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FREE TRADE OF THE AMERICAS AGREEMENT

ECONOMIC IMPACTS FOR THE ANDEAN COMMUNITY

Free Trade of the Americas Agreement
Economic Impacts for the Andean Community*

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Abstract

This report describes how entrance into the Free Trade of Americas Agreement could change the economic structure in Andean Community countries. The central tool for this analysis is a global Computable General Equilibrium (CGE) model of trade and production with a focus upon the Western Hemisphere regions. A major finding is that Andean Community members should not expect large welfare gains if they acceed to the FTAA. Welfare gains are small, and in some cases negative from trade in goods. Countries in the Andean Community members already enjoy preferred access to key trading partners' markets. The FTAA effectively eliminates this preferred status and creates trade-diversion from CAN members to other FTAA countries. The overall effect is small, but the individual sectoral impacts can be important. Some industries expand substantially, while others shrink. Sectoral production, consumption, and fiscal impacts are detailed in the results section.

Several potentially large benefits from the FTAA are not considered in this study. Benefits from free trade in services and knowledge transfer, such as product variety, service liberalization, and foreign direct investment, are often as important to economic growth as the traditional gains from trade in goods.

*Documento elaborado para la Secretaria General de la Comunidad Andina por el Consultor Miles K. Light, profesor de la Universidad de Colorado, USA. Agosto de 2003. Sus opiniones no comprometen a la Secretaria General.

Contents

1 Overview

The Free Trade of the Americas Agreement (FTAA) is a proposed trade accord currently under negotation. In this agreement, member countries will enjoy un-encumbered access to goods markets in the United States and across the Americas. The main directive in the current negotiations is tariff elimination (free trade), but other dimensions of trade are also on the table. Some other important discussions surround intellectual property rights, liberalization in the service sector, and elimination of production subsidies. In this report, we take aim at the most direct aspect of the agreement – trade liberalization in goods. The central analysis employs widely-accepted economic techniques to quantify the cost of existing distortions (tariffs), and the benefits of their removal. Of course, entrance into the FTAA contains several less-tangible benefits for potential entrants. The "new trade theory" and economic geography describe several benefits related to large markets and large economies (or access to them). Large markets support more varieties of goods, which increases welfare for consumers and increases productivity for firms. In turn, higher productivity lowers prices for goods and services. Benefits from the FTAA such as these are possible to quantify in a numerical study, but they are beyond the scope here. We focus mostly upon comparative advantage and goods liberalization through tariff elimination.

1.1 Summary of Results

The total net-benefit from trade-liberalization in goods is unlikely to be large for the Andean Community (CAN[1]). Holding other policy factors constant, if import tariffs and export taxes are set to zero across the Americas, most of the CAN countries see welfare fall: -0.3% in Peru; -0.55% in Equador and Bolivia; and -0.6% in Colombia. Venezuelan welfare is left almost unchanged (-0.02%).[2]

The main reason for the small (negative) impact is that most CAN countries already enjoy free access to markets with their two largest trading partners, the US and other CAN countries. The US grants zero import tariff rates for several goods to Colombia, Equador, Bolivia, and Peru under the Andean Trade Preference Act (ATPA)[3]. CAN member countries also have a free-trade zone within the Andean Community. In this regard, a move from the current state of the world, where CAN members enjoy preferential access to key markets, into a new free-trade area where *all*

[1] CAN is the Spanish acronym for the Andean Community, which stands for *Communidad Andina de Naciones*.

[2] Welfare changes are defined in terms of benchmark consumption (Equivalent Variation). A 1% welfare increase implies that consumers would be willing to pay 1% of their current income in order to enjoy the new level of consumption.

[3] The Andean Trade Preference Act is an incentive offered by the United States which includes increased market access for Andean countries in exchange for cooperation in fighting narco- production and trafficing. For further information, see the US Trade Representative report:
`http://www.ustr.gov/regions/whemisphere/atpa.shtml`

Table 1: %-Change in Consumption

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
PERU	-0.30	0.42	-0.06	-0.19
COLOMBIA	-0.62	0.87	-0.09	-0.39
VENEZUELA	-0.02	0.05	0.10	-0.06
EQUADOR AND BOLIVIA	-0.55	0.97	-0.11	-0.46
ANDEAN COMMUNITY	-0.36	0.56	-0.02	-0.27

Scenario Key:

`FTAA`: Complete tariff and export subsidy elimination.

`ATPA`: Impact of import tariff elimination in the US. Measures the benefits from ATPDEA preferences which CAN members currently enjoy.

`FTAA_XUS`: FTAA agreement without the USA.

`FTAA_XAN` FTAA without the Andean Community.

countries have equal access, will certainly lower exports and production for several CAN exporters and producers. Trade will be diverted from some producers in the Andean Community by other Latin producers (e.g., Brazil, Central America, and Chile) who will now receive full access to US markets. Some consumers and producers will benefit from FTAA because tariff elimination lowers prices in the home country and eliminates price distortions for imported goods, other producers face increased competition from foreign countries. The net effect is a small loss of welfare for most Andean Countries.

1.2 Important Considerations

This section introduces some of the key considerations for CAN member countries who are considering accession to the FTAA. Each consideration is entered as a bullet point:

- **Tariff revenues** One of the most important considerations for developing countries will be lost revenues from tariff elimination. These revenues must be recovered from other tax streams – at a potentially high cost. Unlike the United States and Canada, most Latin countries cannot depend upon income-tax revenues as a primary source of government income. Instead, revenues come mostly from sales taxes and import tariffs. For example, tariff revenues in the United States contributed only 1% to total federal reciepts in 2000[4]. In contrast, tariff revenues represent 6-11% of total collections in the Andean Community.

[4]An interesting statistic is that tariff revenues are historically very large in the United States. Taylor (2002) shows that tariffs contributed almost 75% of total revenues in 1800, then fell to 40% in 1900.

In dollar terms, CAN members stand to lose between $400 million (in Equador/Bolivia) to $1,300 million (in Venezuela) as import tariffs are eliminated. A separate tax-policy study for Colombia estimates that if import tariffs were completely eliminated, then value-added taxes (VAT) would need to increase between 3-4% above current levels in order to recover lost tariff revenues.

Table 2: Import Tariff Revenues (Millions)

REGION	TARIFFS	% GDP
COLOMBIA	1234	1.1
PERU	903	0.6
VENEZUELA	1706	0.7
EQUADOR AND BOLIVIA	657	1.2
UNITED STATES	2000	0.02

Total tax collections do not include state-enterprise collections or oil-revenues.

The central results in this report assume that the lost tariff revenues will be replaced using lump-sum transfers. Naturally, these revenues will actually be replaced by raising existing taxes, such as the value-added tax (VAT). Increasing the VAT will create additional distortions are not captured in this model. Therefore, the true welfare cost of eliminating import tariffs will be slightly higher than what has been reported in Table 1. For example, the MCF for the Colombian VAT (currently posted at 16%) is approximately 1.6[5]. This means that tax-replacement by raising VAT in Colombia would cause welfare to fall an additional 48 billion Colombian Pesos.

- **Sectoral Results** The aggregate impact for the CAN as a single region is relatively small, which hides some of the more important effects that the FTAA will have upon specific sectors in each country. In Colombia, major changes are expected to come about in "other crops" (mostly coffee), wearing-apparel, textiles, cut-flowers, and coal. Other countries, such as Venezuela will see important changes for oil.

  The economic sectors which have a high import or export percentage will be most impacted by the FTAA. Under free trade, we expect those sectors with an international comparative advantage and to increase, while other sectors face increased competition from abroad. Higher export prices presents a windfall for some Andean Community producers, while lower import tariff rates will lower the cost of intermediate inputs to production, which lowers goods prices

[5]The Marginal Cost of Funds (MCF) denotes the dollar-value of consumption foregone by consumers in order for the government to collect one dollar of revenue. An MCF of 1.3 means that consumers lose $1.30 in consumption for every dollar of government revenue.

for final demand. This effect alone increases welfare and consumption for the country. These disparate effects require reporting on a country-by-country, and sector-by-sector basis.

- **Exchange Rate Effects** Without financial intermediation the purchase price for foreign exchange (i.e., US dollars or Euros) depends upon relative supply and demand for the home currency. Holding all else constant, an increase in demand for foreign goods increases the supply of domestic currency on world markets and increases the demand for foreign exchange. This raises the equilibrium price of foreign exchange. In the base CGE model, we assume that the current-account balance is fixed at exisiting levels. Because of this, changes to the exchange rate can produce a large response for those sectors where exports are a large share of domestic production. For example, 98% of natural gas production in Equador and Bolivia is sold on the world market. A 20% depreciation for the Boliviano implies that natural gas has become 25% more profitable on international markets when compared with other domestic goods. Producers will invest to expand this sector until profitability falls in line with other goods. The change in production could be dramatic. It will depend upon the elasticity of supply for the good.

- **Other FTAA considerations** There are other potentially important benefits from the FTAA which are not reflected in this study. First, we are using a constant-returns to scale model, which is probably not the case for several important services. A recent study by Jensen et. al. [2002] shows that total gains from service-sector liberalization and Foreign Direct Investment are 4-5 times larger than the standard gains from improved terms of trade and lower distortions in the medium run. Gains are even larger over the long run as investment adjusts to higher capital returns. Other benefits which were not considered here are technology transfers, improved visibility and increased political stability if Colombia becomes more integrated with the international community as a result of FTAA accession. A model which incorporates endogenous growth effects, such as that developed in Rutherford and Tarr [2002], would be expected to produce gains from trade liberalization several multiples larger than the estimated gains of our CRTS model.

- **Limitations**

  - *Single-agent framework*: We cannot address the distributional impacts of the FTAA because there only exists one agent. Because the RA framework represents welfare for the the *average* citizen, it misses any changes to the poverty rate. The RA approach is reasonable for northern countries like the US and Canada, where there exists a large middle-class, but it is less representative for countries with a polar income distribution.
  - *Constant Returns to Scale*: The new economic geography contends that most gains are found in *services* rather than in *goods* trade. This important component is not

captured in the current study. A useful extension would be the inclusion of Dixit-Stiglitz production with variety effects and market size. Benefits from the transfer of technology and expertise are likely to larger than tariff-distortion elimination.

- *Bolivian Data*: GTAP Version 5 combines data from Bolivia and Equador into a single region, called the "rest of the Andean Pact" (`XAP`). Because of this aggregation, we do not discuss the Bolivian situation in extended detail, and the `XAP` results represent Equador's economy more than Bolivia's. We plan to prepare a special report which focuses upon Bolivia's case in particular. This report will be produced separately.

- **Strengths**:

  - *Multi-regional framework*: This approach offers two important dimensions to the analysis. First, it explicitly accounts for changes in all foreign countries, FTAA and non-FTAA. Changes to comparative-advantage in foreign countries are important to detemine trade-diversion and trade-creation. Second, the multi-regional framework describes the importance of FTAA and the Andean Community to *other* country's welfare. For example, it is possible to identify key exports for Brazil - which will help to understand motives for key trading partners.

  - *Globally consistent and comparable*: The GTAP dataset and GTAPinGAMS model is the only *consistent* dataset across a large number of countries. That is, the GTAP consortium has been very careful to consistently define the nature of each commodity. Because the sectoral definitions are consistent, output and consumption can be compared across different sectors and different countries. Before this, sectoral production across countries was not comparable because each sector had been defined slightly differently.

2 Framework for Analysis

We utilize a computable general-equilibrium model of trade, production and consumption to identify impacts related to tariff and subsidy elimination. The main assumptions here are neoclassical. Zero excess profits, market clearance, income balance, and balance-of-trade constraints are imposed for all activities. These assumptions may be relaxed under some circumstances, but they are widely accepted in the economic community as a starting point for anlaysis.

The GTAPinGAMS framework was developed by Rutherford as a way to utilize the GTAP dataset using GAMS and MPSGE, two systems for optimization and economic modeling (see Rutherford, 1999). A similar model to this has been a central tool in trade-policy for several South American countries - Brazil (Rutherford and Tarr, 2003), Chile (Harrison, Rutherford and Tarr, 2002), and Colombia (Rutherford and Light, 2002). Other recent studies include WTO accession for Russia (Rutherford and Tarr, 2003). The model is described in detail below.

2.1 The Global Trade Model

The quantitative model developed to evaluate the trade policy options facing the Andean Community is multi-regional and multi-sectoral. Tables 32, 32, and 33 list the 16 regions included in the model, as well as the sectors and factors included in each region. The model is quite detailed in the Americas: with 13 distinct countries or regions. Outside of the Americas, we have the European Union 15, Japan and Rest of the World. The general specification of this model follows earlier studies of trade agreements in South America, such as the model of trade policy options for Chile and Brazil.[6]

Overall welfare is measured using a "representative agent," who represents the average citizen in society. This is a useful approach, especially when we are interested mostly in structural changes to the economy. In some cases, multiple-households are useful in order to consider the impact of trade liberalization upon poverty. This sort of analysis is more important, the higher is the inequality in a given country. Countries with a large middle-class can be largely represented using a single-household framework. This approach is less represntative where income is highly disparate, which is the case for Andean Community members.

We adopt a multi-region model, rather than a small open economy model, since we need to consider the possible effects of a reduction in import tariffs for Andean Pact countries as well as all other FTAA regions. Although the general theory of the welfare effects of preferential trading arrangements does allow for the impact of changes in partner country tariffs on the home countrys terms-of-trade,[7] some empirical approaches to evaluating preferential trading arrangements ignore

[6] See Harrison, Rutherford and Tarr [2002].

[7] See Wooton [1986] and Harrison, Rutherford, and Wooton [1993].

them.[8] The GTAPinGAMS framework allows us to explicitly evaluate the importance to the Andean Community of improved market access to regions such as the EU and the Americas, as well as losses CAN members may suffer from trade diversion.

In addition to MERCOSUR and the Andean Pact, we assume that NAFTA operates as an effective free trade area with zero tariffs among the U.S. Canada and Mexico, but each of the three countries has its own external tariff. Although there are many other regional preferential trading arrangements in the Americas that are implemented at different levels of effectiveness, the GTAP dataset does not incorporate these preferential tariff rates. Further notes on the tariff rates in the GTAP5 dataset are presented in Appendix **??**, along with relevant statistics. Several detailed reports are available from the GTAP website describing how tariff and non-tariff barriers are calculated.

2.1.1 Formal Specification

The general specification of the model follows earlier work by Rutherford and Tarr (1999) on the Uruguay Round, Chile, and Brazil. We concentrate here on the "base" model, which is static and assumes constant returns to scale (CRTS). Apart from the fact that imports and exports are distinguished by many regions, the structure of the model within any country is very close to the basic GTAPinGAMS model. Readers should consult an earlier report to the Secretariat General of the Andean Community which describes each equation in the model specifically.[9]

Briefly, production entails the use of intermediate inputs and primary factors (Labor, Capital and Land). Primary factors are mobile across sectors within a region, but are internationally immobile. We assume Constant Elasticity of Substitution (CES) production functions for value added, and Leontief production functions for intermediates and the value added composite. Output is differentiated between domestic output and exports, but exports are not differentiated by country of destination. Each region has a single representative consumer who maximizes utility, as well as a single government agent. Demand is characterized by a nested CES utility function for the representative agent, which allows for multi-stage budgeting. Demand at the top level, for the composite Armington aggregate of each good is Cobb-Douglas. Consumers first choose how much of each Armington aggregate good to consume subject to aggregate income and composite prices of the aggregate goods. The Armington aggregate good is in turn a CES composite of domestic production and aggregate imports. Consumers decide how much to spend on aggregate imports

[8] An example is the approach adopted by Bond [1996]. He develops a simple general equilibrium specification of the effects on Chile of these preferential trading arrangements with an impressive level of detail with respect to tariff data. His results for Chile joining NAFTA, however differ significantly from Harrison et.al.[2002] because his CGE model does not incorporate the impact on Chile of access to NAFTA markets.

[9] This documentation is available on the Andean Community MPSGE website, currently residing at: http://www.mileslight.com/can/

and the domestic good subject to the prior decision of how much income will be spent on this sector, and preferences for aggregate imports and domestic goods are represented by a CES utility function. Finally, consumers decide how to allocate expenditures across imports from the 15 other regions based on their CES utility function for imports from different regions and income allocated to consumption on imports from the previous higher level decision.

2.1.2 Solution Algorithm

The model is formulated using the GAMS-MPSGE software developed by Rutherford [1999] and solved using the PATH algorithm of Ferris and Munson [2000]. Although the model has 16 regions and 29 sectors, and is large by historical standards, it is smaller than other recently solved models for Russia and Brazil.

2.2 The GTAP Database

Domestic and international production and trade comes from the GTAP5 database. The Global Trade Analysis Project (GTAP), based at Purdue University in Indiana produces the best data for international trade analysis. Their database is a compilation of social accounts from separate countries as well as tabulated international trade flows from the United Nations. All of the data is combined and cleaned to provide a consistent measurement of production and trade worldwide.

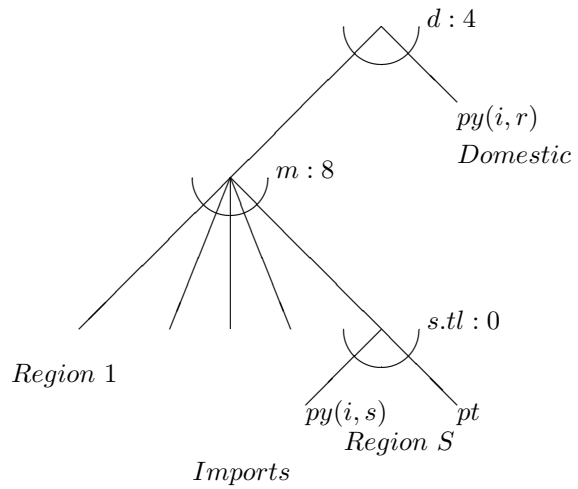
Except where we indicate otherwise, we use the GTAP5 database that is current as of November 2001. The 16 region version of the model retains all regions of the GTAP5 database that are directly relevant to our policy simulations. The full GTAP database contains 57 sectors, which is often aggregated to suit a particular trade-scenario.

Because the GTAP dataset must combine several disparate reports, some concessions and data manipulation are inevitable. Several diagnostic statistics are reported in Appendix **??** - these tables should be consulted in order to confirm that the economic structure in the dataset is representative of the actual national accounts. In general, we find that after correcting the trade levies between Andean Pact countries, the data seem reasonably close to the 1997 social accounts for each country. Further information regarding GTAP trade flows and specific Andean Community trade can be found in Urrunaga (2003).

2.2.1 Elasticities

We generally assume that the lower-level elasticity of substitution between imports from different regions is $\sigma_{MM} = 8$, and that the higher-level elasticity between aggregate imports and domestic production is $\sigma_{DM} = 4$. We refer to these values as our central elasticities. There are econometric

studies, such as those of Reinert and Roland-Holst [1992], Shiells and Reinert [1993], and Hernandez [1994], that suggest values which are lower than these. However, Reidel [1988] and Athukorala and Reidel [1994] argue that when the model is properly specified the demand elasticities are not statistically different from infinity, and their point estimates are close to the central elasticity values we have chosen.



Armington Aggregation Description

To be clear, a value of $\sigma_{MM} = 8$ means that if CAN members tried to raise prices by 1% on world markets relative to an average of aggregate imports, CAN imports would decline relative to aggregate imports by 8%. Given that there may be some economists who would prefer lower elasticity estimates, we also perform most of the important policy simulations with $\sigma_{MM} = 4$ and $\sigma_{DM} = 2$. We refer to these as our low elasticities. In our view, a high elasticity scenario, for an economy with little market power on world markets in most products, would be a specification with still less market power for exports, such as would occur with in the popular theoretical models of international trade where goods are homogeneous. The elasticity of transformation between exports and domestic production is assumed to be $\eta = 4$ for each sector. Elasticities of substitution between primary factors of production is unity. We assume fixed coefficients between all intermediates and value added.

2.2.2 Distortions

All distortions are represented as ad-valorem price-wedges. Border protection estimates combine tariff protection and the tariff equivalents of non-tariff barriers. See the GTAP documentation for full details regarding this methodology.

Outside of some trading agreements, such as the Andean Pact and ATPA, we find that GTAP tariff levels reasonably reflect the average tariff rates for most GTAP product categories in most regions. In services, however, the GTAP dataset contains both some subsidies to imports in some services sectors and significant tariffs on other services imports. We judge neither to be reasonable, and impose zero tariffs on services in our tariff database for the Andean Community (and for other countries as well). In addition, contrary to the GTAP database, we impose zero tariffs on imports within the Andean Pact. After these corrections, the implied collected tariff in the corrected GTAP database is 9.2%, which is slightly larger than the actual collected tariff average in the Andean Community of about 8.6% for those sectors with import tariffs.

We employ the GTAP tariff rates for countries outside of the Andean Community as well. These tariff rates are trade weighted average tariffs, and consequently typically differ according to trading partner. That is, since there are thousands of tariff lines in the tariff schedules of most countries, literally hundreds of tariff lines must be mapped into a single sector in the GTAP database. Since the product mix of imports differs across countries, the trade weighted average tariff rate will differ according to the country of origin.

Other distortions include factor taxes in production, value-added taxes, export subsidies (especially on agricultural exports from the EU, but to a limited extent elsewhere), and export taxes on textiles and apparel.

Tariff Rates Tables 3 and 4 show import tariffs imposed by CAN members under the common external tariff, and also average tariff rates faced by CAN members for exports to other countries. Table 4 reports US protection to Venezuelan exports separately (as VEN/USA) because Venezuela is not an ATPA member. Most tariff rates are zero for the ATPA countries' exports into the US, as we can see from the first row of Table 4. Also, there is a free trade zone within the Andean Community, so that all imports and exports within this zone do not face tariffs.

Non-tariff Barriers There is an attempt to include non-tariff barrier equivalent price wedges into the GTAP database. Where econometric estimates exist, non-tariff barriers are represented by the difference in relative price.

Subsidies Although there are several types of subsidies, two main types are considered here: export subsidies and indirect production subsidies. The GTAP database contains subsidy payments for each country, including the United States and Europe.

Most subsidies are underestimated because they do not include indirect and institutional types of assitance to farmers and producers.

Table 3: Import Tariff Rates Imposed by the Andean Community (Percentage Ad-Valorem)

	CER	OSD	AGR	ENR	MFR	OFD	TEX	MAN
USA	12	12	16	7	15	18	17	9
AND	0	0	0	0	0	0	0	0
E_U	12	16	13	8	14	18	17	9
ROW	14	16	13	6	20	18	17	11
XCM	9	14	13	5	11	18	20	12
JPN	20	15	11	9	22	17	14	9
BRA	12	10	14	7	18	18	13	9
CAN	13	17	15	8	27	18	15	7
MEX	12	14	14	9	20	18	15	11
CHL	15	17	15	12	14	18	16	11
ARG	13	14	17	10	12	18	12	9
URY	18	17	17	7	15	17	13	8
XSM	12	10	14	6	4	13	15	7

Table 4: Import Tariff Rates faced by Andean Community (Percentage Ad-valorem)

	CER	OSD	AGR	ENR	MFR	OFD	TEX	MAN
USA	0	11	0	0	0	6	9	0
AND	0	0	0	0	0	0	0	0
VEN/USA	1	27	4	1	2	11	12	3
E_U	53	3	15	0	2	29	11	3
ROW	21	34	24	4	5	31	11	5
XCM	10	14	15	6	9	17	17	8
JPN	155	24	40	0	1	39	7	0
BRA	12	8	11	5	16	17	16	9
CAN	6	2	3	1	4	19	17	3
MEX	20	11	18	7	11	43	23	8
CHL	12	11	11	11	11	11	11	11
ARG	12	8	11	5	16	17	16	9
URY	12	8	11	5	16	17	16	9
XSM	0	8	20	5	19	15	17	13

1. VEN/USA represents tariffs faced by Venezuela from the US.

2. Tariff rates are imputed rates. They represent tariff collections divided by import values.

Table 5: Subsidies Applied to Production in the GTAP Dataset

	COL	PER	VEN	XAP	USA	E_U
COL		-1				-1
WHT					-5	
GRO					-4	
OSD					-1	
C_B					-1	
CTL					-1	
RMK					-1	
WOL					-1	
FRS						-2
FSH						-3
MVH						-1
ELE						-2
ELY	-1					
WTR	-1					
CNS		-1		-1		
TRD		-3		-3		
OTP	-1	-3		-8	-1	-9
WTP	-46	-16	-12	N/A	-24	N/A
ATP	-1	-5	-1	-36	-6	-11
CMN						0
OFI	-1					
ISR	-1					
OSG						-3

2.2.3 Pre-Existing Trade Agreements

Several trade agreements were signed since 1997 which are not reflected in the data. In order to begin the modeling with a benchmark consistent with the most recent tax and tariff structure, we impose newer trade structures onto the data and re-compute the benchmark. For example, Brazilian accession to the Mercosur trading pact implies zero tariffs for partner countries. We set these particular import tariffs to zero then re-solve the model. This constitutes the new benchmark dataset.

Table 6: Regional Trading Agreements in the Western Hemisphere since 1997

Agreement	Description
NAFTA	North American Free Trade Agreement. Free access to most products between Canada, USA, and Mexico.
Mercosur	Free Trade Zone for Brazil, Argentina and Uruguay.
Multi-fiber Agreement	Special Tariff structure for textiles.
Andean Pact	Free Trade Zone for Colombia, Venezuela, Equador, Peru and Bolivia.
ATPA	Andean Trade Preference Act. Zero import tariffs for most goods exported from Andean countries to the United States.

Table 6 describes various agreements which we have imposed upon the GTAP dataset that are consistent with recent trading agreements. The revised import tariff structure for the Andean Community and its trading-partners is listed in Tables 3 and 4.

2.3 Economic Structure for the Andean Community

The set of central results and statistics uses the `FTAA10` commodity aggregation. The choice of commodities highlights goods which have high existing trade barriers or are important exports in the Andean Community, and at the same time aggregates several sectors which are not expected to be impacted. The 10-sector aggregation is listed in Table 7.

Several special studies will utilize a different sectoral mapping in order to highlight special considerations for Andean Community members. For example, in order to focus upon US agricultural subsidies, we disaggregate agricultural goods, and for the case of Peru, we focus upon mining and ferrous metals, since exports of these goods represents approximately 45% of total exports. If the aggregation changes for a specific scenario, we will always describe the commodities below each table.

Table 7: FTAA10 Sector Description

Code	Description
CER	Paddy rice, cereal grains and processed rice (EU agricultural protected)
OSD	Oil seeds, other crops, milk, sugar (USA agricultural protected)
AGR	Other agriultural products
ENR	Energy and mining
MFR	Leather, lumber, ferrous metals, metal products, motor vehicles, other manufactures
OFD	Food products nec, bovine meat, other meat
TEX	Textiles and finished wearing apparel
MAN	Other manufacturing
SER	Public and privately provided services
DWE	Ownership of dwellings
CGD	Savings good

2.4 Some Basic Statistics

The results coming from this analysis can be seen more clearly after considering the size of Andean economies in comparison with other countries in the Americas. Table 8 lists total production (not GDP) for each aggregated region in the world. Total production in the United States is about 32 times larger than the Andean Community. US production is also about the same size as European production or remaining production in the ROW region. ROW output is large because it represents all remaining countries in the world (about 110 of them). The combined output of the Andean Community is close to that of Argentina, but only one-third as large as Brazil.

Trading Partners The most important trading partners for the Andean Community are: the US, Europe, and other Andean Community members. Imports come mostly from the United States and Europe, 68% of all imports into the Andes originate from one of these regions.

Similarly, the most important export markets are the US, Europe, and the Andean Community. Interestingly, Central America (XCM) represents a larger export market than Brazil, even though the economy is much smaller and imports from XCM are smaller than from Brazil. Energy goods, such as petroleum from Venezuela may explain part of this, but a considerable portion may be attributed to intermediate inputs. These inputs may be exported to Central America, and the final product is re-exported for final consumption in North America.

Table 8: Baseline Output (Billions of 1997 US Dollars)

	CER	OSD	AGR	ENR	MFR	OFD	TEX	MAN	SER	DWE	CGD	TOTAL
USA	44	96	157	268	907	447	182	1,672	9,077	606	1,398	14,853
E_U	36	152	316	102	777	495	140	1,546	8,147	369	1,490	13,570
ROW	326	191	713	473	822	488	331	1,685	5,400	275	1,620	12,325
JPN	53	38	81	70	584	276	87	1,126	4,230	476	1,223	8,244
BRA	20	35	85	29	133	89	62	246	697	37	157	1,590
CAN	3	8	30	33	60	28	12	99	529	67	118	988
MEX	8	7	36	26	48	52	16	73	291	0	79	636
ARG	5	19	36	10	69	52	35	93	193	0	65	578
AND	5	14	28	19	27	37	16	46	217	10	52	470
XCM	4	4	11	4	8	11	7	16	68	5	22	160
CHL	2	2	9	5	6	12	4	12	62	6	19	136
URY	1	1	2	0	1	3	1	2	12	3	2	29
XSM	0	0	1	0	1	1	0	1	7	1	3	16

There is a noticable trade-imbalance between the Andean Community and Mercosur. CAN imports from Brazil and Argentina represented about 2.9 billion dollars, compared with exports valued at 1.9 billion dollars. Trade barriers between these two regions are relatively high, but they are similar and are not sufficient to explain the trade imbalance.

Table 9: Andean Members: Major Trading Partners

Country	**Imports From**	**Exports To**
Peru	US 27%, Chile 8%, Spain 6%, Venezuela 4%, Colombia, Brazil, Japan	US 28%, UK 8%, Switzerland 8%, China 6%, Japan, Chile, Brazil
Venezuela	US 35.8%, Colombia 6.8%, Brazil 4.5%, Germany 3.9%, Italy 3.9%	US 60%, Brazil 5.5%, Colombia 3.5%, Italy 3.5%, Spain 3.4%
Equador	US 25%, Colombia 13%, Japan 8%, Venezuela 8%, Brazil 4%	US 38%, Peru 6%, Chile 5%, Colombia 5%, Italy 3%
Bolivia	US 24%, Argentina 17%, Brazil 15%, Chile 9%, Peru 5%	US 32%, Colombia 18%, UK 15%, Brazil 15%, Peru 6%
Colombia	US 35%, EU 16%, Andean Community of Nations 15%, Japan 5%	US 43%, Andean Community of Nations 22%, EU 14%

Year: 2000

Important Sectors By far the largest export for the CAN is energy. Venezuela is the second largest supplier of petroleum products to the US – energy represents one-half of all exports to the US, and almost one-half of total exports from CAN countries. We do not expect substantial changes in oil exports from Venezuela or Colombia as a result of the FTAA. Oil imports rarely face import tariffs in developed countries and most sales markers relate to a world price.

Oil production may remain constant, but revenues could increase in terms of the local currencty if the FTAA has substantial exchange-rate effects.

Besides oil and petroleum, the CAN is a major exporter of oil seeds, other crops (coffee, bananas, flowers, and fruits), and sugar. Trade liberalization in these goods could stand to improve the competitive position for CAN members. However, under ATPA, most countries in CAN already enjoy preferential access and the FTAA could also introduce competition. An important consideration is the level of US subsidies for these goods. If US subsidies are high, and they are eliminated under the FTAA, then CAN members could enjoy gains coming from increased overall US demand. This gain could occur despite losing some market share to insurgent exporters from Central and South America. In order for CAN exports to increase in the US, the increase in overall demand coming from subsidy elimination would need to be *larger* then the effect from trade diversion to other Latin countries. This issue is considered in the results section.

The free-trade zone in the Andean Community has increased regional trade volume substantially. Trade among CAN regions in manufactured products (`MAN` and `MFR`) is as important and trade with the US. Agricultural products are also highly traded within the free-trade zone. This result is not surprising, since tariff barriers are high (around 19-30%, on average) between other regions. If barriers are eliminated for other South American countries, then we would expect some trade diversion to occur, where Brazil and Argentina see increased participation in exports to CAN. A counter-balancing effect is also expected, where CAN exports into Mercosur also increase.

Table 10: Imports into the Andean Community (Millions of 1997 US Dollars)

	CER	OSD	AGR	ENR	MFR	OFD	TEX	MAN	SER	TOTAL
USA	612	308	334	75	2,168	187	396	9,537	2,588	16,205
E_U	18	178	37	16	1,153	309	167	5,280	4,514	11,672
AND	139	294	619	1,329	2,468	997	710	4,111	66	10,733
ROW	134	195	36	59	960	20	326	1,883	3,192	6,805
JPN	0	0	1	1	1,327	5	24	1,056	650	3,066
BRA	13	87	12	15	622	52	80	1,072	74	2,027
MEX	11	6	8	12	500	32	87	1,057	127	1,839
CAN	250	5	59	15	385	19	6	379	284	1,401
CHL	1	20	128	41	99	179	62	460	33	1,023
ARG	232	28	261	22	65	69	14	165	26	881
XCM	1	60	6	39	134	27	62	320	94	742
URY	17	5	11	0	2	2	13	10	11	70
XSM	5	2	26	2	3	1	1	6	5	49
TOTAL	1,431	1,187	1,538	1,627	9,884	1,900	1,948	25,335	11,663	56,513

Table 11: Andean Community Exports to Other Countries (Millions of 1997 US Dollars)

	CER	OSD	AGR	ENR	MFR	OFD	TEX	MAN	SER	TOTAL
USA	1	3,853	637	12,874	485	1,572	956	2,113	1,339	23,828
AND	139	294	619	1,329	2,468	997	710	4,111	66	10,733
E_U	2	1,051	596	2,040	203	636	145	772	2,631	8,075
ROW	0	155	322	1,422	91	690	32	395	2,094	5,202
XCM	0	24	17	2,121	103	148	35	387	52	2,888
JPN	1	228	61	305	36	193	22	329	839	2,013
BRA	0	4	7	1,203	9	51	28	219	103	1,625
CAN	0	50	3	594	25	18	9	27	151	877
MEX	0	4	9	347	49	6	11	170	183	779
CHL	0	16	67	345	34	26	35	209	24	756
ARG	0	16	61	120	13	22	10	58	34	333
URY	0	0	0	59	1	2	1	4	8	75
XSM	0	1	0	28	3	4	1	8	3	48
TOTAL	143	5,695	2,400	22,786	3,518	4,366	1,995	8,802	7,526	57,230

3 Policy Results

When considering different policy results, our primary interest is economic well-being for residents of the Andean Community. In an economic sense, welfare is measured in terms of consumption. Subsection 3.1 presents the economic effects which combine to change total consumption, subsection 3.2 defines the central scenarios in this report, subsection 3.3 presents the main results from the paper. These results are also summarized in the introduction, the executive summary, and the conclusions. Subsection 3.4 distinguishes special characteristics for each individual country within the Andean Community and country-specific results. Finally, several other aspects regarding the FTAA are examined outside of the current discussion. Agriculture, other trading agreements, and specific effects for Bolivia will be included in future reports.

3.1 Economic Foundations for Policy Evaluation

Consumer welfare can be summarized completely by a single measurement: consumption. In the GTAPinGAMS model, each country has a single "representative agent" or household, who owns all of the factors of production and represents the average consumer. It is overall consumption for this average consumer that we care about.

Most undergraduate textbooks measure changes in consumption by using a *utility function*, typically represented in primal form as: $U(x)$, or by the *indirect utility function* in dual form as: $v(p, M)$. In our case the utility function is defined by a Cobb-Douglass technology[10]:

$$U_r(\mathbf{x}) = \Pi_{ir}\, x_i$$

where x_i is a vector of consumption goods.

Trade policy chages will effect overall consumption by changing producer and consumer prices, as well as household income. Higher (or lower) producer prices will increase (or decrease) income for workers and capital owners. Naturally, changes to income will change the overall level of consumption in the region. Changes to producer prices will also allow for more or less production in a given region. If foreign countries have high domestic prices and limit imports through tariffs, then a free trade agreement will lower foreign consumer prices, but raise producer prices for the exporter. The second type of price is consumer prices. Tariff elimination lowers domestic consumer prices as well as prices for intermediate inputs. Overall, lower consumer prices allows the representative agent to consume more for a given level of income.

The net impact on utility depends upon a combination of producer and consumer prices, overall production, and income. In order to decompose the overall effect into these subcategories, we

[10]If the reader is unfamiliar with the concept of an indirect utility function, or with the associated *expenditure function*, a review of these basic concepts is available in Varian (1992), pp. 94 (Utility Maximization).

decompose the total effect into each of its sub-components. In the end, we want to understand how the FTAA will impact consumption for Andean Community families. In particular - where are the large potential gains, and where are the large potential losses. Below is a listing of several effects which are components of the overall change:

Major Questions:

- Who are the most important trading partners for the Andean Community?
- Which sectors expand and which sectors contract under the FTAA?
- What is the effect upon wages and employment?

Major Trade Policy Effects:

- Trade Diversion Effect Some CAN exports will face increased competition for exports to major markets such as the United States and Canada. Trade is then diverted away from CAN exporters to other latin countries. This effect lowers export prices and quantities for some goods. In turn, this lowers domestic production levels and domestic wages for certain industries.
- Trade Creation Effect This effect is exactly the opposite of the trade-diversion effect. Export goods for which the CAN has a natural comparative advantage will expand in various markets. The most likely markets, however, are not major trading partners with the CAN.
- Import Substitution Effect As import tariffs fall to zero, domestic producers will face hightened competition from foreign imports. Domestic consumers and companies will *substitute* away from domestically-produced goods into foreign imports (because the imports are less expensive). The amount of substitution depends upon the elasticity of substitution between domestic and foreign varieties of goods (currently set to 4 in our model), as well as the magnitude of the import tariff which has been eliminated.

  Import substitution places two types of pressure upon domestic prices. It lowers producer prices to domestic markets, which in turn lowers wages. At the same time, this also lowers *consumer* prices and the price of intermediate inputs. Typically, if import tariffs are eliminated the gains from lower consumption prices and intermediate inputs outweigh the negative effects of lower wages and production. This is the standard Ricardian theory of comparative advantage.
- Tariff Revenue Replacement Elimination of import tariffs lowers prices for imports and eliminates distortions between goods. But it also lowers government revenues. If the government

must replace lost funds by raising taxes elsehwere, then consumption prices for imports will fall, but prices for certain other goods will also rise. The net effect upon the level of distortions in the economy depends upon the pattern of use for these goods, as well as the magnitude of the distortions.

- Productivity Effect Higher international trade implies increased standardization and changes to productivity. In recent years, there have been noted increases to industrial productivity following trade liberalization. Factor productivity in Eastern Europe (Hungary, Czech, and Poland) as well as in Mexico have markedly risen following European block expansion policies and following the North American Free Trade Agreement. The effect of higher productivity is lower domestic prices and higher profitability for exports. Unfortunately, we are unable to *quantify* the magnitude of this effect using a constant-returns to scale model. Future analysis will quantify the productivity effect, which is expected to outweigh all of the previous effects combined.

As we consider the results, we will try to identify the causes for each type of effect. That is, we will explain what is causing the trade diversion effect, where trade creation can be found, how costly is the revenue replacement effect, and whether lower import prices can compensate for potentially lower wages in some industries.

3.2 Central Scenarios

We consider four central senarios. Each scenario is considered because it helps identify separate components of the overall effect.

Complete elimination of import tariffs and export subsidies is considered in scenario `FTAA`. The other three scenarios are intended to identify why welfare falls in the `FTAA` scenario. Table 12 contains a description of each scenario.

Scenario `ATPA` identifies the importance of current trade preferences given to ATPA countries by the United States. This scenario begins from a state where Andean countries face barriers to trade with the United States (i.e. before full ATPA preferences) and considers the counterfacutal situation where tariffs are removed for Colombia, Peru, Equador and Bolivia. This scenario shows that the ATPA has contributed to a level of consumption almost 1% higher than before ATPA preferences were granted.

The `FTAA` scenario begins with the assumption that ATPA preferences are in place (zero US import tariffs for goods from ATPA countries), then considers the counterfactual where tariffs are set to zero for *all* countries in the Western Hemisphere. The ATPA assumption is crucial in this case, because it leads to lower overall welfare. This result is obvious – the ATPA countries are losing

Table 12: Central Trade Scenarios

Scenario	Description
FTAA	Complete tariff and subsidy elimination for all region in the Western Hemisphere. ATPA is assumed to already exist for CAN member countries.
ATPA	Preferential market access for Colombia, Peru, Equador, and Bolivia. US import tariffs from these countries are set to zero for most goods.
FTAA_XUS	FTAA agreement with all members *except* the United States. This scenario considers the role of US consensus in the negotiations.
FTAA_XAN	FTAA agreement with all memeber except the Andean Community. This scenario highlights possible costs of non-accession to the FTAA for CAN members, as well as for other FTAA countries.

pre-existing preferences with a major trading partner, the US. This loss of trade preferences will naturally cause trade diversion toward other countries who have a *natural* comparative advantage for some goods. The ATPA assumption is crucial for the overall effect, if the ATPA did not exist, then the FTAA agreement would lead to increased welfare for CAN members. We chose not to present results under the assumption that ATPA does not exist – because such an assumption is simply not true. However, since some of the Andean Community members have presented such a scenario, we feel that the situation should be clarified. For this reason we present summary tables in the Appendix which present the FTAA results under the assumption that ATPA trade preferences did not exist. If there were no pre-existing ATPA agreement, then overall consumption increases by almost 1%.

Moving along, we consider the FTAA_XUS scenario in order to identify how important the US trade is to the Andean Community. In FTAA_XUS, import tariffs and export taxes are eliminated for all countries *except* the United States. This means that the Andean Community *retains* its preferential standing with the US (ATPA countries still enjoy zero import tariffs to the United States, while all other countries remain at benchmark tariff levels). FTAA_XUS shows how much is gained from non-US trading partners. For the Andean Community, the second largest partner is itself (other CAN members), so this scenario reveals mostly whether the Andean Community has a significant comparative advantage above other latin countries.

Finally, we consider the case where the Andean Community does not participate in the negotiations. This scenario is named FTAA_XAN. Over 1/2 of total imports into the CAN are either from the US or from within the CAN. Additionally, 3/5 of total exports are sent to the US or within the CAN. For this reason, the FTAA scenario is similar to a unilateral reduction of import tariffs to the US. The FTAA_XAN scenario allows us to consider the case where CAN import tariffs are

not reduced but all other latin countries have free trade. Since the CAN already enjoys low tariffs for 3/5 of current exports, not participating in the FTAA does not appear to be dramatically costly. Of course, this model only considers commodity trade. Conventional wisdom would tell most citizens that to not participate in the FTAA would isolate the CAN from most of the world, leading to a situation, which in the extreme would be similar to Cuba.

Additional Scenarios For brevity, we have included only four scenarios into our central results. However, we believe that there exist several other important scenarios that could be helpful when considering potential outcomes during the FTAA trade negotiations.

Separate scenarios not included in this report, but still available from the authors include:

- Agricultural scenarios, where the FTAA does not include tariff reductions for agricultural products.
- Exclusion of Mercosur from the negotiations.
- The impact of bilateral negotiations which are currently proceeding between latin regions (Peru, Colombia, and Central America) and the United States.

If the reader is interested, some of these additional scenarios will be conducted and posted on the internet for review. Also, we will consider requests for scenario development by member countries as we develop a partnership between the research faculty at the Secretariat General and member governments.

3.3 General Results

In general, the impact of a multilateral FTAA agreement is small and negative for the Andean Community. Consumption in the Andean Community falls by 0.36%. The trade diversion effect is the dominating factor as all other latin countries compete on equal terms against CAN countries in US markets. This increased competition reduces the share of sales coming from the CAN. The `FTAA_ATPA` scenario reveals that the pre-existing ATPA trade preferences have already bolstered production and wages enough to increase regional consumption by 0.56% over what they would have been without the ATPA. Now, the FTAA agreement places all countries on equal footing with the US, but welfare under the FTAA scenario is still higher for the CAN than it would be if there were no ATPA concessions or FTAA-style agreements.

To summarize, the FTAA would be welfare-improving if the Andean Community did not already have trade preferences with the United States. The best scenario for the CAN would be continued, permanent trade concessions by the US. In the top row of Table 13, we also see that welfare is

almost the same (-0.27 vs -0.36) whether the Andean Community participates in the FTAA or not. But the bottom row shows that trade volume grows when the CAN participates in the FTAA, and that trade volume shrinks if the CAN does not participate.

Table 13: Summary Results for the Andean Community

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
EV	-0.36	0.56	-0.02	-0.27
EVINUSD	-0.67	1.04	-0.05	-0.51
DOMPROD	-1.03	0.81	-0.61	-0.19
TAXCHG	-3234.13	228.55	-1575.33	-109.38
RER	2.48	-0.50	1.12	0.23
MCHG	9.88	2.32	7.65	-1.67
XCHG	5.99	1.18	3.62	-0.57

Description:

EV	Equivalent Variation: The percentage change in consumption relative to benchmark consumption.
EVINUSD	EV measured in Thousands of Millions of 1997 US Dollars
DOMPROD	% change in domestic production.
TAXCHG	% change in domestic tax revenues.
RER	Real exchange rate. Measured as $\frac{P_x^0/P_d^0}{P_x^1/P_d^1}$.
MCHG	% change in import volume.
XCHG	% change in export volume.

In order to highlight the importance of the US market and ATPA trading preferences, consider the `FTAA_XUS` scenario. In this case, all countries eliminate import tariffs *except* the United States. This means that the Andean Community would retain preferential status with the US with near-zero import tarrifs under the ATPA agreement. All latin countries would enjoy a larger marketplace in the `FTAA_XUS` scenario, but would not have access to US markets. Welfare in this case is nearly unchanged for the CAN. We conclude that despite complete tariff elimination in all other FTAA countries, most of the Andean Community's business will be conducted between CAN members and the United States. The second largest trading partner would remain the internal CAN market itself.

Trade Volumes Imports for almost all sectors in the economy rise. Table 14 shows that agricultural imports are likely to increase the most (at least in percentage terms) under the FTAA. This makes sense because import tariffs for processed food (OFD) are around 18% (see Table 3), and that average agricultural tariffs (CER, OSD, AGR) all hovered around 15%. Some claim that this average tariff rate is low compared to more recent years, but these rates are still higher than for other sectors. When these high tariffs are eliminated, we see the largest import changes in those sectors.

Table 14: Trade Volume Impacts for the Andean Community

	Imports (% change)			
	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	21.36	6.99	13.64	-1.98
OSD	7.97	-3.79	5.97	-0.46
AGR	28.73	7.05	20.39	-2.91
ENR	1.92	0.68	2.60	-0.38
MFR	13.44	2.51	10.45	-1.07
OFD	14.10	0.68	12.97	-2.28
TEX	7.50	-0.44	4.75	-2.91
MAN	4.11	2.49	0.80	-1.09
SER	-10.24	5.61	-3.56	-1.82

	Exports (% change)			
	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-15.94	-2.92	-10.37	1.03
OSD	-1.58	31.79	3.87	-8.94
AGR	4.47	-0.57	2.14	0.59
ENR	7.92	-2.62	4.31	0.05
MFR	-5.38	-2.27	-4.75	0.87
OFD	9.88	5.93	6.20	0.05
TEX	26.54	14.37	9.04	-0.90
MAN	3.24	-1.80	4.12	0.45
SER	7.66	-3.84	2.47	1.30

Interestingly, Andean Community agricultural imports still increase substantially even if the United States does not participate in the FTAA. To see this, compare the import percentage change under the `FTAA` and `FTAA_XUS` scenarios. Imports for AGR increase by 28% under the FTAA, but they also increase by 20% even with import tariffs against the US remaining. The results are similar for CER and OFD. Cereals and grains would still be imported from Canada and other latin countries because of a natural comparative advantage that they have in agricultural products. This

implies that claims the United States would flood CAN markets with grains by using export and production subsidies may be over-stated.

We should also point out that even though the *percentage change* in imports for agriculture is large, the *dollar* change is relatively small compared to manufactures. For example, in the FTAA scenario, imports for cereals (CER) increase by 21% but manufacturing (MAN) imports only increase 4%. But when we consider the change in dollar terms, the change is $300 million ($1,187 * 21%) in increased imports for cereals, but $1,031 million ($25,335 * 4%) in increased imports for manufactures. The change in imports taken in dollars is more than five times as large for manufactures than it is for cereals. When reading the results tables, the reader should consult tables 10 and 11 in order to determine the change in dollar terms.

Exports present a very different pattern than imports. Export volumes increase for most goods, but not by as much as imports. Total imports rose by 9.8% while exports rose a more modest 6%. More importantly, most of the increased exports, in dollar terms, were in the energy sector. Energy (ENR) exports rose by about 8% in the FTAA scenario, which represents $1.8 billion. Compare the energy changes with textiles (TEX) export increases of only $518 million.

Table 15: Andean Community Production (% change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-7.81	-0.93	-4.94	0.39
OSD	-1.26	10.07	0.96	-3.26
AGR	-1.49	0.69	-0.97	-0.10
ENR	5.48	-2.06	2.98	0.10
MFR	-6.94	-1.42	-5.38	0.58
OFD	0.43	1.18	0.21	-0.07
TEX	3.46	2.82	0.78	0.06
MAN	-2.26	-1.55	0.08	0.65
SER	0.38	-0.32	0.09	0.09
DWE	-1.12	0.32	-0.52	-0.17

Export and import changes combine to determine the total change in production. Table 15 shows the overall change in production under each scenario. Under the `FTAA`, production of cereals and grains fall the most (-7.8%), followed by manufactures (-6.9%), while energy and textile production both increased to balance the terms of trade. In the `FTAA_XAN` scenario, production remains nearly unchanged for almost every sector. It is interesting to notice that welfare in this scenario is lower than it is in the `FTAA_XUS` scenario, even though production in the `FTAA_XAN` scenario does not fall. Welfare is higher in the `FTAA_XUS` scenario because the Andean Community is a member of the FTAA in this case, and can enjoy lower import prices – these lower import prices

increase welfare and consumption. In the `FTAA_XAN` scenario, the Andean Community's exports remain mostly unchanged, but imports fall. This raises domestic prices and lowers welfare.

Table 16: National Consumption Changes for Each Region in the GTAPinGAMS Model. Figures represent the %-change in Equivalent Variation.

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
PER	-0.30	0.42	-0.06	-0.19
COL	-0.62	0.87	-0.09	-0.39
VEN	-0.02	0.05	0.10	-0.06
XAP	-0.55	0.97	-0.11	-0.46
BRA	0.03	0.00	0.12	-0.01
ARG	-0.16	0.00	0.04	-0.17
URY	0.01	0.00	0.35	-0.04
CHL	0.42	-0.01	0.63	0.19
MEX	0.21	-0.02	0.46	0.17
XCM	2.08	-0.07	0.52	2.02
XSM	0.09	0.00	0.34	0.06
CAN	0.00	-0.02	0.21	-0.01
USA	0.03	-0.01	-0.04	0.01
E_U	-0.02	0.00	-0.01	-0.01
JPN	0.03	0.00	-0.01	0.04
ROW	-0.06	0.00	0.00	-0.05

Consumption changes measured as a percentage of benchmark income (Equivalent Variation). A figure of 0.5 represents a 1/2% change in equivalent variation.

3.4 Country Analysis

Because each Andean Community member has special characteristics, especially with respect to energy and agriculture, we have included a separate set of results for each individual member. The main distinguishing factor is the prevalence of oil exports for Venezuela, and the exclusion of Venezuela from the ATPA agreement. Colombia, Peru, Equador and Bolivia are more similar in natural endowments as well as having similar trade patterns and agreements.

Due to data limitations, the GTAP dataset does not distinguish Bolivia and Equador. Instead, these countries were combined into a region called "Rest of the Andean Pact" (`XAP`). The prodcure uses input-output tables from Equador to describe the economic structure of the region, then scales the total output for each sector to match combined output of Equador and Bolivia. This means that special characteristics which pertain to Bolivia's economy are lost. We believe that Bolivia's data collection techniques have improved since 1997, and we would consider incorporating Bolivia as a separate region if the Bolivian government can provide adequate information about

the structure of their economy. In the meantime, all results use the `XAP` region and pertain mostly to Equador's situation rather than to Bolivia.

3.4.1 Peru

Among the ATPA countries, Peru is the least affected under the FTAA. This is because most of Peru's exports are region-specific, and as raw commodities, they are not subject to individual country tariff rates. Among the biggest exports for Peru are gold, copper, and fishmeal, all of which require the in-situ natural resource. Gold and copper are both sold to a world market, rather than any particular region. These traditional exports are expected to continue to grow under the FTAA.

Table 17: Summary Results Table for Peru

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
EV	-0.30	0.42	-0.06	-0.19
EVINUSD	-0.13	0.18	-0.03	-0.08
DOMPROD	-0.10	0.24	-0.40	-0.11
TAXCHG	-614.64	47.79	-293.92	-20.04
RER	2.96	-0.38	1.38	0.16
MCHG	9.92	2.27	8.78	-1.41
XCHG	10.24	1.58	5.48	-0.42

Developing sectors in Peru are energy, textiles, and services. Except for energy, these sectors are not resource-intensive and can grow without substantial environmental consequenses. Peru has particular advantage in certain textiles, such as those made from Alpaca and Llama wool. Service exports are also expected to grow by 9%, which is a large change given that 41% of all Peruvian production is in the service industry.

Peru loses about $600 million dollars in tax-revenues which will require a substantial tax-reform/transistion package within the national and regional government. The additional costs from marginally higher VAT and income taxes is uncertain at this point, and would require a country-specific analysis which focuses upon Peru's fiscal situation and tax-stream. With VAT rates currently at 18%, and corporate taxation at 30%, tax-revenue replacement will probably be the single most difficult hurdle toward FTAA accession.

Overall, domestic production in Peru falls slightly (0.1%) as does welfare (0.3%). Peru is the only country where exports increase more than imports (10.2% vs. 9.9%). Even so, most of the increases in exports come from primary and resource goods. These sectors do not employ a large portion of the population. Table supports this. It shows the return to natural resourses (N_RES) increase by 5%, while traditional labor and capital return only increase by 0.7-0.8%. Peruvian production falls for almost all sectors, except energy (ENR) and textiles (TEX).

Peru's traditional economy is driven by natural resource extraction. This sector will continute to be a primary source of income for households. But the majority of the labor in Peru works in the *service* industry. Tourism and basic services are the most likely places for economic growth

in Peru, which implies that this country should be considering what the FTAA has in store with respect to the design of the service industry and the legal institutions surrounding them.

Table 18: Peruvian Import and Export Volume (%-change)

	Import Volume					**Export Volume**			
	FTAA	ATPA	FTAA_XUS	FTAA_XAN		FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	31.85	5.98	27.16	-0.82	CER	-8.02	-2.47	-5.75	0.81
OSD	2.89	-4.40	6.55	-0.84	OSD	-1.41	41.88	4.59	-9.74
AGR	18.26	3.47	13.82	-1.82	AGR	6.37	0.95	3.25	0.50
ENR	-3.35	0.86	-0.99	0.34	ENR	13.34	-4.25	6.29	0.32
MFR	6.37	3.71	4.20	-1.24	MFR	8.43	-2.13	5.38	0.26
OFD	22.06	2.82	23.22	-3.32	OFD	14.72	-0.57	9.15	0.52
TEX	4.67	0.95	5.23	-2.64	TEX	18.42	17.58	5.14	-1.47
MAN	8.36	2.95	2.97	-0.99	MAN	6.84	-1.33	4.31	0.34
SER	-0.40	5.24	-2.20	-1.42	SER	8.96	-3.50	3.27	0.93

Peruvian Production (%-change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-9.05	-1.28	-7.99	0.15
OSD	-0.22	5.43	0.47	-1.57
AGR	-0.62	0.26	-0.49	0.01
ENR	7.86	-2.89	3.62	0.13
MFR	-1.15	-0.70	-0.74	0.17
OFD	2.07	0.04	1.13	0.07
TEX	2.75	3.05	0.47	-0.29
MAN	-1.75	-1.25	-0.32	0.37
SER	0.12	-0.23	0.09	0.03
DWE	-1.03	0.30	-0.55	-0.17

Return to factors in Peru

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
SKL_LABOR	1.00	-0.07	0.61	-0.03
LABOR	0.72	0.45	0.36	-0.18
CAPITAL	0.86	0.15	0.55	-0.01
CAP_PROF	0.77	0.19	0.37	-0.03
N_RES	5.09	-1.10	2.25	-0.09

3.4.2 Colombia

Table 19: Summary Results Table for Colombia

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
EV	-0.62	0.87	-0.09	-0.39
EVINUSD	-0.40	0.57	-0.06	-0.25
DOMPROD	-0.19	0.76	-0.12	-0.14
TAXCHG	-928.40	109.23	-327.43	-41.58
RER	2.22	-1.06	0.65	0.47
MCHG	7.58	5.82	4.89	-2.52
XCHG	5.03	3.23	2.44	-1.11

Accession to the FTAA is not expected to yield large gains from trade in Colombia.

The agreement will combine two effects: the first effect is a loss of competitiveness in US markets from equalized US import tariffs. The second effect is similar to unilateral import tariff elimination. Although the second effect alone results in a welfare gain (import price distortions are eliminated), this gain is outweighed by the trade-diversion effect.

Colombia also depends highly upon import tariff revenues. Tariff revenues represent approximately 8% of all government tax revenues. In order to recover the $928 million in lost revenues, the central government would need to increase value-added taxes between 2-3%, or find revenues from some other source.

One reason that Colombia is among the most impacted by the FTAA is the close trade relations between the two countries. The United States has granted ATPA trade concessions to Colombia for over a decade. Because of this, almost half of total Colombian exports are shipped to the US. Additionally, about 1/3 of total imports come from the US.

As with Peru, the trade diversion effect and import substitution effects lower production and nominal wages. A counter-balancing effect is lower prices overall because of lower import prices. However, the losses in international competitiveness are larger than the gains from lower import prices. Nominal wages fall, but when compared to average prices (i.e., real wages), wages rise slightly. Wages for skilled labor increase about 1.1%, more than the return to capital (0.55%) or traditional labor (0.65%). These are all dwarfed by the 5% increase in the return to natural resources – the major input to the energy sector (coal and oil).

Table 20: Colombian import and export volume (%)

	Import Volume					Export Volume			
	FTAA	ATPA	FTAA_XUS	FTAA_XAN		FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	16.41	9.33	6.47	-3.34	CER	2.68	-6.40	0.77	2.83
OSD	11.56	0.12	6.07	-0.91	OSD	-1.92	31.03	2.97	-8.90
AGR	19.52	10.53	16.05	-4.01	AGR	4.76	-3.58	0.57	2.33
ENR	-1.65	4.67	-0.30	-1.20	ENR	7.26	-5.23	2.52	1.34
MFR	2.91	3.83	3.20	-1.44	MFR	-7.80	-6.18	-7.93	2.36
OFD	9.87	5.44	6.25	-2.59	OFD	5.23	3.20	1.65	1.13
TEX	13.36	4.32	4.77	-4.11	TEX	43.42	14.92	13.62	-0.21
MAN	3.64	4.82	0.92	-1.83	MAN	0.07	-5.92	2.13	1.47
SER	-9.99	8.93	-2.27	-2.92	SER	7.63	-6.22	1.63	2.25

Colombian production (percentage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-6.62	-1.10	-2.43	0.52
OSD	-1.72	15.12	1.37	-4.94
AGR	-1.56	0.30	-0.99	-0.02
ENR	3.66	-3.63	1.28	0.97
MFR	-3.82	-3.82	-3.65	1.43
OFD	-0.89	0.48	-0.39	-0.07
TEX	11.39	4.07	3.44	0.31
MAN	-2.36	-3.67	-0.24	1.31
SER	0.52	-0.78	0.08	0.28
DWE	-1.02	0.34	-0.35	-0.17

Return to factors in Colombia

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
SKL_LABOR	1.19	-0.33	0.41	0.11
LABOR	0.65	0.73	0.31	-0.26
CAPITAL	0.55	0.46	0.31	-0.19
CAP_PROF	0.37	0.69	0.25	-0.30
N_RES	4.97	-3.86	1.76	0.95

3.4.3 Venezuela

Within the Andean Community, Venezuela has the most to gain from free trade. By far the largest export for Venezuela is petroleum, which is sold to the world oil market. Although there could be a change in demand for oil as a result of the FTAA, the magnitude is likely to be small. Venezuela's other exports are relatively small compared to oil. Most of the exports comprise some manufactured goods and various agricultural products. These goods are typically sold to other CAN member countries or to the United States. In Venezuela, 68% of total exports are from oil, and 22% of exports are from manufactured goods and consumables. Exports of all other goods account for only 10% of total export values.

Table 21: Summary Results Table for Venezuela

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
EV	-0.02	0.05	0.10	-0.06
EVINUSD	-0.01	0.03	0.06	-0.04
DOMPROD	-1.69	0.19	-0.91	0.00
TAXCHG	-1359.20	31.71	-748.17	-27.11
RER	2.67	-0.07	1.35	0.08
MCHG	11.54	-0.58	8.14	-0.93
XCHG	5.27	-0.08	3.47	-0.42

In Venezuela, free trade under the FTAA is similar to unilateral tariff reduction. Since most of Venezuela's exports are not taxed anyway, the only real impact is the lowering of domestic tariffs. International trade theory suggests that a small-open economy would gain substantially (on average) from tariff elimination, because it eliminates the distortionary effects of tariffs for intermediate and final goods. This is the case for Venezuela. In fact, we find that the impact of unilateral tariff reduction for Venezuela would be more beneficial without the FTAA. That is, Venezuela's overall consumption would be higher in a scenario where Venezuela lowers import tariffs unilaterally, without any other changes.

Unilateral tariff reduction eliminates price distortions between imports for consumers and producers. The elimination of these distortions causes welfare to *rise* by 0.13%, or about 80 million US dollars. Under FTAA, Venezuelan welfare falls because total output and consumption falls for Venezuela's main trading partners in the Andean Community. The lower consumption levels in CAN states lowers the demand for Venezuelan goods as well, causing welfare to fall from 0.13% in a unilateral case, to -0.02% in the FTAA scenario.

Overall, aggregate output and economic change is not significant in Venezuela because most exports are not taxed anyway (e.g., oil). The main impacts will be import-substitution from domestic tariff elimination. Domestic producers will face increased pressure from international

suppliers. This causes a decline in domestic production. This is also a benefit for consumers and those producers who use imported intermediate goods. Several agricultural goods will be imported instead of produced in Venezuela. In turn, some Venezuelan manufactures will expand as US and other markets lower import tariffs. To reiterate, the major negative impact is the decline in demand by other CAN member states. Venezuela sells most goods to Colombia and Equador. If the demand for goods falls in these countries, then welfare falls slightly in Venezuela as well.

Table 22: Venezuelan Trade Volume

Imports (percentage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	17.57	1.02	9.81	-0.72
OSD	5.31	-2.22	4.06	-0.99
AGR	38.59	0.30	26.35	-0.94
ENR	13.40	0.19	8.77	-1.68
MFR	21.55	0.20	17.08	-0.62
OFD	10.13	-1.39	7.41	-1.03
TEX	4.24	-3.81	3.84	-1.00
MAN	2.92	0.14	-0.52	-0.49
SER	-8.79	0.90	-2.98	-0.88

Exports (percentage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-14.04	3.50	-4.62	-0.80
OSD	5.22	-0.45	6.99	-6.01
AGR	0.59	2.90	0.80	-1.28
ENR	5.70	-0.33	3.27	-0.38
MFR	-0.95	0.75	-1.24	-0.20
OFD	15.52	2.24	14.81	-3.02
TEX	7.47	1.92	8.70	-0.58
MAN	5.25	0.27	6.10	-0.55
SER	5.92	-0.59	1.72	0.65

Table 23: Venezuelan production (percentage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-7.59	-0.07	-3.82	0.09
OSD	-0.17	0.49	0.14	-0.21
AGR	-2.90	0.23	-1.89	-0.03
ENR	4.60	-0.27	2.69	-0.30
MFR	-9.70	0.17	-7.71	0.20
OFD	0.98	0.29	1.00	-0.24
TEX	-1.41	1.19	-0.88	0.19
MAN	-1.61	0.10	1.25	0.13
SER	-0.17	-0.01	-0.23	0.08
DWE	-0.11	-0.01	-0.16	0.06

Table 24: Return to factors in Venezuela

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
SKL_LABOR	1.04	0.00	0.63	-0.03
LABOR	0.31	0.06	0.25	-0.06
CAPITAL	2.03	-0.04	1.23	-0.13
CAP_PROF	2.58	-0.02	1.63	-0.16
N_RES	8.26	-0.39	4.82	-0.54

3.4.4 Equador and Bolivia

Energy, fruits, and vegetables are currently the most important exports for Equador and Bolivia (denoted here as: XAP). Together with meat products, these industries comprise almost 60% of XAP's exports. Energy alone accounts for 25% of total exports.

Table 25: Summary Results Table for `XAP`

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
EV	-0.55	0.97	-0.11	-0.46
EVINUSD	-0.11	0.19	-0.02	-0.09
DOMPROD	-0.64	0.52	-0.32	-0.08
TAXCHG	-434.34	30.49	-256.95	-21.03
RER	2.65	-0.64	1.46	0.22
MCHG	10.44	4.28	8.37	-2.14
XCHG	6.51	1.48	4.26	-0.47

Imports are dominated by manufactured goods (69%) and by services (11%). All other goods, including agricultural products and finished consumables make up the remaining 20% of imports.

Despite the fact that imports increase by 38% under the FTAA, production of agriculture *increases* because exports of agricultural products increase by 7%. Since imports are initially very small, and agricultural exports are large, total production of agriculture rises. The increase in AGR under the FTAA reflects that fact that Equador has a substantial comparative advantage in several fruits and nuts when compared to other South American countries.

The current dataset, GTAP 5, does not distinguish Bolivia as an individual country. Both countries are combined to form the `XAP` region, which represents the economic structure from Equador together with the total value of production from Bolivia added on top. Data taken from the CIA World factbook reveals that Bolivia's economic structure is similar to Peru and Equador. For this reason, we do not discuss Bolivia's case is substantial detail. A more detailed study for Bolivia is forthcoming.

Table 26: Trade Volume Impacts for Equador and Bolivia

Imports (percenage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	16.83	11.44	6.28	-2.47
OSD	5.98	-2.89	5.13	0.38
AGR	38.60	11.23	26.02	-3.37
ENR	3.21	4.48	5.55	-2.58
MFR	4.14	2.82	3.47	-0.69
OFD	20.25	2.12	23.27	-3.08
TEX	1.02	1.26	3.99	-4.06
MAN	1.89	2.57	1.16	-0.79
SER	0.29	7.85	-2.48	-2.30

Exports (percentage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-14.26	-1.74	-4.64	0.84
OSD	-2.97	28.70	3.07	-8.65
AGR	6.83	-1.89	4.00	0.70
ENR	8.20	-4.68	5.21	-1.06
MFR	0.52	-3.98	1.04	0.85
OFD	10.79	14.34	6.07	0.38
TEX	10.02	2.71	5.47	0.40
MAN	4.78	-2.60	3.58	1.17
SER	8.36	-5.03	3.17	1.47

Table 27: `XAP` production (percentage change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	-5.65	0.26	-2.23	0.51
OSD	-1.52	8.86	0.25	-2.69
AGR	1.24	-0.24	0.45	0.37
ENR	4.21	-3.01	2.52	-0.47
MFR	-3.13	-2.64	-2.18	0.49
OFD	1.95	5.10	0.27	0.16
TEX	-0.48	0.56	-0.82	0.42
MAN	-1.94	-2.67	-0.98	0.82
SER	-0.13	-0.28	0.02	0.01
DWE	-1.44	0.43	-0.74	-0.37

Table 28: Return to factors in `XAP`

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
SKL_LABOR	1.29	0.19	1.06	-0.23
LABOR	1.50	0.90	1.23	-0.45
CAPITAL	1.00	0.66	0.68	-0.10
CAP_PROF	0.90	0.81	0.52	-0.12
N_RES	6.72	-2.91	4.17	-0.78

3.5 Relative Prices and Competitiveness

Two factors determine relative prices and the competitive position of sectors in a constant-returns model: the change in tariff rates, and the real exchange rate. This constitutes the terms-of-trade. Andean Community terms of trade are listed below. The first three columns have similar results, but for different reasons. The last column shows the deterioration of the terms of trade when the Andean Community does not participate in the FTAA. Consider the following definition for the terms of trade:

$$TOT = \frac{P_X/P_M}{P_X^0/P_M^0}. \tag{1}$$

The terms of trade improve (increase) when the price of exports rises, or when the price of imports falls. Higher export prices are considered benefitial to domestic firms who sell goods abroad. Lower import prices are typically considered better because they lower prices for domestic producers and consumers. However, they also introduce increased competition for domestic firms.

Full FTAA access raises export prices for the Andean Community for all goods except cereals and oil seeds. Furthermore, it lowers import prices for most goods (except energy and services), including cereals and oil seeds. The lower import prices offset the lower export prices for cereals to improve the terms of trade there. Similarly, the ATPA scenario increases export prices while import

Table 29: Change in Terms of Trade in the Andean Community

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
CER	4.64	1.37	3.02	-0.43
OSD	2.18	4.86	2.73	-2.16
AGR	8.86	1.11	6.01	-0.49
ENR	1.24	0.18	1.08	-0.16
MFR	5.95	0.79	4.41	-0.36
OFD	6.29	1.32	5.01	-0.53
TEX	7.92	2.53	3.62	-1.10
MAN	3.71	1.00	1.63	-0.54
SER	-0.92	0.49	-0.30	-0.16

prices remain mostly constant. This is also an improvement in the terms of trade. The third column of Table 29 also shows an improvement in the terms of trade, but less so than with the full FTAA. This is because export prices rise more in the full FTAA scenario than in the FTAA_XUS scenario.

Finally, the last row shows a deterioration in the terms of trade because the Andean Community does not participate. In this scenario, import prices rise slightly (according to the relatively stronger currency), while export prices remain mostly even and even fall. The terms of trade effect is the

best argument for joining the FTAA, because not joining typically deteriorates the terms of trade and reduces trade volumes.

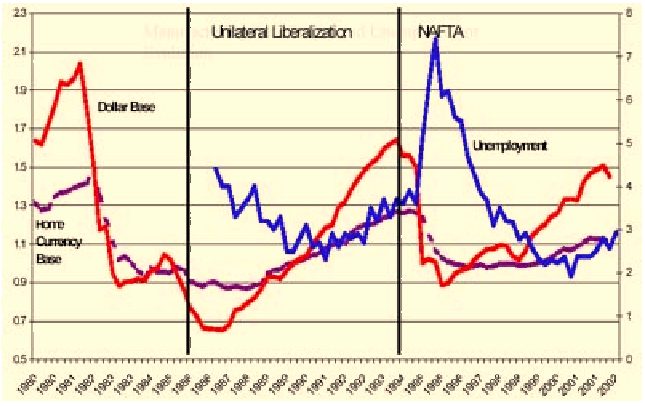
The terms of trade generally increase when barriers to trade are lowered. In the ATPA scenario, terms of trade improve as US import tariffs are eliminated, thereby increasing the relative price of exports. Conversely, in the unilateral tariff reduction scenario, terms of trade improve because import prices have *fallen*, while export prices remain constant.

3.6 Factor Returns and Employment

Free trade is always controversial because it can rapidly eliminate employment across an entire industry. Consequently, special interest groups and employee lobbies protest any free trade proposal intensly. There are several examples of the employment effects coming from tariff reductions. Asian automobile imports into the United States during between 1975 and 1985 eliminated several jobs for US automobile workers. In response, a strong lobby association for US Automobile workers was formed and has successfully lobbied for substantial barriers to Japanese automobile imports.

We expect free trade to cause "frictional" unemployment. Workers will lose jobs in those sectors which decline from trade diversion and import substitution. We call this *frictional* unemployment becaue these workers eventually find employment in another sector, or they learn new skills in order to work in another industry. From a national perspective, the increase in frictional unemployment looks like a spike in unemployment. After this transition period, unemployment falls and wages rise in real terms. This was the case in Mexico after the North American Free Trade Agreement (NAFTA). Figure 1 shows a spike in unemployment immediately after implimentation.

Figure 1: Unemployment in Mexico after NAFTA Implementation



In the long-term, however, we expect wages and returns to capital to rise slightly. Table 30 shows the real return to factors (wages, capital and natural resources) of production for each

of the central scenarios. Skilled labor and natural resources will see the largest gains in real returns. Traditional labor and capital also see rises, but they are relatively small (0.6% and 1.0%, respectively). Exports of natural-resource intenstive goods such as energy and minerals rise under the FTAA mostly because the agreement leads to a depreciation of local currencies among the CAN members. This makes resource exports more profitable in terms of the home currency.

The gains in traditional labor are small because several industries will experience more competition from foreign companies. Imports of agriculture and food products increase while exports to the US decrease. The decline in these sectors is the driving factor behind the small gains in traditional (unskilled) labor.

Table 30: Return to factors in the Andean Community

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
SKILLED LABOR	1.21	-0.03	0.63	-0.03
LABOR	0.63	0.66	0.41	-0.24
CAPITAL	0.99	0.17	0.60	-0.08
CAP_PROF	1.07	0.25	0.64	-0.12
N_RES	7.86	-2.19	4.28	-0.05

The change in factor returns is listed here in *real terms*. For example, factor returns listed in table 30 are calculated using the formula:

$$\Delta P_f = 100 * \left[\frac{P_f}{P_c} / \frac{P_f^0}{P_c^0} - 1 \right]$$

Where P_f is the nominal factor price in the Andean Community and P_c is the Consumption Price Index (CPI).

Table 31: Nominal Percentage Change in Factor Returns

	SKL_LABOR	LABOR	CAPITAL	N_RES	CPI
% Change	-2.11	-2.67	-2.33	4.32	-3.28

*CPI: Consumer's Price Index.

Wages actually *fall* in nominal terms (see Table 31), but prices fall by more than wages, leading to a real appreciation in the return to labor and capital in the long run. The reader should be careful not to conclude that wages themselves will fall – this is not the case. Wages are likely to rise in nominal terms. Our results indicate that nominal wages will rise by less than they would if FTAA were not enacted. But since we also find that overall prices also rise by less than they would have without FTAA, real wages rise under the FTAA scenario.

4 Conclusions and Directions for Further Research

We do not expect the Andean Community to enjoy large gains from trade under the FTAA. However, we do expect there to be potentially large gains from increased industrial productivity.

There are few gains from trade in the traditional sense because the Andean Community has already realized most of its comparative advantage with the United States, as well as within the Andean Free Trade Zone. Although gains from trade remain with countries like Brazil, Mexico, the CAN's endowments are not particularly dis-similar with other latin countries. Most FTAA countries also have a large rural population and a class of workers with very low wages. Because of these similarities, there is not expected to be a large benefit from country-specialization or from comparative advantage in the traditional Ricardian sense.

The US and Canada are two countries in the FTAA with whom the CAN has a comparative advantage in several areas. These "rich" countries pay high prices for labor-intensive goods because of a high minimum wage relative to the CAN. Therefore, these two countries represent the largest *potential* gains from trade and specialization.

But while exports to Canada are expected to rise, exports to the United States (the CAN's largest trading partner) are expected to fall as Brazil, Argentina, and Central America move into US markets.

The Andean Community has enjoyed preferential access to US markets under the ATPA for several years, and the ATPA preferences have been extended until 2006. However, with or without the FTAA, these preferences will be diluted as several new trading partners sign trading agreements with the US. Chile and most of Central America have finished free trade negotiations for almost all goods and services. Asian-pacific countries are concluding arrangements for lower trade barriers to textiles and finished apparel. All of these agreements are certain to dilute the Andean Community's export potential to the US. It would be prudent for CAN members to prepare for the additional competition by developing improved trade and distribution networks within the United States and try to develop a market presence which distinguishes goods from the Andean Community from insurgent imports from other parts of the world. With or without the FTAA – import competition in the US is expected to increase rapidly.

We would like to emphasize that there are substantial gains also being realized. Import prices for manufactures and intermediate inputs fall as a result of this agreement, and exports for several sectors rise dramatically. The net effect is almost balance, weighing in on the negative side.

Some important themes for consideration are: tax revenue replacement, a shifting of the basis for employment away from agriculture, and increased industrial and service productivity.

One important theme for the Andean community will be tax-replacement. Import tariffs con-

stitute roughly 8% of total tax revenues in the Andean Community and most of these revenues will be lost in an FTAA style agreement. Tax revenues will still be collected from European and Asian imports, but since most imports come from the United States and neighboring countries, about 4/5 of the revenues will be lost. A rough calculation of Value Added Tax (VAT) collections versus tariff losses implies that the VAT would need to be increased approximately 2% in most countries in order to recover the funds lost from import tariffs.

Agriculture is also an important theme for members in the Andean Community because much of the employment is a derivative of farming. The FTAA shifts farming production away from less-profitable crops, such as wheat, seeds, oats, and other grains which are better grown in temperate regions. Meanwhile, fruits and oils production will rise as exports for these goods increases. However, the average effect will be consistent with the overall impact: exports of agricultural goods may fall for key markets as other countries compete with the Andean Community, while imports rise as import tariffs are eliminated. The net effect will be lower agricultural employment.

We note that this shift in agricultural employment will be accelerated by a FTAA-style agreemtent, but even if CAN members chose not to participate in the FTAA – these agriculture jobs will still be eliminated. Economic integration and growth will eventually create the same effects. Farm subsidies and government intervention in the face of free trade are typically welfare-worsening and costly means to preserve an economic structure which has out-lived its time. Those countries who choose to remain agrarian economies are likely to remain in subsistence for the forseeable future. A transistion into skilled-labor employment and higher productivity is the only way for developing countries to escape poverty.

4.1 Directions for Future Research

- Multiple Households and Poverty Reduction There has been a substantial debate concerning international trade and its effects upon the poorest households in developing countries. The World Bank has been developing new techniques how to investigate the role of free trade upon poverty levels. A recent example of this technique is the assessment of trade impacts for Brazil. In this study, the GTAPinGAMS database was augmented with detailed household consumption patterns taken from the World Bank survey on household living standards.

  A similar study could be undertaken in the Andean Community in order to determine what effect the FTAA agreement will have upon the poorest segment of the CAN population.

- Data Improvments for Bolivia As noted earlier, there is no specific input-output table currently available for Bolivia. Because of this data limitation, we have been unable to clearly specify which segments of Bolivia's economy will expand and which will contract. A useful extension of the further research would be to develop a dataset specifically for Bolivia, then reconsider

the FTAA analysis specifically with Bolivia's economy in mind.

- Impact of Service Sector Liberalization The overall welfare-worsening effects under FTAA are probably very small when compared to the benefits from service-sector liberalization. Since a major portion of the FTAA deals with services and knowledge-based production, it would be useful to consider what service sector liberalization means for the Andean Community. In particular, we can now *quantify* what the potential gains would be from an FTAA agreement which included service liberalization and increased foreign direct investment (FDI).

  Recent studies, such as the Russian WTO accession study, have found that service-sector effects are five to ten times larger than traditional gains from trade effects. Therefore, a useful extension would be to incorporate imperfect competition and product variety for some sectors in the existing current constant-returns-to-scale (CRTS) model. This, together with a better characterization of the service economy in the Andean Community, would present a more complete characterization regarding the economic impact of FTAA for the Andean Community.

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A Regions and Sectoral Aggregation

Table 32: Regions and Factors in FTAA Study for the Andean Community

Regions Used for the FTAA Analysis	
BRA	Brazil
ARG	Argentina
URY	Uruguay
CHL	Chile
COL	Colombia
PER	Peru
VEN	Venezuela
XAP	Rest of Andean Pact
MEX	Mexico
XCM	Central America and Caribbean
XSM	Rest of South America
CAN	Canada
USA	United States of America
E_U	European Union 15
JPN	Japan
ROW	Rest of World

Factors of Production	
LND	Land
SKL	Skilled labor
LAB	Unskilled labor
CAP	Capital
RES	Natural resources

Table 33: Disaggregate Sectors Available for the FTAA Analysis: Most Results Use More Aggregated Datasets

CRO	Paddy rice, Wheat, Sugar cane, plant fibers, wool, forestry, fishing
GRO	Cereal grains nec
V_F	Vegetables - fruit - nuts
OSD	Oil seeds
OCR	Other Crops
MET	Bo horses, animal product, Bo meat, meat prod, dairy
COL	Coal
OIL	Oil
ONR	Gas - Other Natural Resources, minerals
SGR	Sugar
OFD	Food products nec
TEX	Textiles
WAP	Wearing apparel
SFT	Leather products,wood,paper,publishing
P_C	Petroleum - coal products
CRP	Chemical - rubber - plastic products
NMM	Mineral products nec
IND	Heavy Industry: Ferrous metals, other metals, manufactures, electricity
FMP	Metal products
MVH	Motor vehicles and parts
OTN	Transport equipment nec
ELE	Electronic equipment
OME	Machinery and equipment nec
SER	Gas distribution, Water,Const, trade, recreation, public goods
TRN	Transportation:Air,Water,Other
CMN	Communication
BSR	Business Service: Financial, Insurance, Other
DWE	Ownership of dwellings
CGD	Savings good

B Disaggregate Results

This section contains disaggregate results for the Andean Community. Production, Import volume, and Export Volume are reported in the following three tables.

Table 34: Full FTAA Dataset Commodity Listing

PDR	Paddy rice	B_T	Beverages and tobacco products
WHT	Wheat	TEX	Textiles
GRO	Cereal grains nec	WAP	Wearing apparel
V_F	Vegetables - fruit - nuts	LEA	Leather products
OSD	Oil seeds	LUM	Wood products
C_B	Sugar cane - sugar beet	PPP	Paper products - publishing
PFB	Plant-based fibers	P_C	Petroleum - coal products
OCR	Crops nec	CRP	Chemical - rubber - plastic products
CTL	Bo horses	NMM	Mineral products nec
OAP	Animal products nec	I_S	Ferrous metals
RMK	Raw milk	NFM	Metals nec
WOL	Wool - silk-worm cocoons	FMP	Metal products
FRS	Forestry	MVH	Motor vehicles and parts
FSH	Fishing	OTN	Transport equipment nec
COL	Coal	ELE	Electronic equipment
OIL	Oil	OME	Machinery and equipment nec
GAS	Gas	OMF	Manufactures nec
OMN	Minerals nec	ELY	Electricity
CMT	Bo meat products	GDT	Gas manuacture - distribution
OMT	Meat products	WTR	Water
VOL	Vegetable oils and fats	CNS	Construction
MIL	Dairy products	TRD	Trade
PCR	Processed rice	OTP	Transport nec
SGR	Sugar	WTP	Water transport
OFD	Food products nec	ATP	Air transport
		CMN	Communication
		OFI	Financial services nec
		ISR	Insurance
		OBS	Business services nec
		ROS	Recreational and other services
		OSG	Public admin - and defence - education - health
		DWE	Ownership of dwellings
		CGD	Savings good

Production change (% Change from Baseline)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
COL	3.42	-3.28	-0.29	1.34
PDR	-2.83	1.94	-0.82	-0.39
WHT	-16.33	-3.33	-13.38	0.81
GRO	-9.38	-1.50	-4.84	0.35
V_F	-0.04	-0.79	-0.78	0.41
OSD	-7.11	-1.31	-1.65	0.12
C_B	-1.16	2.40	-0.49	-0.90
PFB	-7.15	-2.52	0.14	0.56
OCR	0.23	14.96	1.88	-4.11
CTL	-0.67	0.38	-0.26	-0.13
OAP	-0.47	0.28	-0.11	-0.09
RMK	-0.39	0.32	-0.09	-0.07
WOL	-2.52	1.78	-2.34	-0.64
FRS	-1.34	0.64	-0.43	-0.21
FSH	-2.04	1.14	-1.20	-0.14
OIL	5.76	-1.83	3.17	0.21
GAS	-0.22	-0.72	-0.21	0.26
OMN	4.78	-3.09	1.27	0.59
CMT	-1.56	0.10	-0.66	-0.04
OMT	0.00	-0.11	0.51	0.05
VOL	-8.01	-0.36	-4.74	-0.72
MIL	0.11	-0.21	0.02	0.15
PCR	-2.20	0.17	-1.26	-0.09
SGR	-6.54	10.55	-0.97	-6.25
OFD	1.12	2.37	0.15	-0.10
B_T	-0.41	0.19	0.09	-0.17
TEX	1.79	1.54	0.33	0.59
WAP	4.03	3.81	1.13	-0.44
LEA	-0.99	0.17	-1.44	0.25
LUM	-1.52	0.07	-0.29	-0.05
PPP	-2.68	-0.93	-0.99	0.26
P_C	3.85	-0.23	2.46	-0.28
CRP	-1.47	-0.77	0.30	0.29
NMM	-2.11	-0.76	0.02	0.34
I_S	-3.53	-2.89	-4.07	1.15

NFM	9.94	-3.18	5.15	0.88
FMP	-1.94	-1.09	0.66	0.32
MVH	-17.57	-2.21	-14.08	0.84
OTN	0.83	-1.62	0.67	0.56
ELE	-4.09	-1.86	-1.22	0.87
OME	-6.76	-3.25	-1.34	1.43
OMF	-0.98	0.49	0.31	0.54
ELY	0.13	-0.56	-0.19	0.19
GDT	-0.53	-0.86	-0.65	0.32
WTR	-0.71	0.29	-0.35	-0.11
CNS	0.05	-0.02	0.02	0.01
TRD	-0.76	0.13	-0.37	-0.01
OTP	1.29	-0.86	0.40	0.24
WTP	9.56	-4.95	2.74	1.54
ATP	6.42	-3.62	2.05	1.05
CMN	-0.17	-0.17	-0.19	0.06
OFI	0.14	-0.22	0.05	0.06
ISR	1.96	-1.49	0.47	0.50
OBS	1.82	-1.26	0.54	0.38
ROS	0.33	-0.15	0.07	0.02
OSG	-0.18	-0.03	-0.07	0.01
DWE	-1.19	0.45	-0.57	-0.17

Andean Community Import Volume (% change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
COL	1.71	1.77	0.66	-0.70
PDR	28.26	10.65	4.65	-8.52
WHT	15.37	6.99	12.81	-1.66
GRO	20.46	8.40	9.94	-1.84
V_F	27.82	10.19	28.19	-5.56
OSD	16.09	8.86	3.69	-2.64
C_B	-4.48	8.07	-1.77	-0.58
PFB	6.47	6.72	-0.85	-1.99
OCR	3.89	-1.74	8.33	-1.37
CTL	6.75	8.53	5.18	-2.25
OAP	5.61	9.14	3.83	-3.06
WOL	34.07	11.26	43.33	-3.71
FRS	7.14	6.28	0.77	-2.27
FSH	12.75	2.50	15.88	-2.10
OIL	2.05	2.12	2.46	-1.03
OMN	14.77	3.68	18.15	-1.14
CMT	59.48	7.40	26.18	-3.59
OMT	16.87	5.53	5.74	-2.90
VOL	25.94	3.59	15.84	0.53
MIL	-3.46	4.60	0.82	-2.38
PCR	16.63	3.62	10.73	-1.14
SGR	25.98	-23.03	20.70	14.73
OFD	15.54	-0.32	16.60	-2.18
B_T	3.97	4.15	3.95	-1.68
TEX	7.65	3.47	4.74	-3.26
WAP	12.39	-4.16	6.15	-2.92
LEA	8.89	3.59	12.67	-3.28
LUM	21.56	4.21	8.20	-1.85
PPP	7.64	3.62	3.35	-1.25
P_C	-1.34	0.43	-0.55	0.01
CRP	2.99	2.90	0.56	-1.15
NMM	10.18	2.94	2.59	-1.62
I_S	3.05	1.48	4.55	-0.70
NFM	-2.40	0.94	-1.30	-0.14
FMP	8.13	2.89	0.64	-1.12

MVH	18.41	1.90	14.41	-0.74
OTN	-4.12	3.22	-3.84	-1.12
ELE	0.99	0.99	-0.26	-0.49
OME	3.66	1.84	0.36	-0.85
OMF	10.07	2.98	1.85	-2.06
ELY	-8.38	5.28	-2.47	-1.28
WTR	-10.08	6.22	-2.96	-1.92
CNS	-10.27	5.46	-3.26	-1.54
TRD	-9.82	6.23	-3.38	-1.79
OTP	-7.37	5.22	-2.65	-1.68
WTP	-5.13	3.09	-1.33	-0.98
ATP	-5.80	4.46	-2.16	-1.28
CMN	-4.93	5.85	-1.60	-2.01
OFI	-4.60	5.63	-2.14	-1.87
ISR	-6.88	5.29	-2.12	-1.75
OBS	-6.67	4.70	-1.89	-1.44
ROS	-8.50	5.15	-3.13	-1.48
OSG	-3.36	6.08	-2.71	-2.16

Andean Community Export Volume (% change)

	FTAA	ATPA	FTAA_XUS	FTAA_XAN
COL	3.78	-3.43	-0.32	1.40
PDR	-12.03	-0.48	-2.76	2.41
WHT	-24.66	-6.52	-20.60	1.65
GRO	-16.43	-3.93	-8.62	0.85
V_F	7.36	-2.20	2.92	1.39
OSD	0.47	-3.31	4.47	-0.71
C_B	2.09	-2.53	1.02	-1.35
PFB	-6.08	-4.55	1.42	0.90
OCR	1.06	29.58	3.87	-7.19
CTL	-0.71	-2.52	-0.93	0.69
OAP	8.24	-4.40	5.67	0.42
WOL	3.06	-3.63	-1.61	0.86
FRS	3.85	-2.58	1.20	0.85
FSH	-0.17	1.08	-1.39	0.98
OIL	6.87	-2.70	3.62	0.49
GAS	-0.04	-0.89	-0.71	0.40
OMN	9.17	-4.48	3.37	0.57
CMT	3.77	-2.27	1.92	1.03
OMT	22.74	-3.30	19.59	1.08
VOL	-10.58	-1.52	-5.67	-2.15
MIL	32.32	5.03	27.29	1.03
PCR	-7.81	-0.59	-4.85	0.17
SGR	-25.77	68.96	1.16	-28.62
OFD	9.02	7.75	4.36	-0.10
B_T	15.80	-1.37	15.73	-1.83
TEX	14.51	3.89	6.92	0.79
WAP	34.66	26.34	11.26	-2.68
LEA	5.95	0.98	3.16	0.19
LUM	7.28	-0.71	7.74	-0.46
PPP	-0.05	-2.50	1.75	-0.26
P_C	7.74	-0.11	5.04	-0.65
CRP	3.11	-0.94	4.47	-0.19
NMM	3.76	-0.28	4.78	-0.37
I_S	1.69	-3.27	-1.26	1.13
NFM	14.40	-3.56	7.29	0.91

FMP	5.65	-2.11	8.62	-0.27
MVH	-24.19	-3.25	-19.76	1.26
OTN	10.90	-3.17	5.36	1.18
ELE	4.32	-3.22	3.97	1.21
OME	-5.03	-4.40	1.83	1.38
OMF	6.45	3.08	4.02	1.12
GDT	5.94	-4.31	1.12	1.37
WTR	6.24	-3.53	1.53	1.12
CNS	8.61	-3.51	3.14	0.99
TRD	6.77	-3.71	2.04	1.15
OTP	8.38	-4.38	2.57	1.40
WTP	13.57	-6.74	3.92	2.14
ATP	11.96	-5.79	3.72	1.71
CMN	6.66	-3.72	1.60	1.33
OFI	6.58	-3.87	1.72	1.34
ISR	7.94	-4.72	2.23	1.69
OBS	8.08	-4.43	2.29	1.41
ROS	7.87	-3.56	2.39	1.04
OSG	7.09	-3.77	2.12	1.29

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