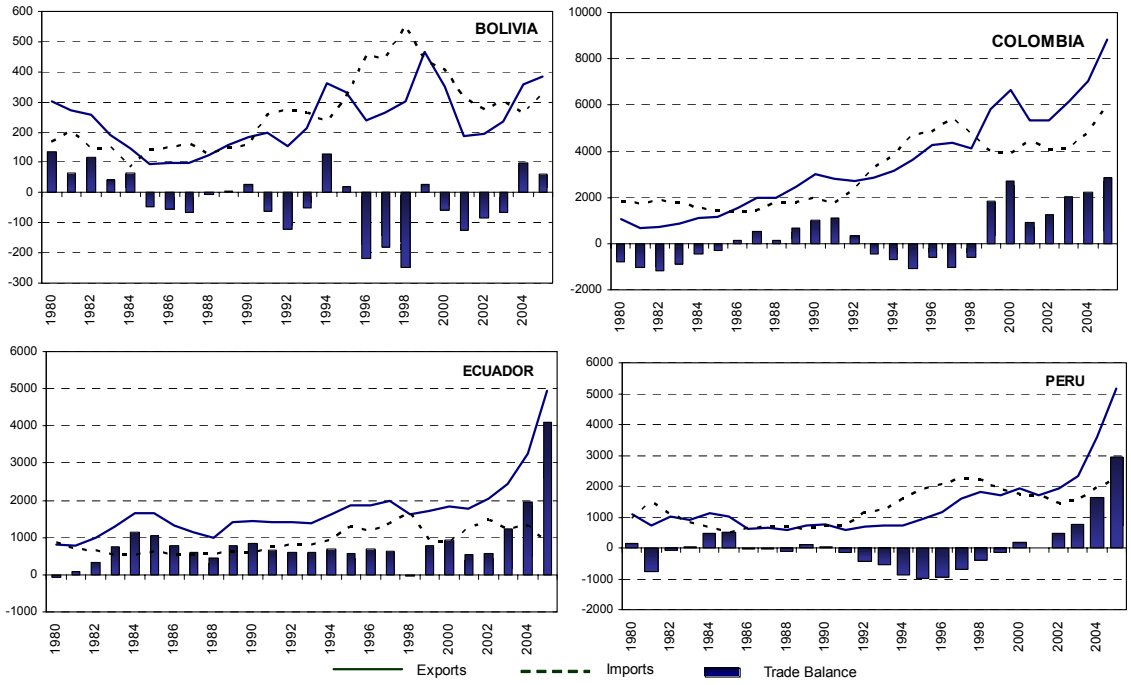
Exports to United States from the Andean Countries grew at a yearly rate of 12% in average during the period 2000-2005. It represented around 50% of the growth of their combined total exports. In 2005, the U.S. contribution to the growth of the combined total exports of the AC was 17.5%, the highest contribution compared with other partners (countries and subregions) (see table 3).

From the point of view of the United States, the Andean region is important for several reasons. First, its size and economic scale: the four countries favored by the ATPDEA have a joint population of about 93 million people -about a third of US-population-, and a combined gross domestic product of about $ 453 billion on a purchasing power parity (USITC, 2006). For the Andean countries, United States also represents a huge market, with a per capita income of about $ 35,000 dollars and a population of 297 million people.

Figure 2

ANDEAN ATPA COUNTRIES: TRADE WITH THE UNITED STATES, 1980-2005

(Millions of dollars)



Source: Authors' calculation on the basis of COMTRADE databases and national sources

Table 2

ANDEAN COMMUNITY TRADE WITH THE UNITED STATES, 2004

(Millions dollars at currents prices)

Countries	Exports	Imports	Trade Balance	Breakdown of trade balance, by technological intensity				
				Commodities	Natural-Resource basis	Low technology	Medium and high technology	Others
Bolivia	360	260	99	31	127	99	- 144	- 13
Colombia	7 042	4 807	2 235	3 729	42	472	-2 434	426
Ecuador	3 265	1 323	1 942	2 682	168	- 58	- 847	- 4
Peru	3 604	1 981	1 622	170	1 713	692	-1 042	89
Venezuela[a]	11 075	2 754	8 321	9 305	111	- 112	- 963	- 20
Andean Community	**25 346**	**11 126**	**14 220**	**15 917**	**2 161**	**1 093**	**-5 430**	**479**

[a] Data for 2003.

Source: Authors' calculation on the basis of COMTRADE United Nations databases.

Table 3

CONTRIBUTION OF THE UNITED STATES AND OTHER REGIONS IN ANDEAN COMMUNITY TOTAL GROWTH OF EXPORTS, 2005

(Percentages)

	Latin America and the Caribbean	United States	European Union 25	Japan	Asia	Other countries	World
Andean Community	**6.8**	**17.5**	**2.3**	**0.2**	**1.5**	**8.5**	**35.3**
Bolivia	15.2	2.1	-0.3	4.6	0.0	9.5	24.6
Colombia	8.9	10.7	2.7	0.4	1.0	3.2	26.6
Ecuador	3.9	23.3	2.0	-0.1	-0.7	-2.5	18.7
Peru	9.3	13.5	-1.1	0.3	6.2	17.5	36.7
Venezuela	5.7	21.3	4.5	0.1	1.3	15.1	43.0

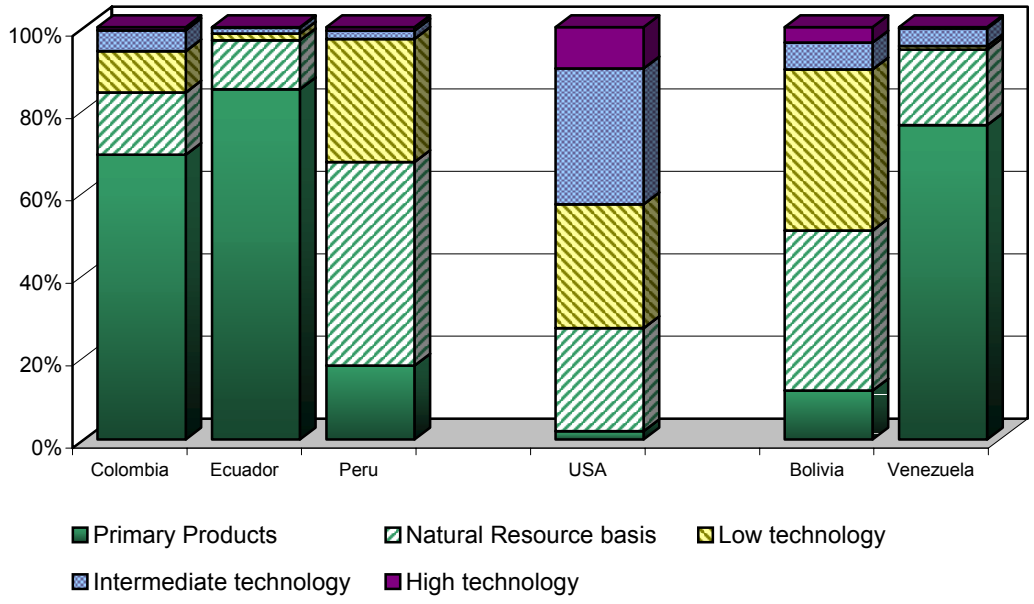
Source: Authors' calculation based on official figures.

Nevertheless, a comparison of US and AC trade patterns can show big differences. While the Andean countries export mainly raw material and natural resources based manufactures[12], the United States exports mostly technology based manufactures. In fact, this difference influences the way that the economic agents of the Andean countries perceive the FTA: as a way to reduce the costs of their imports of inputs from the US market (see figure 3).

Figure 3

TRADE PATTERNS OF THE ANDEAN EXPORTS TO THE UNITED STATES COMPARED WITH THE UNITED STATES EXPORTS TO THE ANDEAN COMMUNITY (2000-2004)

(Percentages of total exports)



Source: Authors' calculation on the basis of COMTRADE United Nations databases

[12] It is important to note that the intra-bloc exports are intensive in manufactures, so the AC members will have to decide whether to grant tariffs-preferences to the United States in such sectors that would compete with other AC members.

d) Motivations behind accepting trade negotiations with U.S.

Given (i) the limited size of the Andean regional market; (ii) the weakness of trade integration in the Andean Community; (iii) the small probability to carry on negotiations towards the Free Trade Area of Americas (FTAA), stalled since march of 2004; and (iv) the skepticism in WTO multilateral negotiation (Doha Round); combined with the need to have stable and predictable trading relations with the United States after the period of completion of the ATPDEA (December 2006), drove Colombia, Ecuador and Peru to accept the United States invitation to initiate free trade negotiations.

Negotiations were launched on May 18, 2004 in Cartagena (Colombia). Through 2005, there were twelve negotiating rounds involving the four governments. Bolivia has been participating as an observer in those negotiations.

From the beginning, FTA discussions have been under a lot of stress. Indigenous people, farmers' organizations, labor unions and other social movements have been very active to stop the FTA negotiation process. Indeed, they have considered it as a significant concession to U.S. economic and geopolitical interests. In Colombia, Ecuador and Peru, different sectors have pushed for national referenda on their respective FTA. Additionally, Venezuela has recently announced the decision to withdraw from the Andean trade bloc[13].

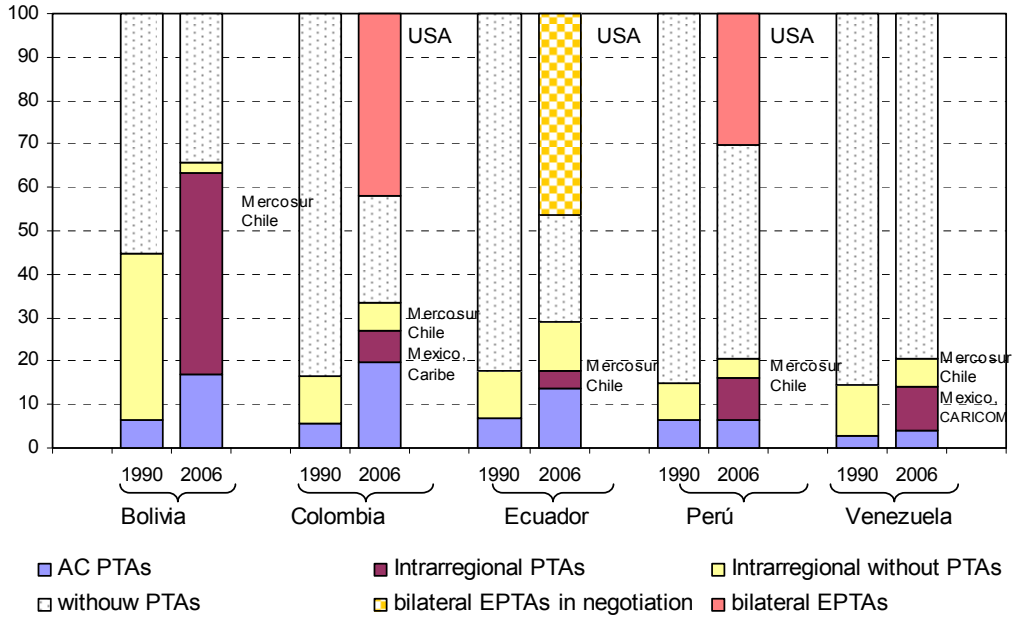
So far Peru and Colombia have fulfilled their negotiations on bilateral FTAs with USA (in November 2005 and March 2006, respectively), while Ecuador has prorogued the negotiations with USA in an effort to broaden the trade agreement. Taking into account trade data (exports) for 2005, figure 4 depicts the picture of preferential trade agreements perceived by exporters of each Andean Community country in 2006. With all these antecedents, the core of this manuscript is devoted to analyze the direct and indirect effects, the winners and losers and some policy implication of the three simultaneous FTAs.

[13] When the set up of this manuscript was conceived, Venezuela was an active member of the Andean Community of Nations.

Figure 4

ANDEAN COMMUNITY: PREFERENTIAL TRADE AGREEMENTS' EXPORT SHARES, 1990 AND 2006

(Percentage of total exports)



Notes: AC PTAs = Andean Community Preferences in trade agreement (Custom Union); PTAs = Preferential Trade Agreements; EPTAs = External Preferential Trade Agreements.

Source: Authors' calculation on the basis of COMTRADE United Nations databases and national statistics.

e) Literature overview

The economic literature related to the quantification of impacts from FTAs has grown fast since changes in international trade policy speed up as big players become more active in the international arena of globalization, mainly through this type of agreements, and economic techniques improve. Many economists have turned their attention to the evaluations of the implications of *deep integration* mainly focused on free trade-like agreements as a pillar of the North-South trade interaction.

There are a significant number of studies about the economic impacts of the FTA, particularly in the case of the Free Trade Agreement of Americas (FTAA). Most of these studies were made at a highly aggregated level in terms of regional and sectoral dimensions. Studies such as Cuadra and Florian (2005); CAF (2005); Arguello and Valenzuela (2005), ALADI (2004); Arguello (2004); Gopal, Andriamananjara (2004); Diao, Diaz-Bonilla, Robinson (2002); Diao, Somwaru (2001); and, Hinojosa-Ojeda, Lewis, Robinson (1997) present this scheme.

Specific references to the Andean countries were done by Monteagudo, Rojas, Stabilito, Watanuki (2004); Light (2003); Arguello (2004); Arguello & Valenzuela (2005); Arguello (2005); Comunidad Andina (2004); Morales, Parada and Torres (2005); and Sepúlveda (2005). Some important country references are: Botero (2005) for the Colombian case, and Comunidad Andina (2005) for the Ecuadorian case.

In general, the studies show that trade expansion is bigger than GDP growth, and welfare effects are very small. Only Cuadra and Florian (2005) undertakes a long run approach, which introduces explicitly a dynamic behavior and the capital accumulation effects into the model (following Baldwin and Venables (1995), Francois et al (1996) and Walmsley (1999)). Their results show that GDP growth would be higher than in the case of applying static Computable General Equilibrium (CGE) models[14]. The discussion about the positive bias of the dynamic effects is just opened.

3.- The GTAP Model and simulated scenarios

It is not easy to estimate the feasible impacts of a FTA, since many factors and conditions are involved. The expected impacts of agreements among the Andean countries and the United States 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).

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 its systemic nature, the extensive economy-wide effects expected from policy shocks associated with trade openness require the use of general equilibrium analysis. 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 tool for policy analysis and applied economic research. CGE models are multisectoral, and in many cases 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.

a) 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

[14] In section 4.4 we arrive to similar conclusions.

Miguel, (2006)), to conduct CGE static analysis of multi-region and economy-wide scenarios. 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 have 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[15].

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.

Lastly, the use of a set of accounting balance relationships embodies all the needed general equilibrium conditions and nonlinear programming is used to find the solution of the CGE outcomes. We use 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) and 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 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 Andean Countries, as a response to the incentives provided by the bilateral liberalization. However, we try to estimate the impacts of these dynamic effects by changing the model closure as it is showed in Francois et al (1996). These results are discussed in the last part of the manuscript.

[15] 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.

b) 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 6.1, 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)). Annex 2 and 3, respectively shows the regional and product aggregations used in the experiments implemented in this manuscript. 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 (24 regions) is based on the selection of all LAC available countries as well as those other countries that are either their largest trade patterns or main actors in the international trade (see Annex 2). The 57 commodities distinguished in GTAP 6.1 database were grouped into 31 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 Annex 3).

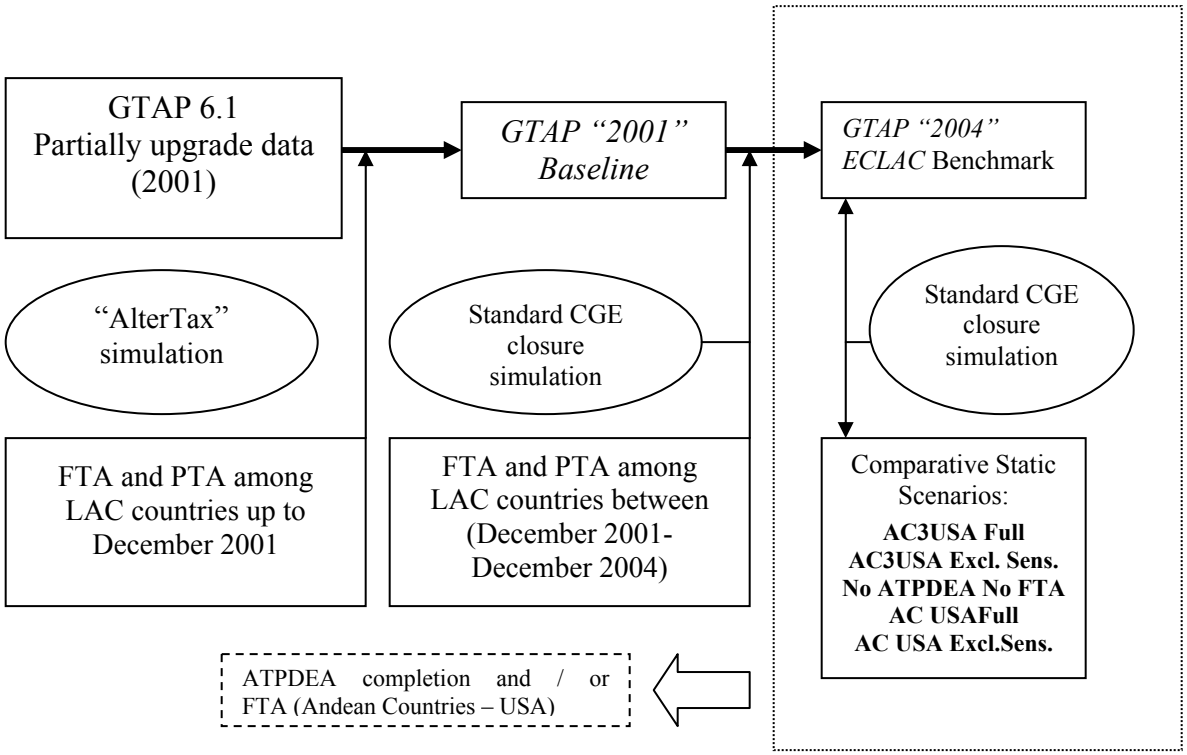
c) Benchmark equilibrium characterization

The year 2001, cannot provide a good basis to analyze the possible FTAs to be sign among the Andean Countries and the United States of America. The baseline year of the GTAP database is more than five years apart from the possible implementation date of the FTAs under study. The economic environment and the protection data have largely changed between 2001 and the likely implementation date. We perform some updates to the database, in order to bring the baseline to the year 2004. We have adjusted the protection data included in the original database. Details of the followed procedure are presented in Schuschny, Durán & de Miguel (2006).

Figure 5 summarizes the implemented course of action to fill the gap between the years 2001 and 2004. We used the 'Altertax' simulation closure and parameters with the purpose of improving the protection data by changing the LAC tariff's structure (see Malcolm, G (1998)). 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. Annex 4A shows the list of FTA and PTA considered in this part of the upgrading process.

Figure 5

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



Source: Authors' based on Schuschny, Durán & de Miguel, C. (2006)

In order to establish 2004 as a new baseline year, 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 between the end of 2001 and 2004, was implemented using the standard CGE closure and is known as "*GTAP 2004 ECLAC*" benchmark. Annex 5B shows the FTA and PTA included this part of the benchmark characterization process. All other simulated scenarios that appear in this manuscript include the very same tariff shocks as the "*GTAP 2004 ECLAC*" benchmark plus the new shocks that allow us to analyze the impacts of the FTA among the Andean countries and the United States.

d)- Liberalization FTA Scenarios

Once we performed the upgrading of the original protection database by establishing the benchmark equilibrium "*GTAP – ECLAC 2004*", we proceed to carefully study the possible impacts of the Andean liberalization initiative with the United States. To do this we assume five different scenarios.

1. **AC3 USA Full liberalization:**
   In this set-up we consider that all traded products of Colombia, Ecuador and Peru are fully opened to the USA market place and vice versa.

2. AC3 USA Excluding Sensibles:
This scenario takes into account that some traded products of Colombia, Ecuador and Peru are fully opened to the USA market place and vice versa; but there is a short list of products that don't take part of the liberalization process. The sensible products that the Andean countries do not open are: Arroz, Trigo, Ocereales, Semilloil, AceiteVeg, Azucar, Ocultivos, Lacteos, Oaliment, Pesca, Textil, Confeccion, CueroCalz, Autop (see Annex 3 for definitions). In addition, the USA opens its economy to these three Andean countries to all traded products with the exclusion of the Azucar (see Annex 3 for product definitions).

3. No FTA / No ATPDEA:
In this scenario we assumed that, after the termination of the ATPDEA (Andean Trade Promotion and Drug Eradication Act) agreement in the 31st December, 2006, no FTA will be signed. Therefore, the ATPDEA beneficiaries' countries (Bolivia, Colombia, Ecuador and Peru) lose their unilateral preferential access to the USA product market place. This scenario is considered as the most pessimistic but it is a plausible alternative to the FTAs.

4. AC USA Full liberalization:
In this case, we consider that all traded products of the five Andean Community countries (e.g. Bolivia, Colombia, Ecuador, Peru and Venezuela) are fully opened to the USA market place and vice versa.

5. AC USA Excluding sensible products:
Some traded products of the Andean Community (Bolivia, Colombia, Ecuador, Peru and Venezuela) are fully opened to the USA market place and vice versa. Nevertheless, as in scenario "2" above, there is a list of products that don't take part of the assumed liberalization process. The sensible products that the Andean Community declines to open, are: Arroz, Trigo, Ocereales, Semilloil, AceiteVeg, Azucar, Ocultivos, Lacteos, Oaliment, Pesca, Textil, Confeccion, CueroCalz, Autop. In addition, the USA opens its economy to the five Andean community countries to all traded products with the exclusion of the Azucar (see Annex 3 for product definitions).

4.- Simulations' results [16]

This section presents the results of the above mentioned five trade-policy scenarios. The baseline scenario, built for 2004, includes all FTAs and modifications of tariffs/preferential accesses, happened in Latin America and the Caribbean between 2001 –GTAP data base reference year- and 2004 (see Annex 4A and 4B). Therefore, it must be noted that the effects of the ATPDEA on the Andean Countries (Bolivia, Colombia, Ecuador and Peru) are included already in this baseline benchmark. The 2004 benchmark is used as reference to compare the results of all simulations and, when necessary, to calculate the net effects. Results will be presented in the following order: a.) macroeconomic effects, b) regional trade, c) sectoral impacts, and d) welfare implications.

[16] The findings presented in this section are a summary of the Spanish version of this article.

a) Macroeconomic results

Under the ***AC3-USA Full liberalization scenario***, there are unambiguous positive impacts on trade. Export and imports of all signing countries increase (see figure 6). Nevertheless, they are not translated into improvements of public or private consumption and impacts on investment demand are negligible. Colombia, Ecuador and Peru increase their imports from USA more than their exports to the northern country. The reason is that many of their products had ATPDEA preferential access before the trade agreement, as we showed in part 2, section b). As consequence, the effect on these three AC countries' GDP is negative (see table 6).

Consumption fall represents between 65% and 70% of the GDP reduction. Ecuador presents the biggest differential between bigger exports and imports, suffering more the negative GDP effects due to the FTA. The FTA has positive impacts in all macro-variables in USA, although figures are insignificant. Non-signing AC countries, i.e., Bolivia and Venezuela, experience a very slight indirect negative impact.

Table 6

EFFECTS ON PRODUCTION OF ANDEAN COUNTRIES - UNITED STATES FTAS

(Percentage changes with respect to baseline 2004)

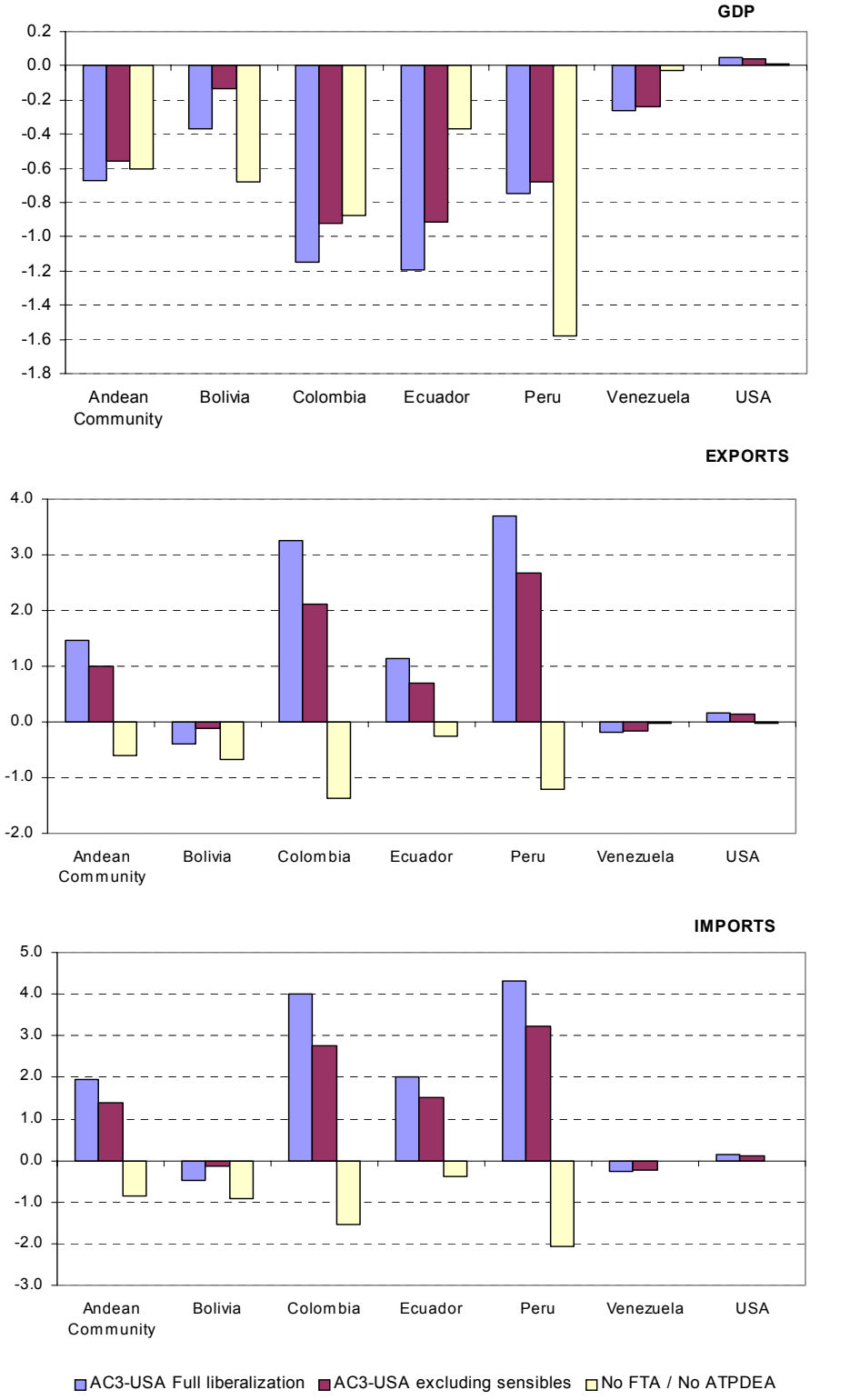
	Andean Community	Bolivia	Colombia	Ecuador	Peru	Venezuela	USA	MERCOSUR	Chile	Mexico	Central America and the Caribbean
A.- GDP under all scenarios											
AC3-USA-Full	-0.7	-0.4	-1.1	-1.2	-0.7	-0.3	0.0	-0.1	-0.2	0.0	0.0
AC3-USA excluding sensible products	-0.6	-0.1	-0.9	-0.9	-0.7	-0.2	0.0	-0.1	-0.1	0.0	0.0
No FTA / No ATPDEA	-0.6	-0.7	-0.9	-0.4	-1.6	0.0	0.0	0.0	0.0	0.0	0.0
AC-USA-Full	-1.1	-0.8	-1.7	-1.4	-0.8	-0.9	0.1	-0.2	-0.3	-0.1	-0.1
AC-USA-excluding sensible products	-0.8	-0.3	-1.3	-1.0	-0.7	-0.6	0.1	-0.1	-0.2	0.0	-0.1
A.1.- Breakdown of GDP under FTAs AC3-USA (Full liberalization) scenario											
GDP	**-0.7**	**-0.4**	**-1.1**	**-1.2**	**-0.7**	**-0.3**	**0.0**	**-0.1**	**-0.2**	**0.0**	**0.0**
Consumption	-0.7	-0.4	-1.1	-1.2	-0.7	-0.3	0.0	-0.1	-0.2	0.0	-0.1
Investment	-0.2	-0.4	-0.1	0.3	-0.1	-0.3	0.0	-0.1	-0.2	-0.1	-0.1
Government expenditure	-0.8	-0.4	-1.1	-1.2	-0.7	-0.3	0.0	-0.1	-0.2	0.0	-0.1
Exports	1.5	-0.4	3.3	1.1	3.7	-0.2	0.2	-0.1	-0.2	0.0	0.0
Imports	2.0	-0.5	4.0	2.0	4.3	-0.3	0.1	-0.1	-0.2	0.0	-0.1
A.2.- Breakdown of GDP under No FTA / No ATPDEA scenario											
GDP	**-0.6**	**-0.7**	**-0.9**	**-0.4**	**-1.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Consumption	-0.6	-0.7	-0.9	-0.4	-1.6	0.0	0.0	0.0	0.0	0.0	0.0
Investment	-0.7	-1.0	-1.0	-0.5	-2.2	0.0	0.0	0.0	0.0	0.0	0.1
Government expenditure	-0.7	-0.7	-0.9	-0.4	-1.6	0.0	0.0	0.0	0.0	0.0	0.0
Exports	-0.6	-0.7	-1.4	-0.3	-1.2	0.0	0.0	0.0	0.0	0.0	0.0
Imports	-0.9	-0.9	-1.5	-0.4	-2.1	0.0	0.0	0.0	0.0	0.0	0.1

Source: Authors' calculation on the basis of GTAP 6.1 simulations

Figure 6

MAIN MACROECONOMICS RESULTS OF SIMULATIONS ON DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004)



Source: Authors' calculation on the basis of GTAP 6.1 simulations

The FTAs have also negative impacts on fiscal revenues and on the remuneration of productive factors in the signing AC countries. Nevertheless, results differ among countries and productive factors. Thus, although factor payments on natural resources improve in all countries (especially in Ecuador and Colombia), land rents strongly increase in Ecuador, increase in Peru and decrease in Colombia. Payments to capital and skilled labor get worse; meanwhile unskilled labor may suffer negative effects. Anyway, within the productive factor's structure in the AC countries, the final effect is explained mainly by the reductions of payments to capital. There are not significant effects in USA.

If signing countries exclude sensible products ***(AC3-USA excluding sensible products scenario)***, with respect to previous simulation the FTA's negative impact on GDP decrease by 20% in Colombia and Ecuador, and by 10% in Peru. Colombia reaches the biggest reduction of the raise in imports. On the value added side, there are not many differences between both scenarios. Bolivia and Venezuela benefit from this scenario avoiding most of the negative effects coming from the scenario AC3-USA. USA does not show relevant variations in the results.

By the end of 2006, ATPDEA concessions will conclude. Therefore, the results of the ***No FTA / No ATPDEA scenario*** should be considered as the alternative to those in the FTA scenario for Andean Community countries. This scenario is not convenient for Peru: the drop in the GDP is more than twice the one obtained in previous scenarios. There is a fall of trade and consumption (final demand side of GDP) as well as in the productive factors' rent (value added/origin side of GDP). Results are less negative in Colombia and Ecuador. Concerning trade, both exports and imports show a 1% to 2% decrease in relation to the base scenario. Moreover, if we also consider the raise in trade due to the FTAs, the fall would account for 4.9% in Peru, 4.7% in Colombia and 1.4% in Ecuador. This scenario is also negative for USA, despite impacts are again insignificant.

Table 7

TRADE EFFECTS IN ANDEAN COUNTRIES - UNITED STATES FTAS.

(Percentage changes with respect to baseline 2004)

	Andean Community	Bolivia	Colombia	Ecuador	Peru	Venezuela	USA	MERCOSUR	Chile	Mexico	Central America and the Caribbean
A.- Exports of goods and services											
AC3-USA-Full liberalization	1.47	-0.39	3.25	1.13	3.70	-0.19	0.17	-0.09	-0.21	-0.02	-0.04
AC3-USA -excluding sensibles	0.99	-0.12	2.12	0.70	2.69	-0.16	0.13	-0.06	-0.18	-0.02	-0.03
No FTA / No ATPDEA	-0.61	-0.67	-1.36	-0.26	-1.22	-0.03	-0.03	-0.01	-0.02	0.01	0.03
AC-USA-Full liberalization	1.66	-0.20	2.33	0.84	3.58	0.88	0.32	-0.19	-0.30	-0.04	-0.11
AC-USA-excluding sensibles	1.21	0.08	1.62	0.59	2.60	0.68	0.23	-0.12	-0.26	-0.04	-0.08
A.- Imports of goods and services											
AC3-USA-Full liberalization	1.96	-0.47	4.02	2.00	4.32	-0.27	0.14	-0.14	-0.24	-0.04	-0.06
AC3-USA-Full-excluding sensibles	1.40	-0.15	2.77	1.51	3.22	-0.24	0.11	-0.10	-0.21	-0.04	-0.04
No FTA / No ATPDEA	-0.85	-0.91	-1.53	-0.39	-2.07	0.00	-0.02	-0.01	-0.02	0.01	0.05
AC-USA-Full liberalization	3.06	0.43	2.96	1.64	4.17	3.35	0.26	-0.31	-0.34	-0.09	-0.17
AC-USA-excluding sensibles	2.22	0.76	2.16	1.38	3.11	2.29	0.19	-0.21	-0.29	-0.08	-0.12

Source: Authors' calculations based on the basis of GTAP 6.1 simulations

Up to now, Bolivia and Venezuela suffered indirect negative impacts in their macro-variables connected to trade deviation due to AC3 FTAs with USA. To avoid them, these two countries can negotiate their own agreements with USA ***(scenario AC-USA Full liberalization)***; results are mixed and depend on the exclusion of sensible products ***(scenario AC-USA excluding sensible products)***. As GDP is concerned, these scenarios are the worst for AC countries (with the exception of Peru, where the scenario No FTA / No ATPDEA is even worse), and the best for USA. It must be noted that Venezuela did not obtain ATPDEA preferential access from USA - thus it is not affected by their elimination-, and signing a FTA with USA seems not to have macroeconomic advantages (strong raise in imports and reduction of fiscal revenues and GDP). In the case of Bolivia, GDP effects from scenarios FTA versus No FTA / No ATPDEA are similar but if the agreement includes sensible products, results improve. For the rest of the countries in Latin America and the Caribbean this scenario increases the loss of relative preferential access and increase trade deviation, therefore eroding even more the macro-indicators.

Regarding just trade, the AC-USA Full liberalization scenario is the one that strengthens more Andean Community and USA exports and imports, although it is also the most adverse for third countries' trade. It should also be pointed out that Colombia, Ecuador and Peru would reduce their trade benefits in relation to the scenario where just them sign the FTAs (AC3Full liberalization) (see table 7); that Bolivia must exclude sensible products, and; that this is the best scenario for the FTAA area.

b) Intra-subregional trade

It is clear that the ***AC3-USA full liberalization scenario*** increases exports and imports of signing countries and affects negatively third countries as a consequence of the trade creation/erosion processes. The final impact depends on their structure of trade partners and on the new situation of preferential accesses and cost/prices (trade creation and deviation). AC countries concentrate exports to USA market, which represents 40% of total exports; meanwhile intra-subregional Andean Community (AC) trade only represents 10%. Diversification of exports is much higher in Peru than in Colombia or Ecuador, where intra-subregional market is slightly bigger. In the case of Bolivia, shares of exports to AC and to MERCOSUR are bigger than to USA (50% of its exports go to Latin America) (see table 8).

After the FTAs, exports to USA increase by 3.8%, 5.4% and 7.3% in Ecuador, Colombia and Peru, respectively. Additionally, they increase competitiveness against third countries but also competence among them. The first effect allows them to increase export to non-signing AC countries (Bolivia and Venezuela) as well as to the rest of the world; meanwhile the later provokes a reduction of reciprocal exports by around 10%. Bolivia and Venezuela face up to cheaper imports from other AC countries, as well as more competence to put their products in these markets; therefore they divert export from AC markets to others. In sum, intra-subregional AC trade suffers a strong reduction (4.1%). On the other hand, USA increases exports to Colombia, Ecuador and Peru by 43%, 46% and 67%, respectively (see table 9), which implies around 3370 million dollars (USA imports from them rise by 1 billion). USA exports to other countries remain almost the same as well as its total trade.

Table 8

EXPORTS DISTRIBUTION BY MAIN PARTNERS

(Percentages in total exports, baseline 2004)

	Andean Community	MERCOSUR	Rest of Latin America and the Caribbean	United States	European Union	Rest of the world
Andean Community	**10**	**3**	**11**	**40**	**16**	**20**
Bolivia	24	20	4	16	15	21
Colombia	18	2	10	39	20	11
Ecuador	14	2	10	36	19	18
Peru	6	3	7	29	26	30
Venezuela	5	3	13	48	10	21
MERCOSUR	4	13	10	19	25	29
Chile	7	7	5	17	24	39
Mexico	1	1	3	79	7	10
Central America and Caribbean	2	3	12	34	25	23
Unites States	**2**	**3**	**13**	**0**	**30**	**53**
Western Europe	0	1	2	11	55	30
Japan	1	1	3	28	18	50
Asia	0	1	2	23	20	54
Rest of the world	0	1	1	31	26	40

Source: Authors' calculations on the basis of GTAP 6.1simulations

If the FTAs exclude sensible products ***(AC3-USA excluding sensibles scenario)*** AC3 exports to USA just increase by half, meanwhile USA exports to them increase around 10% less than in the full liberalization scenario. Peru continues to be the best destination for USA exports. This scenario is slightly better with regard to intra-AC trade; Bolivia appears as the most favored as its products now face up less competence in the AC-market (its exports decrease now by less than 2% instead of 5%); Venezuela's trade remains without significant changes.

If all the five Andean countries undertake FTAs with the USA ***(AC-USA full liberalization),*** their total exports would increase with the exception of Bolivia. Nevertheless, all AC countries divert trade from the intra-regional market, which suffers a 10% drop, to USA, which increases by 4%. Thus, this scenario shows a bigger fall in the intra-AC trade; AC exports more to the northern country who doubles its exports to the Latin American region despite of increasing less those to Colombia, Ecuador and Peru. As an indirect effect, AC countries also export much more to other trade partners such as MERCOSUR, the rest of LAC, and the EU, jumping 2.3%, 2.7% and 2.6% respectively. On the other hand, other countries, especially LAC, lose market share in the Andean region (for example, Chilean and Mexican exports go down 13% and 19%, respectively). The exclusion of sensible products softens the results but conclusions hardly change.

The last scenario, ***No FTA / No ATPDEA***, changes drastically the results on intra-subregional Andean Community trade. Trade creation disappears and some trade deviation from USA to third trade partners, including intra-AC, becomes visible (see table 9). These effects are stronger in Peru. Venezuela and Bolivia recover a part of their AC market, although only Bolivian exports increase. USA also reduces its imports from Andean Countries, being Peru the most affected. Its exports also decrease slightly, which in terms of its total exports is meaningless.

Table 9

ANDEAN COMMUNITY (AC): COMPETITION IN THE INTRA-SUB REGIONAL MARKET AFTER THREE DIFFERENT SCENARIOS

(Percentage changes in exports from base year 2004)

Origin \ Destination	Bolivia	Colombia	Ecuador	Peru	Venezuela	Intra-AC	USA	Rest of the world	World
Intra-subregional trade under AC3-Full liberalization scenario									
Bolivia		-9.7	-10.4	-8.0	0.3	-5.1	1.5	1.0	-0.4
Colombia	4.6		-9.3	-10.1	4.8	-0.5	5.4	3.0	3.3
Ecuador	3.0	-12.0		-4.9	2.4	-6.3	3.8	1.4	1.2
Peru	3.2	-8.7	-10.3		2.7	-3.6	7.3	2.8	3.7
Venezuela	0.2	-11.6	-8.6	-9.0		-10.3	0.4	0.4	-0.2
Andean Community	3.3	-11.2	-9.3	-7.8	4.1	-4.1	2.8	1.6	1.5
United States	-1.1	43.4	45.8	66.6	-1.0	26.7		-0.2	0.2
Intra-subregional trade under AC Full liberalization scenario									
Bolivia		-9.6	-9.9	-7.0	-10.5	-9.6	6.4	1.8	-0.2
Colombia	-1.7		-7.9	-8.5	-14.4	-11.8	6.8	4.5	2.4
Ecuador	-3.1	-12.4		-4.8	-19.5	-10.9	4.2	1.8	0.9
Peru	-2.8	-9.6	-10.6		-15.1	-10.1	7.7	3.0	3.6
Venezuela	-3.8	-10.1	-6.3	-7.9		-8.8	2.0	0.9	0.9
Andean Community	-2.6	-10.6	-7.9	-7.0	-14.5	-10.7	4.1	2.3	1.7
United States	43.8	41.5	44.6	65.8	54.1	50.5	...	-0.5	0.3
Intra-subregional trade under No FTA / No ATPDEA scenario									
Bolivia		-0.3	0.8	0.1	0.9	0.4	-12.6	2.1	-0.7
Colombia	2.4		2.5	1.4	3.0	2.7	-7.8	2.7	-1.4
Ecuador	-0.2	-1.2		-0.4	1.0	-0.4	-1.6	0.8	-0.3
Peru	5.1	4.5	6.1		6.9	5.7	-18.6	5.8	-1.2
Venezuela	-0.9	-1.2	-0.5	-0.4		-0.9	0.0	0.0	0.0
Andean Community	3.6	-0.5	2.1	0.2	2.9	1.5	-4.4	2.0	-0.6
United States	-1.2	-1.5	-1.0	-2.3	-0.3	-1.0	...	0.0	0.0

Source: Authors' calculations on the basis of GTAP 6.1 simulations

c) Sectoral Impacts

(i) Sectoral impacts on total output

Although there are relevant differences among AC countries, when the region is considered as a whole, heavy manufactures and agricultural products are the most negatively affected in case of FTAs with USA. With the exception of petroleum products, all sectors producing heavy manufactures suffer from the agreements, leading machinery and equipment the falls. Within agricultural products, wheat, plant-based fibers, forestry, oleaginous sheds are the most harmed. Including sensible products in the agreements allow AC countries to mitigate the negative effect on agricultural sectors. Impacts on light manufactures vary from very positive (sugar, if it is not considered sensible by USA) and positive (wearing apparel) to negative (meat products and vegetables oils and fats). The performance of light manufactures also improves when sensible products are excluded in the agreement. Nevertheless, it must be considered that heavy manufactures and services account for most of the productive structure of AC countries as well as of the negative total effect (see table 10).

Table 10

SECTORAL DISTRIBUTION OF TOTAL PRODUCTION VALUE

(Percentages of total productions)

	AC	Bolivia	Colombia	Ecuador	Peru	Venezuela
Agricultural Products	9.1	14.4	10.0	14.8	9.6	7.1
Petroleum and mining	10.2	9.2	7.0	10.2	8.0	13.1
Light manufactures	14.7	15.5	12.0	15.2	21.6	13.4
Heavy manufactures	13.9	8.4	10.9	10.5	14.9	16.2
Services	52.1	52.4	60.1	49.3	45.9	50.2
Total Production	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Authors' calculations on the basis of GTAP 6.1 simulations

Not signing the FTAs plus losing ATPDEA preferences, means to redirect the negative impacts on light manufactures, especially on textiles and wearing apparels whose production would fall by 6% and 9.5%, respectively. Meanwhile, oil, mining and metals sectors get better.

To conclude, the choice whether to sign or not does not depend on the effects on total output (which are similar) but on considerations about winner and loser sectors under each scenario. Let's analyse the effects country by country using variations with respect to the 2004 baseline and sectoral contributions to total changes that weight the real magnitude of effects in each sector. Consolidated results are summarized in table 11.

Table 11

SECTORAL DECOMPOSITION OF CHANGES IN TOTAL PRODUCTION AT MARKET PRICES UNDER DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004 and sectoral contributions)

Scenarios / Main Sectors	AC3-USA Full liberalization		AC3-USA Excluding sensibles		No ATPDEA / No FTA		AC-USA Full liberalization		AC-USA Excluding sensibles	
	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]
Andean Community										
Agricultural Products	-0.6	-0.1	-0.3	0.0	-0.4	0.0	-0.9	-0.1	-0.4	0.0
Petroleum and mining	0.2	0.0	0.2	0.0	0.7	0.1	0.2	0.0	0.2	0.0
Light manufactures	-0.3	0.0	-0.2	0.0	-2.1	-0.3	-0.8	-0.1	-0.4	-0.1
Heavy manufactures	-1.3	-0.2	-1.3	-0.2	0.2	0.0	-2.5	-0.3	-2.2	-0.3
Services	-0.4	-0.2	-0.4	-0.2	-0.5	-0.3	-0.6	-0.3	-0.4	-0.2
Total Production	*-0.5*		*-0.4*		*-0.5*		*-0.8*		*-0.6*	
BOLIVIA										
Agricultural Products	-0.7	-0.1	-0.2	0.0	-0.4	-0.1	-1.4	-0.2	-0.3	-0.7
Petroleum and mining	0.4	0.0	0.1	0.0	1.2	0.1	0.6	0.1	0.0	0.4
Light manufactures	-0.8	-0.1	-0.2	0.0	-2.4	-0.4	-1.2	-0.2	-0.3	-0.8
Heavy manufactures	0.0	0.0	-0.2	0.0	0.6	0.1	-1.0	-0.1	-1.2	0.0
Services	-0.3	-0.2	-0.1	-0.1	-0.7	-0.3	-0.5	-0.2	-0.1	-0.3
Total Production	-0.4		-0.1		-0.6		-0.7		-0.3	-0.4
COLOMBIA										
Agricultural Products	-1.1	-0.1	-0.6	-0.1	-0.5	0.0	-1.4	-0.1	-0.7	-0.1
Petroleum and mining	-0.2	0.0	-0.2	0.0	0.7	0.0	-0.2	0.0	-0.3	0.0
Light manufactures	-0.5	-0.1	-0.2	0.0	-3.6	-0.4	-1.0	-0.1	-0.2	0.0
Heavy manufactures	-1.8	-0.2	-1.8	-0.2	1.0	0.1	-3.0	-0.3	-2.7	-0.3
Services	-0.6	-0.4	-0.5	-0.3	-0.8	-0.5	-1.2	-0.7	-0.9	-0.5
Total Production	-0.8		-0.6		-0.8		-1.3		-1.0	
ECUADOR										
Agricultural Products	-0.4	-0.1	-0.1	0.0	0.0	0.0	-0.5	-0.1	-0.1	0.0
Petroleum and mining	-0.3	0.0	-0.4	0.0	0.1	0.0	-0.3	0.0	-0.4	0.0
Light manufactures	-0.6	-0.1	-0.2	0.0	-1.1	-0.2	-0.8	-0.1	-0.3	0.0
Heavy manufactures	-3.3	-0.3	-3.3	-0.3	0.2	0.0	-4.1	-0.4	-3.6	-0.4
Services	-0.5	-0.2	-0.4	-0.2	-0.3	-0.2	-0.7	-0.4	-0.5	-0.2
Total Production	-0.8		-0.6		-0.3		-1.0		-0.7	
PERU										
Agricultural Products	-0.4	0.0	-0.3	0.0	-1.1	-0.1	-0.5	0.0	-0.4	0.0
Petroleum and mining	1.4	0.1	1.5	0.1	3.6	0.3	1.4	0.1	1.5	0.1
Light manufactures	0.1	0.0	-0.1	0.0	-4.2	-0.9	0.0	0.0	-0.1	0.0
Heavy manufactures	-2.8	-0.4	-2.7	-0.4	0.1	0.0	-2.9	-0.4	-2.8	-0.4
Services	-0.3	-0.1	-0.3	-0.1	-1.3	-0.6	-0.4	-0.2	-0.4	-0.2
Total Production	-0.5		-0.5		-1.3	-1.3	-0.6	-0.6	-0.5	-0.5
VENEZUELA										
Agricultural Products	-0.3	0.0	-0.2	0.0	0.0	0.0	-0.8	-0.1	-0.3	0.0
Petroleum and mining	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Light manufactures	-0.3	0.0	-0.2	0.0	-0.1	0.0	-1.3	-0.2	-0.8	-0.1
Heavy manufactures	-0.4	-0.1	-0.4	-0.1	0.0	0.0	-2.1	-0.3	-1.5	-0.2
Services	-0.3	-0.1	-0.2	-0.1	0.0	0.0	-0.2	-0.1	-0.2	-0.1
Total Production	-0.3		-0.2		0.0		-0.6		-0.4	

[a] Shows the change in exports of each sector group considering its weigh in total production.

Source: Authors' calculations on the basis of GTAP 6.1 simulations

- **Bolivia**

In the case of Bolivia the worst scenarios are AC-USA and No FTA / No ATPDEA, although the affected sectors differ[17]. Signing the FTAs has negative effects on the agricultural sectors (particularly oleaginous sheds) and light manufactures (specially other food products). Excluding sensible product from the FTA can reduce them. Yet, the lack of FTA strongly deteriorates textiles and wearing apparel[18], driving the structure of the Bolivian economy towards heavy manufactures, oil, mining and metals. If Bolivia is just an observer of the AC3-USA FTAs, its light manufactures and agricultural products are indirectly affected in negative terms.

- **Colombia**

In the case of Colombia, the best scenario implies signing the FTA, excluding its sensible products, because it would minimize the negative impact on the agricultural products and light manufactures. The lack of a FTA implies a negative shock in light manufactures but a positive effect on heavy manufactures (particularly machinery and equipments and chemical, rubber and plastic products, due to the reduction of US products competence).

- **Ecuador**

Concerning Ecuador, a FTA with USA would deteriorate the value of the output of all aggregated sectors, in particular heavy manufactures. Even though those impacts can be partially mitigate by excluding sensible products, not signing the FTA is the best option for all but light manufactures (in particular, textiles and wearing apparel could fall by 8%). As many Andean countries sign the FTAs with USA inferior are the impacts on Ecuador, as it would lose part of the advantages of preferential access coming from its agreement.

- **Peru**

Peru bears the smallest adverse effect when signing the FTAs. In fact, in terms of output, not signing and lose the ATPDEA preferences is the worst case scenario. Nevertheless, impacts at sectoral level change dramatically depending on the scenario. The FTA deteriorate heavy manufactures -chemical, rubber and plastic products, machinery and equipments and other manufactures account for 50% of the total negative effect- and agricultural sectors. The no-FTA scenario affects negatively mainly textiles and wearing apparel as well as services; meanwhile mining products and metals increase output.

- **Venezuela**

Venezuela did not receive ATPDEA benefits, therefore the scenario No FTA / No ATPDEA has not relevant impacts. Signing the FTA with USA has negative effects on all sectors but oil and mining.

Finally, just mention that the behavior of **production for the domestic market** is quite similar to the total output, although impacts present a smoother distribution among sectors. Machinery and equipments experiences the biggest reduction, from 6% in Bolivia and Peru to 9% in Colombia and Ecuador (see table 12 and Annex 5). As it will be shown later on, this sector undergoes the biggest increment of imports due to the FTAs.

[17] It must be considered that Bolivia just sign the FTA with USA in the AC-USA scenarios and it maintains the ATPDEA preferences unless none of the AC countries sign the FTAs.

[18] In La Paz, the surrounding area called "El Alto" hosted to over 5 000 enterprises (mainly small and micro), including textile and apparel, jewelry and others, which are granted by ATPDEA preferences. La Paz, Cochabamba and Santa Cruz are important locations of suppliers of textile and apparel products to USA (USITC, 2005).

Table 12

SECTORAL DECOMPOSITION OF CHANGES IN PRODUCTION FOR DOMESTIC MARKET AT MARKET PRICES UNDER DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004 and sectoral contributions)

Scenarios / Main Sectors	AC3-USA Full liberalization		AC3-USA Excluding sensibles		No ATPDEA / No FTA		AC-USA Full liberalization		AC-USA- Excluding sensibles	
	Changes	Contribu-tion [a]	Changes	Contribu-tion [a]	Changes	Contribu-tion [a]	Changes	Contribu-tion [a]	Changes	Contribu-tion [a]
Andean Community										
Agricultural Products	-0.8	-0.1	-0.5	0.0	-0.5	0.0	-1.2	-0.1	-0.6	-0.1
Petroleum and mining	-0.4	0.0	-0.4	0.0	0.3	0.0	-0.6	0.0	-0.6	0.0
Light manufactures	-0.9	-0.1	-0.5	-0.1	-0.9	-0.1	-1.5	-0.2	-0.8	-0.1
Heavy manufactures	-1.7	-0.2	-1.7	-0.2	0.0	0.0	-3.1	-0.4	-2.7	-0.3
Services	-0.4	-0.3	-0.4	-0.2	-0.6	-0.3	-0.6	-0.4	-0.5	-0.3
Total Production	**-0.7**		**-0.6**		**-0.5**		**-1.1**		**-0.8**	
Bolivia	-0.4		-0.1		-0.6		-0.7		-0.3	
Colombia	-1.2		-1.0		-0.8		-1.7		-1.3	
Ecuador	-1.2		-0.9		-0.3		-1.4		-1.0	
Peru	-0.9		-0.8		-1.3		-1.0		-0.9	
Venezuela	-0.3		-0.2		0.0		-0.8		-0.6	

[a] Shows the change in exports of each sector group considering its weigh in total production for domestic market

Source: Authors' calculations on the basis of GTAP 6.1 simulations

(ii) Sectoral impacts on exports

FTAs have a very positive impact on trade in all scenarios, both for AC and USA, and for all sectoral groups, especially in the case of light manufactures. Nevertheless, there are strong differences among specific sectors in the AC. In the case of full liberalization scenarios, sugar double exports, transport equipments exports raise by 10%, wheat, milk, and wearing apparel by 6%, meanwhile cereal grains, rice and oleaginous sheds fall by between 3% and 6%. More balance sectoral effects can be obtained excluding sensible products from the agreement. Although exports of all AC countries rely mainly on petroleum and mining, there are also relevant differences among their exports patterns, which tinge the results depending on the scenarios (AC-USA versus AC3-USA).

No FTA / No ATPDEA scenario provokes a fall of AC exports, which is stronger among light manufactures (in particular, exports of textiles and wearing apparel drop by more than 20% and 40% respectively). This effect is compensated partially by the raise of petroleum, mining and heavy manufactures exports.

In the case of **Bolivia**, the best scenario in AC-USA excluding sensible products; although in all alternatives, the raise of its total exports are low. Light manufactures are always affected negatively, although the specific sectors differ according to the scenario (vegetable oils and other food, in AC5, and textile and wearing apparel, in No FTA / No ATPDEA). Agricultural sectors also suffer from a FTA. Given the weight of mining and metals in the Bolivian economy, the positive impact on them influences the final total effect on exports.

Concerning exports, after Peru, **Colombia** is the most favored by a FTA with USA. When only AC3 agree, Colombia takes more advantage of further market access in USA. Meanwhile, not signing is the worst scenario. Under the agreement, export expansion is explained by light manufactures and, in smaller degree, heavy manufactures. More competence, i.e., an AC5 scenario, hurts the FTA positive impact on heavy manufactures exports. If Colombia decides not to sign, exports of wearing apparel, textiles and leather products will suffer.

Ecuador raises its exports less than other AC countries with the agreement, but also reduces them less than others under the No-FTAs scenario. Light manufactures profit more from the FTA, but also suffer more from the No-FTAs scenario. Heavy manufactures experience the opposite result. The impacts on the Ecuadorian export sectors vary widely (amount and sign) along with the four FTA scenarios. These changes between winners and losers are not so stressed in Colombia and Peru. Finally if Ecuador decides against a FTA with USA (also losing ATPDEA preferences), textiles and wearing apparel exports would fall by 14% and 48%, respectively.

Peru takes advantage from the FTA, thanks to sugar (when USA does not include it as sensible product), other food products and mining and metals; other sectors, less relevant in Peruvian exports structure, also experience positive impacts above 5% (rice, wheat, milk and other manufactures). The FTA deteriorates only three sectors: oleaginous seeds (if it is not considered sensible), and machinery and equipment and transport equipment (the last, if all AC sign the agreements). The No FTA / No ATPDEA scenario has an awful impact on Peruvian exports, which concentrates on light manufactures, particularly, textile and wearing apparel.

Venezuelan exports are negatively affected by other's AC-USA FTAs, with the exception of petroleum and mining sectors. If Venezuela also joins to the FTAs, the last sectors, together with some heavy manufactures, explain the positive effect on exports. Nevertheless, the biggest positive variations are experienced by sectors such as milk, wearing apparel, leather products, etc. Other cereal grains and meat, not relevant sectors in Venezuelan exports, show the biggest drops. Not signing the FTA does not have direct impacts on Venezuela as this country has not the ATPDEA benefit.

Table 13

SECTORAL DECOMPOSITION OF CHANGES IN EXPORTS UNDER DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004 and sectoral contributions)

Scenarios / Main Sectors	AC3-USA Full liberalization		AC3-USA Excluding sensibles		No ATPDEA / No FTA		AC-USA Full liberalization		AC-USA-Excluding sensibles	
	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]
Andean Community										
Agricultural Products	1.1	0.1	0.9	0.1	0.5	0.0	1.6	0.1	1.2	0.1
Petroleum and mining	0.8	0.3	0.7	0.3	1.1	0.5	1.1	0.5	1.0	0.4
Light manufactures	5.4	0.8	2.3	0.3	-12.4	-1.5	5.3	0.8	2.9	0.4
Heavy manufactures	0.7	0.2	0.6	0.1	1.4	0.3	0.4	0.1	0.4	0.1
Services	1.2	0.1	1.1	0.1	1.9	0.2	1.9	0.2	1.5	0.2
Total Exports	1.5	1.5	1.0	1.0	-0.6	-0.6	1.7	1.7	1.2	1.2
BOLIVIA										
Agricultural Products	-1.8	-0.1	-0.7	0.0	1.1	0.1	-2.2	-0.1	-0.6	0.0
Petroleum and mining	0.7	0.3	0.2	0.1	1.8	0.7	1.3	0.5	0.4	0.2
Light manufactures	-2.2	-0.7	-0.3	-0.1	-7.0	-2.0	-3.3	-1.0	-0.4	-0.1
Heavy manufactures	0.3	0.0	-0.8	-0.1	3.9	0.5	2.1	0.2	0.2	0.0
Services	0.8	0.1	0.3	0.0	1.8	0.3	1.3	0.2	0.5	0.1
Total Exports	-0.4	-0.4	-0.1	-0.1	-0.7	-0.7	-0.2	-0.2	0.1	0.1
COLOMBIA										
Agricultural Products	1.9	0.3	1.2	0.2	0.4	0.1	2.5	0.4	1.7	0.2
Petroleum and mining	1.1	0.3	1.0	0.3	1.4	0.4	1.4	0.4	1.1	0.3
Light manufactures	8.6	1.6	3.4	0.6	-16.3	-2.4	7.5	1.4	4.3	0.8
Heavy manufactures	3.7	0.9	3.4	0.8	2.8	0.7	-0.8	-0.2	-0.1	0.0
Services	1.7	0.2	1.5	0.2	2.3	0.4	3.1	0.5	2.4	0.3
Total Exports	3.3	3.3	2.1	2.1	-1.4	-1.4	2.3	2.3	1.6	1.6
ECUADOR										
Agricultural Products	0.5	0.1	0.6	0.2	0.2	0.1	0.7	0.2	0.7	0.2
Petroleum and mining	0.4	0.1	0.3	0.1	0.3	0.1	0.6	0.1	0.4	0.1
Light manufactures	3.7	0.8	1.9	0.4	-2.7	-0.6	3.6	0.8	1.8	0.4
Heavy manufactures	-0.7	-0.1	-0.8	-0.1	0.8	0.1	-4.9	-0.5	-2.2	-0.2
Services	1.0	0.2	0.8	0.1	0.7	0.1	1.4	0.2	0.9	0.2
Total Exports	1.1	1.1	0.7	0.7	-0.3	-0.3	0.8	0.8	0.6	0.6
PERU										
Agricultural Products	0.9	0.0	1.2	0.1	2.3	0.1	0.9	0.1	1.1	0.1
Petroleum and mining	3.2	1.3	3.3	1.3	6.0	2.6	3.3	1.3	3.3	1.3
Light manufactures	6.2	1.9	2.5	0.7	-17.2	-4.2	6.1	1.8	2.6	0.8
Heavy manufactures	3.5	0.3	3.6	0.3	6.9	0.7	2.0	0.2	2.1	0.2
Services	1.4	0.2	1.4	0.2	4.1	0.7	1.6	0.2	1.6	0.2
Total Exports	3.7	3.7	2.7	2.7	-1.2	-1.2	3.6	3.6	2.6	2.6
VENEZUELA										
Agricultural Products	-0.6	0.0	0.3	0.0	-0.2	0.0	2.1	0.0	2.4	0.0
Petroleum and mining	0.2	0.1	0.1	0.1	0.0	0.0	0.6	0.4	0.5	0.3
Light manufactures	-1.5	0.0	0.1	0.0	-0.5	0.0	3.4	0.1	3.8	0.1
Heavy manufactures	-1.1	-0.3	-1.1	-0.3	0.0	0.0	1.3	0.3	0.8	0.2
Services	0.6	0.0	0.6	0.0	0.1	0.0	0.8	0.0	0.7	0.0
Total Exports	-0.2	-0.2	-0.2	-0.2	0.0	0.0	0.9	0.9	0.7	0.7

[a] Shows the change in exports of each sector group considering its weigh in total exports.

Source: Authors' calculations on the basis of GTAP 6.1 simulations

(iii) Sectoral impacts on imports

Impacts on imports are bigger than on exports in Andean countries. This result explains part of the negative change rate of the GDP within some simulated scenarios (see section 4a). Heavy manufactures and, at less degree, light manufactures, account for most of the traditional imports of the region. The AC3-USA FTA scenario implies a relevant increase of imports of agricultural products (especially wheat), light manufactures (meat, wearing apparel and textile) and heavy manufactures (machinery and equipment, other manufactures, chemical, plastic and rubber products). The latter explains most of the increments. If the FTA excludes sensible products, it is possible to mitigate the raise of imports of most agricultural products and some light manufactures. If all AC sign FTAs, the effect is similar but the scale is bigger. The NO FTA / NO ATPDEA scenario implies a fall of imports connected with the general fall down of trade.

For all AC countries a FTA with USA implies an increase of imports of heavy manufactures, principally, which are mostly capital goods and represent positive long-term impacts on the economy. This outcome is not contemplated in these comparative static simulations. As it will be shown in section 4.d (iii), we need to include some sort of capital accumulation behavior in the model in order to account long-term impacts. In Bolivia, main imports are machinery and equipment, motor vehicles and parts, and other manufactures. In Colombia, the increase of imports affects all major groups of sectors (heavy and light manufactures and agricultural products), with special impacts on other manufactures, machinery and equipment, chemical products, wearing apparels, textiles, and meat. In Peru, heavy manufactures explain almost all the effect (in particular chemical products, machinery and equipment and transport equipments), although the biggest increments are accomplished by agricultural products and some light manufactures such as meat. In the case of Venezuela, heavy manufactures again explain the raise in imports.

The No APTDEA / No FTA scenario has low negative impacts on imports, which are quite balanced among sectors. Textiles in Colombia and, machinery and equipment, other manufactures, chemical products, motor vehicles and parts, other food and textiles in Peru, have negative impacts to be noticed.

Table 14

SECTORAL DECOMPOSITION OF CHANGES IN IMPORTS UNDER DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004 and sectoral contributions)

Scenarios / Main Sectors	AC3-USA-Full liberalization		AC3-USA-excluding sensibles		No ATPDEA / No FTA		AC-USA-Full liberalization		AC-USA-excluding sensibles	
	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]	Changes	Contribution [a]
Andean Community										
Agricultural Products	3.6	0.2	0.6	0.0	-0.7	0.0	4.2	0.2	0.7	0.0
Petroleum and mining	0.6	0.0	0.7	0.0	-0.3	0.0	1.6	0.1	1.9	0.1
Light manufactures	3.7	0.5	0.6	0.1	-1.9	-0.2	4.5	0.5	0.8	0.1
Heavy manufactures	2.4	1.4	2.3	1.4	-0.6	-0.4	4.1	2.4	3.6	2.2
Services	-0.9	-0.1	-0.8	-0.1	-1.2	-0.2	-1.4	-0.2	-1.1	-0.2
Total Imports	**2.0**	**2.0**	**1.4**	**1.4**	**-0.9**	**-0.9**	**3.1**	**3.1**	**2.2**	**2.2**
BOLIVIA										
Agricultural Products	-1.7	-0.1	-0.4	0.0	-0.8	-0.1	-2.3	-0.1	-0.4	0.0
Petroleum and mining	-0.2	0.0	-0.1	0.0	-0.1	0.0	0.7	0.1	0.8	0.1
Light manufactures	-0.5	-0.1	-0.1	0.0	-1.8	-0.3	-0.1	0.0	-0.1	0.0
Heavy manufactures	-0.3	-0.2	-0.1	-0.1	-0.7	-0.4	1.2	0.7	1.4	0.8
Services	-0.6	-0.1	-0.2	0.0	-1.3	-0.2	-1.0	-0.1	-0.4	0.0
Total Imports	**-0.5**	**-0.5**	**-0.1**	**-0.1**	**-0.9**	**-0.9**	**0.4**	**0.4**	**0.8**	**0.8**
COLOMBIA										
Agricultural Products	6.0	0.4	0.7	0.0	-1.2	-0.1	5.3	0.3	0.5	0.0
Petroleum and mining	2.4	0.2	2.5	0.2	-0.6	0.0	1.1	0.1	1.5	0.1
Light manufactures	9.6	1.1	2.0	0.2	-4.4	-0.5	8.6	1.0	1.5	0.2
Heavy manufactures	4.5	2.6	4.4	2.6	-1.1	-0.6	3.5	2.0	3.8	2.2
Services	-1.3	-0.2	-1.1	-0.2	-1.7	-0.3	-2.3	-0.4	-1.8	-0.3
Total Imports	**4.0**	**4.0**	**2.8**	**2.8**	**-1.5**	**-1.5**	**3.0**	**3.0**	**2.2**	**2.2**
ECUADOR										
Agricultural Products	3.1	0.1	1.6	0.1	-0.3	0.0	2.9	0.1	1.5	0.1
Petroleum and mining	-0.4	0.0	-0.3	0.0	0.0	0.0	-1.2	-0.1	-0.5	0.0
Light manufactures	5.5	0.6	0.7	0.1	-0.7	-0.1	5.2	0.5	0.6	0.1
Heavy manufactures	2.5	1.6	2.4	1.6	-0.3	-0.2	2.2	1.4	2.3	1.5
Services	-1.4	-0.2	-1.0	-0.1	-0.8	-0.1	-2.0	-0.3	-1.2	-0.2
Total Imports	**2.0**	**2.0**	**1.5**	**1.5**	**-0.4**	**-0.4**	**1.6**	**1.6**	**1.4**	**1.4**
PERU										
Agricultural Products	7.2	0.6	1.3	0.1	-1.1	-0.1	7.0	0.6	1.2	0.1
Petroleum and mining	0.7	0.1	0.7	0.1	-0.5	-0.1	0.6	0.1	0.6	0.1
Light manufactures	5.1	0.5	0.3	0.0	-3.6	-0.4	4.9	0.5	0.2	0.0
Heavy manufactures	6.6	3.4	6.3	3.3	-2.0	-1.0	6.4	3.3	6.2	3.2
Services	-0.8	-0.2	-0.9	-0.2	-2.6	-0.5	-1.0	-0.2	-1.0	-0.2
Total Imports	**4.3**	**4.3**	**3.2**	**3.2**	**-2.1**	**-2.1**	**4.2**	**4.2**	**3.1**	**3.1**
VENEZUELA										
Agricultural Products	-0.2	0.0	-0.2	0.0	0.0	0.0	2.3	0.1	0.3	0.0
Petroleum and mining	-0.3	0.0	-0.2	0.0	0.0	0.0	3.9	0.3	4.1	0.3
Light manufactures	-0.2	0.0	-0.2	0.0	0.0	0.0	2.3	0.3	0.8	0.1
Heavy manufactures	-0.2	-0.1	-0.2	-0.1	0.0	0.0	4.5	2.8	3.2	2.0
Services	-0.5	-0.1	-0.5	-0.1	0.0	0.0	-0.8	-0.1	-0.6	-0.1
Total Imports	**-0.3**	**-0.3**	**-0.2**	**-0.2**	**0.0**	**0.0**	**3.3**	**3.3**	**2.3**	**2.3**

[a] Shows the change in exports of each sector group considering its weigh in total imports.

Source: Authors' calculation on the basis of GTAP 6.1 simulations

(iv) Sectoral impacts on trade between AC and USA

USA is the most important trade partner of the AC. Main exports of the AC to the northern country are petroleum and mining (54%), heavy manufactures (21%) and light manufactures (13%). Oil and petroleum-based products represent 56% of AC exports to USA; although metals, wearing apparels, other crops, and chemical products are also relevant. On the other side, AC countries import heavy manufactures from USA (more than 70% of the total); machinery and equipments (which can be considered as capital good and it is, in fact, the main import product), chemical, rubber and plastic products and other manufactures account for more than 60% all together. Differences among impacts on total exports and imports and those with USA are very low and they are just a matter of levels. Taking into consideration the changes with regard to baseline 2004, trade results are summarized in table 15 (total versus to USA) and 16[19] (sectoral trade between the AC and USA under different scenarios).

Table 15

AC3 – USA (FULL LIBERALIZATION): BREAKDOWN OF TRADE EFFECTS BY SECTOR GROUPS

(Percentage changes with respect to baseline 2004)

Trade Flows / Sectors	AC Exports		AC Imports	
	World	To USA	World	From USA
Agricultural Products	1.1	1.6	3.6	36.9
Petroleum and mining	0.8	0.7	0.6	31.5
Light manufactures	5.4	13.0	3.7	67.2
Heavy manufactures	0.7	2.6	2.4	27.3
Services	1.2	1.4	-0.9	-1.0
Total (all sectors)	**1.5**	**2.8**	**2.0**	**26.7**

Source: Authors' calculations on the basis of GTAP 6.1 simulations

Table 16

TRADE WITH THE UNITED STATES. SIMULATION RESULTS FOR THE ANDEAN COMMUNITY AS A SINGLE BLOCK

(Percentage changes with respect to baseline 2004)

Trade Flows / Sectors	AC-USA Full liberalization	AC-USA Excluding sensibles	AC3-USA (Full liberalization)		AC3-USA Excluding sensibles	No ATPDA / No FTA
				Structure [a]		
EXPORTS to the United States						
Agricultural Products	2.5	1.6	1.6	7.6%	1.1	-1.4
Petroleum and mining	1.4	1.3	0.7	53.7%	0.7	0.5
Light manufactures	15.3	5.4	13.0	12.7%	4.1	-38.1
Heavy manufactures	5.3	4.7	2.6	21.0%	2.5	0.7
Services	2.2	1.8	1.4	5.0%	1.3	2.0
Total exports	**4.1**	**2.6**	**2.8**	**100.0%**	**1.6**	**-4.4**
IMPORTS from the United States [b]						
Agricultural Products	50.4	8.4	36.9	6.1%	5.9	-0.7
Petroleum and mining	74.3	75.1	31.5	3.9%	31.6	-0.7
Light manufactures	114.9	22.9	67.2	5.8%	12.3	-2.9
Heavy manufactures	53.5	46.5	27.3	71.3%	26.1	-0.9
Services	-1.7	-1.3	-1.0	13.0%	-0.9	-1.2
Total imports	**50.5**	**37.7**	**26.7**	**100.0%**	**20.8**	**-1.0**

[a] Trade structure in the baseline 2004; [b] Imports from USA were calculated as export from USA to each AC partner.

Source: Authors' calculations on the basis of GTAP 6.1 simulations

[19] Country results are presented in Annex 5A, 5B and 5C.

d) Welfare effects

As in most CGE studies, welfare effects are estimated through the equivalent variation. Details about its calculation can be seen in Schuschny, Durán y de Miguel (2006). 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, it is necessary to filter their welfare impacts in order to calculate accurately the net estimation of welfare connected directly to the AC-USA FTAs.

It must be noted that the benefits attained by Bolivia, Colombia, Ecuador and Peru as a consequence of the preferences granted by the USA through the ATPDEA became already visible from the period 2001-2004. Accordingly, we analyze the equivalent variation (in million of 2001 dollars and as percentage of GDP) obtained at the benchmark (2004) and in all other simulated scenarios, with the final purpose of calculating the net effects that each scenario could cause. Estimations of welfare impacts are complemented with a systematic sensitivity analysis for the AC3-USA full liberalization scenario as well as with two "steady-like state" simulations under the AC3-USA full liberalization and the No FTA / No ATPDEA scenarios.

(i) Welfare effects of the FTAs between AC countries and the Unites States

As it can be seen in the **benchmark equilibrium** (2004), those countries of the Andean Community which benefit from preferences of the ATPDEA have reached improvements in their welfare levels that represent about 0.1% of their GDP, with the exception of Peru that leads up to 0.2%. Moreover, Chile -a country that signed significant FTAs with its main trade partners (e.g. USA, European Union, Korea, and other LAC countries)- has confirmed a large increase on its welfare levels which represents 1.1% of its GDP and triplicates the one obtained by the whole Andean Community. The rest of the LAC countries have borne a loss of relative competitiveness (or trade erosion from previous attained preferences) mainly in the USA and the European markets, especially if we compare them with those countries that achieve new preferential access during the period 2001-2004. Thus, MERCOSUR, Mexico and Central America and the Caribbean underwent slight welfare reductions. Anyway, these reductions are not really significant with regards to their respective levels of GDP. All of these effects can be explained mainly by the changes in the terms of trade. Within the Andean Community, Ecuador is the only country where resources allocation has an influence comparable with the terms of trade's one in the total welfare effect.

We can add to all previous effect those coming from the **implementation of the FTAs** between Colombia, Ecuador and Peru with the USA -assuming also that Bolivia prorogues the completion of the ATPDEA-. Then, the accumulated effects on welfare turn out to be negative in Ecuador and in Colombia, even excluding sensible products. In both countries, the negative effect on terms of trade leads the welfare reduction. Nevertheless, the effect due to efficiency in resource allocation keeps on positive in Ecuador. In this country the negative effect on its terms of trade is caused by sectors such as other foods, other manufactures and livestock, while in Colombia it is connected to all types of heavy manufactures, textiles, wearing apparels and other food products. In the other hand, cereal grains (especially in Colombia), petroleum and motor vehicles and parts (the latter, in Ecuador) push against this negative effect on welfare.

In the case of Peru, the effects on welfare stay positive, although it gets worse with regard to the previous benchmark baseline. Nevertheless, the net negative effect caused by the FTA is due to a fall of the terms of trade, since the allocation of resources even reaches improvements. It is important to note that these three Andean countries are already beneficiaries of an agreement of unilateral preferences granted by the USA, the APTDEA (Andean Trade Promotion and Drug Eradication Act), so FTAs entail greater relative tariff concessions by them to USA. Finally, on the other hand, USA achieves a tiny improvement of welfare.

Table 17

WELFARE EFFECTS OF THE "AC3 – USA" AND "NO FTA / NO ATPDEA" SCENARIOS

(Comparison of the equivalent variations, in million 2001 dollar and as 2004 GDP percentage)

	Baseline 2004	Full liberalization		Excluding sensibles		No ATPDEA / No FTA	
	Million US$	Million US$	% of GDP	Million US$	% of GDP	Million US$	% of GDP
LAC	**864**	**422**	**0.0%**	**529**	**0.0%**	**644**	**0.0%**
LAC (excl. Mex.& Chile)	85	-285	0.0%	-191	0.0%	-150	0.0%
Andean Community	**229**	**-27**	**0.0%**	**26**	**0.0%**	**-27**	**0.0%**
Bolivia	10	6	0.1%	9	0.1%	2	0.0%
Colombia	88	-75	-0.1%	-40	0.0%	-7	0.0%
Ecuador	20	-11	-0.1%	-3	0.0%	5	0.0%
Peru	121	78	0.1%	85	0.2%	-21	0.0%
Venezuela	-10	-24	0.0%	-25	0.0%	-6	0.0%
MERCOSUR	**-90**	**-179**	**0.0%**	**-151**	**0.0%**	**-98**	**0.0%**
Argentina	-42	-78	0.0%	-57	0.0%	-45	0.0%
Brazil	-42	-92	0.0%	-86	0.0%	-46	0.0%
Uruguay	-6	-8	0.0%	-8	0.0%	-7	0.0%
Chile	**784**	**757**	**1.1%**	**760**	**1.1%**	**782**	**1.1%**
Mexico	-5	-50	0.0%	-40	0.0%	12	0.0%
Central America and the Caribbean	-53	-79	0.0%	-66	0.0%	-25	0.0%
United States	**-287**	**472**	**0.0%**	**341**	**0.0%**	**-183**	**0.0%**
EU15+PECOS+EFTA	752	607	0.0%	612	0.0%	790	0.0%
Japan	-104	-165	0.0%	-146	0.0%	-92	0.0%
Asia	-171	-269	0.0%	-241	0.0%	-83	0.0%
Rest of the World	-48	-196	0.0%	-165	0.0%	-68	0.0%
World	**1005**	**872**	**0.0%**	**930**	**0.0%**	**1009**	**0.0%**

Note: Equivalent Variation of the accumulated effects since the original baseline year 2001

Source: Authors, based on GTAP 6.1 simulations

Table 18:

DECOMPOSITION OF THE WELFARE EFFECTS OF THE 2004 BENCHMARK AND THE "AC3 – USA" SCENARIOS

(in million 2001 dollar)

	BENCHMARK 2004				AC3 - USA (FULL LIBERALIZATION)				NET EFFECT			
	Equivalent variation	Allocation of resources	Terms of trade	Saving-Investment	Equivalent variation	Allocation of resources	Terms of trade	Saving - Inverstment	Equivalent variation	Allocation of resources	Terms of trade	Saving - Inverstment
LAC	864	152	730	-18	422	45	418	-41	-442	-107	-312	-23
LAC (exclud. Mex & Chile)	85	25	62	-2	-285	-85	-175	-25	-370	-110	-237	-23
Andean Community	229	60	160	9	-27	-18	-2	-7	-256	-79	-162	-16
Bolivia	10	1	7	2	6	0	4	1	-4	-1	-3	-1
Colombia	88	15	69	4	-75	-45	-24	-6	-163	-60	-93	-10
Ecuador	20	8	9	2	-11	1	-5	-7	-31	-7	-14	-9
Peru	121	25	93	2	78	33	44	1	-43	7	-49	-1
Venezuela	-10	11	-19	-1	-24	-7	-22	4	-15	-17	-2	5
MERCOSUR	-90	-24	-68	2	-179	-48	-130	0	-89	-24	-63	-2
Chile	784	65	744	-26	757	62	718	-23	-27	-3	-27	3
Mexico	-5	62	-76	10	-50	68	-124	7	-45	6	-48	-3
Central America & the Caribbean	-53	-11	-30	-13	-79	-18	-42	-18	-26	-7	-13	-5
United States	-287	-14	-178	-96	472	4	416	53	759	18	593	148
EU15+PECOS+EFTA	752	931	-217	39	607	917	-309	-2	-145	-13	-91	-41
Japan	-104	-16	-103	16	-165	-27	-128	-11	-61	-10	-25	-26
Asia	-171	-34	-186	49	-269	-46	-231	8	-97	-11	-45	-41
Rest of the World	-48	-6	-54	12	-196	-15	-174	-7	-148	-10	-120	-18
World	1005	1013	-9	0	872	879	-7	0	-133	-135	1	0

Note: Equivalent Variation of the accumulated effects since the original baseline year 2001

Source: Authors, based on GTAP 6.1 simulations

The most probable alternative situation to the AC3 - USA scenario implies the No FTA / No ATPDEA scheme, which means the loss of the preferences attained by the ATPDEA that will cease by the end of 2006. This fact could imply a net loss of the welfare ranging from 0.1% of the GDP, in the cases of Colombia and Ecuador, to 0.3% in Peru, -always with regard to the 2004 baseline-. If we compare all the simulated situations (signing or not the FTAs, with or without sensible products), in terms of welfare the worst scenario for Colombia and Ecuador would be an implementation of the FTA with the United States that does not consider the exclusion of sensible products. For Peru and the United States, the worst scenario would be not to sign a FTA, which also includes the end of the ATPDEA preferences.

Table 19:

NET WELFARE EFFECTS OF THE "AC3 – USA" AND "NO FTA / NO ATPDEA" SCENARIOS

(in million 2001 dollar with regard to the 2004 baseline scenario and as percentage of the 2004 GDP)

	AC3 – USA (Full liberalization)		AC3 - USA (Excluding sensibles)		No FTA / No ATPDEA	
	Million US$	% of GDP	Million US$	% of GDP	Million US$	% of GDP
LAC	**-442**	**0.0%**	**-335**	**0.0%**	**-220**	**0.0%**
LAC (excl. Mex. y Chile)	-370	0.0%	-276	0.0%	-235	0.0%
Andean Community	**-256**	**-0.1%**	**-203**	**-0.1%**	**-255**	**-0.1%**
Bolivia	-4	-0.1%	-1	0.0%	-9	-0.1%
Colombia	-163	-0.2%	-128	-0.2%	-95	-0.1%
Ecuador	-31	-0.2%	-23	-0.1%	-14	-0.1%
Peru	-43	-0.1%	-35	-0.1%	-141	-0.3%
Venezuela	-15	0.0%	-15	0.0%	4	0.0%
MERCOSUR	**-89**	**0.0%**	**-61**	**0.0%**	**-8**	**0.0%**
Chile	**-27**	**0.0%**	**-24**	**0.0%**	**-2**	**0.0%**
Mexico	-45	0.0%	-35	0.0%	17	0.0%
Central America & Caribbean	-26	0.0%	-13	0.0%	28	0.0%
United States	**759**	**0.0%**	**628**	**0.0%**	**105**	**0.0%**
EU15+PECOS+EFTA	-145	0.0%	-140	0.0%	38	0.0%
Japan	-61	0.0%	-42	0.0%	12	0.0%
Asia	-97	0.0%	-70	0.0%	88	0.0%
Rest of the World	-148	0.0%	-117	0.0%	-20	0.0%
World	-133	0.0%	-75	0.0%	4	0.0%

Note: The net effect is the difference between each considered scenario and the 2004 baseline benchmark

Source: Authors based on GTAP 6.1 simulations

When we make a comparison between the increases or reductions of the net welfare in each of the five simulated scenarios, that is, the three previous cases and the two cases where we include Bolivia and Venezuela as potential FTA partners of the USA (with and without sensible products), the outcomes show some modest variations. The worst scenario for Peru is still not to sign the FTA and, as a consequence, to lose the ATPDEA preferences, but the best alternative is to sign excluding the sensible products while Bolivia and Venezuela do not sign. Not to sign appears as the best simulated option for Colombia and Ecuador; whereas the worst one is to sign without excluding sensible products when the five Andean countries do it, since in this case they both lose part of the relative access advantages to the USA market. In the case of Bolivia, there is not such a difference between not to sign and to sign (when all the five Andean countries sign). The best simulated scenario for the USA arises when the full liberalization scheme takes place, i.e., when the five Andean countries sign the FTAs without the sensible products exclusion.

As proportion of GDP, the reduction of welfare only becomes relevant in Peru, when it does not sign and lose the ATPDEA preferences, and in Colombia, when the five Andean countries sign their FTAs under the full liberalization scheme.

Table 20:

NET NOMINAL WELFARE EFFECTS OF ALL THE SIMULATED SCENARIOS

(in million 2001 dollar with regard to the 2004 baseline scenario)

	AC3 – USA		AC - USA		No FTA / No ATPDEA
	Full liberalization	Excluding sensibles	Full liberalization	Excluding sensibles	
LAC	**-442**	**-335**	**-784**	**-546**	**-220**
LAC (excl. Mx. y Chile)	-370	-276	-661	-443	-235
Andean Community	**-256**	**-203**	**-400**	**-268**	**-255**
Bolivia	-4	-1	-9	-3	-9
Colombia	-163	-128	-215	-160	-95
Ecuador	-31	-23	-38	-25	-14
Peru	-43	-35	-49	-40	-141
Venezuela	-15	-15	-89	-41	4
MERCOSUR	**-89**	**-61**	**-183**	**-122**	**-8**
Chile	-27	-24	-40	-35	-2
Mexico	-45	-35	-83	-68	17
Central America & the Caribbean	-26	-13	-78	-53	28
United States	**759**	**628**	**1434**	**1124**	**105**
EU15+PECOS+EFTA	-145	-140	-331	-301	38
Japan	-61	-42	-125	-81	12
Asia	-97	-70	-184	-130	88
Rest of the World	-148	-117	-266	-200	-20
World	**-133**	**-75**	**-256**	**-135**	**4**

Note: The net effect is the difference between each considered scenario and the 2004 baseline benchmark

Source: Authors, based on GTAP 6.1 simulations

Table 21:

NET WELFARE EFFECTS OF ALL THE SIMULATED SCENARIOS

(percentaje of share of the 2004 baseline GDP)

	AC3 – USA		AC – USA		No FTA / No ATPDEA
	Full liberalization	Excluding sensibles	Full liberalization	Excluding sensibles	
LAC	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
LAC (excl. Mex. y Chile)	0.0	0.0	-0.1	0.0	0.0
Andean Community	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**
Bolivia	-0.1	0.0	-0.1	0.0	-0.1
Colombia	-0.2	-0.2	-0.3	-0.2	-0.1
Ecuador	-0.2	-0.1	-0.2	-0.1	-0.1
Peru	-0.1	-0.1	-0.1	-0.1	-0.3
Venezuela	0.0	0.0	-0.1	0.0	0.0
MERCOSUR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chile	0.0	0.0	-0.1	-0.1	0.0
Mexico	0.0	0.0	0.0	0.0	0.0
Central America & the Caribbean	0.0	0.0	0.0	0.0	0.0
United States	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
EU15+PECOS+EFTA	0.0	0.0	0.0	0.0	0.0
Japan	0.0	0.0	0.0	0.0	0.0
Asia	0.0	0.0	0.0	0.0	0.0
Rest of the World	0.0	0.0	0.0	0.0	0.0
World	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: The net effect is the difference between each considered scenario and the 2004 baseline benchmark

Source: Authors, based on GTAP 6.1 simulations

(ii) Robustness of the effects on welfare: static conclusions

Given that the effects on welfare of some of the analyzed countries are not very significant, a Systematic Sensitivity analysis (SSA) on the Armington substitution elasticities (between domestic and imported goods) was done for the AC3 - USA scenario with the purpose of supporting the main outcomes about the best and most probable scenario. We chose to establish the SSA over these elasticities because they are the most relevant parameters in connection with trade effects and terms of trade variability (see Schsuchny, Durán, de Miguel, 2006). As we can see in table 22, the SSA represents a key element in order to understand the most significant effects on welfare[20].

Table 22:

COMPARISON OF WELFARE IMPACTS WITH REGARD TO THE SYSTEMATIC SENSIBILITY ANALYSIS OF THE "AC3 – USA" SCENARIO

(Accumulated effects since the original 2001 baseline, in Million 2001 dollars)

Country	AC3 – USA (Full liberalization)			AC3 – USA (excluding sensibles)	AC - USA		No FTA / No ATPDEA
	Simulation as usual	Lower Limit	Upper Limit		Full liberalization	Excluding sensibles	
Bolivia	6	0	13	9	1	8	2
Colombia	-75	-149	3	-40	-127	-72	-7
Ecuador	-11	-29	7	-3	-19	-6	5
Peru	78	-1	173	85	72	81	**-21**
Venezuela	-24	-34	-16	-25	**-99**	-50	**-6**
United States	472	364	586	341	**1147**	836	**-183**

Note: The lower and upper limit up to a 95% of confidence was based on the mean and standard deviation calculated from the SSA

Source: Authors based on GTAP 6.1 simulations

As we can see from the lower and upper limits, the accumulated effects on welfare could become positive in the cases of Colombia and Ecuador and, in the case of Peru, they could hardly be negative. The results on Bolivia and Venezuela are not significant under this scenario since the last one is not signing the FTAs with USA and only undergoes indirect effects, and Bolivia sustains the positive effects of the preferences given by the ATPDEA, as it was assumed.

If we consider the confidence intervals, we can conclude from the welfare point of view that:

- In the case of the United States, the larger is the number of countries of the Andean Community that sign a FTA and the fewer sensible products are included, the better situation will arise. So, the best scenario is AC5 – USA (full liberalization) and the worst is the end of the ATPDEA with no FTAs. As it is expected, in terms of GDP, the outcomes are rather irrelevant.
- In the case of Bolivia, results are not so conclusive since all of them belong to the confidence interval of the AC3 - USA scenario and welfare impacts are roughly tiny and quite similar in

[20] 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. The mean value 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.

terms of GDP. Just in case, if there is a real option to sign a FTA with the United States, exclude sensible products is better than the full liberalization scheme.

- The outcomes for Colombia are not decisive since all of them belong to the confidence interval of the AC3 – USA scenario. All the considered alternatives result on negative outcomes in terms of welfare. So, as we will see, the choice of one alternative will depend on the dynamic effects and other additional explanations based on an assessment that this kind of study cannot answer. However, although the AC3 – USA scenario seems to be the worst, it could produce positive welfare impacts from the dynamic point of view. In any case, excluding sensible products is better than the full liberalization scheme.
- The results for Ecuador are similar to those in Colombia. The outcomes are not decisive because they all belong to the confidence interval of the AC3 – USA scenario and in this scenario could take place positive welfare accumulated values as well. But, in the case of Ecuador, the result of the No FTA / No ATPDEA scenario gives positive welfare values. Although, it could be the best choice, in terms of GDP they don't provide us a clear indication. If FTA is signed, it is better to exclude the sensible products.
- In the case of Peru it is reasonably clear that the completion of the ATPDEA with no other trade agreement is the worst alternative from every point of view. The results show that the best choice is to sign the FTA, better under AC3 than AC5, and exclude the sensible products.
- Venezuela represents a special case because it is not a beneficiary of the ATPDEA unilateral preferences. In this case, the worst scenario arises when all the Andean countries sign FTAs with the United States. This situation is even worse when a full liberalization scheme including all the products is being considered. Therefore, the preferred option arise when no Andean country sign FTAs. However, the results are not significant in terms of GDP.

(iii) Robustness of the effects on welfare when dynamic issues are included: the impacts of capital accumulation

In the static CGE models, as it is the GTAP, the potential benefits of trade liberalization are due to the better allocation of productive resources as well as the favorable adjustments of the terms of trade. Usually, the estimation of the outcomes of trade liberalization tends to be modest and the improvements of welfare don't go beyond a point of the GDP. This kind of results could be larger if we consider the dynamic impacts of the liberalization.

With the intention to reach a better calculation of the long run benefits of liberalization but, without incurring in a dynamic modeling scheme, authors such as Francois, McDonald y Nordström (1996) o Rutherford y Tarr (2003) suggested an adaptation of the standard GTAP model in order to establish a comparative steady-like state, in a Solow-like representation, able to identify welfare increments due to this kind of effects. The steady state models allow us to adjust the capital stock by connecting the rate of return on capital with the cost of its production. As well as we consider the productive effect of the rise of the capital stock, we would contemplate the long run since we include the impacts of greater capital availability on the production levels of the economy. Schuschny, Durán & de Miguel (2006) explains the applied methodology, based on Francois, McDonald y Nordström (1996), in order to include capital accumulation effects over the model outcomes by means of a closure rule modification. We have focused our attention only in the comparison of the net welfare effects between the AC3 – USA (Full liberalization) and No FTA / No ATPDEA scenarios (based on the 2004 baseline).

Table 23:

EQUIVALENT VARIATION; STANDARD CGE AND "STEADY-LIKE STATE" CLOSURES (CAPITAL ACCUMULATION IMPACT)

(in million 2001 dollar with regard to the 2004 baseline scenario)

	AC3 - USA Full liberalization		No FTA / No ATPDEA	
	Standard CGE Closure	Steady-like State Closure (dynamic bias)	Standard CGE Closure	Steady-like State Closure (dynamic bias)
Bolivia	-4	-7	-9	-17
Colombia	**-163**	**156**	**-95**	**-185**
Ecuador	**-31**	**44**	**-14**	**-26**
Perú	**-43**	**214**	**-141**	**-485**
Venezuela	-15	-51	4	12
United States	**759**	**768**	**105**	**158**

Source: Authors based on GTAP 6.1 simulations

As it can be seen in table 23, when this steady-like state closure is included -in spite of the theoretical limitations-, outcomes change fundamentally. The equivalent variation of the three signers of the AC3 – USA scenario, that is Colombia, Ecuador y Peru, turns out to have a positive net value, while Bolivia and Venezuela increase their negative impact. The situation of the United States improves slightly. On the other hand, the alternative of the No FTA / No ATPDEA scenario considerably increase the negative impacts: In the cases of Colombia and Ecuador the figures of this adverse effect are twice as much as the static scheme and it is even worse in Peru, where the negative value triples.

With these results, conclusions given in the previous section can be enriched as we consider the possible "dynamic-like" effects of a potential FTA among Colombia, Ecuador and Peru with the United States of America:

- For Peru and the United States, the FTA continues to be the best option. In addition, if Peru takes advantage of the dynamic effects, it could obtain significant net improvements on welfare: up to 0.4% of the GDP.
- In the cases of Colombia and Ecuador, the FTA becomes now a valid option in order to improve their welfare, especially if we make a comparison with the other option, which is No FTA / No ATPDEA scenario. In both countries, the FTAs could reach welfare improvements that represent 0.2% of their GDPs, in opposition to a reduction of 0.2% (in Colombia) and 0.1% (in Ecuador) in the alternative scenario. It is important to note that to achieve effectively these positive improvements it is required an effort within these countries. Active policies to take advantage of the dynamic bias of the FTAs must be undertaken and, therefore, results will not be noticeable merely with the FTA sign.

Although, we achieve some insights about the long-term dynamic-like effects of the FTAs, the results obtained by means of the steady-like state closure must be, however, considered with certain caution. First, the closure does not consider the possible capital mobility. On the other hand, it is quite probable that the new calibrated equilibrium of the model is not consistent with a steady state representation as it is assumed. In order to surpass these limitations Walmsley (1998) suggested a way to produce a new database from the original one with the purpose of setting up a more realistic steady state in which the growth rates of the capital stock are hold identical across countries, but allowing the rates of return to be different as a consequence of differential risk premiums. Another alternative to surpass the possible mentioned inconsistencies would be the implementation of a full dynamic model like the developed by Ianchovichina and McDougall (2000). Both representations were not considered in this study.

Nevertheless, the obtained outcomes offer us a first approximation of the long-term effects that capital accumulation could produce on the results of the simulated scenarios.

5.- Concluding remarks and policy implications

This article is founded on the implementation of seven different CGE simulated scenarios, based on the GTAP model/database, all of them referred to a benchmark scenario (also calibrated). Five of them followed the standard comparative static CGE model framework; the other two reproduce previous scenarios under a steady-like state set up. Table 24 summarizes the main outcomes of the study in terms of GDP, exports, imports as well as welfare effects.

As the general empiric evidence shows, the GDP impacts of the analyzed FTAs under all scenarios turn out to be negative but quite tiny. Trade effects are positive for Ecuador, Colombia and Peru in all the simulated set-ups, with the exception of the No FTA / No ATPDEA pessimistic scenario. Bolivia and Venezuela, the two other Andean Countries, only reach a positive trade impact when all the AC countries sign a FTA with the USA at once (that is, when they also sign an agreement). In general, FTAs have a positive impact on light manufactures exports of Andean Countries, whereas heavy manufactures experience strong increments on the import side. In particular, imports of machinery and equipment, which can be considered as capital good, could give them opportunities for boosting future economic growth.

The net impact in terms of welfare of the FTAs tends to be negative; but we must state that the positive effects on welfare due to ATPDEA preferences were already accounted under the 2004 benchmark baseline. When we compare net effects of the FTAs, we also must take into account that the alternative to not signing them is the full loss of the ATPDEA one-sided preferences (i.e. losing the benefits obtained and accounted at the baseline scenario).

Let us summarize the most important outcomes for each analyzed country:

- The results for Colombia are not conclusive since all of them belong to the confidence interval of the systematic sensitivity analysis of the AC3 – USA scenario. However, all the considered comparative static alternatives result on negative values in terms of welfare. So, the choice of the alternative depends on the dynamic-like effects, which would be undoubtedly positive in the case of a FTA as we showed, and other additional explanations (based on other domestic policy measures) that this kind of study cannot address.

- Ecuador has similar results. The outcomes are not decisive since they all belong to the confidence interval of the AC3–USA scenario, and within this interval it can be found positive welfare accumulated values. The results of the No FTA / No ATPDEA scenario also carry out positive welfare values. Although, the latter scenario ought to be the best option, in terms of GDP, outcomes don't provide a clear indication. If we consider the "long run" effects, both trade and welfare show clear positive net values in the FTA simulation. In any case, if a FTA is signed, it is better to exclude the sensible products.

- In the case of Peru it is unambiguous that the end of the ATPDEA preference scheme with no FTA is the worst alternative from every point of view. The results show that the best choice is to sign the FTA and, in any case, exclude the sensible products from the agreement. Dynamic-like simulations confirm these conclusions.

Table24

ANDEAN COMMUNITY: REVIEW OF THE MAIN OUTCOMES FROM SIMULATIONS

(GDP, Exports, Imports and Welfare variables)

Scenarios / Outcomes by country	Comparative static CGE Model "short run results"					Steady- like state CGE Model "long run results"	
	AC3-USA Full liberalization	AC3-USA excluding sensibles	No FTA / No ATPDEA	AC-USA Full liberalization	AC-USA excluding sensibles	AC3-USA Full	No FTA / No ATPDEA
COLOMBIA							
GDP	-	-*	--	-	-	-*	--
Exports	++	+	--	+	+	++	--
Imports	++	+	--	+	+	++	--
Welfare effect (EV) Gross effect	-	-	-*	…	…	…	…
Welfare effect (EV) Net effect	-	-	-*	--	-	++	--
ECUADOR							
GDP	-	-	-*	--	-	-	-*
Exports	++	+	--	+	+	++	--
Imports	++	+	--	+	+	++	--
Welfare effect (EV) Gross effect	-	-	+	…	…	…	…
Welfare effect (EV) Net effect	-	-	-*	--	-	++	--
PERU							
GDP	-	-	-	--	-	-*	--
Exports	++	+	--	+	+	++	--
Imports	++	+	--	+	+	++	--
Welfare effect (EV) Gross effect	++		--	…	…	…	…
Welfare effect (EV) Net effect	-	-*	--	-	-	++	--
BOLIVIA							
GDP	-	-	--	-	-*	-*	--
Exports	-	-	--	-	++	-*	--
Imports	-	-	--	-	++	-*	--
Welfare effect (EV) Gross effect	+	++	+	…	…	…	…
Welfare effect (EV) Net effect	-	-*	--	-	-	-	-*
VENEZUELA							
GDP	-	-	Indifferent	-	-*	-	-*
Exports	--	-	Indifferent	++	+	-	Indiffe-rent
Imports	--	-	Indifferent	++	+	-	-*
Welfare effect (EV) Gross effect	-	-	-*	…	…	…	…
Welfare effect (EV) Net effect	-	-	++	--	-	--	++
Andean Community							
GDP	-	-*	-	--	-*	-*	--
Exports	+	+	-	++	+	++	--
Imports	+	+	-	++	+	++	--
Welfare effect (EV) Gross effect	-	++	-	…	…	…	…
Welfare effect (EV) Net effect	-	-*	-	--	-	++	--

Note: ++ represents the best alternative in term of the analyzed variable; **--** represents the worst alternative in terms of the analyzed variable; **-*** symbolizes a suitable scenario minimizing losses in terms of the analyzed indicator;

Source: Authors' calculations based on the GTAP 6.1simulations

- The results for Bolivia are not so conclusive since all of them belong to the confidence interval of the AC3 – USA scenario. Welfare impacts are roughly tiny and, in terms of GDP, quite similar. Venezuela represents a special case because this country does not receive ATPDEA preferences. In this case, the worst scenario arises when all the Andean countries sign a FTA with USA. This situation is even worse when a full liberalization scheme with no sensible products is being considered. So, the preferred option arise when no Andean country sign FTAs. Nevertheless, the results are not significant in terms of GDP.

- The results for United States confirms its trade strategy towards LAC countries; the greater is the number of countries of the Andean community that sign a FTA and the fewer the sensible products considered, the better is the situation. As it is expected, in terms of GDP, the outcomes are rather irrelevant.

As a final point, results suggest that the FTAs would be beneficial to improve terms of trade of all subscribers. Nevertheless, FTAs divert trade from the intra-bloc Andean market towards the USA and also from those other no signers; particularly, Bolivia and Venezuela record losses in terms of GDP and exports due to trade deviation and further competition within intraregional markets when Colombia, Ecuador and Peru do sign. Thus, enterprises of the Andean Community will face competition from products coming from United States, as they will replace imports of less competitive products from the sub-region. This study concludes, therefore that opening up to imports from the United States leaves intra-bloc exports in a vulnerable situation. Additionally, some countries in the region, such as Chile and Mexico, undergo some erosion in their benefits from trade preferences with USA. The exclusion of sensible products in the agreements improves the outcomes for the signing Andean countries, giving us some insights for policy makers. On the other hand, the case of unsuccessful negotiations and ATPDEA expiration is the worst solution.

In any case, active public policies to mitigate the potential negative effects, enhance positive impacts and seize the large dynamic opportunities towards sustainable development must be undertaken in order to achieve successful FTAs.

References

ALADI (Asociación Latinoamericana de Integración) (2005), *Informe relativo a las disciplinas comerciales y demás materias complementarias contempladas en los acuerdos registrados en el ámbito de la Asociación Latinoamericana de Integración* (ALADI/SEC/di 1883), 4 de febrero.

ALADI (2004), *Impacto del ALCA sobre la Economía de los Países Miembros de la ALADI: un Análisis de Equilibrio General*, ALADI/SEC/dt 457, 8 de marzo.

ALADI (2002), *Evolución del comercio negociado entre los países miembros de la Asociación Latinoamericana de Integración (ALADI)*. (ALADI/SEC/Estudio 152), 22 de octubre.

Arguello, Ricardo (2004), *An Exploratory Assessment of the Potencial Impact of the Free Trade Area of the American on the Andean Communty*. Serie Documentos borradores de Investigación No. 46. Universidad del Rosario. ISSN 0124-4396.

Arguello, Ricardo y Ernesto Valenzuela (2005), *Market Access in The Wester Hemisphere: Implications for the Andean Community*. Serie Documentos borradores de Investigación No. 68. Universidad del Rosario. ISSN 0124-4326.

Arguello, Ricardo y Ernesto Valenzuela (2004), *Market Access in The Wester Hemisphere: Implications for the Andean Community*. Mimeo. Universidad del Rosario y Universidad de Purdue.

Armington, P.S. (1969), *The geographic pattern of trade and the effects of price changes*. International Monetary Fund Staff Papers, 16(2), pp. 179-201.

Baldwin, R. E. y Venables, A. J. (1995), *Regional economic integration*, en Handbook of Internacional Economics, Vol. III, editado por Grossman, G. M. y Rogoff, K., Ámsterdam, North-Holland - Elsevier.

Berrentoni, Daniel y Martín Cicowiez (2005), *El Acuerdo de libre comercio Mercosur-Comunidad Andina de Naciones: una evaluación cuantitativa*. Serie estudios estadísticos y prospectivos. No. 33. División de Estadísticas y Proyecciones Económicas. CEPAL, Naciones Unidas. http://www.eclac.cl/publicaciones/Estadisticas/0/LCL2310PE/lcl2310e.pdf

Bielschowsky R. (1998), *La evolución de las ideas de la CEPAL*. Revista de la CEPAL Número Extraordinario, Chile.

Botero, Jesús (2005), *Estimación del impacto sobre el empleo de los tratados de libre comercio en Colombia; análisis de equilibrio general computable*. Serie Estudios y Perspectivas No. 8. Oficina de la CEPAL en Bogotá. Naciones Unidas. Julio. http://www.eclac.cl/publicaciones/colombia/6/LCL2366P/SERIECOL8-G-ES.pdf

Comunidad Andina de Naciones (2005), *Evaluación de las posibles implicaciones para Ecuador de la no suscripción del Tratado de Libre Comercio con Estados Unidos*. Documento Informativo. SG/di 709. 3 de marzo. 2.16.21.

Corporación Andina de Fomento (CAF) (2005), *América Latina en el comercio global. Ganando Mercado. División de Estudios Económico*s. Vicepresidencia de Estrategias de Desarrollo de la Corporación Andina de Fomento (CAF). Noviembre.

Cuadra C. Gabriela and David Florián H. (2005), *Impacto de los procesos de integración latinoamericanos a partir de un modelo multiregional de equilibrio general computable*. En

Perspectivas: Análisis de temas críticos para el desarrollo sostenible. Corporación Andina de Fomento (CAF). Vol.3 No. 1. Julio 2005.

Diao, Xinshen, Eugenio Diaz-Bonilla, Sherman Robinson (2002), *Scenarios for Trade Integration in the Americas*, Internacional Food Policy Research Institute, TMD Discussion Paper No.90, February.

Diao, X. and A. Somwaru (2001), *A Dynamic Evaluation of a Free Trade Area of the Americas: An Intertemporal Global General Equilibrium Model*, *Journal of Economic Integration*, 16, pp. 21-47, 2001.

Dimaranan, Betina V. y McDougall Robert A., Editors (2005). *Global Trade, Assistance, and Production: The GTAP 6 Data Base*, Center for Global Trade Analysis, Purdue University, https://www.gtap.agecon.purdue.edu/databases/v6/v6_doco.asp.

Durán, Lima José y Raúl Maldonado (2005), *América Latina y el Caribe: La Integración regional en la hora de las definiciones*. Serie comercio internacional, No. 62. Santiago de Chile. Naciones Unidas. http://www.eclac.cl/publicaciones/Comercio/4/LCL2454P/lcl2454e.pdf

Francois, Joseph and McDonald, Bradley (1996), *Trade Liberation and Capital Acumulation in the GTAP Model*, GTAP Technical Paper No. 7, Julio.
https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=310

Francois, Joseph, McDonald, Bradley J. y Nordström, Hakan (1997), *Capital Accumulation in Applied Trade Models*, en Applied Methods for Trade Policy Analysis: A Hanbook, Francois, J. F. y Reinert, Kenneth A. (editors), Cambridge University Press.

Gehlhar, Mark et al. (1997), *Overview of the GTAP data base*. In Hertel, Thomas W. (ed): Global trade analysis: Modeling and applications, Cambridge University Press.

Gopal Das, Gouranga, Soamiely Andriamananjara (2004), *Hub-and-Spokes Free-Trade-Agreements in the Presence of Technology Spillovers: An Application to the Western Hemisphere*, U.S. International Trade Commission, Office of Economics Working Paper, No. 2004-09-A, September.

Gutierrez, Gabriel (2005), *Ex post evaluation of the employment effects of a PTA: Methodological issues, illustrated with a reference to Chile*. Serie Comercio Internacional. No. 57. CEPAL, Naciones Unidas, diciembre.
http://www.eclac.cl/publicaciones/Comercio/9/LCL2439PI/lcl2439i.pdf

Hertel, Thomas W. (ed.) (1998), *Global Trade Analysis: Modeling and Applications,* Cambridge University Press.

Hinojosa-Ojeda, R. (2003), *Regional integration among the unequal: a CGE model of US-CAFTA, NAFTA and the Central American Common Market*, unpublished.

Hinojosa-Ojeda, R., J.D. Lewis, and S. Robinson (1997), *Convergence and Divergence Between NAFTA, Chile, and MERCOSUR: Overcoming Dilemmas of North and South American Economic Integration*, Integration and Regional Programs Department, Inter American Development Bank, Working Paper Series 219, May.

Hornbeck, J.F. (2003), *The U.S.-Central American Free Trade Agreement (CAFTA): challenges for sub-regional integration* (RL31870), Congressional Research Services, The Library of Congress, April.

Ianchovichina, Elena y McDougall, Robert (2000), *Theoretical Structure of Dynamic GTAP*, GTAP Technical Paper No 17,
https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=480

Kuwayama, Mikio; José Durán Lima y Verónica Silva (2005) *Bilateralism and Regionalism: Re-establishing the primacy of multilateralism: A Latin American and Caribbean perspective.* Serie Comercio Internacional N°. 58. Santiago de Chile, Naciones Unidas, diciembre.

Light, Miles (2003), *Acuerdo de Libre Comercio de las Américas: Impactos Económicos en la Comunidad Andina*, Secretaría de la Comunidad Andina, Septiembre.

Monteagudo, Josefina, Laura Rojas, Augusto Stabilito, Masakazu Watanuki (2004), *The New Challenges of the Regional trade Agenda for the Andean Countries*, Paper presented at the Seventh Annual Conference on Global Economic Analysis, June 17-19, Washington D.C. https://www.gtap.agecon.purdue.edu/resources/download/1853.pdf

Morales, César, Soledad Parada y Miguel Torres (2005), *Los Impactos diferenciados del Tratado de Libre Comercio Ecuador-Estados Unidos de Norte América sobre la agricultura del Ecuador*. CEPAL, FAO y UNICEF. Proyecto "Apoyo al sector rural para facilitar la información y participación en el proceso del Tratado de Libre Comercio" No. 00038896. Febrero.

Panagariya, Arvind (1999), *Preferential trading and welfare: The small-union case revisited*. Mimeo, University of Maryland.

Panagariya, Arvind (2000), *Preferential trade liberalization: The traditional theory and new developments*. Journal of Economic Literature vol. XXXVIII (June), pp. 287-331;

Rosales, Osvaldo; José Durán L. and Sebastián Saéz (2006), Recent trends in Latin American Integration: An overview. Baylor University, Forthcoming.

Rutherford, Thomas F. y Tarr, David (2003), *Acuerdos regionales de comercio para Chile: ¿Los resultados difieren con un modelo dinámico?*, Revista Integración & Comercio N° 18 (Enero-Junio), 125- 148.
http://www.iadb.org/intal/aplicaciones/uploads/publicaciones/e_INTAL_IYC_18_2003_Rutherford-Tarr.pdf

Saez, Sebastián (2005), Implementing trade policy in Latina America: The cases of Chile and Mexico. Serie Comercio Internacional N°. 54. Santiago de Chile, Naciones Unidas, October.

Schuschny, A., José E. Durán, and Carlos J. de Miguel (2006), *El modelo GTAP y las preferencias arancelarias en América Latina y el Caribe: reconciliando su año base con la evolución reciente de la agenda de liberalización regional*. ECLAC, forthcoming

Secretaría General de la Comunidad Andina (SGCAN), (2005), *Evaluación de las posibles implicaciones para Ecuador de la no suscripción del Tratado de Libre Comercio con los Estados Unidos*. Documento Informativo SG/di 709, 3 de marzo, 2.16.21.

Sepúlveda, C. (2005), *Metodologías aplicables para un análisis sobre impactos comerciales de un tratado de libre comercio entre los países miembros de la Comunidad Andina de Naciones (CAN) y los Estados Unidos*, mimeo, CEPAL, Naciones Unidas.

SGCAN (2004a), *Intercambio Comercial Comunidad Andina – Estados Unidos: Dinámica reciente, composición sectorial y potencialidad comercial*. Documento Informativo SG/di 650, 6 de agosto, 2.17.24.

SGCAN (2004c), *Análisis de las diferentes disciplinas comerciales que se negocian en el TLC con los Estados Unidos y su posible impacto en la normativa andina*. Documento Informativo SG/di 657, 31 de agosto, 2.23.

SGCAN (2004c), *Efectos del TLC Colombia-EEUU sobre el comercio Colombo-Venezolano*. Documento de Trabajo SG/dt 281m 25 de noviembre, 2.16.21.

Vela Sosa, Raúl (2004), *México: Tratados internacionales de libre comercio (Estructura, análisis y comentarios). F*acultad de Economía de la Universidad Autónoma de Yucatán, Instituto de Administración Pública de Yucatán y Confederación de Profesionistas de Yucatán. Mérida.

United States International Trade Commision (USITC) (2006), *2006 Trade Policy Agenda and 2005 Annual Report of the President of the United States on the Trade Agreements Program*. March.

United States International Trade Commision (USITC) (2005), *The Impact of the Andean Trade Preference Act. Eleventh Report 2004*. Investigation No. 332-352 (Publication 3803). September.

Walmsley, Terrie L. (1998), *Long-run Simulations with GTAP: Illustrative Results from APEC Trade Liberalization*, GTAP Technical Paper No. 9, marzo. https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=312

Annex 1

MAIN EXPORT DESTINATIONS OF ANDEAN COMMUNITY AND OTHER TRADE PARTNERS, 2004

(Millions of dollars and percentages)

	AC	Mercosur	Chile	Mexico	Rest of LAC	USA	EU	Japan	China	Other of Asia	Rest of the World	World
Andean Community	**7 361**	**1 770**	**913**	**1 256**	**9 585**	**29 843**	**7 906**	**1 178**	**1 671**	**1 813**	**8 799**	**72 095**
share in total (%)	*10.2*	*2.5*	*1.3*	*1.7*	*13.3*	***41.4***	*11.0*	*1.6*	*2.3*	*2.5*	*12.2*	*100.0*
Bolivia	508	865	51	27	5	359	109	68	24	94	145	2 254
Colombia	**3 193**	**179**	**245**	**508**	**1 466**	**6 503**	**2 290**	**262**	**133**	**257**	**1 433**	**16 468**
share in total (%)	*19.4*	*1.1*	*1.5*	*3.1*	*8.9*	***39.5***	*13.9*	*1.6*	*0.8*	*1.6*	*8.7*	*100.0*
Ecuador	**870**	**99**	**113**	**35**	**1 521**	**3 204**	**884**	**69**	**49**	**247**	**133**	**7 224**
share in total (%)	*12.0*	*1.4*	*1.6*	*0.5*	*21.1*	***44.3***	*12.2*	*1.0*	*0.7*	*3.4*	*1.8*	*100.0*
Peru	**802**	**250**	**399**	**101**	**854**	**3 625**	**2 992**	**574**	**1 189**	**742**	**833**	**12 363**
share in total (%)	*6.5*	*2.0*	*3.2*	*0.8*	*6.9*	***29.3***	*24.2*	*4.6*	*9.6*	*6.0*	*6.7*	*100.0*
Venezuela	1 988	377	104	585	5 715	16 152	1 631	204	277	473	6 255	33 763
MERCOSUR	**5 981**	**17 312**	**6 467**	**5 102**	**3 457**	**24 794**	**31 158**	**3 206**	**8 227**	**8 677**	**21 091**	**135 473**
Argentina	1 685	6 770	3 831	1 032	745	3 825	6 082	405	2 630	2 197	5 247	34 448
Brazil	4 162	8 912	2 546	3 948	2 519	20 341	24 160	2 768	5 440	6 356	15 282	96 434
Paraguay	60	865	30	5	65	52	347	18	44	19	120	1 625
Uruguay	75	764	61	117	79	577	569	15	112	106	442	2 917
Chile	**1 570**	**1 951**	**0**	**1 307**	**706**	**4 569**	**7 879**	**3 697**	**3 212**	**4 225**	**2 888**	**32 004**
Mexico	**2 168**	**1 181**	**555**	**0**	**5 072**	**143 474**	**7 309**	**1 977**	**1 645**	**1 989**	**23 714**	**189 084**
United States	**13 241**	**18 195**	**3 625**	**110 715**	**25 732**	**0**	**172 880**	**54 400**	**34 721**	**120 681**	**264 810**	**819 000**
share in total (%)	***1.6***	*2.2*	*0.4*	*13.5*	*3.1*	*0.0*	*21.1*	*6.6*	*4.2*	*14.7*	*32.3*	*100.0*
European Union	7 226	22 440	3 840	18 460	15 334	289 000	2440 650	53 710	60 470	144 430	585 740	3641 300
Japan	1 776	2 883	723	5 190	9 281	128 606	89 926		73 917	200 421	53 084	565 807
China	1 869	4 711	1 723	4 664	6 886	143 922	113 114	76 280		196 251	73 388	622 808

Sources: Authors' calculation based on COMTRADE database and official information

Annex 2

REGIONAL AGGREGATION USED IN THE SIMULATIONS

No.	Codex	Countries	Groups
1	Bol	Bolivia	Andean Community
2	Col	Colombia	
3	Ecu	Ecuador	
4	Per	Peru	
5	Ven	Venezuela	
6	Arg	Argentina	MERCOSUR
7	Bra	Brazil	
8	Uru	Uruguay	
9	Mex	Mexico	NAFTA
10	USA	United States of America	
11	Canada	Canada	
12	Chil	Chile	
13	CyC	Central America and the Caribbean	Other LAC countries
14	Rlac	Rest of Latin America	
15	UE15	European Union[a]	EU-25
16	PECOS	New European Union Members[b]	
17	Reuro	Rest of Europe	
18	China	China	Asian countries
19	Japon	Japan	
20	India	India	
21	Corea	korea	
22	Rasia	Rest of Asia	
23	Sudafrica	South Africa	ROW
24	ROW	Rest of the World	

Source: Authors based on GTAP 6.1 Database

[a] Include: Germany, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden, The Netherlands and United Kingdom.

[b] Include: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

Annex 3

COMMODITY AGGREGATION USED IN THE SIMULATIONS

No.	Codex	Description	Sectoral 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	AceiteVeg	vol (Vegetable oils and fats)	Light manufactures
7	Azucar	c_b (Sugar cane, sugar beet), sgr (Sugar)	
8	FibrasVeg	pfb (Plant-based fibers), wol (Wool, silk-worm cocoons)	
9	Ocultivos	ocr (Crops nec)	
10	BeyTa	b_t (Beverages and tobacco products)	
11	Ganaderia	ctl (Cattle,sheep,goats,horses), oap (Animal products nec)	
12	Carne	cmt (Meat: cattle,sheep,goats,horse), omt (Meat products nec)	
13	Lacteos	rmk (Raw milk), mil (Dairy products)	
14	Oaliment	ofd (Food products nec)	
15	Pesca	fsh (Fishing)	
16	Forestal	frs (Forestry)	
17	Textil	tex (Textiles)	
18	Confeccion	wap (Wearing apparel)	
19	CueroCalz	lea (Leather products)	
20	Madera	lum (Wood products)	
21	Mineria	omn (Minerals nec), nmm (Mineral products nec)	Petroleum and mining
22	Combustibles	coa (Coal), oil (Oil), gas (Gas)	
23	Dpetrol	p_c (Petroleum, coal products)	
24	Quimica	crp (Chemical,rubber,plastic prods)	
25	Metal	i_s (Ferrous metals), nfm (Metals nec)	
26	ProdMetal	fmp (Metal products)	Heavy manufactures
27	MaquiEqui	ome (Machinery and equipment nec)	
28	Autop	mvh (Motor vehicles and parts)	
229	Etransp	otn (Transport equipment nec)	
30	Omanu	ele (Electronic equipment), omf (Manufactures nec), ppp (Paper products, publishing)	
31	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 nec), ros (Recreation and other services), osg (PubAdmin/Defence/Health/Educat), dwe (Dwellings)	Services

Source: Authors based on GTAP 6.1 Database

Annex 4A

LIST OF FTA AND PTA CONSIDERED IN THE "ALTERTAX" SIMULATION, UP TO DECEMBER 2001

No.	Agreement	Signed in	Implementation date
1	Chile - Canada	5-Dec-1996	5-Jul-97
2	Chile - MERCOSUR	1996	1-Oct-196
3	Chile - Bolivia	1993	7-Jul-93
4	Chile - Ecuador	1994	1-Jan-94
5	Chile – Peru	1998	1-Jul-98
6	Chile - Venezuela	1993	1-Jul-93
7	Chile - Mexico	1991 y 1998	1-Aug-99
8	Chile - MCCA	…	18-Oct-99
9	Chile - Colombia	1993	1-Jan-94
10	MERCOSUR (Arg+Bra+Uru+Par)	Mach 1991	1991
11	AC (Bol+Col+Ecu+Per+Ven)	1969	1969
12[a]	MCCA (Cri+ElSalv+Hon+Gua+Nic)	1960	1960
13	Mexico - Colombia - Venezuela (G-3)	1995	1-Jan-95
14	Mexico-European Union	2000	1-Jun-00
15	Mexico-European Free Trade Association (EFTA)	2001	1-Jun-01
16	Mexico – Northern Triangle (El Salvador, Guatemala and Honduras)	29-Jun-00	15-Mar-01
17	Mexico – Nicaragua	18-Dec-97	1-Jul-98
18	Mexico - Costa Rica	5-Apr-94	1-Jan-95
19	Mexico – Bolivia	…	1-Jan-95
20	México – Uruguay (Preferential agreement)	1994	1994
21[a]	Mexico – Israel	10-Apr-00	1-Jun-00
22[a]	Mexico – Panama (Preferential agreement)	…	22-Apr-96
23	Mexico - USA – Canada	1994	1-Jan-94

[a] Although the agreement was implemented, aggregation limitations avoid its effective addition

Source: Authors based on Kuwayama, Durán and Silva (2005), Sáez (2005) and Vela Sosa (2004).

Annex 4B

LIST OF FTA AND PTA CONSIDERED IN THE 2004 BASELINE BENCHMARK SIMULATION (*GTAP-ECLAC 2004*)

No.	Agreement	Signed in	Implementation date
1	Chile – United States of America	6-Jul-03	1-Jan-04
2	Chile – European Union	18-Nov-02	1-Feb-03
3	Chile – EFTA	26-Jul-03	1-Dec-04
4	Chile – Republic of Korea	2003	1-Apr-04
5	Mexico – Uruguay (FTA)	1994 y 2004	15-Nov-03
6	United States of America - Australia	2004	1-Apr-05
7	ATPDEA USA Preferences to AC	6-Aug-2002	6-Aug-2002
8	EU15 to EU 25	2004	May 2004

Source: Authors based on Kuwayama, Durán and Silva (2005)), Sáez (2005), USITC (2005), and Vela Sosa (2004).

Annex 5A

COLOMBIA: TRADE WITH THE UNITED STATES UNDER DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004)

Trade Flows / Sectors	AC-USA (Full liberalization)	AC-USA- Excluding sensibles	AC3-USA (Full liberalization)		AC3-USA Excluding sensibles	No FTA / No ATPDEA
				Structure		
EXPORTS to the States						
Agricultural Products	3.0	1.8	2.1	15.9%	1.3	-2.2
Petroleum and mining	1.4	1.2	0.8	40.4%	0.8	1.1
Light manufactures	18.8	6.6	16.0	21.3%	4.9	-42.4
Heavy manufactures	11.7	10.6	9.8	16.1%	9.4	0.8
Services	3.6	2.8	1.9	6.4%	1.7	2.6
Total exports	**6.8**	**3.9**	**5.4**	**100.0%**	**3.1**	**-7.8**
IMPORTS from the United States[b]						
Agricultural Products	36.7	5.8	37.7	7.8%	6.0	-1.0
Petroleum and mining	67.5	68.6	70.2	3.5%	70.5	-1.2
Light manufactures	117.9	22.1	121.3	10.1%	23.2	-5.1
Heavy manufactures	41.9	40.5	43.8	69.8%	41.7	-1.2
Services	-2.6	-2.0	-1.4	8.8%	-1.3	-1.7
Total imports	**41.5**	**31.9**	**43.4**	**100.0%**	**32.9**	**-1.5**

[a] Trade Structure in the baseline 2004; [b] Imports from USA were calculated as export from Colombia

Source: Authors' calculation on the basis of GTAP 6.1 simulations

Annex 5B

ECUADOR: TRADE WITH THE UNITED STATES UNDER DIFFERENT SCENARIOS.

(Percentage changes with respect to baseline 2004)

Trade Flows / Sectors	AC-USA (Full liberalization)	AC-USA Excluding sensibles	AC3-USA (Full liberalization)		AC3-USA Excluding sensibles	No FTA / No ATPDEA
				Structure		
EXPORTS to United States						
Agricultural Products	1.3	0.8	1.0	22.4%	0.7	-0.5
Petroleum and mining	1.3	1.1	1.1	38.9%	1.0	0.3
Light manufactures	12.5	5.5	11.8	26.2%	5.2	-7.3
Heavy manufactures	3.5	2.9	3.0	5.9%	2.7	0.9
Services	2.3	1.6	1.6	6.6%	1.2	1.1
Total exports	**4.2**	**2.2**	**3.8**	**100.0%**	**2.1**	**-1.6**
IMPORTS from United States[b]						
Agricultural Products	28.2	6.7	28.8	5.4%	6.8	-0.3
Petroleum and mining	61.6	62.9	63.6	4.3%	63.9	-0.8
Light manufactures	102.9	14.4	105.1	8.3%	15.1	-2.0
Heavy manufactures	46.1	43.9	47.4	75.7%	44.6	-1.0
Services	-2.3	-1.4	-1.5	6.2%	-1.1	-0.8
Total imports	**44.6**	**36.4**	**45.8**	**100.0%**	**37.1**	**-1.0**

[a] Trade Structure in the baseline 2004; [b] Imports from USA were calculated as export from Ecuador

Source: Authors' calculation on the basis of GTAP 6.1 simulations

Annex 5C

PERU: TRADE WITH UNITED STATES UNDER DIFFERENT SCENARIOS

(Percentage changes with respect to baseline 2004)

Trade Flows / Sectors	AC-USA (Full liberalization)	AC-USA Excluding sensibles	AC3-USA (Full liberalization)	Structure	AC3-USA Excluding sensibles	No FTA / No ATPDEA
EXPORTS to United States						
Agricultural Products	1.2	1.1	1.1	8.2%	1.1	-0.4
Petroleum and mining	4.0	4.1	3.7	31.8%	3.8	3.5
Light manufactures	13.8	3.8	13.3	40.5%	3.4	-54.5
Heavy manufactures	7.6	7.5	7.2	10.7%	7.3	7.3
Services	1.8	1.7	1.5	8.8%	1.6	4.2
Total exports	**7.7**	**3.9**	**7.3**	**100.0%**	**3.6**	**-18.6**
IMPORTS from United States[b]						
Agricultural Products	100.5	15.1	101.5	10.1%	15.3	-1.0
Petroleum and mining	103.7	104.1	104.7	2.9%	104.9	-1.0
Light manufactures	105.7	22.7	106.9	7.0%	23.2	-3.9
Heavy manufactures	80.8	78.6	81.6	66.5%	79.2	-2.3
Services	-1.2	-1.2	-1.0	13.5%	-1.0	-2.6
Total imports	**65.8**	**52.6**	**66.6**	**100.0%**	**53.1**	**-2.3**

[a] Trade Structure in the baseline 2004; [b] Imports from USA were calculated as export from Peru

Source: Authors' calculation on the basis of GTAP 6.1 simulations