CPB Discussion Paper

No 99

February, 2008

Economic perspectives for Central America after CAFTA

A GTAP-based analysis

Joseph F. Francois, Luis Rivera and Hugo Rojas-Romagosa

CPB Netherlands Bureau for Economic Policy Analysis
Van Stolkweg 14
P.O. Box 80510
2508 GM The Hague, the Netherlands

Telephone +31 70 338 33 80
Telefax +31 70 338 33 50
Internet www.cpb.nl

ISBN 978-90-5833-352-0

Abstract in English

Using a GTAP CGE application, we assess the main economic results of CAFTA for Central America (CA). Currently, Central America enjoys preferential access to the US market through the Caribbean Basin Initiative (CBI). CAFTA will consolidate and augment these concessions. Meanwhile, the agreement requires widespread opening of CA markets to US imports over time. The implementation of the ATC protocol in 2005 implies increased Chinese competition for the region in the textile and apparel sectors. CAFTA will balance for this new source of competition by allowing better access for CA textiles and apparel products, while creating large opportunities for labour market improvements and FDI inflows to Central America. If these opportunities are exploited, the region has much to gain from CAFTA. However, we also find a strong sectoral readjustment from agricultural sectors to *maquila*-based industries, which could create important adjustment strains.

Key words: Free trade agreements, CGE models, GTAP applications
JEL code: F13, C68

Abstract in Dutch

We hebben de belangrijkste economische effecten voor Centraal Amerika geëvalueerd van de handelsovereenkomst (CAFTA) tussen Centraal Amerika (CA) en de Verenigde Staten door het algemeen-evenwichtsmodel GTAP toe te passen. Op dit moment heeft Centraal Amerika preferentiële toegang tot de Amerikaanse markt vanwege de CBI (Caribbean Basin Initiative). De overeenkomst voorziet op termijn een volledige opening van de CA-markten ten opzichte van Amerikaanse importproducten. De implementatie van het ATC-protocol in 2005 heeft tot grotere concurrentie met China in de textiel- en kledingsectoren geleid. Door CAFTA ontstaat een nieuwe balans, omdat de toegang tot de Amerikaanse markt beter wordt. Bovendien biedt CAFTA Centraal Amerika meer mogelijkheden voor verbetering van de arbeidsmarkt en binnenkomende buitenlandse directe investeringen. Als deze mogelijkheden worden benut, kan de regio sterk van de overeenkomst profiteren. Echter, CAFTA zou ook leiden tot een ingrijpende verschuiving van de landbouw naar de textiel- en kledingsectoren en dit vraagt om een behoorlijk aanpassingsvermogen.

Steekwoorden: Vrijhandelovereenkomsten, Algemeen-evenwichtsmodellen, GTAP-applicaties

Contents

Summary

The United States (US) and the five Central American countries –Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua– concluded negotiations on the US-Central American Free Trade Agreement (CAFTA) in January 2004. Under the Caribbean Basin Initiative (CBI), many Central American exports already enter without duties to the US. CAFTA will consolidate those benefits and make them permanent, so nearly 100% of all consumer and industrial products made in Central America will enter the US market duty-free immediately on ratification of the agreement.

Our analysis uses the GTAP database and standard static model with different shocks to evaluate the alternative scenarios. For the five Central American economies, CAFTA represents a series of opportunities that can be exploited, but also a series of critical challenges. Given the importance of US trade and investment in the region, in addition to the huge size differences between both regions, the agreement produces significant sectoral and economy-wide effects.

From a Central American perspective, our simulations find a noteworthy welfare increase from CAFTA. However, the agreement also induces a larger export specialization in the already significant *maquila*-based sectors (i.e. textiles and apparel). This effect increases the region's trade and growth dependence on a single sector, and it draws resources from other industries and the agricultural sector. The short-term political and social consequences of this specialization can be costly.

The most welfare-improving mechanism in CAFTA is the increase in FDI and the capital stock of the region. This emphasizes the importance of exploiting the investment opportunities associated with permanent market access to the US. Without complementary economic policies, the trade agreement can be considered mainly as a balancing force to counteract the negative impact that the implementation of the ATC protocol has for the regional economy with the increased competition of Chinese textiles and apparel goods. On the other hand, the US economy is barely affected.

1 Introduction

The United States (US) and the five Central American countries –Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua– concluded negotiations on the US-Central American Free Trade Agreement (CAFTA) in January 2004.[1]

The ratification process of the CAFTA is completed and few CGE applications have been used to evaluate its consequences for Central America (CA).[2] These studies mainly analyze the effects of the treaty on the USA and pay less attention of the consequences for CA. A related study by the World Bank (2005) presents an in-depth analysis of the consequences of the treaty for CA, but does not include a CGE application for the region as a whole.[3]

We use a standard GTAP application to evaluate the static effects of CAFTA for Central America. In addition, we identify and evaluate potential effects associated with the complementary policies negotiated in the agreement.

Under the Caribbean Basin Initiative (CBI), many Central American exports already enter without duties to the US.[4] CAFTA will consolidate those benefits and make them permanent, so nearly 100% of all consumer and industrial products made in Central America will enter the US market duty-free immediately on ratification of the agreement. The existence of an earlier trade enhancing mechanism represented by the CBI introduces two important considerations. Firstly, the CBI can be regarded as a halfway step in the trade liberalization process between both regions. As such, it would imply that CAFTA does not grant new market access for Central American products to the US, but it enhances the list of products that have had such trade preferences in the past.

Under these considerations, some sectors have already adjusted and taken advantage of export opportunities, and it is expected that CAFTA will expand the participation and trade volume of the remaining sectors. This distinction is important because previous static CGE applications have been criticized for failing to fully account for the productive and export diversification driven by such trade agreements as NAFTA (Kehoe, 2003). The combined implementation of the CBI and CAFTA with a relatively long intermediate period, assures that the productive adjustment process is gradual, and that we can be less concerned with this type of static CGE limitations. On the other hand, given the relatively small size of the CA market for US companies, the agreement can hardly create any significant economy-wide effects for the US.

[1] The Dominican Republic was included into the Agreement on August 2004, named afterwards DR-CAFTA.

[2] Existing CGE applications include Brown *et al.* (2004), Hilaire and Yang (2004) and USITC (2004).

[3] They include a CGE application for Nicaragua and use other analytical instruments, i.e. partial equilibrium analysis and gravity model estimations. Sánchez and Vos (2006) and Sánchez (2007) use CGE models to assess the effects for Nicaragua and Costa Rica.

[4] The 1984 CBI benefits were enhanced by the Caribbean Basin Trade Partnership Act (CBTPA), enacted in May 2000 as part of the Trade and Development Act.

Secondly, the agreement includes political sensitive products not present in the CBI (e.g. sugar, textiles, and apparel). Although the US economy is barely affected, the trade agreement caused intense lobbying from interest groups in the US.

From a Central American perspective, our simulations find a noteworthy welfare increase from CAFTA. However, the agreement also induces a larger export specialization in the already significant *maquila*-based sectors (i.e. textiles and apparel). This effect increases the region's trade and growth dependence on a single sector, and it draws resources from other industries and the agricultural sector. The political and social consequences of this specialization could be costly.

However, the already implemented quota reduction of Chinese textile and apparel exports to the US is currently creating intense competition pressures that will seriously affect the trade flows from CA to the US. Our baseline estimations already capture the Chinese quota reduction. Thus, the lower-bound gains from CAFTA are expected to roughly compensate for Chinese competition in this sector. Taken into consideration the significant differences between the economies of both regions, CAFTA entails both significant opportunities and threats to CA. Chinese competition highlights the importance of implementing policies aimed at diversifying exports and increasing agricultural competitiveness, which in turn can reduce the high unemployment and poverty rates of the region.

The main achievement of CAFTA is the formalization of market access concessions currently set by the US on a unilateral basis under the CBI. In addition, an institutional and legal framework has been negotiated to ease FDI flows into the region. Thus, the potential increase in FDI is expected to incentive growth and employment opportunities. Moreover, an increase in trade facilitation mechanisms creates a positive and significant welfare effect.

On the other hand, the welfare implications of the agreement are positive for the US. Without CAFTA the reduction of the textile and apparel (T&A) Chinese quotas negatively affects this sector in the US. With CAFTA the T&A sector in the US increases output to supply the Central American *maquilas*. In addition, the bilateral trade balance is improved, while no specific sectors are hurt.

Under the negotiated conditions, the US sugar industry remains highly protected from CA competition. In an additional scenario we analyze the potential impact of full US sugar liberalization. We find that CA had much to gain from such a policy and the increase in the production and exports of processed sugar will have balanced the *maquila*-based textile and apparel expansion. The welfare gains associated with sugar liberalization are sizeable, and the lost opportunity of a larger agricultural liberalization points to one of the main drawbacks from this kind of bilateral agreements: developed countries usually do not liberalize sensible agricultural sectors. In contrast, multilateral agreements as the Doha Round provide a better framework to implement such liberalization policies.

Our analysis is based on the GTAP 6.0 pre-release 3.10 database and we use a standard GTAP static model with different shocks to evaluate the alternative scenarios. A limitation of the database is that it groups together all Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and Belize), of which only the first five are included in the CAFTA.[5] A recent study by the USITC (2004) broadly adjusts the data to account only for the five countries and includes the Dominican Republic, which joined the agreement in August 2004.[6] We do not find significant differences with the USITC's broad estimations and thus leave the data unaltered. However, this highlights the need to include the countries separately in the future. This distinction is especially necessary for evaluating the effects of CAFTA for Costa Rica, which has a different productive structure and export platform than the rest of the region.

Finally, it is important to remark that CGE models only account for medium and long-term macroeconomic effects. These models assume that production factors adjust without cost between industries. In reality, short-term adjustment costs can be significant and also politically sensible issues. Moreover, CGE models work with representative households, and thus, they cannot analyze the impact of trade policy changes on specific populations (i.e. small farmers, poor households).[7]

The paper is organized as follows. Section 2 presents the main economic characteristics and current conditions in the five Central American economies. Section 3 describes the main issues negotiated under CAFTA. Section 4 explains the main features of the GTAP CGE model and its associated database. Section 5 presents our baseline scenario with some complementary simulations. In Section 6 we model changes in labour and capital endowments which are expected from the increased trade volumes and FDI flows to the region. Finally, in Section 7 we summarize our results and present our main conclusions.

[5] Panama is currently negotiating an FTA with the US.

[6] We do not include this country in our exercise, because of data limitations and instead, we want to focus exclusively on CA.

[7] However, a recent strand of the literature combines CGE models with household surveys to produce top-down macro-micro approaches that can explicitly deal with the effects on specifics populations, and furthermore, analyze poverty and income inequality issues. A detailed description of this methodology can be found in Bourguignon and da Silva (2003) and Porto (2006).

2 Central America before CAFTA

2.1 General conditions

Given its geography, Central America is a natural bridge between North and South America, and between the Pacific and Atlantic Oceans. Closeness to the US market implies a geographical advantage that has been exploited in the past and is expected to increase in importance with CAFTA.

Although most of Central American countries suffered civil wars in past decades and natural disasters in recent years, the region has witnessed a period of economic recovery in the 1990s and 2000s. These results are reinforced by the stability brought by democratically elected governments, creating a positive perspective for the region's future.

Perhaps the most significant change experienced by CA in the last ten years is the consolidation of the economic opening of the region. CA has accelerated its insertion into world markets through tariff reductions, the privatizations of public enterprises and the signing of free trade agreements.[8]

Table 2.1 presents economic growth indicators. The average growth rate for the region was 3% for the period 2001-2005. This growth rate has only increased per capita GDP around one percentage point. So far, the economic recovery of the region has not been strong enough to improve the income of all Central Americans. Overall, GDP per capita data shows that the region has low-income country characteristics, while poverty rates are significant (ranging from 22% in Costa Rica to around 60% in Guatemala).

Table 2.1 Central America, main economic indicators, 2005

	GDP (current)		GDP Growth %	GDP per capita[a]	Population		Poverty rate %
	US$ mill.	share	2001-2005	US$	millions	share	1990-2003
Costa Rica	19814	0.24	3.7	4580	4.005	0.11	22
El Salvador	17017	0.21	2.0	2475	6.533	0.19	48
Guatemala	32038	0.39	2.5	2523	12.307	0.35	56
Honduras	8384	0.10	3.6	1079	6.969	0.20	48
Nicaragua	4910	0.06	3.1	850	5.480	0.15	48
Total	82163	1.00			35.294	1.00	

[a] Atlas method

Source: National Accounts from Central Banks, and UNDP (2006).

[8] Central American countries have already signed free trade agreements with Canada, Chile, Mexico and some Caribbean countries. Negotiations with the European Union are expected to start in June 2007.

Under these circumstances, CAFTA is seen in the region as an important force that can eventually increase growth rates, and diversify the economy by creating new industries and attracting foreign direct investments.

It is important to highlight that Costa Rica has distinct economic characteristics from the rest of the region. It has a medium-income GDP per capita, and a more dynamic and diversified economy. This difference can be better understood by observing the human capital and productive indicators shown in the following sections. This differentiation introduces an important shortcoming from the present analysis, where data limitations do not allow us to isolate each national economy. Thus, we may be overlooking important country-specific results.[9]

2.2 Human capital and unskilled-labour abundance

Despite recent economic and political stability in the region, the armed conflicts and stagnant economic conditions of the past have left the region with important shortcomings of human capital. As shown in Table 2.2, with the exception of Costa Rica, the region has low literacy rates, health expenditures and few initial conditions for the spreading of R&D activities.

Table 2.2 Human Capital Indicators for Central America

	Human Development Index	Adult Literacy Rate	Health Expenditure per capita	Public Expenditure on Education	Researchers in R&D per million people
	Rank 2004	2004	PPP US$ 2003	% GDP 2002-04	1990-2003
Costa Rica	48	94.9	616	4.9	368
El Salvador	101	79.2	378	2.8	47
Guatemala	118	69.1	235	1.7	n.a.
Honduras	117	80.0	184	n.a.	78
Nicaragua	112	76.7	208	3.1	44

n.a. = not available

Source: UNDP (2003).

These characteristics imply that with this low human capital profile –together with the absence of major natural resource endowments– unskilled labour is a relatively abundant factor in the regional economy. Moreover, from Table 2.3 we observe that even when unemployment is relatively low, under-employment is relatively high. This result is a tied to the significant informal sector in these economies. The subsequent high sub-utilization rates of labour imply that labour can be drawn to the formal sector with the improved labour opportunities expected from CAFTA.

[9] As part of the present research project, we are currently including Costa Rica into the GTAP database to later conduct a separate CGE analysis for this country and overcome the limitations of analyzing the region as a single, homogenous economy.

Table 2.3 Central America, employment characteristics, averages for 1995-2003

	Unemployment %	Under-employment %	Total sub-utilization %
Costa Rica	5.9	7.5	13.4
El Salvador	7.2	16.1	23.4
Guatemala	6.2	45.1	51.3
Honduras	6.1	25.6	31.7
Nicaragua	12.9	20.8	33.7
Average	7.7	23.0	30.7

The average is taken with the available information. Some countries do not have information for the whole period or present preliminary data.

Source: Central Banks and Statistical Offices of the region

2.3 Productive structure, trade and tariffs

Table 2.4 shows the productive structure of the five Central American countries. It points to a very significant role for the service sector, with relatively low agricultural participation (except in Guatemala). The volume of trade with respect to GDP is high in most countries, which highlights the importance of external demand for the region. However, only Costa Rica has a significant share of its industrial exports classified as high-technology products.

Table 2.4 Central America, Production and Trade Indicators, 2005

	Agriculture	Manufacturing	Services	Trade in goods	High-tech exports
	% of GDP	% of GDP	% of GDP	% of GDP	% of manuf. exports
Costa Rica	8.4	28.8	62.8	86.7	36.8
El Salvador	10.7	29.9	59.4	59.5	4.1
Guatemala	22.9	18.8	58.3	38.8	n.a.
Honduras	13.3	30.7	56.0	77.5	n.a.
Nicaragua	19.5	31.1	49.4	66	6.1

n.a. = not available

Source: World Development Indicators, World Bank.

The US is the main trading partner of CA. Almost 50 percent of the region's international trade is with the US. According to USITC data, in year 2006, the region exported more than US$14,8 billion to the US market. Although "traditional" exports like apparel products, bananas and coffee still represent a very important share of regional exports, in recent years there has been a diversification of exports, towards more technologically advanced sectors like electronics and medical instruments, non-traditional agricultural products like fruits and vegetables, beverages and prepared meats, marine products, and chemical products. Table 2.5 depicts the main US imports from Central American countries.

Table 2.5 US imports from Central America by main products, shares for 2006

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
Total Imports (US$ millions)	4084	1909	3327	3893	1570
Articles of apparel and clothing	11.7	77	52.6	66.2	57.6
Electrical machinery and equipment	20.2	1.4	0.0	10.0	8.1
Vegetables and fruits	25.0	0.7	17	6.4	2.4
Coffee	3.5	3.8	8.7	1.7	5.9
Fish and crustaceans	1.7	0.6	0.5	3.4	5.8
Meat	0.2	0.0	0.0	0.0	3.8
Tobacco	0.0	0.0	0.4	2.3	2.2
Sugar	1.1	1.4	4.1	0.8	2.0
Medical instruments	13.3	0.0	0.0	0.0	0.0
Mineral oils and products	1.1	6.5	8.8	0.0	0.0
Other manufactures	6.5	1.1	0.0	0.0	0.0
Others	15.8	7.5	7.9	9.1	12.2

Source: Own elaboration with data from the US International Trade Commission

The five CA countries agreed in 1995 to reduce their common external tariff to a maximum of 15 percent.[10] The region has low average tariff rates, as a result of a unilateral process of trade liberalization and a strong commitment to global integration. However, selected agricultural commodities are protected with tariffs that significantly exceed the 15 percent common external tariff ceiling. These specially protected commodities include dairy products, rice, sugar, and poultry. In addition, the use of non-tariff barriers has decreased significantly in recent years; although there are still some of these barriers in place.[11]

2.4 Foreign direct investment

Foreign direct investment (FDI) inflows to CA increased significantly in the 1990s. This phenomenon has contributed in a decisive manner to export diversity in the region. Moreover, FDI inflows help finance the persistent current account deficits, especially in Costa Rica. Although apparel and textile products sectors in Central America traditionally received the most important amounts of FDI, the region has become an attractive option for investors looking to do business in other productive sectors as well. A wide range of industries, including electrical equipment, medical devices, software, chemical products, beverages and food preparations, tourism, financial services, call centers, energy and telecommunications, among others, have been growing and attracting significant foreign investment.

[10] Through the Central American Common Market (CACM) of which all countries are members. The Central American integration process has been reactivated in the last decade. At present, an average of 30 percent of total trade is intraregional.

[11] A summary of tariff rates and NTBs is presented in Table 9.1 in the Appendix.

For example, in Costa Rica 65 percent of total FDI inflows were concentrated in the industrial sector in 1997-2003, particularly because of Intel's and several electronics and medical products companies operations, while since 2003 services like call centers and tourism, and real state sectors have attracted significant annual investments. In El Salvador, besides the important growth in telecommunications and energy, industry, commerce, finance and insurance sectors are also attracting FDI.

Together with the widening sector differentiation, there are an increasing number of companies from a diverse group of countries investing in Central America. Although US FDI participation in the region is the most significant (see Table 2.6), investments from the European Union, Asian nations, Canada and Mexico are growing.

Table 2.6 FDI Flows to Central America, million US$

	Average 1996-2000	Average 2001-2005	2005	US Share (average 1996-2005)
Costa Rica	495.2	593.1	653.2	0.63
El Salvador	309.5	373.0	477.0	0.35
Guatemala	243.7	203.9	167.8	n.a.
Honduras	166.1	219.7	190.0	0.45
Nicaragua	229.2	194.2	230.0	n.a.
Total	1443.7	1583.9	1718	

n.a. = not available

Source: ECLAC (2006)

2.5 Tariff revenue replacement

An important consequence of trade liberalization is the loss of fiscal revenues. The absence of feasible alternative taxes that can replace the lost revenue can thus be problematic for some countries. In particular, it can be the case that these negative fiscal effects can overcome the potential trade liberalization gains.

Due to the liberalization process initiated in CA during the 1980s, the dependence of fiscal revenues on tariffs has been significantly reduced. For 2000-2001, the World Bank (2005) reports that tariff revenue represent 1.5% of GDP. In the same report, they assess that without any consumption or production changes, the tariff revenue reduction associated with CAFTA will be less than 1% of GDP. However, when the expected growth effects of the treaty are included, the fiscal losses are compensated.

When we run our baseline experiments in GTAP, government income increases by 4.3%, despite the reduction in tariffs. Thus, the loss of fiscal revenues under CAFTA does not seem to be a problematic issue and we will not take it into consideration in the rest of our analysis.

3 Main issues negotiated under CAFTA[12]

In general, the agreement is aimed at consolidating CBI market access benefits and extending it to previously excluded sectors. Furthermore, important provisions and legal requirements are included to improve investment opportunities in CA.

3.1 Tariffs and market access

Almost no products are excluded from the agreement. Tariffs will be eliminated for all products, except sugar for the United States, fresh potatoes and fresh onions for Costa Rica, and white corn for the rest of Central America. More than 80 percent of US exports of consumer and industrial products to Central America will be duty-free immediately upon ratification of the agreement, and 85 percent will be duty free within five years. All remaining tariffs will be eliminated within ten years. Close to 98 percent of Central American exports to the US exports will be duty-free immediately. The Central American countries will accord substantial market access across their entire services regime, subject to few exceptions.

Moreover, inter-regional trade within CA is fully liberalized after the approval of the agreement.

3.1.1 Agriculture

More than half of current US farm exports to Central America will become duty-free immediately. Each Central American country will have a separate schedule of commitments providing access for US products. The US will provide the same tariff treatment to each of the five countries, but will make country-specific commitments on tariff-rate quotas. Sensitive goods (e.g. rice, beef, dairy products, corn, poultry and pork) will have tariffs phased out incrementally so that duty-free treatment is reached in 5, 10, 15, or 20 years from the time the agreement takes effect.

3.1.2 Textiles and Apparel

Textiles and apparel will be duty-free and quota-free immediately if they meet the agreement's rule of origin. The agreement's benefits for textiles and apparel will be retroactive to January 1st 2004. Some apparel made in Central America that contains certain fabrics from NAFTA partners (Mexico and Canada) will have duty-free access. A "de minimis" provision will allow

[12] Based on information from the United States Trade Representative, www.ustr.gov, accessed on May 5, 2005. The recent World Bank (2005) report on DR-CAFTA devotes a chapter to analyze in detail the contents of the agreement.

limited amounts of third-country content to go into CAFTA apparel, giving producers in both the US and Central America needed flexibility.

3.2 FDI and trade facilitation mechanisms

3.2.1 Protections for Investors and property rights

One of CAFTA's main aims is to implement a secure and predictable legal framework for investors. All forms of investment are protected under the agreement, including enterprises, debt, concessions, contracts and intellectual property. Pursuant to US Trade Promotion Authority, the agreement draws from US legal principles and practices to provide US investors in CA a basic set of substantive protections that Central American investors currently enjoy under the US legal system. For example, copyright owners maintain rights over temporary copies of their works on computers, which is important in protecting music, videos, software and text from widespread but unauthorized sharing through the Internet.

3.2.2 Access to Government Procurement Contracts

US suppliers are granted non-discriminatory rights to bid on contracts from Central American government ministries, agencies and departments. The agreement covers the purchases of most Central American central government entities, including key ministries and state-owned enterprises. It also requires fair and transparent procurement procedures, such as advance notice of purchases and timely and effective bid review procedures. Moreover, it ensures that bribery in government procurement is specified as a criminal offence under CA and US laws.

3.2.3 Protection and Promotion of Worker Rights

CAFTA fully meets the labour objectives set out by the US Congress in the Trade Promotion Act of 2002. Labour obligations are a part of the core text of the trade agreement. CA countries commit themselves to provide workers with improved access to procedures that protect their rights. The agreement requires that all parties effectively enforce their own domestic labour laws, and this obligation is upheld through the agreement's dispute settlement procedures.

3.2.4 Trade Capacity-Building

CAFTA will include a Committee on Trade Capacity Building, in recognition of the importance of such assistance in promoting economic growth, reducing poverty, and adjusting to liberalized trade. The trade capacity building committee will build on work done during the negotiations to enhance partnerships with international institutions (Inter-American Development Bank, World Bank, Organization of American States, ECLAC, and the Central American Bank for Economic Integration), non-governmental organizations, and the private sector.

4 Empirical assessments using CGE models

It is complicated to estimate the possible impacts of a free trade agreement (FTA), since many factors and conditions are involved. The expected impacts of CAFTA will depend on the static reallocation effects of productive factors and the dynamic effects resulting from expected increased competition within the integrated market, potential investments flows and technology transfers. Moreover, complementary economic policies associated with FTAs can also have important consequences (e.g. development cooperation and "agreement-pushed" domestic reforms).

Since the implementation of NAFTA in the early 1990s, CGE modelling has become the main empirical tool to assess the impact of free trade agreements. The considerable economy-wide effects expected from the policy shocks associated with trade openness require the use of general equilibrium analysis. Moreover, theoretical models and databases have been undertaking continual improvements over the years to match the extensive use of CGE models.

4.1 Previous CGE results

Quantitative instruments like Computable General Equilibrium (CGE) models have been used to evaluate the likely impact of CAFTA for its member countries.[13] The United States International Trade Commission (USITC, 2004) reports positive but very small economy-wide welfare effects for the United States. US exports to Central America are likely to increase by US$2.7 billion or 15%, and US imports are likely to grow 12%, by US$2.8 billion after full implementation of the tariff liberalization provisions of CAFTA. The impact on US employment and output is expected to be minimal. The largest sectoral effects are expected in the textiles and apparel, and sugar industries, both highly-protected activities.

For Central America as a whole, Hilaire and Yang (2004) report an important welfare gain with the full implementation of CAFTA of US$3.9 billion (1.5% percent of regional GDP). A main source of the gain for Central American countries comes from expanded sales of textiles and clothing and processed crops, which more than offsets trade diversion from other countries and regions. Total exports from Central America to the US market are likely to increase by 50% from their 2002 values, according to their model simulations.[14]

On the other hand, Brown *et al.* (2004) report a total improvement in US economic welfare of US$17.3 billion, which represent 0.2% of GNP. Economic welfare in CA increases by

[13] Because of differences in model specifications, databases, and country aggregations, the results of these studies show differences in magnitude, but similar "signs" and "directions" of likely effects.

[14] This result must be interpreted with caution, since the authors use data for 1997, and some recent preferential agreements are not considered; as well as the recent implementation of the quota reduction for Chinese exports of textiles and apparel products.

US$5.3 billion, which is 4.4% of regional GNP. For Central America, there are sizable percentage increases in the exports of food, beverages and tobacco, textiles, wearing apparel, leather products and footwear, and services. Total export value increases by US$8.3 billion and the likely impact on output in textiles, wearing apparel, and leather products and footwear in CA is also significant. As a result, the authors estimate that employment increases by 53,741 workers in textiles, 230,663 workers in wearing apparel, and 9,518 workers in leather products and footwear. The percentage increases in employment in these sectors are 28, 42, and 15 percent, respectively. These employment reallocations are apparently quite substantial and suggest that the agreement may result in significant worker displacement in the process of adjustment brought about by elimination of import barriers.

4.2 The GTAP framework

The Global Trade Analysis Project (GTAP) is an international network of institutions and researchers that facilitates and fosters trade analysis. The main aim of the project is to provide updated datasets of bilateral trade, transport, and import protection data in conjunction with individual-country, input-output data bases. Moreover, it also provides a modelling framework to conduct CGE static analysis of multi-region and economy-wide scenarios. In particular it can simulate the effects of trade policy and resource-related shocks on the medium-term patterns of global production and trade.

We use the GTAP database and CGE model to analyze the economic implications of CAFTA for Central America. Using this framework we can incorporate some issues not accounted for in previous CGE applications, including the elimination of Chinese quotas to the US, trade facilitation mechanisms and increased FDI flows to CA.

4.2.1 Database considerations

We use the GTAP database 6.0 pre-release 3.10 version, which uses 2001 as its baseline and provides the best available basis to analyze current trade policy (USITC, 2004). However, for this specific application, there are two main limitations. First, the regional aggregation available in the database groups the five Central American participants (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua) together with Belize and Panama, which are not in CAFTA. Secondly, the baseline year is four years apart from the implementation date of the agreement. Thus, the economic environment and data changes that have taken place between 2001 and 2005 are not included in this experiment.

A recent study by the USITC (2004) broadly adjusts the data to account only for the five countries and includes the Dominican Republic, which was incorporated into CAFTA at the end of the negotiations. Moreover, the authors perform some updates to the database, in order to bring the baseline to 2005. Nevertheless, we do not find significant differences with the USITC's broad estimations and hence we leave the data unaltered.

However, this database limitation highlights the need to include the countries separately in the future. This need is especially important when evaluating the effects of CAFTA for Costa Rica, which has a different productive structure and export platform than the rest of the region.
In this paper we aggregate the data in 20 sectors and 4 regions: USA, Central America, China and the Rest of the World (ROW). With this regional grouping we can estimate the impact of CAFTA, as well as the influence of China on its bilateral trade. The sectoral aggregation was done considering the relevant exporting and importing sectors for CA.[15]

4.2.2 Theoretical setting[16]

First, we use a standard GTAP static model with different shocks to evaluate the alternative scenarios.[17] In the final section we estimate some potential dynamic effects and embed them in the GTAP model as endowment shocks. The standard GTAP model uses a regional representative household with a Cobb-Douglas function to assign constant expenditure shares to private consumption, public expenditure and savings. This formulation allows for an unambiguous indicator of welfare offered by the regional utility function, which accounts for the three sources of utility. Household behaviour is modelled using a Stone-Geary utility function where all subsistence shares are equal to zero. This specification allows for a well-defined intertemporal maximization between consumption and savings.

Firm behaviour is modelled using a technology tree that depends largely on the assumptions of *separability* in production (see Figure 9.1 in the Appendix). This allows for decisions being made at each level, without considering the variables of other levels. Using this simplification, it is assumed that firms first choose between primary factors *independently* of the prices of intermediate inputs. In addition, constant returns to scale are also assumed and thus, output levels are also left out of the choice of the factor mix. The combination of production factors and intermediate inputs is assigned using a Leontief function. Thereafter, the mix of intermediate domestic and foreign inputs is selected using a CES function, the selection between foreign inputs uses an Armington specification within a CES function and finally, the mix of factors is assigned also with a CES function. All elasticities of substitution are held constant.

There is imperfect factor mobility, which is described with a CET revenue function. Full employment is also assumed, although the use of slack variables can introduce some flexibility in this assumption and initial endowments can also be changed to proxy for increases in the employment of factors previously not used.

[15] A summary of the definitions and grouping of sectors can be found in Table 9.2 in the Appendix. However, the GTAP database allows for other possible combinations of sectors and regions.

[16] This section draws heavily on Hertel and Tsigas (1997). They present the formal mathematical and schematic representation of the GTAP model, which can be consulted for those interested in understanding the specifics of the model's structure.

[17] In particular, we use the RunGTAP software version 5.

Aggregate investment is not explained within the standard GTAP model, since it does not account for macroeconomic policies and monetary phenomena. Thus, the macroeconomic closure employed is neo-classical and investment is forced to adjust in line with regional changes in savings. In addition, a *global closure* is assumed and the current account deficits can be non-zero but must be balanced in the *global bank* (where trade deficit must be compensated between countries).

Finally, the use of a series of accounting relationships embodies all the necessary general equilibrium conditions and nonlinear programming is used to find a feasible solution to the maximization problem. In this particular application, we use a Gragg extrapolation solution method, which allows us to deal with the significant shocks that are induced by the full trade liberalization negotiated under CAFTA.

Before we analyze the results, it is important to remember that we are first using a static GTAP application that does not take into consideration possible increases in US foreign direct investment in CA, in response to the incentives provided by the bilateral liberalization. Moreover, no allowance has been made for possible increases in capital formation and economic growth and improvements in productivity in the United States and the CAFTA countries. However, some of these dynamic effects are indirectly assessed in the last section. Finally, it is important to stress that the simulation results include the full adjustment of the economy to the policy shock and thus can represent the long-run effect of CAFTA. Therefore, the short-run adjustment and preliminary implications of the trade agreement are not analyzed here.

5 Static GTAP baseline scenario

We first present the tariff rates and trade flows that emerge using our setting with 20 sectors and four regions. Table 5.1 shows that under the CBI initiative many Central American products already have a zero tariff to the US. This list excludes sugar, the milk and diary sectors and textiles and apparel (T&A). On the other hand, CA has high average tariffs for most agricultural goods and some industrial goods as well.

Table 5.1 Tariff rates embedded in the GTAP database, percentages

	Tariffs to the USA			Tariffs to Central America			
Sector code	2 CA	3 China	4 ROW	1 USA	2 CA	3 China	4 ROW
1 Rice	0.0	8.6	3.7	25.9	1.2	0.0	41.0
2 Other_cereal	0.0	1.5	0.1	13.1	0.1	23.8	12.6
3 Veg_fruits	0.1	7.3	0.9	12.1	0.1	14.4	12.7
4 Sugar	37.4	37.4	24.8	33.8	35.0	45.9	34.0
5 Other_agric	1.1	6.3	7.5	0.7	1.4	5.3	3.0
6 Cattle_anim	0.0	0.6	0.2	4.8	0.4	3.4	4.0
7 Milk_diary	16.6	7.2	16.3	17.6	6.5	37.7	20.7
8 Forest_wood	0.0	0.9	0.2	4.5	1.0	10.1	5.4
9 Fishing	0.0	0.3	0.1	12.6	4.5	0.0	5.3
10 Minerals	0.0	0.1	0.0	1.7	1.3	0.3	0.4
11 Meat_bovine	3.7	5.2	3.6	8.7	1.4	14.4	12.5
12 Meat_nec	0.0	7.0	1.3	17.4	1.9	14.1	26.9
13 Bev_tobacco	0.5	3.6	2.2	20.8	2.6	18.0	23.0
14 Otherfoodpro	0.4	4.9	2.5	10.3	1.3	12.0	9.6
15 Textiles	13.3	10.2	7.6	12.6	2.9	8.1	10.2
16 Apparel	10.7	11.6	9.8	16.7	7.9	12.3	13.9
17 Leather	1.3	14.8	8.3	10.0	6.5	11.9	11.7
18 Mineral_prod	0.0	3.9	2.1	3.2	1.3	4.5	4.3
19 Other_manuf	0.0	1.7	0.9	3.3	1.6	7.4	8.4
20 Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: GTAP database 6.0 pre-release 3.11

The implicit bilateral trade from the GTAP database is reported in Table 5.2, which shows exports by region and sector. The concentration of Central American exports of T&A to the US is shown in this table. They represent 55% of all exports to the US. US exports, instead, are more diversified and concentrated in industrial goods. Overall, CA has a bilateral trade surplus with the US using these initial values. The US represents roughly half of all Central America's trade.

5.1 Including the ATC implementation as a pre-experiment condition

The global liberalization of textile and clothing quotas at the beginning of 2005 under the Agreement on Textiles and Clothing (ATC) has already opened the US market for Chinese exports. This fact has a significant impact for Central American T&A products and has already produced a very significant increase of Chinese exports to the US and Europe.[18] Hence, to assess the current international setting in the T&A sector, we eliminate the textile quotas for Chinese imports to the US as a pre-experiment condition in our baseline estimations. Subsequently, we use the updated database for our CAFTA simulations.

Table 5.2 Exports at market prices, by region and sector, million US$

	USA Exports			Central American Exports			
Sector code	2 CA	3 China	4 ROW	1 USA	2 CA	3 China	4 ROW
1 Rice	84.2	0.2	674.6	0.9	4.7	0.1	4.7
2 Other_cereal	221.7	7.5	5551.3	0.4	10.2	0.1	4.6
3 Veg_fruits	50.0	86.7	4996.9	967.8	101.7	2.0	975.6
4 Sugar	4.4	11.4	338.6	150.2	0.8	0.1	432.6
5 Other_agric	281.9	1327.8	13537.4	525	47.5	1.0	977.3
6 Cattle_anim	24.9	676.7	3142.5	6.9	49.7	0.6	42.0
7 Milk_diary	31.6	32.6	784.2	6.2	72.4	0.4	15.9
8 Forest_wood	567.2	1111.6	27859.3	180.7	350.2	0.9	163.2
9 Fishing	0.3	3.2	240.2	89.1	1.7	0.1	6.2
10 Minerals	11.7	89.7	6272.5	83.7	11.5	0.1	60.5
11 Meat_bovine	55.0	55.3	3891.2	60.1	46.8	2.4	31.8
12 Meat_nec	68.4	198.7	4087.2	2.0	26.3	0.3	11.4
13 Bev_tobacco	30.0	15.7	4330.8	82.9	79.1	0.5	41.0
14 Otherfoodpro	463.2	415.4	13978.2	570.1	576.3	4.4	439.0
15 Textiles	1570.2	450.8	10698.2	2363.2	126.4	0.8	204.4
16 Apparel	1119.5	98.5	4118.1	4222.1	80.5	0.9	214.9
17 Leather	43.9	95.7	1817.3	20.8	80.6	1.8	107.9
18 Mineral_prod	1613.8	3902.2	112121.7	251.4	1109.9	2.9	594.4
19 Other_manuf	2985.2	16473.5	424580.2	1409.8	746.9	57.2	2270.8
20 Services	631.9	4353.4	253927.7	910.5	23.1	81.8	4404.1
Total	9859.0	29406.6	896948.1	11903.8	3546.3	158.4	11002.3

Source: GTAP database 6.0 pre-release 3.11

Given the highly significant participation of China in this sector, we consider it imperative to include this event prior to our CAFTA baseline estimations, and this is a significant contribution of this paper with respect to previous CGE assessments.

[18] The sheer increase in textile and wearing apparel trade between China and the US may prompt temporary policies to limit this trade (The Economist, 2005a). China has already imposed an export tax, which has been considered insufficient by some US commentators and thus may be complemented by other policy measures from the US. However, even when these additional measures may be implemented, the significant impact of Chinese exports for CA has to be considered.

From Table 5.3, we observe that with the implementation of the ATC, the T&A sector shrinks in CA and the US, while it increases in China by roughly the same amount of the Central American and US decline. Wages and capital returns to CA are diminished and this creates a welfare loss to the region of around 0.8% of GDP.[19]

Table 5.3 Elimination of Chinese T&A quotas to the US, percentage changes

	Output			Market price		X fob			M cif		
Sector code	USA	CA	China	USA	CA	USA	CA	China	USA	CA	China
Land				– 0.01	3.30						
UnSkLab				– 0.08	– 2.35						
SkLab				– 0.04	– 2.33						
Capital				– 0.05	– 2.55						
NatlRes				0.12	3.94						
Rice	0.21	0.41	– 0.19	– 0.06	– 1.16	0.30	4.78	– 5.38	– 0.42	– 2.08	4.35
Other_cereal	0.08	0.50	– 0.37	– 0.05	– 0.96	0.23	1.06	– 1.66	0.00	– 0.52	0.84
Veg_fruits	0.05	1.13	– 0.11	– 0.06	– 0.82	0.22	1.71	– 2.98	– 0.01	– 1.25	4.06
Sugar	– 0.04	2.86	– 0.47	– 0.07	– 1.40	– 0.04	5.1	– 5.25	0.18	– 3.04	1.51
Other_agric	– 0.11	1.85	1.87	– 0.08	– 0.72	0.69	3.41	– 7.63	– 0.16	– 1.24	5.01
Cattle_anim	0.09	0.08	– 0.06	– 0.05	– 1.06	1.32	1.39	– 3.99	– 0.14	– 1.32	6.03
Milk_diary	0.03	0.34	– 1.29	– 0.06	– 1.38	0.02	3.55	– 7.02	– 0.10	– 3.50	1.39
Forest_wood	0.11	2.63	– 2.16	– 0.07	– 1.80	0.33	5.98	– 5.02	– 0.33	– 2.90	1.86
Fishing	0.03	0.35	– 0.18	– 0.03	– 1.12	0.10	0.99	– 0.86	– 0.02	– 2.12	1.09
Minerals	0.02	2.62	– 1.35	– 0.02	0.05	– 0.01	-0.51	1.82	– 0.03	2.98	– 2.90
Meat_bovine	0.06	0.44	– 2.35	– 0.05	– 1.47	0.06	6.76	– 7.00	– 0.01	– 3.63	– 1.13
Meat_nec	0.07	0.01	– 2.45	– 0.05	– 1.43	0.63	5.74	– 9.54	– 0.17	– 5.08	4.39
Bev_tobacco	0.02	– 0.05	– 0.13	– 0.06	– 1.83	0.00	0.97	– 1.46	– 0.03	– 2.24	1.34
Otherfoodpro	0.04	1.24	– 0.61	– 0.06	– 1.37	0.14	2.86	– 3.68	– 0.06	– 1.87	2.33
Textiles	– 4.76	– 9.06	12.17	– 0.39	– 1.34	0.75	– 11.16	19.34	3.98	– 12.81	14.59
Apparel	– 8.14	– 19.52	29.11	– 1.09	– 1.43	6.60	– 28.09	47.59	9.77	– 3.70	4.58
Leather	1.52	4.87	– 4.48	– 0.01	– 1.45	2.15	11.03	– 4.69	– 0.41	– 2.37	1.87
Mineral_prod	– 0.01	2.86	– 1.4	– 0.06	– 1.32	0.25	4.77	– 4.12	– 0.29	– 1.38	1.71
Other_manuf	0.29	6.85	– 3.31	– 0.06	– 1.31	0.55	8.87	– 5.57	– 0.19	– 1.15	1.12
Services	0.02	0.19	– 0.22	– 0.06	– 1.96	0.09	5.51	– 2.89	– 0.08	– 3.75	1.87

Source: Own estimations

5.2 CAFTA baseline scenario

Once we updated our database to include the quota reduction to Chinese exports of T&A, we proceeded to estimate the impact of CAFTA. This calculation is done by assuming a full liberalization of trade between the US and Central America, as well as free trade within CA. Thus, we reduce all tariffs between both regions to zero and eliminate all tariffs within CA; but keep the original tariffs with China and the ROW. In accordance with the agricultural exclusions made in the agreement we do not remove the tariffs for sugar from CA to the US, or

[19] The main results for each scenario are presented in Table 7.1 in the last section of this paper.

for “other_cereal” from the US to CA.[20] In addition, some minor quotas across both regions and within CA were also eliminated.

The results for this baseline scenario show that welfare gains are positive for CA. Welfare increases US$1028 million or 1.5% of previous GDP, which in turn has a 0.3% growth rate. Household incomes rise 4.1%, driven by a significant increase in wages and capital returns. Moreover, CA has positive terms-of-trade effects that also contribute to these welfare gains.[21] As expected, the equivalent values for the US are close to zero.

From Table 5.4, we also find that textiles and clothing production in CA increase significantly, drawing an even higher specialization into these sectors, at the expense of the rest of the economy. This situation is also reflected in the export composition, where T&A accounts now for 65% of total exports. Agricultural production is significantly decreased, with rice being the most affected crop.

5.3 US sugar liberalization under CAFTA

While Central American countries will phase out their sugar tariffs over 15 years, the approximately 100% out-of-quota duty in the United States will not be cut. The United States will establish tariff-rate quotas (TRQs) for Central American countries, starting at 97,000 MT and growing to about 140,000 MT in year 15, thereafter growing by 2% a year. Provisions will ensure that only net surplus exporting countries in the region have access to the new system, and provisions have been agreed to allow alternative forms of compensation to be established to facilitate sugar stock management by the United States.[22]

Therefore, even though CAFTA has been highly opposed by the US sugar industry, in fact, the trade agreement will produce no substantial changes in current bilateral trade conditions in this sector. Under the current conditions, 33.6% of CA exports are in-quota, while CAFTA will increase this percentage up to 47.5%. This will maintain CA sugar exports below 1.7% of total US consumption (World Bank, 2005). In turn, the TRQs change will not increase sugar production in CA, but the revenue received by CA sugar producers will increase due to higher US prices relative to world prices.[23]

However, sugar is especially significant for CA, since the elimination of the US import tariff would have produced a very important increase of output and exports. This was assessed in a separate simulation were import tariffs for Central American sugar to the US were included as an additional shock to the baseline scenario.

[20] Because of limitations with the aggregation of sectors provided by the GTAP database, the exclusion of white corn is proxied by leaving the tariff of “other_cereal” unaltered, even when other products are being included. For similar reasons, onion and potato tariffs to Costa Rica were not considered, even when they were excluded from the negotiated tariff reductions.

[21] These positive terms-of-trade effects are present throughout the rest of scenarios. However, they diminish when factor endowments are endogenously determined in the model.

[22] USTR (2004).

[23] Angel (2005) estimates a 3% average price increase for the sugar producer in El Salvador.

When analyzing factor prices, CA experiments significant increases in wages for unskilled and skilled labour, as well as capital returns. These gains assure the welfare and income increases and, moreover, promises a relief to poor unskilled workers. In addition, consumer prices increase less than income and the representative agent experiments a utility rise. The overall situation of poverty in each country is likely to improve under these conditions, given that unemployment can be curved (something we analyze further in a separate simulation).

Table 5.4 CAFTA, baseline scenario, percentage changes

	Output		Market price		X fob		M cif	
Sector code	USA	CA	USA	CA	USA	CA	USA	CA
Land			0.30	– 7.66				
UnSkLab			0.02	5.63				
SkLab			0.02	5.56				
Capital			0.02	6.31				
NatlRes			– 0.06	– 10.74				
Rice	2.15	– 11.96	0.17	0.69	8.10	– 26.14	0.61	65.51
Other_cereal	0.04	– 0.87	0.06	2.04	– 0.04	– 2.03	0.13	0.88
Veg_fruits	0.09	– 2.61	0.06	1.66	0.36	– 3.38	0.03	7.12
Sugar	0.31	– 6.39	0.07	2.98	2.96	– 9.80	– 0.34	62.97
Other_agric	0.00	– 2.83	0.06	1.64	– 0.20	– 5.03	0.23	3.65
Cattle_anim	0.05	– 1.74	0.04	1.81	– 0.13	– 3.98	0.16	3.23
Milk_diary	0.06	– 1.61	0.03	2.52	5.97	29.07	0.66	22.62
Forest_wood	0.02	– 7.84	0.01	3.83	0.43	– 13.75	0.07	10.42
Fishing	0.02	– 1.33	0.04	1.16	– 0.06	– 0.79	0.08	6.62
Minerals	– 0.01	– 5.75	0.00	0.10	– 0.07	1.10	0.04	– 6.63
Meat_bovine	0.04	– 1.58	0.04	2.83	0.64	– 3.87	0.34	26.78
Meat_nec	0.13	– 6.76	0.03	2.79	2.04	– 29.96	0.19	73.11
Bev_tobacco	0.01	– 0.35	0.02	3.98	0.31	– 1.15	0.02	8.77
Otherfoodpro	0.07	– 4.24	0.03	2.34	1.20	– 6.15	0.03	9.41
Textiles	0.70	46.57	– 0.06	1.10	11.88	93.49	3.35	48.68
Apparel	0.41	41.43	– 0.13	0.73	15.58	75.34	1.72	23.67
Leather	0.23	– 5.51	– 0.01	2.51	1.92	– 1.84	0.07	12.47
Mineral_prod	0.03	– 6.67	0.01	2.59	0.15	– 10.71	0.08	5.50
Other_manuf	– 0.04	– 13.36	0.01	2.73	– 0.04	– 15.72	0.06	3.84
Services	0.00	– 0.63	0.02	4.50	– 0.07	– 11.43	0.04	8.58

Source: Own estimations

However, land returns are adversely affected because of the negative impact of CAFTA on the agricultural sector. This change implies a redistribution of income from rural land-owners to workers.

On the other hand, the effects of CAFTA for the US are very small, where only the T&A and rice sectors obtain a significant output and export increase. Moreover, the bilateral trade between both regions increases by around 27%.

As shown in Table 5.5, the increase in sugar exports would have created less dependence on T&A exports for CA, and also a much needed balance between the sectoral division of

production between agriculture and industry.[24] Moreover, welfare gains for CA increase in an additional 120 million US$, driven by a higher factor price increase in CA and utility gains for the representative household of the region. Thus, US sugar protectionism seems very harmful for CA and it is a very relevant issue partially excluded from CAFTA.

Table 5.5 AFTA including US sugar liberalization, percentage changes

	Output		Market price		X fob		M cif	
Sector code	USA	CA	USA	CA	USA	CA	USA	CA
Land			0.28	– 6.08				
UnSkLab			0.02	6.1				
SkLab			0.01	6.02				
Capital			0.02	6.78				
NatlRes			– 0.05	– 11.09				
Rice	2.24	– 10.76	0.17	1.23	8.42	– 27.73	0.62	68.21
Other_cereal	0.06	0.64	0.06	2.88	0.09	– 1.00	0.14	4.32
Veg_fruits	0.11	– 3.15	0.06	2.15	0.41	– 4.29	0.01	8.66
Sugar	– 2.92	20.48	– 0.47	4.03	5.16	54.69	29.25	67.93
Other_agric	0.04	– 3.41	0.06	2.15	– 0.13	– 7.23	0.18	6.64
Cattle_anim	0.06	– 1.39	0.04	2.47	– 0.09	– 4.70	0.15	4.17
Milk_diary	0.07	– 1.74	0.02	2.98	6.23	27.47	0.60	23.93
Forest_wood	0.02	– 8.27	0.01	4.17	0.46	– 14.70	0.06	10.96
Fishing	0.02	– 1.35	0.06	1.47	– 0.08	– 1.04	0.10	7.18
Minerals	– 0.01	– 6.23	0.00	0.13	– 0.08	0.73	0.05	– 7.13
Meat_bovine	0.05	– 1.86	0.03	3.34	0.72	– 6.22	0.30	28.35
Meat_nec	0.14	– 7.03	0.03	3.32	2.16	– 31.72	0.17	76.45
Bev_tobacco	0.01	– 0.32	0.01	4.38	0.33	– 1.34	0.02	9.31
Otherfoodpro	0.08	– 4.54	0.01	2.73	1.30	– 6.90	-0.02	10.04
Textiles	0.71	44.06	– 0.06	1.37	11.72	90.59	3.28	47.50
Apparel	0.44	39.39	– 0.12	0.99	15.75	72.83	1.68	24.26
Leather	0.24	– 6.44	– 0.01	2.82	1.97	– 3.40	0.06	12.88
Mineral_prod	0.03	– 7.19	0.01	2.84	0.17	– 11.59	0.07	5.57
Other_manuf	– 0.04	– 14.32	0.01	2.97	– 0.02	– 16.96	0.05	4.17
Services	0.00	– 0.62	0.02	4.88	– 0.05	– 12.31	0.03	9.43

Source: Own estimations

[24] E.g. the increase in *maquila*-based production drawn from agricultural sectors, supposes a high rate of immigration from rural to urban communities. This can be costly and ultimately, an unrealistic situation as also expressed by Brown *et al.* (2004). However, an increase in sugar production would have created a more balanced situation between rural and urban production.

5.4 Agricultural protection in CA

Accounting for the negative effects of CAFTA on the agricultural sectors in CA reported in our baseline scenario, it is useful to simulate an alternative case where food protection in this region is not lifted with the agreement. Given the phase-out schedule for most of the agricultural sensible products of CA, this simulation can proxy a "medium-way scenario" where agriculture is still not fully opened. [25]

With regard to welfare gains, this scenario is fairly comparable to the baseline case, providing a slight increase of US$37 million. Table 5.6 shows that the dependence of CA on the T&A sector continues, but now the "Rice" and "Milk_diary" are less affected by the agreement.

Table 5.6 CAFTA with food protection in CA, percentage changes

	Output		Market price		X fob		M cif	
Sector code	USA	CA	USA	CA	USA	CA	USA	CA
Land			0.20	-6.22				
UnSkLab			0.02	5.84				
SkLab			0.02	5.71				
Capital			0.02	6.42				
NatlRes			– 0.05	– 10.19				
Rice	0.06	– 0.36	0.03	2.61	0.26	– 6.55	0.15	4.27
Other_cereal	0.01	– 0.74	0.04	2.45	0.01	– 2.08	0.07	1.73
Veg_fruits	0.11	– 3.07	0.05	1.98	0.42	– 3.98	0.00	7.83
Sugar	0.20	– 6.23	0.06	3.28	0.18	– 10.59	– 0.45	17.96
Other_agric	0.03	– 3.65	0.05	1.98	– 0.10	– 6.50	0.15	5.02
Cattle_anim	0.01	0.01	0.03	2.53	– 0.06	– 4.12	0.08	5.64
Milk_diary	– 0.02	0.62	0.02	3.12	– 0.31	38.76	0.59	15.38
Forest_wood	0.02	– 7.99	0.01	3.95	0.44	– 14.07	0.06	10.62
Fishing	0.02	– 1.20	0.06	1.56	– 0.07	– 1.12	0.10	7.11
Minerals	– 0.01	– 5.92	0.00	0.10	– 0.07	1.09	0.05	– 6.86
Meat_bovine	0.03	– 1.88	0.03	3.29	0.74	– 6.04	0.26	28.25
Meat_nec	– 0.02	– 0.17	0.02	3.31	– 0.10	– 2.15	0.15	14.18
Bev_tobacco	0.01	– 0.36	0.02	4.18	0.32	– 1.26	0.02	9.01
Otherfoodpro	0.07	– 4.63	0.02	2.89	1.28	– 7.13	0.00	10.46
Textiles	0.71	45.49	– 0.06	1.22	11.83	92.21	3.32	48.23
Apparel	0.42	40.71	– 0.13	0.82	15.65	74.45	1.70	23.89
Leather	0.24	– 6.12	– 0.01	2.71	1.96	– 2.86	0.06	12.71
Mineral_prod	0.03	– 6.91	0.01	2.69	0.16	– 11.06	0.07	5.47
Other_manuf	– 0.04	– 13.7	0.01	2.80	– 0.02	– 16.13	0.05	3.88
Services	0.00	– 0.64	0.02	4.64	– 0.06	– 11.76	0.03	8.86

Source: Own estimations

[25] For instance, in the case of rice, all Central American tariffs will be eliminated in 18 years (20 years for Costa Rica). All tariff cuts will be back loaded, with out-of-quota imports subject to a safeguard. TRQs will be established for rough and milled rice. For pork, all tariffs will be eliminated by 15 years. Tariffs on bacon and some offal products will be eliminated immediately. TRQs amounting to 9,450 MT will be established and grow from 5 to 15 percent a year (USTR, 2004).

The rest of the agricultural sectors in CA continue to face output reductions, driven mainly by the reallocation of resources to the T&A *maquila*-based sectors. Factor prices and bilateral trade are also mainly unchanged.

Therefore, this medium-term scenario roughly replicates our baseline scenario results. However, it would imply an important interval for some Central American agricultural sectors to adjust for competition from the US.

Finally, it is important to remember that without CAFTA, CA experiments a welfare loss driven from higher competition from Chinese products in the US T&A market. Provided that the current CBI assures market access to many Central American products, in our baseline scenario, CAFTA is more than compensating for the negative effects of the Chinese quota reduction in T&A.[26]

[26] In Table 7.1, we present the net gains for USA and CA when the implications of the ATC protocol are included.

6 Assessment of gains derived from complementary policies and dynamic effects

Besides liberalizing bilateral trade between the United States and the region, CAFTA will also strengthen integration efforts among the countries of Central America, and remove barriers to trade and investment in the region to US companies. [27] The agreement will also require CA to undertake reforms to improve their performance in areas critical for competitiveness, including: customs integration and administration, the protection of intellectual property rights, access and protection of investments in utilities (energy, telecommunications, and water), construction, insurance and financial services markets, sanitary standards, and other certification norms. In the case of Costa Rica, market liberalization in state monopolies (i.e. telecommunications and insurance) will be gradually implemented.

There are also important efforts in each country to improve ports and airports, and to coordinate regional customs modernization and harmonization. All these complementary policies, together with the expanding logistics, transport and distribution services, present a promising outlook for Central America as a future investment and trade platform for the Americas and the rest of the world. Leading global companies (e.g. Intel, Siemens, Hydro Quebec, AT&T, Maersk-SeaLand, and Procter & Gamble) are investing and even placing their Latin American headquarters in the region, an optimistic signal for the future of business and economic growth. CAFTA can contribute to this process, attracting the necessary investments to increase productivity in Central American countries, and consolidate the development of a regional market of significant scale.

To assess for the potential impact of these complementary policies, we conduct four experiments. First, we estimate the effects of trade facilitation and then assess the potential impact of CAFTA on the employment conditions in CA. In a third experiment we model an increase in FDI flows to CA, by allowing capital accumulation to be endogenously determined in the model to reflect differences in expected returns from both regions. Finally, we explore an "optimistic scenario" experiment where the three previous results are simultaneously assessed.

6.1 Trade facilitation

In the GTAP setting trade costs are modelled using the "iceberg cost" approach. This implies that no specific international transportation sector is modelled, but instead that there is a mark-up between the effective price of goods and services between importers and exporters. This mark-up is lost ("melted") and cannot be explained by tariffs or NTBs, or can be assigned to any region or institution.

Using this approach, we can model trade facilitation mechanisms as a decrease in these iceberg trade costs. These efficiency-enhancing trade facilitation mechanisms include customs

[27] Pratt and Rivera (2003).

automation, improvements in ports and roads that reduce transportation costs, and the simplification of custom procedures that serve to reduce effective import prices.[28]

When we include a uniform 2% decrease in transportation costs between both regions and within CA, to simulate an improvement in trade facilitation mechanisms, the gains from CAFTA are highly increased. First, 10% further increase in trade volumes between both regions is reached. In addition, welfare gains for CA rise by US$729 million with respect to our baseline case, which are motivated by a 3.6% increase in terms of trade and additional increases in wages and capital returns in the region. These increased trade volumes amplify our previous results. In Table 6.1 we project further increases in the volumes of T&A form CA to the US, while the agricultural output reduction in the former region are also enlarged.

Table 6.1 CAFTA baseline with a 2% trade facilitation increase, percentage changes

	Output		Market price		X fob		M cif	
Sector code	USA	CA	USA	CA	USA	CA	USA	CA
Land			0.32	– 9.01				
UnSkLab			0.03	8.10				
SkLab			0.02	8.19				
Capital			0.03	8.86				
NatlRes			– 0.10	– 9.79				
Rice	2.34	– 13.25	0.19	1.50	8.85	– 27.33	0.70	72.31
Other_cereal	0.04	– 2.10	0.06	3.03	– 0.04	– 2.97	0.15	1.18
Veg_fruits	0.06	– 2.96	0.07	2.77	0.46	– 3.20	0.13	10.08
Sugar	0.28	– 7.74	0.06	4.25	3.46	– 11.98	– 0.14	72.47
Other_agric	0.00	– 4.15	0.07	2.66	– 0.09	– 5.80	0.44	8.41
Cattle_anim	0.06	– 2.10	0.05	2.94	– 0.15	– 3.98	0.19	5.97
Milk_diary	0.08	– 1.92	0.03	3.74	7.26	35.43	0.74	29.77
Forest_wood	0.02	– 9.90	0.02	5.31	0.57	– 13.34	0.10	14.82
Fishing	0.00	– 1.28	0.03	3.01	– 0.06	0.11	0.06	10.13
Minerals	– 0.02	– 6.78	0.00	1.04	– 0.07	5.79	0.06	– 7.45
Meat_bovine	0.05	– 1.63	0.04	4.21	0.83	-2.29	0.44	37.61
Meat_nec	0.16	– 7.88	0.04	4.20	2.47	– 30.98	0.25	92.77
Bev_tobacco	0.01	0.09	0.02	5.61	0.34	– 0.21	0.03	11.44
Otherfoodpro	0.08	– 4.66	0.03	3.43	1.41	– 5.04	0.08	12.52
Textiles	0.78	51.28	– 0.07	1.84	13.77	107.45	3.77	55.97
Apparel	0.42	47.46	– 0.15	1.50	17.61	87.71	1.94	27.64
Leather	0.28	– 7.31	– 0.01	3.60	2.41	– 1.81	0.09	16.55
Mineral_prod	0.03	– 8.29	0.01	3.51	0.22	– 9.59	0.11	7.02
Other_manuf	– 0.05	– 15.65	0.01	3.75	– 0.01	– 15.84	0.09	5.80
Services	0.00	– 0.45	0.02	6.38	– 0.08	– 14.84	0.06	13.11

Source: Own estimations

[28] Hertel *et al.* (2001).

6.2 Employment gains in CA

One of the most anticipated gains from CAFTA for CA is expected on increased employment opportunities for the region, which can curb low wages and high under-employment and sub-utilization rates. In turn, these improved labour conditions can ease the high poverty rates in the region.

While our baseline scenario shows a wage increase of around 5.6% for both skilled and unskilled labour, these figures are implicitly assuming full employment. As shown in Section 2, despite relatively low unemployment figures, labour sub-utilization is a serious problem in CA. Therefore, a more realistic simulation must take into account these labour market characteristics.

To simulate an eventual positive impact of the agreement on employment, we change the closure rule of the basic GTAP model. Thus, we fix unskilled workers wages in CA, to allow for trade shocks to adjust the number of unskilled employed workers.[29]

Using this closure rule under our baseline scenario, CAFTA increases employment of unskilled workers by 5.6%. In addition, GDP presents a significant increase of 2.2%, determined by the use of previously idle workers. Thus, even when sub-utilization figures will remain high, CAFTA can be a very positive influence to tackle this problem in the region, while providing a significant increase in production. However, we also find that Central American output and exports are still biased toward the T&A sector, with the related decrease in the agricultural employment and production.

6.3 Assessment of Dynamic Effects

Many of the economy-wide effects of increased trade openness are dynamic in nature. While an improvement in the allocation of resources is the main static effect of liberalization, most of the expected gains from increased trade are dynamic. These include more and cheaper inputs and final products, pro-competitive effects associated with increasing returns to scale and the erosion of market power (Francois *et al.*, 1996). However, the increase in investment flows is generally regarded as the main dynamic effect associated with trade liberalization.

Overall, static gains from trade are relatively small with respect to base GDP and this is not consistent with cross-country estimates of trade and growth. These studies imply that there is a strong link between increased trade, more investment and growth.[30] Thus, in order to assess the wider impact of trade liberalization it is important to include some estimates of the dynamic gains associated with increased investment and capital accumulation.

[29] This is done by letting the variable “endwslack” capture the increase in employment in CA.

[30] Some literature surveys on the topic include Edwards (1993), Barro and Sala-i-Martin (1995), and Easterly (2001).

6.3.1 Implications of expected FDI increased flows

As explained in Section 2, US FDI to the region is highly significant and CAFTA is expected to increase these investment flows. In addition, the stock of US foreign direct investments in the region is relatively high at US$3 billion.[31] To take full advantage of CAFTA, the greatest challenge for the region is to improve its productivity and competitiveness. One of the most important expected effects of CAFTA on Central America will be the "agreement-pushed" reforms and policy changes that would create a better investment climate for US companies, and at the same time generate positive externalities for other foreign firms interested in investing in the region.

Besides the expansion of trade flows, CAFTA builds the foundations for a development path in Central America based on increasing foreign direct investments, the creation of productive linkages with local firms and cluster consolidation, the transfer of technology and human capital formation, and the reinforcement of integration strategies in the region. Already some advances have been made in Central America with the creation of regulatory frameworks and incentives schemes to attract more foreign companies.

Preference-sensitive products like textiles and apparel, bananas, and sugar, will have a better positioning with CAFTA, although important forces outside the region's control influence the international markets for these products. Other goods like fruits and vegetables, forestry products, and processed food have growth potential, particularly if higher value is added with further processing, product differentiation, and quality improvements. Growing sectors like electrical equipments and medical devices, and apparel and textiles are foreign investment-led activities, so further improvements in the competitiveness climate of the region should help consolidate and expand investments and trade in these sectors. New business opportunities in the expanding eco-tourism sector, and nature-based activities like bio-prospecting and environmental services, should gain more prominence in the region's competitive positioning. Under our baseline scenario there is already a significant flow of capital to CA. The current net rate of return on the capital stock (RORC) of the region is increased by 5.7% in our CAFTA baseline scenario. Since this rate of return in the rest of the regions does not change, the agreement creates large incentives for FDI flows towards the region. This condition is partially responsible for the increase of 6.5% in the output of capital goods in CA and a rise of 0.6% in the end-of-period capital stock.

However, given the provisions contained in CAFTA to ease US investments in CA, it is expected that greater FDI flows can be obtained under the agreement. We would account for this increased FDI flows by allowing capital accumulation to endogenously adjust and take advantage of the differences in rates of return between both regions.

[31] According to USTR data.

6.3.2 FDI and Capital Accumulation in GTAP

In this subsection we focus our analysis in the relationship between trade openness and increased capital formation. In our previous static model, the savings rate and initial capital are held constant, while end-of-period capital is increased to reflect changes in the net rate of return and the ease with which excess savings are allocated between regions. However, the final level of capital does not affect the main economic results associated with tariff reductions (e.g. GDP, welfare, trade volumes).

Following Francois *et al.* (1996), we can assess the impact of increased capital accumulation by changing the closure rule of the standard GTAP model. To do this, we assume that the savings rate and the initial level of capital are endogenously determined and thus, the increase in capital associated with trade liberalization is directly integrated into the results of the simulation.

In practical terms, GTAP uses the end-of-period capital level, which is associated with the new savings rate and the flow of FDI from regions with lower capital returns, as the initial capital level. Hence, the trade shocks are implicitly considering the capital accumulation associated with the shock itself. In this way, although we are not explicitly using a dynamic model, we proxy the dynamic effects of capital accumulation.

6.3.3 Capital accumulation under CAFTA

As explained before, one of the main issues negotiated in CAFTA was the inclusion of legal and administrative provisions to ease the flow of FDI into the region. Moreover, given that the CBI already grants market access to the US for many Central American products, it is expected that investment will provide the biggest economic impact of the agreement for the region (The Economist, 2005b).

Therefore, we can link FDI flows into the region with an increase in the amount of capital. In our GTAP model, we assess this effect by including an additional scenarios were we shock our baseline case by changing the closure rule to include endogenous capital accumulation and saving rates. The results show an increase in the initial stock of capital of 8.7%; and this in turn is associated with a very significant 4% raise in both GDP and social welfare. As before, output changes are concentrated in the T&A sectors, but given an increase in the productive capacity of the economy, there is not a reduction in all other sectors and some are even expanding (i.e. services, beverages and tobacco, milk and diary products).

6.4 Optimistic scenario

Until now, we have assessed the impact of individual shocks compared with our baseline scenario where CAFTA only alters the tariffs between both regions. However, it is relevant to assess the full impact of the trade agreement when all these individual shocks take place. While the baseline scenario can be considered to be a lower bound assessment where only tariff

removal is considered, this last cumulative scenario can be described as the optimistic outlook of CAFTA. In this last case, the agreement generates increased FDI, trade facilitation mechanisms that reduce the mark-up between world and domestic prices and, additionally, reduces the high under-employment rates of the region.

The joint impact of these positive assumed outcomes is achieved by changing the closure rules and adding shocks to our baseline scenario. The new macroeconomic closure rule reflects two changes. First, it allows capital to increase, due to the expected flows of FDI into the region. Secondly, it changes the unskilled labour market closure, where wages are now fixed and the market is cleared by the quantity of unskilled labour supplied. Finally, for the additional shocks we assume a 2% decrease in the transport costs to reflect the impact of trade facilitation mechanisms.

Table 6.2 CAFTA, optimistic scenario, percentage changes

	Output		Market price		X fob		M cif	
Sector code	USA	CA	USA	CA	USA	CA	USA	CA
Land			0.3	12.01				
UnSkLab		11.50	0.05	0.00				
SkLab			0.04	8.93				
Capital		16.33	0.05	– 0.30				
NatlRes			0.01	20.69				
Rice	2.41	– 5.83	0.20	– 0.54	9.19	– 19.15	0.76	76.07
Other_cereal	0.06	6.13	0.08	2.98	0.27	2.72	0.15	9.95
Veg_fruits	0.02	0.48	0.07	1.91	0.44	– 1.31	0.19	14.06
Sugar	0.02	3.31	0.04	0.58	2.88	0.17	0.53	69.05
Other_agric	– 0.01	1.77	0.08	2.30	– 0.03	– 3.97	0.51	16.45
Cattle_anim	0.04	5.48	0.06	2.66	– 0.18	– 0.30	0.19	12.90
Milk_diary	0.07	5.25	0.05	0.74	6.49	52.59	0.93	28.06
Forest_wood	0.01	7.17	0.03	– 0.37	0.42	9.48	0.17	16.55
Fishing	0.04	2.32	0.10	5.87	– 0.11	– 2.15	0.16	16.19
Minerals	– 0.01	2.74	0.03	2.32	0.08	– 4.92	0.09	12.87
Meat_bovine	0.03	4.86	0.05	1.24	0.61	14.74	0.66	35.30
Meat_nec	0.14	– 2.18	0.05	1.62	2.15	– 19.89	0.30	84.27
Bev_tobacco	0.01	6.09	0.04	– 0.12	0.30	5.22	0.06	10.48
Otherfoodpro	0.05	3.01	0.04	0.05	1.24	3.86	0.23	13.46
Textiles	0.74	99.65	– 0.10	– 2.11	18.25	159.25	4.99	85.15
Apparel	– 0.06	91.3	– 0.23	– 2.82	17.30	138.87	2.70	26.41
Leather	0.19	13.64	– 0.01	– 1.00	1.99	27.85	0.09	18.64
Mineral_prod	0.03	10.62	0.03	– 0.52	0.29	12.43	0.15	17.04
Other_manuf	– 0.06	9.61	0.03	– 0.36	0.01	10.57	0.15	12.80
Services	0.00	8.55	0.04	0.95	– 0.11	– 1.62	0.11	11.62

Source: Own estimations

As expected, this upper-bound scenario produces significant welfare gains for CA with an increase of roughly US$4,500 million. This improvement is primarily supported by the increase in factor endowments, where unskilled labour raises by 11.5% and the capital stock by 16.3%. In addition, GDP is increased by a very significant 12.3%, while skilled labour wages increase by almost 9%.

From Table 6.2 we observe again a high specialization in the *maquila*-based T&A sector, which is a constant throughout all our simulations. Nevertheless, now most of the CA economy is also expanding and only two sectors are shrinking (rice and meat_nec). Thus, in this optimistic scenario most of the expected gains from trade are realized and the general economic results are positive.

7 Conclusions

In this last section, we present a summary in Table 7.1 of the main results for all the scenarios. From the point of view of the US, CAFTA represents insignificant overall changes in its main macroeconomic indicators. From the different scenarios, some sectors are benefited from the agreement, mainly the T&A sector, which is expected to provide intermediate inputs to the T&A *maquilas* of CA.[32] Moreover, bilateral trade volumes are significantly boosted, from values between 25% and 60% for the different scenarios.

Table 7.1 CAFTA, summary results for all scenarios

	Welfare gains		Welfare net gains[a]		GDP		Terms of trade		Bilateral trade volume	
	(mill. US$)		(mill. US$)		(% change)		(% change)		(% change)	
Scenario:	USA	CA	USA	CA	USA	CA	USA	CA	USA	CA
Initial values (bill. US$)					10082.1	70.1			23.2	23.0
ATC protocol	6292.7	– 540.6	6292.7	– 540.6	0.02	– 0.16	0.33	– 1.26	– 8.04	– 7.37
CAFTA: Base	115.5	1027.8	6408.2	487.2	0.00	0.26	0.02	2.55	26.72	27.45
Full sugar lib.	54.9	1148.8	6347.6	608.3	0.00	0.28	0.01	2.87	27.77	28.61
CA food prot.	80.7	1064.9	6373.4	524.4	0.00	0.24	0.01	2.70	25.42	26.31
Trade facilitation	395.2	1756.3	6687.9	1215.7	0.00	0.82	0.02	3.58	36.33	37.21
Fixed unsklab wages	269.9	671.1	6562.6	130.5	0.00	2.16	0.03	1.44	30.52	31.08
Endog. cap. ac.	247.3	2845.3	6540.0	2304.6	0.00	4.08	0.03	1.76	31.85	32.53
CAFTA: Opt.	1006.4	4471.2	7299.1	3930.6	0.00	12.25	0.07	0.03	55.51	55.95

[a] After excluding the effects of the ATC protocol scenario

Source: GTAP database 6.0 pre-release 3.11 and own estimations

For the five Central American economies, CAFTA represents a series of opportunities that can be exploited, but also a series of critical challenges. Given the importance of US trade and investment in the region, in addition to the huge size differences between both regions, the agreement produces significant sectoral and economy-wide effects.

It is clear from Table 7.1 that the most welfare-improving mechanism in CAFTA is the increase in FDI and the capital stock of the region. This observation points to the importance of exploiting the investment opportunities associated with a bilaterally determined and permanent privileged market access to the US. If CAFTA can improve the investment climate in the region and this is complemented with economic policies that improve infrastructure and increase competitiveness, then the region can achieve a path of sustainable growth.

[32] Although we do not explicitly create any restrictions to account for rules of origin, in all our simulations CAFTA produces an increase of T&A imports from the US to CA, with a decrease of imports from the other two regions.

The key factor for CA will be the scope and depth of the complementary policies associated with CAFTA. After analyzing the Mexican experience with NAFTA, Lederman *et al.* (2004) conclude that FTAs with the USA offer great opportunities for Latin American countries, but without these complementary policies, there is no guarantee that the agreement can increase growth. In relation to CAFTA, the same conclusions are reached by the World Bank (2005). In addition, they analyze and report the specific complementary policies most needed in each Central American country.

Therefore, without complementary economic policies, CAFTA can be considered mainly as a balancing force to counteract the negative impact of the implementation of the ATC protocol. Given the great of importance of T&A commerce with the US, the CA economy without CAFTA will be hurt by the increased competition of Chinese textiles and apparel goods. Even when our baseline scenario produces modest but positive welfare gains and the improvement of labour market outcomes, CAFTA also incentives a higher concentration in the already significant *maquila*-based T&A sector of the region. This specialization is so important that roughly two thirds of exports will be supplied from these two sectors alone.

In turn, to generate this sectoral concentration, resources must be taken from the rest of the economy. The agricultural sector is significantly affected by this process, which is complemented by the reduction of import protection negotiated in the trade agreement. When we assess a medium-term simulation of the agreement by not liberalizing the agricultural sector in CA, this situation is partially reverted. This highlights the importance of complementary policies in the agricultural sector which can mitigate or reverse these negative effects, while the phase-out of import protection is not fully implemented.

One significant drawback from CAFTA is that US sugar protection is mainly unaffected, in clear contrast to the recent rhetoric of this influential industry in the US. With the liberalization of the sugar sector, the problematic imbalances created between the rural and urban sectors in CA could have been adverted, with additional welfare improvements for the region.

If the region can effectively implement the complementary economic policies that are expected, then we could reach the significantly positive outcomes estimated in our upper-bound scenario. In any case, the favourable impact in the labour market outcomes, if it is assessed as an increase in wages or a reduction in unemployment, generate key welfare gains which can be shared by the workers of the region and create a positive income increase for poor families. If in addition, labour market legal conditions are also improved with the implementation of CAFTA, these positive outcomes could be even higher.

Finally, in the case of Costa Rica, CAFTA does not seem as favourable as it is for the rest of Central America. The first reason is that it has little to gain from T&A exports to the US. Moreover, Costa Rica will open some sensitive markets to US imports (i.e. milk and diary products, poultry, pork, rice, telecommunications and insurance services). This implies that the implementation of competitiveness policies associated with the agreement will be fundamental for this country to take advantage of the increased trade and investment opportunities embedded

in CAFTA. Potential gains will depend on FDI inflows. As far as Costa Rica successfully implements policies to improve the country's business and investment climate, the probability of positive effects will increase.

References

Angel, A., 2005, CAFTA, cuotas y consecuencias para la agricultura centroamericana, Mimeo, World Bank.

Barro, R. and X. Sala-i-Martin, 1995, Economic Growth, McGraw-Hill, New York

Bourguignon, F. and da Silva, L. P., 2003, The impact of economic policies on poverty and income distribution: Evaluation techniques and tools, The World Bank and Oxford University Press, Washington, D.C.

Brown, D., K. Kyota and R. Stern, 2004, Computational analysis of the U.S. FTAs with Central America, Australia and Morocco, RSIE Discussion Papers N° 507, School of Public Policy, The University of Michigan.

Central Bank of Costa Rica, 2004, Cuentas nacionales de Costa Rica: 1991-2003, División Económica, Departamento de Contabilidad Social.

Condo, A., F. Colburn and L. Rivera, 2005, The United States Central America Free Trade Agreement (CAFTA): Negotiations and expected outcomes, Nomura Research Institute, Tokyo, Japan

Easterly, W., 2001, The lost decades: Developing countries' stagnation in spite of policy reform 1980-1998, Journal of Economic Growth, 6: 135-57.

Economic Commission for Latin America and the Caribbean (ECLAC), 2006, La Inversión extranjera directa en América Latina y el Caribe, Santiago de Chile.

Economic Commission for Latin America and the Caribbean (ECLAC), 2004, Istmo centroamericano, evolución económica durante 2003 y perspectivas para 2004. LC/Mex/L.605.

Edwards, S., 1993, Openness, trade liberalization, and growth in developing countries, Journal of Economic Literature 31: 1358-93.

Francois, J., B. McDonald and H. Nordström, 1996, Liberalization and capital accumulation in the GTAP model, GTAP Technical Paper No. 7.

Hertel, T. and M Tsigas, 1997, Structure of GTAP, in Global Trade Analysis, edited by T. Hertel. Cambridge University Press.

Hertel, T., R. McDougall and K. Itakura, 2001, GTAP model version 6.0. GTAP Resource #576. Center for Global Trade Analysis, http://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=576.

Hilaire, A. and Y. Yang, 2004, The United States and the new regionalism/bilateralism, Journal of World Trade 38(4): 603-625.

Kehoe, T., 2003, An evaluation of the performance of applied general equilibrium models of the impact of NAFTA, Research Department Staff Report 320, Federal Reserve Bank of Minneapolis.

Lederman, D., W. Maloney and L. Servén, 2004, Lessons from NAFTA for Latin America and the Caribbean. World Bank, ECLAC, IADB and Stanford University Press.

Porto, G. G., 2006, Using survey data to assess the distributional effects of trade policy, Journal of International Economics 70: 140–160.

Pratt, L. and L. Rivera, 2003, El CAFTA y la estrategia de competitividad en América Central., Actualidad Económica, No 276-277, March 10-14.

The Economist, 2005a, China-bashing and trade, April 21st.

The Economist, 2005b, CAFTA's impact on Central America, August 6th.

United Nations Development Programme (UNDP), 2006, Human Development Report 2006, Oxford University Press.

United States International Trade Comission, 2004, U.S.-Central America-Dominican Republic Free Trade Agreement: Potential Economy-wide and selected sectoral effects, USITC Publication 3717.

Unites States Trade Representative, 2004, Free trade with Central America: Highlights of the U.S.-Central America Free Trade Agreement, Trade Facts.

Sánchez, M. V. and R. Vos, 2006, DR-CAFTA: Panacea o fatalidad para el desarrollo económico y social en Nicaragua, Serie Estudios y Perspectivas, Nº 57, ECLAC, Mexico.
Sánchez, M. V., 2007, Liberalización comercial en el marco del DR-CAFTA: efectos en el crecimiento, la pobreza y la desigualdad en Costa Rica, Serie Estudios y Perspectivas, Nº 80, ECLAC, Mexico.

World Bank, 2005, DR-CAFTA: Challenges and opportunities for Central America, World Bank Central America Department and Office of the Chief Economist. Washington, DC.

A Appendix

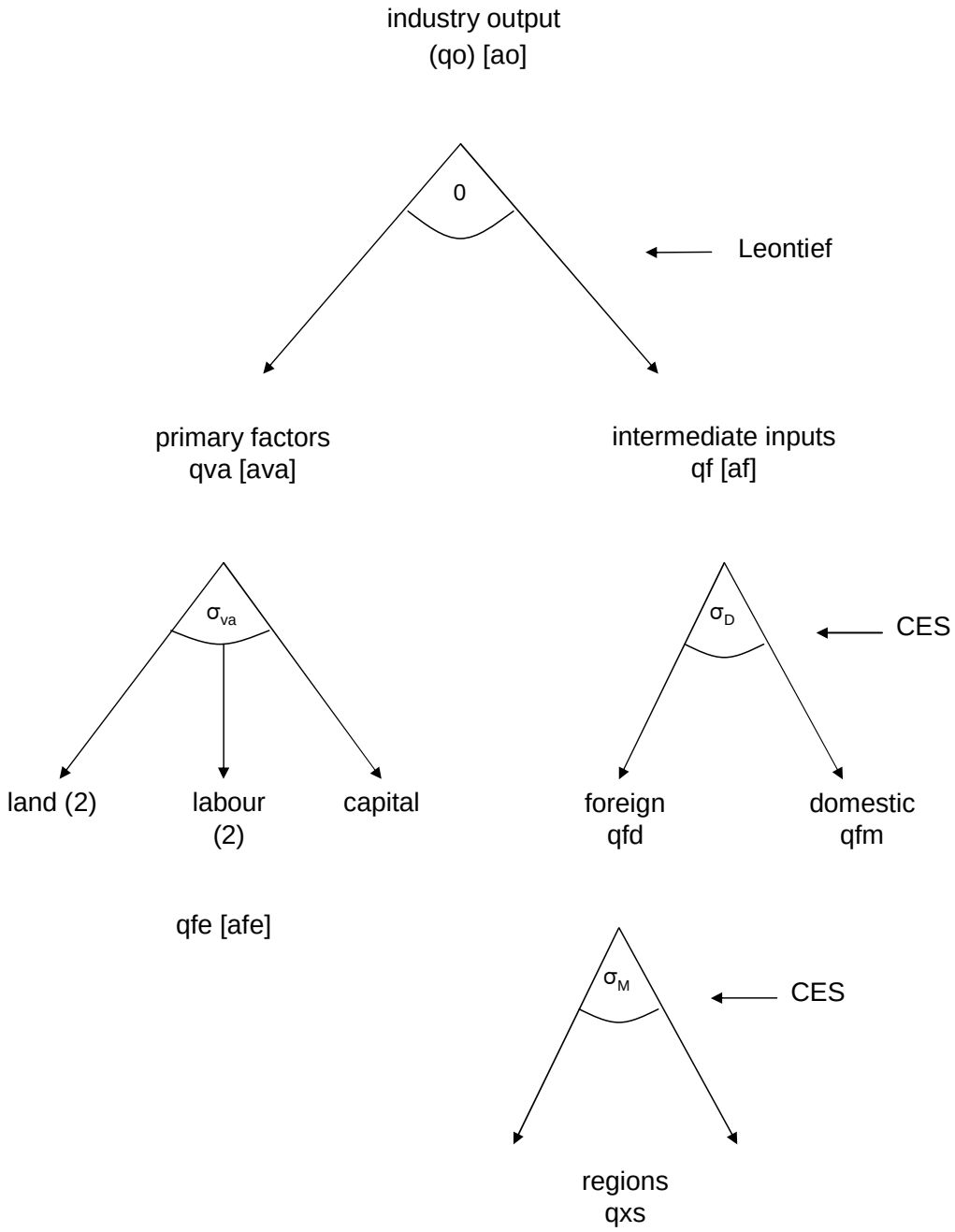
A.1 Main Trade Barriers in Central America

Average Tariffs (%)	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
Average nominal external tariff	7.1	6.9	7.1	7.1	5.1
Capital goods	0	0	0	1	0
Inputs	0	0	0	1	0
Intermediate Goods	5 – 10	5 – 10	5 – 10	5 – 10	5
Final Goods	15	15	15	15	15
Most Protected Industries (%)					
Diary products (Milk)	65	40	15	20	40
Corn (yellow)	1	0	5 – 35	20	0-30
Rice	35	40	32	35	62
Sugar	50	40	20	40	55
Pork meat	48	40	15	15	15
Chicken meat	150	20	15	50	170
Non-Tariff Barriers					
Countervailing & anti-dumping	yes	yes	yes	yes	yes
Safeguards	yes	yes	yes	yes	yes
Non-automatic licensing	yes	yes			yes
SPS Prohibitions	yes	yes	yes	yes	yes
Tariff Rate Quotas	yes	yes	yes	yes	yes
Price Band Controls				yes	

Source: Own elaboration with information from SIECA

A.2 CAFTA sectoral aggregation

	Sector code	Sectors included
1	Rice	Paddy rice; and Processed rice
2	Other_cereal	Cereal grains nec
3	Veg_fruits	Vegetables, fruit, nuts
4	Sugar	Sugar cane, sugar beet; and Processed sugar
5	Other_agric	Wheat; Oil seeds; Plant-based fibbers; and Crops nec
6	Cattle_anim	Bovine cattle, sheep and goats, horses; Animal products nec; and Wool, silk-worm cocoons
7	Milk_dairy	Raw milk; and Dairy products
8	Forest_wood	Forestry; Wood products; and Paper products, publishing
9	Fishing	Fishing
10	Minerals	Coal; Oil; Gas; and Minerals nec
11	Meat_bovine	Bovine meat products
12	Meat_nec	Meat products nec
13	Bev_tobacco	Beverages and tobacco products
14	Otherfoodpro	Vegetable oils and fats; Food products nec
15	Textiles	Textiles
16	Apparel	Wearing apparel
17	Leather	Leather products
18	Mineral_prod	Petroleum, coal products; Chemical, rubber, plastic products; and Mineral products nec
19	Other_manuf	Ferrous metals; Metals nec; Metal products; Motor vehicles and parts; Transport equipment nec; Electronic equipment; Machinery and equipment nec; and Manufactures nec
20	Services	Electricity; Gas manufacture, distribution; water Construction; Trade; Transport nec; Water transport; Air transport; Communication; Financial services nec; Insurance; Business services nec; Public Administration, Recreation and other services; Defence, Education, Health; and Dwellings


industry output
(qo) [ao]
0
Leontief
primary factors
qva [ava]
intermediate inputs
qf [af]
σva
land (2)
labour
(2)
capital
qfe [afe]
σD
CES
foreign
qfd
domestic
qfm
σM
CES
regions
qxs