

**KEYWORDS**

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# Is the phasing out of the Agreement on Textiles and Clothing eroding competitiveness in Central America and the Dominican Republic?

*René A. Hernández*

**T**he Agreement on Textiles and Clothing (ATC) of the World Trade Organization (WTO), and the restrictions deriving therefrom, expired on 1 January 2005. This article quantifies the expected effect of the phasing out of ATC in the context of the free trade agreement between Central America, the Dominican Republic and the United States (DR-CAFTA). We argue that, other things equal, Central America and the Dominican Republic will obtain a smaller share of the United States market, owing to stronger competition from Asian countries, the consequent market reorganization, the rise of the “full package” system, and the lesser competitive advantage afforded by low wages in the value chain of the textile and clothing sectors. In the post-ATC era, other factors, such as just-in-time production and specialization, are the keys to competing advantageously on the international market, given the trend of integration in the links of that chain.

René A. Hernández  
 Economic Affairs Officer,  
 Office of the Executive Secretary,  
 ECLAC  
 ✉ [rene.hernandez@cepal.org](mailto:rene.hernandez@cepal.org)

# I

## Introduction

This article puts forward a set of stylized facts describing the potential effects caused by the ending of the WTO Agreement on Textiles and Clothing (ATC) among the main exporters of these product lines in Central American countries, following the entry into force of the free trade agreement between Central America, the Dominican Republic and the United States (DR-CAFTA, hereinafter referred to as the Agreement). We attempt to quantify those effects through a partial equilibrium model using two approaches, one *ex ante* and the other *ex post*.

We argue that the supply pattern in the post-quota era will be determined not only by the cost of factors of production, but also by the capacity to supply highly specialized products (clear advantage for China) and “full package” solutions. Central America and the Dominican Republic recognize the overwhelming strength of Chinese garment making, but continue to pin their hopes largely

on the static benefits of the Agreement, rather than on vertical integration of the industry or the adoption of new supply facilitation, just-in-time production or flexible production models.

The article is divided into five sections. Following this introduction, a set of stylized facts summarize the main implications for DR-CAFTA signatory countries of the expiry of ATC (section II). This is followed by a brief review of the relevant empirical literature and the methodologies that are most widely used to analyse the impact of preferential agreements, free-trade treaties or regional integration arrangements (section III). A partial equilibrium analysis is then performed and its empirical results are presented, with a view to quantifying the potential impact of the expiry of ATC (section IV). Lastly, section V sets forth a number of final thoughts and comments.

# II

## Main consequences of the ending of the Agreement on Textiles and Clothing

### 1. Backgrounds

The developing countries that signed the DR-CAFTA Agreement —Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua— already enjoy preferential access to the United States market under the trade partnership agreement signed between that country and those of the Caribbean basin,<sup>1</sup> which came into force on 1 October 2000.

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<sup>1</sup> US-Caribbean Basin Trade Partnership Act (CBTPA), which represents a programme of preferential tariff benefits granted unilaterally by the United States to Central American and Caribbean basin countries (U.S. Customs Service, 2001). There are 24 beneficiary countries altogether.

In general, DR-CAFTA expanded benefits in the textile and clothing sector, while increasing imports of certain inputs for that sector from the United States, in compliance with rules of origin. Moreover, under the Agreement, Central American countries obtained tariff-free entry to the United States for their textile and clothing products, also subject to rules of origin, this measure operating retroactively as from 1 January 2004.

Inclusion of a “short supply” list also allows imports of inputs from countries that are signatories of the North American Free Trade Agreement (NAFTA), and countries that benefit from two pieces of United States legislation: the African Growth and Opportunity Act (AGOA) and the Andean Trade Preference Act (ATPA), for inclusion as originating products.

Both CBTPA and the Agreement seek to increase exports from beneficiary countries and exploit the advantages offered to sensitive sectors, such as textiles

and clothing. In this sense, the ending of ATC represents a sharp external shock for Central American countries, which largely depend on the United States market and the preferences that country grants them, to keep their exports competitive in those sectors.

## 2. The Agreement in the textile and clothing sectors

Since 1973, under the auspices of the General Agreement on Trade and Tariffs (GATT), the Multifibre Arrangement (MFA) governing international trade in textiles allowed a group of countries to impose quantitative restrictions on textile and clothing products that posed a threat to their domestic industry. Subsequently, in the Uruguay Round, WTO member countries signed ATC in 1993, which was designed to eliminate the quota-based protection system within 10 years and incorporate WTO rules.<sup>2</sup> The “integration” process began in 1995 and ended in January 2005. The ATC agreement gave countries that imported and exported textile and clothing products a 10-year period to strengthen their domestic industries, once a gradual reduction in quotas had been agreed.<sup>3</sup> Nonetheless, tariff elimination was concentrated in the final stage of ATC, for which reason countries have been waiting to see its potential effects, particularly when faced with competitors as strong as China and India, which were the major nations subject to quotas.<sup>4</sup>

Although the Central American countries and the Dominican Republic also face quotas established by the United States,<sup>5</sup> like other countries that export textiles and garments, they were able to benefit from the Caribbean Basin Economic Recovery Act (CBERA) of 1984, also known as the Caribbean Basin Initiative (CBI), and subsequently from CBTPA as from 2000. As

noted above, these two instruments enabled beneficiary countries to export their textile and clothing products to the United States, free of tariffs and quota restrictions, provided they fulfilled the rules of origin and standards that those instruments imposed.

Preferential access to the United States market in an international setting of quotas and restrictions helped to diversify Central American and Dominican exports towards other non-agricultural product lines, but at the same time caused their external sales to become concentrated in that market. While just 0.25% of Nicaragua’s exports to the United States were sold to that country’s textile industry in 1990, by 2003 the figure was close to 63%. Similar trends occurred in Guatemala, El Salvador and Honduras, where the share of textile exports in 1990 was 26%, 29% and 24%, but by 2003 had risen to 60%, 87% and 78%, respectively. Thus the five countries of the Central American Common Market (CACM) generated roughly 75% of garment exports to the United States from all CBTPA-eligible countries between the mid-1990s and 2010. CBI countries were jointly ranked second after Mexico in terms of garment exports to the United States (figures 1 and 2).

In the Dominican Republic, the textile industry share of total exports to the United States was similar to that recorded in Costa Rica (40% and 39%, respectively). But, after peaking in the early 1990s, this industry tended to decline and diversify its exports, particularly in the case of Costa Rica. In 2003, textile exports accounted for 49% of total Dominican exports to the United States, and 18% in the case of Costa Rica (figure 1).

The Central American countries and the Dominican Republic have focused on the second sector of the textile-clothing-distribution chain, i.e. cutting, grouping and assembly of the different garment parts, or else in just one of these activities. According to the United States Harmonized Tariff System, these exports include articles grouped under chapters 61 and 62 of the system: Articles of apparel and clothing accessories; and Articles of apparel and clothing accessories, not knitted or crocheted, respectively (figure 3). The yarn-textile-garment chain encompasses chapters 50 to 63 of the Harmonized System (figure 4).

Garment making uses large amounts of labour, not necessarily skilled; so its increasing weight in total exports has also meant greater employment, especially for women, but with lower wages to maintain competitiveness with the Asian countries. It should be noted that the textile and clothing sector in Nicaragua absorbs 30% of all persons employed in manufacturing activity; in

<sup>2</sup> Among WTO members, the United States, Canada, the European Community and Norway maintained quotas under MFA.

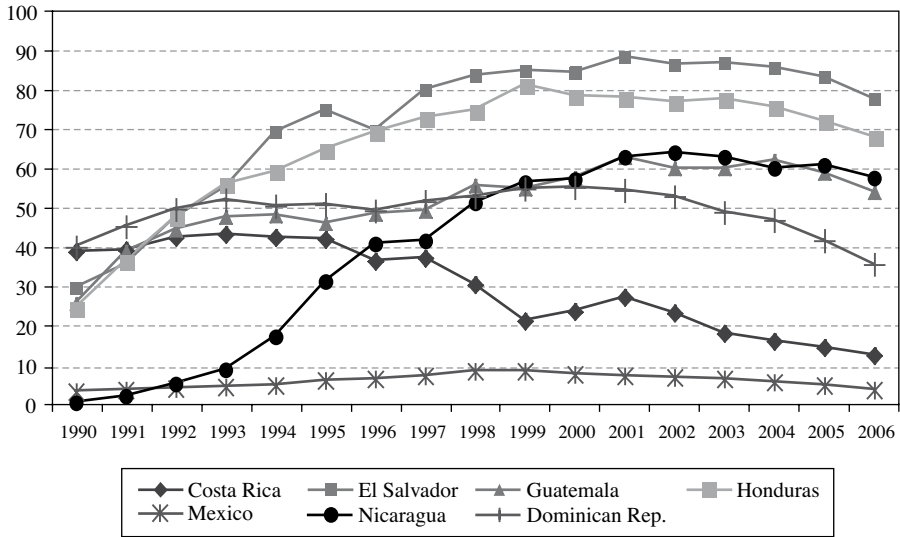
<sup>3</sup> The ATC integration process was divided into four phases in which the products would gradually adopt normal GATT rules. The first phase started on 1 January 1995, the date on which each DR-CAFTA signatory had to select and add products to the schedule contained in the annex of the Agreement representing at least 16% of the total volume its textile and clothing imports in 1990. The second phase began on 1 January 1998 and had to encompass products representing at least an additional 17% of the country’s 1990 textile and clothing imports. The third stage began on 1 January 2002, covering at least a further 18%, and lastly, on 1 January 2005, the remaining 49% of products were integrated.

<sup>4</sup> Some parts of this article were published previously in Hernández, Romero and Cordero (2006).

<sup>5</sup> Except for Nicaragua and Honduras, which have been free of quota control since the mid-1990s. On the competitiveness of maquila clothing manufacture in Central America, see Dussel (2001 and 2004).

FIGURE 1

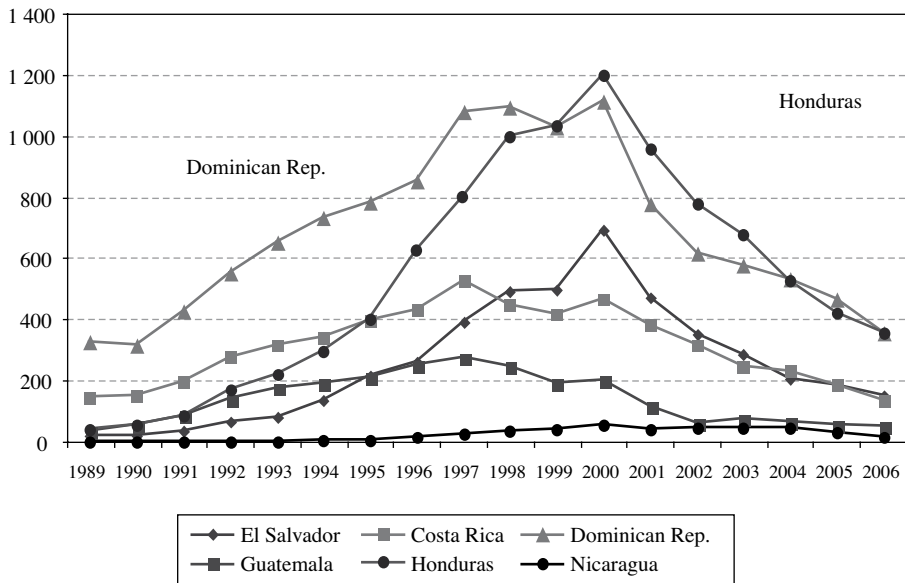
**Northern region of Latin America and the Caribbean: share of textile and clothing sector in total exports to the United States, 1990-2006**  
(Percentages)



Source: Prepared by the author using data from the MAGIC Plus computer program and the United States International Trade Commission.

FIGURE 2

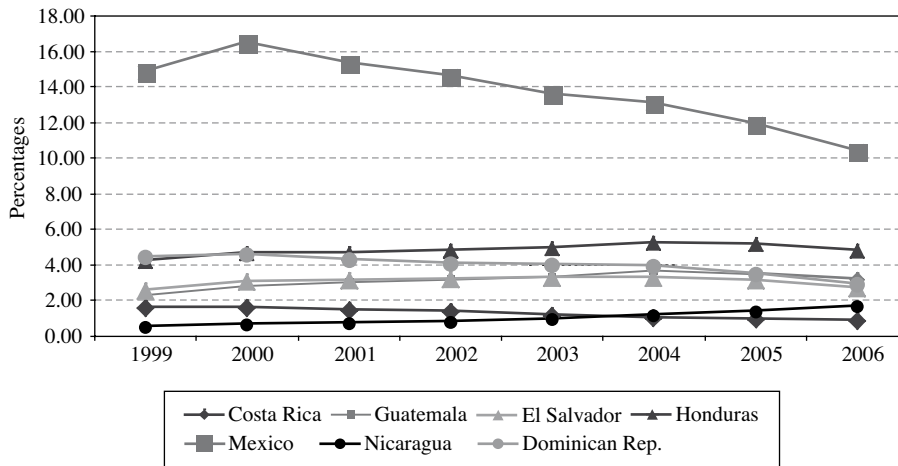
**United States: exports of textile products to Central American countries and the Dominican Republic, 1989-2006**  
(Millions of dollars)



Source: Prepared by the author using data from the United States Textile and Clothing Office (OTEXA).

FIGURE 3

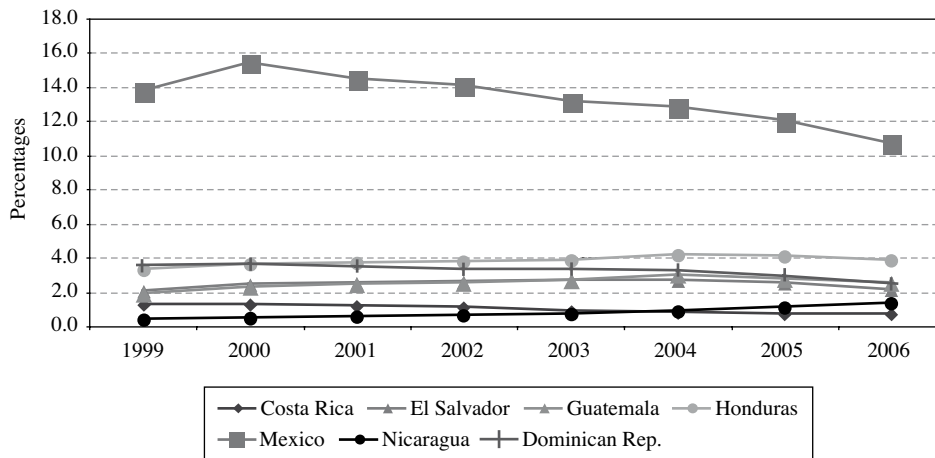
**Central America, Dominican Republic and Mexico: Market share in United States imports, 1999-2006**  
(Chapters 61 and 62 of the Harmonized Tariff System)



Source: Prepared by the author using data from the United States International Trade Commission.

FIGURE 4

**Central America, Dominican Republic and Mexico: market share of United States imports, 1999-2006**  
(Chapters 50-63 of the Harmonized Tariff System)



Source: Prepared by the author using data from the United States International Trade Commission.

Honduras the figure is 27%, in El Salvador 20%, and in Costa Rica 8%.

The garment industry also requires a large quantity of inputs, specifically obtained from the United States to exploit the corresponding trade preferences. Hence, textile imports from the United States market have grown

alongside exports of apparel to that destination, and this explains the complementary nature of the textile-clothing chain between the United States on the one hand, and the Central American countries and Dominican Republic, on the other, as well as the lack of national textile development in the latter countries. Figure 2, above,

TABLE 1

**United States: simulation of textile and clothing imports under a full liberalization scenario (base year 2004)**  
(Millions of dollars)

	<i>Ex-ante</i> United States imports	<i>Ex-post</i> United States imports	Variation in United States imports	Variation in United States imports (%)
<i>Totals</i>		87 460.07	3 507.33	4.18
Costa Rica	610.26	845.35	235.09	38.52
El Salvador	1 794.72	2 736.93	942.21	52.50
Guatemala	1 812.64	2 766.27	953.63	52.61
Honduras	2 631.13	3 916.04	1 284.92	48.84
Nicaragua	498.69	710.20	211.51	42.41
Dominican Republic	2 165.11	3 123.93	958.82	44.29
DR-CAFTA countries <sup>a</sup>	9 512.53	14 098.72	4 586.19	48.21
China	12 690.64	12 620.71	-69.93	-0.55
Mexico	8 781.04	8 576.41	-204.63	-2.33

Source: WITS/SMART computer program (World Integrated Trade Solutions/Software for Market Analysis and Restrictions on Trade), under all pre-established assumptions and with tariff elimination.

<sup>a</sup> Free Trade Agreement between the Dominican Republic, Central America and the United States.

shows the behaviour of such imports, which, since 2001, have declined in the wake of Chinese competition and the slowdown in the United States economy.<sup>6</sup>

Exports are highly concentrated. In El Salvador, 44.5% of all exports are contained in just five tariff headings (according to the Harmonized Tariff System); in Honduras the equivalent figure is 45.4%, in Guatemala 35.4%, Nicaragua 39.4%, Costa Rica 10.28%, and in the Dominican Republic 27.9%. These countries also compete amongst each other with the same products (table 1).

Even with this level of concentration in a single product type, the Central American countries and Dominican Republic have gradually increased their textile and clothing exports to the United States, to the point where since 2000 they have jointly outweighed those of Mexico. They are currently the United States' second most important trading partner in this product line, after China; and this situation is expected to persist following the Agreement's entry into force.

The DR-CAFTA Agreement, which was signed in 2004, maintained the benefits that previously had been granted by CBI, and expanded its preferences to include imports of short-supply merchandise from AGOA, ATPA and CBI beneficiary countries in its rules of origin. It also allowed Nicaragua to maintain annual quotas for fabric or spun yarn for a limited time,<sup>7</sup> and allowed Costa Rica to do the same with wool.

Although initially it was thought that the continuation and expansion of such preferences would bring major benefits, it is worth analysing these advantages in the light of the experiences of CBTPA with regard to textile quotas. Data from the United States Office of Textiles and Apparel (OTEXA) show that, while Central American countries benefited from trade preferences, a large proportion of their exports were unable to fulfil

<sup>6</sup> There are significant amounts of Asian capital in Guatemala, Honduras and Nicaragua, attracted initially by the possibility of exploiting the absence of quotas in the textile and clothing sector, particularly in the two latter countries.

<sup>7</sup> Under the Agreement, Nicaragua obtained the benefit of the Preferential Tariff Regime, which grants levels of preferential access to the United States market for garments made with fabrics or yarns that do not originate from DR-CAFTA countries. Under this regime, Nicaragua can import up to 100 million m<sup>2</sup> or US\$300 million worth of fabrics per year from any country, for the purpose of manufacturing garments and exporting them to the United States. Another advantage of the regime is that it has a nine-year application throughout the local textile industry. Nicaragua was the only DR-CAFTA country to obtain this benefit.

the origin restrictions imposed, so they had to enter the United States market under the quotas modality.

With the ending of ATC, there will doubtless be major changes in the world textile and clothing market, particularly since the United States, the main importer of these product lines, left a large proportion of its products until the last stage of liberalization ending 1 January 2005. Thus, until now, China has been the country to benefit most from the ending of ATC — as also concluded by other research on this subject.<sup>8</sup>

The elimination of quotas by the United States could increase China's share of its market by about 50%, at the expense of other countries that have enjoyed preferential access, including African and Latin American ones. Most analyses, particularly those using general equilibrium models, have found that China and India could jointly account for about 65% of textile and garment imports into the United States (International Trade Commission, 2004b and 2004c):<sup>9</sup> China could triple its market share, and India stands to quadruple its share (Kyvik Nordas, 2004). Other studies estimated that the increase in China's share of those imports would be somewhat smaller, around 28% in 2010 (OXFAM International, 2004).

What is clear is that China's increased importance on the world market is undeniable. Nonetheless, with the imposition of quotas by the United States, those forecasts could prove exaggerated. In fact, Mayer (2004) states that predictions of a sharp increase in China's share of the world textile and clothing market obtained through general equilibrium models are overstated, because such

models do not take account of the fact that buyers in the United States may choose to diversify their supplier portfolio to avoid reliance on just one or two countries. Another important factor that general equilibrium models omit is that *they assume very rapid and unproblematic responses to changes in trade, particularly in developed countries (the countries that impose the quotas), which will probably invoke safeguard clauses or initiate anti-dumping measures to contain the growth of imports from China* (Mayer, 2004).

Some of these results were visible in the first few months after the expiry of ATC: from January to August 2005, Agreement signatory countries displayed a slight decrease (nearly 0.6%) in exports to the United States in the yarn-textile-garment chain,<sup>10</sup> whereas China posted an increase of about 62% and India one of around 28% with respect to the same period in the previous year. As was to be expected, the United States responded by imposing safeguard measures against China,<sup>11</sup> which encompassed 10 product categories up to the end of October 2005.<sup>12</sup>

This justifies the interest of Central American countries in ascertaining what might happen in the textile and clothing sector when the Agreement enters into force. Although, in theory at least, the expiry of ATC brings to an end the imposition of quotas by countries such as the United States, Canada and members of the European Union, nations that do not have any preferential access or free trade agreement still face tariffs in this sector.

<sup>8</sup> See Kuwayama and Cordero (2005). See also a summary of the methodologies and results of other studies in the appendix.

<sup>9</sup> The first of these studies mainly indicates the advantages and disadvantages of buying from one or other country and stresses the fact that both China and India could be the main United States choice after the ending of ATC.

<sup>10</sup> These correspond to chapters 50 to 63 of the Harmonized Tariff System.

<sup>11</sup> An exclusive safeguard for textile and clothing products from China, included within this country's WTO admission protocol, whereby the United States may impose quotas on China to maintain this country's textile shipments at a level no greater than 7.5%.

<sup>12</sup> After three months of negotiations, on 9 November 2005 an agreement between China and the United States was signed in London, whereby the latter reimposes quotas for 34 product categories other than textiles and garments, representing 46% of China's sales to the United States market. The agreement entered into force on 1 January 2006, and is set to expire on the last day of 2008.

### III

## Partial equilibrium analysis

### 1. Methodological aspects

In stylized form, there are two basic approaches to analysing the impact of trade policy. The first consists of an ex-ante simulation of the change in trade policy, which makes it possible to project the future effect of a given set of economic variables. The second is ex-post analysis, which uses historical data to analyse the effects of a trade policy that has been adopted. Gravity models are in this second category and are widely used in empirical studies. Based on this initial typology, individual models may differ by being either static or dynamic, or general or partial equilibrium.

To quantify the effect of the ending of ATC in the context of the DR-CAFTA Agreement, both approaches were used, and in each case partial equilibrium models were adopted. A review of published studies on the ending of ATC the framework of the Agreement made it possible to identify two methodologies specifically used for this purpose. The first uses panel data estimation techniques to measure the impact of the ending of ATC in the framework of a preferential access programme. Thus the relative-price effects of implementing a preferential programme and the ending of ATC<sup>13</sup> are both estimated.

### 2. Ex post model

Drawing on the work of Winters and Chang (2000), Olarreaga and Ozden (2004) and Bulmer and others (2005),<sup>14</sup> it was possible to identify and specify the model and perform the econometric estimation reported in this article (see appendix). After setting out the theoretical foundations for the results of granting preferential access and estimating the effects of Spain's entry into the European Community (now the European Union),

Winters and Chang (2000) reached the following main conclusions: (i) regional integration has effects on relative prices between member and non-member countries both before the tariff and after it, and it lowers export prices in non-member countries; and (ii) tariff reductions stemming from preferences within trade blocs harm non-member countries.

Olarreaga and Ozden (2004) perform a similar exercise for AGOA countries, considering the effects of this preferential agreement on the garment segment only. Although in this case those authors agree with the second conclusion reported by Winters and Chang, they nonetheless find that AGOA countries do not fully benefit from the agreement, because of the market power of other importers or the high concentration of exports by AGOA beneficiary countries in the United States market. The impact of the ending of ATC in DR-CAFTA countries (which are also covered by CBTPA) is measured indirectly through its effect on the relative prices of those countries' exports. The equation which is estimated for selected Central American countries (El Salvador and Honduras)<sup>15</sup> adopts and modifies the econometric techniques used by Bulmer and others (2005), with two aims. Firstly, as El Salvador and Honduras are beneficiaries of a preferential agreement with the United States, the aim is to estimate the fraction of the tariff revenue or margin of preference that is actually captured by garment exporters, through the higher prices they receive as beneficiaries of the preferential agreement. The second aim is to quantify the effect of the ending of the quota system by the United States (the main destination of those countries' garment exports), comparing the export prices of products that are free of quotas, with those that still face this type of quantitative restriction.

<sup>13</sup> In international trade theory, the best way to ascertain whether or not a preferential access programme is advantageous for the beneficiary countries is by measuring its impact on the terms of trade of the country in question. Many of the studies that have used this approach have only been able to calculate the impact on relative prices, either of exports or imports, between the beneficiary and non-beneficiary country/ies.

<sup>14</sup> Bulmer and others (2005) measure the impact of the ending of ATC in the case of the Dominican Republic.

<sup>15</sup> El Salvador and Honduras were selected because they are the two Central American countries with the largest share of garment exports to United States market and because of the preferential advantage they have obtained under CBTPA. The Dominican Republic is the other major competitor and has been analysed and included on the basis of the results of a recent study (Bulmer and others, 2005).



On that basis, the equation estimated by the model is as follows:

$$\ln\left(\frac{p_{kt}^i}{p_{kt}^{RDM}}\right) = \beta_0 + \beta_1(t_{kt}^{RDM} - t_{kt}^i) + \beta_2 \ln(x_{kt}^i) + \beta_3 \ln(m_{kt}^{RDM}) + \beta_4 d\_quota + \sum_k \delta_k \Phi_k + \sum_t \theta_t \Psi_t + \varepsilon_{kt}^i \quad (1)$$

The dependent variable in the estimation is the relative price of country *i*'s tariff-free exports (*i* = El Salvador or Honduras) with respect to those of the rest of the world in the clothing sector, which is the most important export industry in those Central American countries. The unit prices included in the estimation were replaced by unit value (i.e. the ratio between the value of trade and the quantity exported). The coefficient on the tariff differential between the rest of the world and one of the Central American countries,  $\beta_1(t_{kt}^{RDM} - t_{kt}^i)$ , represents the percentage of the margin of preference that the Central American country captures as a result of the preferences granted by the United States. Thus, the tariff rent simply represents the difference between the tariff paid by countries that do not have preferential access to the United States market (i.e. the most favoured nation (MFN) tariff) and the tariff that country *i* exporters pay for certain products sold to the United States, which could be zero.

As a way of measuring the market power of other exporters and (indirectly) considering the effect of

country *i*'s dependence on the United States as an export market for its products, the estimation also includes the value of country *i*'s clothing sector exports and total United States imports in that sector (customs value in both cases). In other words, it does not include insurance or freight. Both series are included in the estimation in logarithmic form. These variables serve as a possible explanation for why the Central American countries do not appropriate 100% of the margin of preference.

The expressions  $\sum_k \delta_k \Phi_k$  and  $\sum_t \theta_t \Psi_t$  represent the inclusion of cross-section fixed effects (in our case, product groups at the four-digit level) and temporary effects; i.e. they are variables that capture non-observable effects and the heterogeneity of cross-section units, for the purpose of obtaining a better estimate of equation (1).

The model also includes a dummy variable (*d\_quota*), which aims to capture the export-price effect of eliminating quotas according to the timetable established in ATC. This variable takes a value of 1 for products that were subject to a quota up to 1 January 2005; otherwise it takes the value zero.

The results obtained for each country are shown below (table 2). Note that two estimations are made of equation (1); one is referred to as a restricted equation because it does not include the temporary effects,  $\sum_t \theta_t \Psi_t$ ; the other is the unrestricted equation which does include them.

TABLE 2

El Salvador and Honduras: two estimates of equation 1

Country/coefficient	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$
<i>El Salvador</i>					
Restricted equation	0.161*	0.394*	0.007**	-0.041*	0.281*
	(0.066)	(0.078)	(0.004)	(0.004)	(0.037)
Unrestricted equation	0.106*	0.342*	0.006	-0.038*	0.262*
	(0.070)	(0.092)	(0.005)	(0.006)	(0.043)
<i>Honduras</i>					
Restricted equation	-0.338*	0.794*	0.051*	-0.054*	0.209*
	(0.112)	(0.061)	(0.006)	(0.008)	(0.044)
Unrestricted equation	-0.289*	0.776*	0.056*	-0.057*	0.179*
	(0.061)	(0.061)	(0.007)	(0.007)	(0.050)

Source: Prepared by the author.

\* Significant at 1%. \*\* Significant at 10%.

(a) *El Salvador (restricted equation)*

The estimation is performed using feasible generalized least squares with fixed effects. The results show that all coefficients, except for the natural logarithm of the value of Salvadoran exports, are significant at the 1%, 5% and 10% levels; and the signs on all coefficients are as expected. Substitution of the values obtained from the equation (1) estimation produces the following:

$$\ln\left(\frac{p^{ES}}{p^{RDM}}\right) = 0,161 + 0,394(t^{RDM} - t^{ES}) \\ + 0,007 \ln(x^{ES}) - 0,041 \ln(m^{RDM}) + 0,281(d\_quota)$$

The results suggest that Salvadoran exporters capture 40% of their preference margin (i.e. the differential between the MFN tariff rate and the preferential rate). It should be recalled that implementation of a preferential access programme is equivalent to a reduction in the tariff paid by the beneficiary countries. The coefficients on the value of exports from El Salvador and those of the rest of the world to the United States market, both of which reflect market power in the garment sector, show that, *ceteris paribus*, a 100% increase in Salvadoran exports is associated with a 0.7% rise in the relative price received by exporters in payment for their exports. Moreover, a 100% increase in United States imports from the rest of the world, other things equal, mean a 4% reduction in their relative price.

The signs and magnitudes obtained in this exercise are consistent with the results reported by Winters and Chang (2000), Olarreaga and Ozden (2004), Ozden and Sharma (2004), and Bulmer and others (2005).<sup>16</sup> More recent research analysing the garment sector<sup>17</sup> has found that Dominican exporters capture 66% of their preference margin in that sector. Olarreaga and Ozden (2004) find that, on average, AGOA beneficiary countries capture just 38% of the margin of preference or tariff rent<sup>18</sup> in the same sector. These authors also find that the two countries that appropriate the largest percentage of the tariff rent also export more garments and to a larger number of countries, which gives them greater bargaining power in relation to other competitors in the United States market and affords them a larger

margin of preference. Ozden and Sharma (2004) argue that, on average, exporters capture around 66% of the tariff rent.

The results reported reflect the inclusion of the dummy variable *d\_quota*, the purpose of which is to estimate the effect of eliminating quotas according to the timetable established in ATC. This variable takes the value 1 for products subject to quota up to 1 January 2005 and zero for quota-free products. Thus, the value of the coefficient on the variable *d\_quota* shows that the relative price received by Salvadoran exporters is roughly 28% higher in products whose exports continue to be quantitatively restricted, so that once quotas are eliminated their prices will fall. It is also likely that the new post-ATC prices set for the products will not cover their production costs, and that El Salvador (along with Honduras) will start to lose market share. In the worst-case scenario, these countries will cease to be competitive in those products and will be forced out of the United States market, which is their main export destination. In fact, this section shows that in 2005 El Salvador and Honduras both lost market share relative to the previous year.

These figures are also consistent with those obtained in previous analyses. Unlike other studies, however, in this article the dummy variable covers up to the third stage (which began on 1 January 2002) and only excludes the final phase (1 January 2005), because if the latter were included there would not be sufficient data to ascertain the effect of eliminating the ATC quota system.

(b) *El Salvador (unrestricted equation)*

This subsection presents the results of the estimation of equation (1) including temporary effects. Eight dummy variables are included for the nine years covered by the estimation. Substituting the values in the equation produces the following results:

$$\ln\left(\frac{p^{ES}}{p^{RDM}}\right) = 0,106 + 0,342(t^{RDM} - t^{ES}) \\ + 0,006 \ln(x^{ES}) - 0,038 \ln(m^{RDM}) + 0,262(d\_quota)$$

While the inclusion of temporary effects slightly lowers the value of the estimated coefficients, the clearest result is that the coefficient on the logarithm of the value of exports from El Salvador is not statistically significant. An F-test performed to assess the appropriateness of the unrestricted model found that the specification which includes temporary effects through dummy variables does seem to be the most suitable. For the unrestricted equation,

<sup>16</sup> See the appendix.

<sup>17</sup> For example, Bulmer and others (2005) perform a similar estimation for the Dominican Republic in 1996-2003.

<sup>18</sup> These authors define tariff rent as the difference between the export prices received by countries that enjoy preferential access and the prices received by those that do not have such access.

the coefficient on  $\beta_2$  is not statistically significant, unlike the result in the restricted equation.

(c) *Honduras (restricted equation)*

Honduras is expected to capture a larger margin of preference since its share of the United States garment market is considerably larger than El Salvador's (Dussel, 2001 and 2004). It is therefore predictable that the effect of the series included in the estimation to capture market power will be greater than in the previous case. Substituting values in the equation produces the following results:

$$\ln\left(\frac{p^{HON}}{p^{RDM}}\right) = -0,338 + 0,794 (t^{RDM} - t^{HON}) + 0,051 \ln(x^{HON}) - 0,054 \ln(m^{RDM}) + 0,209 (d\_quota)$$

All coefficients are statistically significant at the 5% level; and all the signs are as expected, both from the theoretical and from the empirical standpoints. The results show that Honduran exporters capture roughly 79% of their margin of preference. The fact that the coefficient is higher than that obtained by El Salvador may reflect Honduras' better positioning in the United States garment market.

The coefficients associated with the value of Honduran exports and those of the rest of the world, in both cases reflecting market power in the garment sector, show that, other things equal, a 100% increase in Honduran exports will be associated with a 5% rise in the relative price received by Honduran exporters in payment for their exports. Similarly, a 100% increase in imports from competitors in the United States, other factors equal, means a reduction in the relative price of just over 5%. These results show that the better positioning of Honduras with respect to El Salvador in the United States garment market does enable it to obtain a larger proportion of the benefits derived from the preferential programme.

The value of the coefficient on the  $d\_quota$  variable shows that the relative price received by Honduran exporters is 21% higher in products whose exports continue to be restricted by quotas. This suggests that, once the quotas are eliminated,<sup>19</sup> the price differential will disappear, so Honduran

exporters in the garment sector run the risk of losing market share.

(d) *Honduras (unrestricted equation)*

As in the Salvadoran case, temporary effects are included through a dummy variable, and it is found that the values associated with the explanatory variables change slightly: in particular, the coefficients on the margin of preference and dummy variable  $d\_quota$  fall slightly.

$$\ln\left(\frac{p^{HON}}{p^{RDM}}\right) = -0,289 + 0,776 (t^{RDM} - t^{HON}) + 0,056 \ln(x^{HON}) - 0,057 \ln(m^{RDM}) + 0,179 (d\_quota)$$

An F-test was performed in this case also to detect which specification, restricted or unrestricted, is more appropriate for estimating equation (1). As in the case of El Salvador, the null hypothesis is rejected, which suggests that the unrestricted model is the more appropriate.

In short, the foregoing analysis suggests that the outlook for El Salvador and Honduras, in terms of loss of market share in the garment sector, appears worrisome. Countries that enjoy preferential access must exploit this advantage to make their products more competitive, establish stronger linkages within the yarn-textile-garment chain and exploit their location and agglomeration economies, rather than waiting for this temporary advantage to dissipate before taking urgent new measures to avoid losing market share. Nonetheless, no one can guarantee that their position in the United States market can be reversed or at least not deteriorate, once the Agreement enters into force.

**3. Ex ante model**

(a) *Simulation techniques*

The ex-ante model uses simulation techniques (through the WITS/SMART computer system to quantify the impact of the entry into force of a trade agreement, in terms of trade creation and diversion, among other things.<sup>20</sup> The trade policy simulation model of the United Nations Conference on Trade and Development

<sup>19</sup> In fact, quotas have already been eliminated for all countries apart from China, but the estimation assumed that this had not yet happened.

<sup>20</sup> For a detailed presentation of the foundations of this model, see Hernández, Romero and Cordero (2006).

(UNCTAD) was applied using the program Software on Market Analysis and Restrictions on Trade (SMART). This was developed in the framework of the World Integrated Trade Solution (WITS) for the purpose of estimating various effects generated by changes in trade policy, including alterations in tariff rates and the incidence of non-tariff distortions on international trade (Laird and Yeats, 1986).

WITS/SMART is capable of measuring immediate or initial impacts caused by simulated changes in trade policy (Gine, 1978; IMF, 1984; Sapir and Baldwin, 1983; Stern, 1976). In this sense, SMART is an analytical tool constructed within WITS, and, as a simulation model, it aims to provide an overview of the trade creation effects that would be obtained from tariff reductions on negotiated products, either through an expansion of the market based on a better price, or through the advantage acquired by new trade partners over other competitors. In other words, the model is based on the theory of trade creation and diversion developed by Jacob Viner (Andic and Teitel, 1977). The model includes analytical modules that make it possible to simulate changes in trade policy, such as multilateral tariff reductions, preferential trade liberalization and *ad hoc* changes in tariffs.

The economic theory underlying the SMART model departs from the standard partial equilibrium framework, which holds dynamic effects constant. Like any other model of this type, the initial assumptions only allow changes in trade policy to be analysed with respect to one country at a time. Nonetheless, the model can simulate the effects in terms of trade creation and diversion, welfare, and tariff revenue, for countries that have the relevant data available.

The most recent versions of WITS/SMART can undertake multi-market simulations, but they cannot simulate the effect of the ending of ATC, because they simulate tariff reductions and not quota elimination. Accordingly, an alternative *ex-post* model was used which makes it possible to focus the study on estimating the trade creation and diversion effect that would be associated with the ending of ATC.

To simulate any proposed scenario, WITS/SMART requires three variables to be chosen, and these will determine the results. The first is the base year, because the results of the WITS/SMART simulation, irrespective of the different scenarios introduced, will be defined in terms of the behaviour of trade in that year and the tariff levels in force at that time. If, in the chosen year, some of the parties run a trade deficit, this will continue to be reflected in any scenario used. If there are no imports of a given product in that year, the results will never reflect

trade creation, because there will be no data on which to project the simulation scenarios.

The second variable relates to the magnitude of the tariff reductions. The larger the reduction, the greater will be the effect on trade creation and diversion, and also on the subsequent results. Reductions may be total, linear or the result of a reduction formula.

The third and last variable relates to elasticities. WITS/SMART bases its assumptions on three elasticities. The first of these is the elasticity of supply, in which the program pre-establishes that foreign and national supply curves are completely elastic, implying infinite supply (99). The second is the elasticity of substitution, in which WITS/SMART considers that national and imported goods are imperfect substitutes, so a change in the price of the imported product following a tariff reduction will not cause a change in the domestic price (1.5). Lastly, the elasticity of demand assumes that all imports are final products and sets different elasticity levels for each product depending on the level of demand recorded in the chosen year. Calculations of trade creation and diversion are made in accordance with all these variables.<sup>21</sup>

#### (b) Simulation results

The simulation exercise aims to observe the effects that could be generated by implementation of the Agreement in the United States and in the Central American countries and the Dominican Republic, with regard to the textile and clothing sector (chapters 50 to 63 of the Harmonized Tariff System).

All of the simulation scenarios used take 2004 as the base year, since this is the last year for which ATC was in force, and shows the latest trend of trade before the ending of the agreement. It is also the year in which negotiations on the DF-CAFTA Agreement were concluded.

An initial exercise to ascertain the potential effects of DR-CAFTA in the United States market, applying the pre-established WITS/SMART elasticity assumptions and considering total tariff reduction, reports an increase in trade of more than 48% for signatory countries, caused more by trade creation resulting from lower prices than trade diversion. This is illustrated by the result obtained for competitors such as Mexico and China under this scenario: those nations' trade only decreases by 2.3% and 0.6%, respectively, while Guatemala and El Salvador

<sup>21</sup> See Hernández, Romero and Cordero (2006) for the full derivation, which starts with the basic trade model consisting of simplified functions for import demand and export supply in an equilibrium identity.

TABLE 3

**United States: simulation of textile and clothing imports under  
a full liberalization scenario by chapters (base year 2004)**  
(Millions of dollars)

Chapters of the Harmonized Tariff System	<i>Ex-ante</i> United States imports	<i>Ex-post</i> United States imports	Variation in United States imports	Variation in United States imports (%)
<i>Totals</i>	83 896.55	87 403.88	3 507.33	4.18
50	257.88	257.88	0.00	0.00
51	299.02	299.03	0.00	0.00
52	1 910.75	1 910.83	0.08	0.00
53	162.81	162.81	0.00	0.00
54	1 934.29	1 934.49	0.20	0.01
55	1 224.20	1 224.23	0.03	0.00
56	1 120.19	1 120.56	0.36	0.03
57	1 761.98	1 761.99	0.00	0.00
58	556.37	556.57	0.20	0.04
59	1 083.51	1 083.51	0.00	0.00
60	1 099.27	1 099.63	0.35	0.03
61	31 011.09	33 531.21	2 520.13	8.13
62	34 360.74	35 341.61	980.87	2.85
63	7 114.44	7 119.15	4.71	0.07

*Fuente:* WITS/SMART, WITS, bajo todos los supuestos preestablecidos y con eliminación de los aranceles.

are the countries displaying the highest growth (see table 1 above).

Given that these two latter countries concentrate their textile and clothing exports in chapter 61, which encompasses “Articles of apparel and clothing accessories, knitted or crocheted”, the greater trade creation occurs specifically in that chapter, under both this scenario and all others, owing to the aforementioned characteristics of WITS/SMART. The increase in exports to the United States under chapter 61 is 8%, and in chapter 62, “Articles of apparel and clothing accessories, not knitted or crocheted”, it is 2.9% (table 3).

Tariff elimination under this scenario would reduce the revenues of the United States in this category by 10.5%, once through the suppression of tariffs on chapter 61 products, either as a result of the creation of tariff-free trade, or as a result of tariff reduction arising from trade diversion, or both. It should be noted, however, that tariffs are not the only form of trade barrier: there are others, such as rules of origin.

Analysis of the behaviour of DR-CAFTA signatory countries in the United States market, under CBTPA preferences, shows that even with free access, rules of

origin restrain those countries’ exports. Accordingly, a new simulation scenario was tested, using the same variables but altering the amount of the tariff reduction: instead of starting with tariff elimination, a 50% reduction was applied.

The values obtained show that exports to the United States under the Agreement grew by 23%; and, once again, El Salvador and Guatemala posted the strongest growth, this time by around 25% in both cases. The decline in exports from Mexico and China to the United States is -1.10 and -0.26, respectively, and, as expected, equivalent to half of that recorded in the previous year. Total trade creation in the United States market amounts to 2% (table 4).

Here again, these results reflect the greater trade creation and diversion under HS chapters 61 and 62, which reduce total tariff revenues in the United States by about 5% (table 5). This also shows that the greatest barriers are specifically in those chapters. In both scenarios, the countries most affected by trade liberalization would be Mexico, China, Vietnam, Hong Kong Special Administrative Region, and Canada, in that order, although impacts would be small given the

weight of their exports. The country most affected would be Mexico, whose exports have been decreasing since 2000 (table 6).

It needs to be remembered that in neither of scenarios does the simulation consider the elimination of quotas as a result of the ending of ATC. This means that, even under the partial liberalization scenario, the results would be considerably smaller than those estimated, particularly if account is taken of the figures for United States imports in January-September 2005, and the magnitude of Chinese exports compared to those of the United States' other trade partners. Nonetheless, on this point it should also be reiterated that total quota elimination is not the most appropriate scenario. For example, the United States re-imposed quotas on nearly half of all exports in the textile and clothing sector through an agreement signed with China that is set to remain in force until 2008.

Two further simulations were performed for DR-CAFTA countries, to measure the potential impact on their markets of tariff liberalization for the United States market in the yarn-textile-garment chain. As in the first exercise for the United States market, a simulation was performed based on all of the WITS/SMART pre-established parameters and with full tariff elimination. This estimated a 33.8% total increase in United States exports to Agreement countries, with larger increases in exports to Honduras and the Dominican Republic (37% and 34%, respectively). Clearly, a favourable trade balance for DR-CAFTA signatory countries in this and all scenarios, in accordance with the nature of WITS/SMART (table 7). Note that the aggregate trade

balance expresses changes only through tariff reduction in the textile and clothing sector.

Unlike the United States market, where the changes are clearly located in chapters 61 and 62, in the case of Central American countries and the Dominican Republic, the growth of exports to the United States varies from one country to another. Although textile exports are larger in absolute amount, garment exports are growing much faster: by about 40% in this group of countries. This may indicate that there is a minimum level of complementarity between the two markets, which WITS/SMART does not reveal given the nature of this simulation tool.

Nonetheless, assuming that substitution between these goods was not imperfect, another simulation was performed using an elasticity of substitution of 0.8, instead of the 1.5 pre-established in WITS/SMART, given that a medium elasticity has been assumed for developing countries generally, and an estimated reaction in domestic prices (Jachia and Teljeur, 1999). The results obtained under this partial liberalization scenario do not differ much from those reported under full liberalization. The increase in exports only varies by tenths of a percentage point — 33.14% instead of 33.82%. Nonetheless, the measurement of exports minus imports in the United States, under the two partial liberalization scenarios, obtains a smaller trade deficit for this country which decreases by less than half (from –US\$9,661 to –US\$7,298 million) when moving from total liberalization scenario to one of partial liberalization.

With regard to the reduction in tariff revenues among DR-CAFTA countries arising from the effects of trade

TABLE 4

**United States: simulation of textile and clothing imports under a partial (50%) liberalization scenario (base year 2004)**  
(Millions of dollars)

	<i>Ex-ante</i> United States imports	<i>Ex-post</i> United States imports	Variation in United States imports	Variation in United States imports (%)
<i>Totals</i>	83 952.74	85 641.99	1 689.25	2.01
Costa Rica	610.26	722.88	112.62	18.45
El Salvador	1 794.72	2 248.48	453.76	25.28
Guatemala	1 812.64	2 266.88	454.25	25.06
Honduras	2 631.13	3 250.12	619.00	23.53
Nicaragua	498.69	596.35	97.66	19.58
Dominican Republic	2 165.11	2 628.26	463.15	21.39
DR-CAFTA countries <sup>a</sup>	9 512.53	11 712.97	2 200.44	23.13
China	1 690.64	12 657.98	–32.66	–0.26
Mexico	8 781.04	8 684.26	–96.78	–1.10

Source: WITS/SMART, WITS, under all pre-established assumptions and with a 50% tariff reduction.

<sup>a</sup> Free Trade Agreement between the Dominican Republic, Central America and the United States.

TABLE 5

**United States: simulation of reduction in tariff revenues resulting from tariff reduction in the textile and clothing sectors under a partial (50%) liberalization scenario (base year 2004)**  
(Millions of dollars)

Chapters of the Harmonized Tariff System	Previous tariff revenues	New tariff revenues	Variation in revenues (%)	Consumer benefit
<i>Total</i>	7 501.96	7 149.89	-4.69	173.32
50	0.66	0.66	0.00	0.00
51	25.13	25.13	-0.01	0.00
52	132.95	132.77	-0.14	0.01
53	3.05	3.05	-0.03	0.00
54	113.78	113.70	-0.07	0.01
55	77.22	77.21	-0.02	0.00
56	14.92	14.86	-0.45	0.00
57	35.52	35.52	0.00	0.00
58	30.67	30.61	-0.19	0.01
59	24.04	24.04	0.00	0.00
60	89.98	89.94	-0.05	0.01
61	3 571.69	3 318.43	-7.09	136.91
62	2 930.50	2 833.92	-3.30	36.16
63	451.83	450.04	-0.40	0.21

Source: WITS/SMART, WITS, under all pre-established assumptions and with a tariff reduction.

TABLE 6

**United States: simulation of trade creation and diversion effects under a partial (50%) liberalization scenario (base year 2004)**  
(Millions of dollars)

Country/region	1. Total variation (2+3)	2. Trade diversion	3. Trade creation
<i>Total</i>	1 689.25	0.00	1 689.25
Costa Rica	112.62	26.55	86.07
El Salvador	453.76	103.12	350.64
Guatemala	454.25	111.66	342.58
Honduras	619.00	140.02	478.98
Nicaragua	97.66	23.58	74.09
Dominican Republic	463.15	106.26	356.89
DR-CAFTA countries <sup>a</sup>	2 200.44	511.19	1 689.25
Main countries affected	0.00	0.00	0.00
Mexico	-96.78	-96.78	0.00
China	-32.66	-32.66	0.00
Vietnam	-27.63	-27.63	0.00
Hong Kong <sup>b</sup>	-25.30	-25.30	0.00
Canadá	-20.04	-20.04	0.00
Countries most affected	-202.41	-202.41	0.00

Source: WITS/SMART, WITS, under all pre-established assumptions and with a tariff reduction.

<sup>a</sup> Free Trade Agreement between the Dominican Republic, Central America and the United States.

<sup>b</sup> Special Administrative Region.

TABLE 7

**United States: Simulation of variations in the trade balance with Agreement signatory countries<sup>a</sup> (base year 2004)**  
(Millions of US dollars)

Country	<i>Ex-ante</i> United States trade balance	<i>Ex-post</i> United States trade balance	Variation in the United States trade balance	Variation in the United States trade balance (%)
Costa Rica	-407.51	-578.96	-171.45	42.07
El Salvador	-1 699.22	-2 619.88	-920.66	54.18
Guatemala	-1 596.08	-2 514.42	-918.34	57.54
Honduras	-1 109.43	-1 821.67	-712.23	64.20
Nicaragua	-485.81	-693.39	-207.58	42.73
Dominican Republic	-898.70	-1 433.23	-535.53	59.48
Agreement countries <sup>a</sup>	-6 196.75	-9 661.55	-3 464.80	55.91

Source: WITS/SMART, WITS, under all pre-established assumptions and with full tariff reduction.

<sup>a</sup> Free Trade Agreement between the Dominican Republic, Central America and the United

creation and diversion, in all cases the reduction is greater than what would be experienced by the United States even under full liberalization. This shows the extent to which protection has been dismantled in Central America and the Dominican Republic in the textile sector. For Costa Rica, the tariff reduction would mean foregoing 57.6% of the revenue obtained in this category in 2004;

for El Salvador, the reduction would be 34.9%, for Guatemala 55.5%, for Honduras 80%, for Nicaragua 34% and for the Dominican Republic 88%. This shows that in the textile sector, Agreement countries will have to cope not only with larger Chinese exports, but also a restructuring of their own textile and clothing sector as a result of more liberalized trade.

## IV Conclusions

Given the expected loss of competitiveness among DR-CAFTA countries in the United States garment market arising from the ending of import quotas on 1 January 2005, one of this paper's main empirical contributions is to uphold the results obtained in earlier studies on the possible effects of the ending of ATC. Other things equal, the share of Central American countries in United States market would be reduced as a result of greater competition from Asian countries, generally, and from China and India in particular. In the United States, a significant impact is expected, albeit not immediately, in the shared production modality in the garment sector. Nonetheless, the garment industry only expects a large change in the "supply matrix" if the absence of quotas leads to lower production costs.

Moreover, the benefits arising from the Agreement's entry into force are unlikely to be sufficient or to occur

in time to compensate for the effects of the ending of the quota system. This is mainly because the protection provided by CBTPA did not encourage vertical integration in the yarn-textile-garment chain. Thus far the Central American countries do not seem to have undertaken any productive restructuring in this chain with a view to making their processes more flexible and speeding up restocking and response to changes in fashion—necessary measures for competing advantageously in the international market.

The basic predictions of studies analysing the effects of the ending of ATC show that textile and clothing exports from United States and European Union producers will decrease; exports from the bloc of 12 Asian countries will increase sharply, particularly from China and India; and exports from Central America, the Caribbean and Africa will decline. This does not necessarily mean



that countries such as El Salvador, Honduras and the Dominican Republic, among others, will cease to be strong competitors in the garment sector. In fact, the forecasts contained in the studies do not fully agree over the magnitude of these effects, but they do share a general view of the direction and sign of the trends, at least at the regional level.

In estimations made for the 1996-2004 period, it was found that El Salvador and Honduras captured around 40% and 80% of their preference margin, respectively. With these estimations, progress has been made in applying the methodology, because an approximation has also been obtained for the expected effect of the ending of ATC on relative export prices (Honduras and El Salvador with respect to the rest of the world).

The results obtained suggest that the ending of ATC will cause a fall in the relative prices of export garments of around 20% for El Salvador and Honduras. Accordingly, if these nations do not adjust their prices to the international price (or cannot do so because their costs are uncompetitive), with the ending of ATC, other things equal, they will gradually lose market share, unless they seek to compete through different channels, such as the “full package” system or other forms of innovation in production processes.

The findings of this research are theoretically and empirically consistent with the results of previous studies and the direction of the trends identified in them. This article aims to move forward on key modalities, such as the “full package”, especially in chapter 61 of the Harmonized Tariff System; strengthen national strategies to attract investments into the textile sector,

especially for the manufacture of technical textiles; and improve links in the productive chain where value can be added, such as design, quality control, logistics, and retail distribution. This in turn requires appropriate education, qualification and training of human capital, together with good transport and telecommunications infrastructure.

The ending of ATC is also expected to reduce interest in shared production programmes (i.e. processing abroad under the various maquila modalities). In current circumstances, distance, location economies and “just-in-time” systems are decisive for defining the competitive advantage of the textile and clothing sector.

Before ATC expired on 1 January 2005, developing countries such as the Dominican Republic, El Salvador and Honduras had a clear advantage in the assembly and sewing of cloth pieces based on low wages. Nonetheless, with the ending of ATC and consequent reorganization of the market, along with the rise of the “full package system”, the competitive advantage obtained from low wages seems to represent only a small fraction of the value chain of the textile and clothing sectors. With the appearance of new forms of production and less accentuated diversification of the productive processes involved in garment manufacture, other factors, such as time, become more important for competing advantageously on the international market. Given the trend towards integration of the links of the productive chain, time intervals between one process and the next need to be minimized to respond effectively and rapidly to the demands of fashion.

## Summary of the methodologies used and key results of selected studies

APÉNDICE

Authors	Countries	Period and variables	Sector	Equation	Methodology	Key results
Özden and Sharma (2004)	Costa Rica, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua	1989-2002 and also 1998-2002. Relative prices received by exporters; Margin of preference, total export volume, total United States imports, Dummy variable of fixed effects for products and years. In addition, a second stage of the estimation included a dummy integration variable to calculate the effect of eliminating quotas in stages 1 or 2.	Garment	$\ln\left(\frac{P_{it}^{RD}}{P_{it}^{ROW}}\right) = \beta_0 + \beta_1(t_{it}^{ROW} - t_{it}^{RD}) + \beta_2 X_{it}^1 + \beta_3 M_{it}^{ROW} + \sum_k \lambda_k \Omega_k^1 + \sum_k \delta_k \Phi_k + \sum_t \theta_t \Psi_t + \epsilon_{it}^1$	Feasible two-stage generalized least squares, fixed effects	In competitive markets, exporters should capture the entire tariff revenue that previously (before the preferential agreement) went to the United States Treasury, through the higher prices received for their product. This is known as the tariff rent. The results show that garment exporters capture only about one third of this potential benefit. Inclusion of a concentration index shows that the smaller exporting countries and those with exports highly concentrated in the United States market capture less of the tariff rent.
Olarreaga and Özden (2004)	Kenya, Lesotho, Madagascar, Malawi, Mauritius, South Africa, Swaziland (beneficiary countries of the Africa Growth and Opportunity Act (AGOA))	2001-2002, quarterly. Tariff rent that exporters receive, defined as the increase in the price arising from AGOA, divided by the percentage MFN tariff rate. Tariff is the percentage MFN tariff rate. Ln Value is the natural logarithm of the value of exports; the concentration index is constructed in a similar way to the Herfindahl index, using data on exports passing through the various ports of the United States.	Garment	$\text{Rent}_{ijt} = a + \beta_1 \text{Concentration}_{ijt} + \beta_2 \text{Tariff}_{ijt} + \beta_3 \text{Ln\_Value}_{ijt} + \epsilon_{ijt}$	Weighted least squares with fixed effects by country, standard errors robust.	In competitive markets, exporters should capture the entire tariff revenue that previously (before the preferential agreement) went to the United States Treasury, through the higher prices received for their product. This is known as the tariff rent. The results show that garment exporters capture only about one third of this potential benefit. Inclusion of a concentration index shows that the smaller exporting countries and those with exports highly concentrated in the United States market capture less of the tariff rent.
Bulmer and others (2005)	Dominican Republic	1996-2003 Logarithm of relative prices in the Dominican Republic. Margin of preference; Logarithm of the value of exports; Logarithm of total United States imports; Dummy variable $d\_quota$	Garment	$\ln\left(\frac{P_{it}^{RD}}{P_{it}^{ROW}}\right) = \beta_0 + \beta_1(t_{it}^{ROW} - t_{it}^{RD}) + \beta_2 X_{it}^{RD} + \beta_3 M_{it}^{ROW} + \sum_t \lambda_t \Omega_t + \sum_k \delta_k \Phi_k + \sum_t \theta_t \Psi_t + \beta_4 \text{dummy\_quota} + \epsilon_{it}^1$	Feasible generalized least squares with fixed effects, by product group and by years	Between 1996 and 2003, Dominican Republic exporters captured two thirds of the margin of preference, measured as the difference between MFN tariffs and preferential access tariffs under CBI. The prices received by Dominican Republic exporters are 15% higher in the garment product categories in which quotas have not been eliminated.

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