



**FORECASTING THE FISCAL IMPACT OF A POTENTIAL  
FREE TRADE AGREEMENT BETWEEN  
THE EUROPEAN UNION AND THE SMALL  
ECONOMIES OF CARICOM**

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**Forecasting the Fiscal Impact of a Potential Free Trade Agreement  
between the European Union and the Small Island Economies of  
CARICOM\***

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**Abstract**

The small island economies of the Caribbean Basin are presently engaged in negotiations with the European Union over the successor agreement to the Lomé IV Convention which grants non-reciprocal preferential access to the European market for exports of African, Caribbean and Pacific countries. Preliminary discussions have suggested the establishment of a Free Trade Area (FTA) between CARIFORUM group of countries and the European Union, eliminating tariff and non-tariff barriers. This paper utilizes the Almost Ideal Demand System (AIDS) to compute import elasticities for SITC product groups in selected Caribbean economies. These elasticities along with proposed average tariff reductions are utilized to forecast the potential revenue gain or loss resulting from the establishment of a FTA. The preliminary results indicate that the smaller economies of the Caribbean Basin would suffer greater fiscal revenue loss from the establishment of a FTA.

**Key words:** Free Trade Area, Almost Ideal Demand System (AIDS), CARICOM, ACP

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*For discussion purposes only. Comments and criticisms are welcome.*

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## INTRODUCTION

In November 1996, the European Union circulated its “Green Paper” (see European Commission 1996) which recommended a major alteration in its approach to cooperation with the African, Caribbean and Pacific (ACP) countries under the existing Lomé IV Convention. This convention was signed on December 15<sup>th</sup> 1989 with a view to extending co-operation between the European Union (EU) and the ACP states in a number of areas including human rights, aid, industrial development and *trade*.

Since the Lomé convention was signed in 1989, the global economy has undergone profound change. The conclusion of the Uruguay Round at Marrakesh, Morocco on April 15, 1994 has ushered in a process of full scale liberalisation of trade in both goods and services. Moreover, the provisions of the present Lomé convention which apply for a ten year period will expire on February 29, 2000. As a result, a successor agreement to the current Lomé arrangement is being actively discussed between the European Union and members of the ACP group (including CARICOM<sup>1</sup>).

One of the major policy issues which has surfaced in the discussions on a successor agreement to the present convention is the *notion of reciprocity* and its implications for the establishment of a Free Trade Agreement<sup>2</sup> between the countries of the CARICOM basin and the European Union. Of concern to some CARICOM governments is the potential loss of tariff revenues which may result from the establishment of a two-way preferential agreement between Europe and CARICOM.

This paper seeks specifically to analyse the potential impact of a reduction in import taxes from the formation of an FTA between the EU and CARICOM on the revenues of selected member countries of CARICOM. Section 1 discusses the concept of a Free

<sup>1</sup> This refers to the Caribbean community which consist of Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago and Suriname.

<sup>2</sup> The European Commission’s proposal for a Regional Partnership Agreement is essentially a proposal for a Free Trade Area.

Trade Area (FTA) and explores the link between tariff liberalisation and the fiscal impact of trade taxes drawing from the contributions of Bhagwati and Panagariya (1996) and Greenaway and Milner (1991, 1993a, 1993b). Section 2 of the study presents empirical facts on the degree of dependence of the various member states of CARICOM on revenues from trade taxes. In Section 3, the Almost ideal demand system of Deaton and Muellbauer (1980) is utilised to estimate import share equations (inclusive and exclusive of tariffs) for trade with Europe and NAFTA. These import shares provide base estimates for the computation of import expenditures as well as trade taxes under two regimes, namely a Pre-FTA regime and a Post-FTA regime (Section 4). In the final section of the paper, some tentative conclusions are drawn about the fiscal implications of trade taxes. This section also provides a glimpse of some of our ambitions for the extension of this study.

## SECTION 1: Free Trade Area between Europe and CARICOM

The notion of reciprocity which has been introduced into the current negotiations between the European Union and the ACP countries represents a *de facto* attempt at establishing a *two-way preferential trading arrangement* between Europe and members of the ACP group (including CARICOM). Indeed, proposals have also surfaced for a series of FTAs between the European Union and various constituent elements of the ACP group. The proposed FTA between CARICOM and the European Union is one of these proposals.

Indeed, the proposed FTA between CARICOM and the European Union is seen in many quarters as a viable means around the one way preferences which were established by the various Lomé accords and which are now in violation of several of the core principles enshrined in the Marrakesh Agreement. This preferential agreement (FTA) requires the elimination of trade barriers between the CARICOM region and the European Union with each partner maintaining separate trade barriers against the rest of the world. Orthodox vinerian integration analysis (See Viner (1950)) requires a comparison of the trade

creating gains with the magnitude of the trade creating losses before the overall net impact on a country's welfare could be determined.

The traditional vinerian apparatus assumes that the FTA will be beneficial if imports from the European Union displace higher-cost local production in the CARICOM region and lead, in the final analysis, to a reduction in domestic prices. This will provide consumers in CARICOM with the advantage of being able to consume more commodities at a cheaper price. Alternatively, if the FTA allows the supplies from Europe to displace cheaper imports from the rest of the world and, in particular, from the United States of America, then trade diversion will result since the CARIFORUM region will have to expend more of its resources on expensive imports from the partner country (European Union).

A proper demonstration of the vinerian concepts of trade creation requires a comparison of the production cost in each member country of the CARIFORUM region with the export price for the commodity charged by the European Union. If the price in the European Union is lower than that in the CARIFORUM region then there is considerable scope for trade creation provided that the demand for imports from the European Union remains relatively inelastic. Obviously, the magnitude of the trade creation effects will depend on the extent to which imports from Europe are close or perfect substitutes for domestic production in the CARIFORUM region. In the case of trade diversion, one really needs to be able to verify that the cost of producing the commodity in Europe is likely to exceed the cost of producing the commodity in the rest of the world, i.e. the United States of America. Even if the cost of producing the commodities were the same in both Europe and the United States of America, it is likely that the inclusion of transportation costs would most certainly make the goods emanating from the United States of America cheaper than those emanating from the European Union.

Several weaknesses have surfaced in the vinerian theoretical apparatus. One of the more important ones concerns the assessment of the distributional considerations which arise from preferential integration schemes. In the context of CARICOM, the issue of the

likely distribution of gains between the European Union and the member states of CARICOM is of some significance. In criticising the first wave of theorising on economic integration, Bhagwati and Panagariya (1996, 1998) have argued that if the effect on a member country's welfare is to be properly analysed then some attention ought to be devoted to examining the the question of *the transfer of revenues between members of an FTA following the abolition of tariffs*. These authors have opined that the loss of tariff revenues on inter-member trade can outweigh the net gains that are usually identified in the Harberger-Johnson triangles<sup>3</sup> and thus result in an overall welfare loss. In short, the distributional considerations involved in a preferential trading arrangement can erase much of the static welfare gains that are identified using the vinerian apparatus. Thus unless issues relating to distribution of the gains under a Free Trade Agreement are carefully understood and considered then the existing orthodoxy for evaluating the effects of integration may offer no useful conclusions for FTAs which involve the small island territories of the Caribbean region.

One critical distributional issue which arises in any FTA concerns the fiscal impact of tariff liberalisation. In the context of this study, the relevant question that arises is the following: *What is the likely impact of a reduction in tariffs on the fiscal revenues of the small island economies of the CARICOM region following the establishment of an FTA between the European Union and CARICOM?*

Yagci *et al* (1985) have noted that a reduction in tariffs tends, *ceteris paribus*, to reduce government revenues and to increase the quantum of imports. This situation eventually worsens the budgetary position as well as the balance of payments of the respective member states. Greenaway and Milner (1991, 1993) have argued that that a reduction in the average tariff rate need not lead automatically to a loss in tariff revenues. The precise impact on the revenues of the member state will depend on (a) *the number of tariff line items that are above and below the maximum revenue tariff*, (b) *the level of the initial tariffs*, (c) *the nature of the tariff rate changes*, (d) *the share of those imports subject to*

<sup>3</sup> These triangles are the building blocks for the estimation of vinerian trade creation gains [See Nicholls (1998) for a detailed discussion].

*high tariffs in total imports and (e) the own and cross price elasticities of import demand.*

Moreover, countries that are highly dependent on trade taxes as a source of revenue are likely to be more affected by the reduction in tariffs than countries that are not so dependent. On this latter score of dependence, at least two studies in the Caribbean region have cautioned about the likely impact of tariff reduction on the fiscal revenues of the smaller territories of the Eastern Caribbean region.<sup>4</sup>

## SECTION 2: Stylised Facts about the Relationship between Trade Taxes and Government Revenue

### *Fiscal Dependence of CARICOM on Trade Taxes*

The extent to which the FTA will impact on the revenues of any of the member states of CARICOM depends partly on the level of dependence of the given member country on trade taxes. Greenaway and Milner (1991, 1993) suggest that the level of dependence on trade taxes can be measured by *the ratio of revenues collected from international trade to total current tax revenue*. In addition, the level of dependence can also be gauged from two additional ratios, namely, (i) the ratio of import taxes to total current revenue and (ii) the ratio of import taxes to Gross Domestic Product.

Table A1 presents computations of these ratios for the most recent year (1997) as well as an average for the period 1997-1997. To permit more effective comparisons, an attempt was also made to classify each CARICOM member state by the degree of its dependence (DDT) on taxes as a source of government revenue. For the purpose of this study, the following three categories of dependence were utilized: low dependence ( $0 < \text{DDT} < 0.15$ ), moderate dependence ( $0.15 < \text{DDT} < 0.3$ ) and high dependence ( $0.3 < \text{DDT} < 1$ ).

<sup>4</sup> See Bourne, Nicholls and Ferguson (1999) and Stevens (1998).

An analysis of the data in Appendix Table ?? indicates that among the CARICOM countries, revenue from taxes on imports ranged between 7.3 and 66.6 per cent of total tax revenue in 1997 and between 6.2 and 57.2 per cent of total current revenue. On average, the CARICOM region was moderately dependent on import tax revenues as a source of total tax revenue (26.9 per cent) and of current revenue (23.8 per cent). A closer examination of the data however indicates that eight of the twelve CARICOM countries under study, primarily those belonging to the OECS group, were highly dependent on revenue from taxes on imports as a source of total tax revenue in 1997.

Specifically, Antigua and Barbuda, The Bahamas, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines derived 57.2 per cent, 45.5 per cent, 46 per cent, 58.3 per cent, 42.5 per cent, 39.3 per cent, 51.6 per cent and 42.2 per cent of current revenue, respectively from taxes on imports. In contrast, the table illustrates that the more developed countries of CARICOM were least dependent on taxes from imports. In 1997, the degree of dependence of Barbados, Guyana and Trinidad and Tobago measured 9 per cent, 11.7 per cent and 7.5 per cent, respectively of total tax revenue and 8.8 per cent, 10.9 per cent and 6.2 per cent of current revenue, respectively. Among the MDCs, Jamaica was the most dependent on taxes from imports, with import duties accounting for 27 per cent and 24 per cent, respectively of government tax revenue and current revenue.

Although the evolution of revenue from taxes on international trade varied significantly from individual country to country, the contribution of import taxes to government revenue for the CARICOM region as a whole, has increased steadily over the period under study. Appendix Table A1 and the accompanying graphs in Figure 1 illustrate in detail the evolution of revenue from taxes on imports in the CARICOM region. The table indicates that the value of tax revenue from imports for the entire CARICOM region amounted to US\$495 million in 1980. The value of import duties increased steadily to US\$718 million by 1987 and subsequently rose to US\$1,392 million by 1997. Over the period 1980 to 1997, import duties averaged US\$863 million. The contribution to total tax revenue and current revenue of these import duties increased from 14 per cent and

12.3 per cent in 1980 to 26.9 per cent and 23.8 per cent in 1997, respectively. The proportion of import duties to total tax revenue and current revenue averaged 22 per cent and 19.2 per cent, respectively.

As regards the individual member countries of CARICOM, the evolution of the contribution of import tax revenue to government fiscal revenue did not follow the same pattern in many cases. Of the four MDCs under study, only the data for Jamaica closely mirror the evolution of import duties portrayed for the entire CARICOM region. Import duties in Jamaica increased steadily from US\$43 million in 1976 to US\$447 million by 1997. The contribution of these revenues to government current revenue also increased over from 5.6 per cent in 1976 to 24.3 per cent in 1997, averaging 12 per cent over the period. This pattern was reversed in the case of Barbados for which the contribution of import duties to current revenue declined progressively between 1976 (20.2 per cent) and 1997 (8.8 per cent). Over the period, import duties averaged 14 per cent of total current revenue. Meanwhile with respect to Guyana and Trinidad and Tobago, the contribution of import duties to current revenue fluctuated between 4 per cent and 13 per cent over the period. On average, these countries were dependent on revenue from import taxes to provide 8.2 and 7.6 per cent of current revenue, respectively.

Among the OECS countries and The Bahamas, the evolution of import taxes was characterized by considerably high ratios of dependency with relatively low coefficients of variation. Revenue from import duties grew steadily in The Bahamas between 1976 and 1997 from US\$64 million to US\$353 million. These revenues represented 58.8 per cent of current revenue in 1976, increasing to a high of 63.2 per cent in 1989 and declining subsequently to 45.5 per cent in 1997. Over the period, the ratio of import revenue to current revenue averaged 53 per cent. For the OECS group as a whole, taxes from imports amounted to US\$88 million in 1980 and increased progressively to US\$141 million in 1997. On average, the OECS countries derived 60 per cent of their total tax revenues and 5 per cent of their current revenues from import taxes. These ratios exhibited little variation over the 18-year period, fluctuating by just 4.4 per cent and 5.6 per cent, respectively.

A further indicator of the degree of dependency of CARICOM countries on tax revenue from international trade can be derived from examining the proportion of import duties to Gross Domestic Product. Table ?? indicates that in general all CARICOM countries had relatively high ratios of import duties to GDP in 1997 when compared to the United States and the United Kingdom. These latter countries registered ratios of 0.3 per cent and 0.03 per cent, respectively, compared to 10.5 per cent for the CARICOM region.

For the entire period 1980 to 1997, the ratio of taxes from imports to GDP averaged 5.5 per cent for CARICOM. With respect to the OECS group, an average ratio of 17.1 per cent was recorded for the period 1980-1997, with the highest ratio being registered by Antigua and Barbuda (32.1 per cent). Lower ratios were recorded for Dominica (15.2 per cent), Grenada (12.5 per cent), Montserrat (9 per cent), St. Kitts (12.1 per cent), St. Lucia (12.6 per cent) and St. Vincent and the Grenadines (13.3 per cent). Among the MDCs, the ratio of import tax revenue to GDP was relatively low in Barbados (3.8 per cent), Guyana (2.9 per cent), Jamaica (3.5 per cent) and Trinidad and Tobago (2.4 per cent).

The empirical analysis of the fiscal dependence of CARICOM countries on revenues from trade taxes has revealed three important findings. First, the smaller countries of the OECS region are highly dependent on trade taxes as a source of government current tax revenues. Second, the more developed countries of the CARICOM region are not very dependent on trade taxes as a source of current tax revenues. Third, the CARICOM region as a whole is moderately dependent on taxes on imports as a source of government current tax revenues.

### SECTION 3: ALMOST IDEAL DEMAND MODEL (AIDS) FOR IMPORT SHARES

In this section, an attempt is made to examine the demand for imports of selected CARICOM countries from the two dominant global trading blocks<sup>5</sup>, namely the

<sup>5</sup> Import demand in the CARICOM area is generally satisfied from either one of two trade blocks. Both the United States and Canada are important trade markets while the other important trading partner is Europe.

European Union and NAFTA. The paper estimates import shares from these blocks using the Almost Ideal Demand System (AIDS) developed by Deaton and Muellbauer (1980, 1988). Consider therefore the following expenditure function<sup>6</sup> for imports for each individual country of the CARICOM region.

$$\text{Log } e(u, \bar{p}) = \alpha_0 + \sum_{k=1}^n \alpha_k \log P_m + \frac{1}{2} \sum_k \sum_j \gamma_{kj} \log P_k \log P_j + u \beta_0 \prod_{k=1}^k P_k^{\beta_k} \quad (1)$$

This function defines the minimum expenditure on imports that is needed to obtain a specific utility level at given prices (see Parikh (1986, 1988)). In the context of the CARICOM, it is assumed that most of the small island economies which make up the group are quite open and heavily dependent on imports for both intermediate and final consumption. Indeed, the utility of consumers in such economies tends to be dependent on the consumption of imports. In this function,  $p$ , is the vector of prices of the blocks that supply the imports to each of the respective CARICOM countries. The parameters of this function are assumed to satisfy the following restrictions:

(a) *Adding up Restrictions*

$$\sum_{k=1}^n \alpha_k = 1; \quad \sum_{k=1}^n \gamma_{kj} = 0; \quad \sum_{k=1}^n \beta_k = 0;$$

(b) *Homogeneity constraint:*

$$\sum_{j=1}^n \gamma_{kj} = 0;$$

(c) *Symmetry Constraint*

$$\gamma_{kj} = \gamma_{jk}$$

<sup>6</sup> This expenditure function is assumed to be non-decreasing in prices, homogenous of degree one in  $p$  and continuous in  $p$  for all strictly positive price vectors.

The Almost Ideal Demand Systems for each member country of CARICOM is derived from the expenditure function by differentiating the import expenditure function w.r.t. prices (Sheppard's Lemma).

$$\frac{\partial \log e(u, \bar{p})}{\partial \log P_i} = \frac{P_i q_i}{e(u, \bar{p})} = w_i \quad (3)$$

This logarithmic differentiation yields an equation for import shares as a function of import prices (export prices of each block) and utility

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log P_j + \beta_i u \beta_0 \prod_k P_k^{\beta_k} \quad (4)$$

$$\text{where } \gamma_{ij} = \frac{1}{2} (\gamma_{ij} + \gamma_{ji})$$

If each of the member countries of CARICOM is assumed to be a utility-maximizer, then total import expenditure  $y$  (which equals  $e(u, \bar{p})$ ) can be inverted to yield utility ( $u$ ) as a function of prices and  $y$ . Substitution of this expression into the equation for the budget shares yields the following Almost Ideal Demand function in budget share form (equation 5):

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log P_j + \beta_i \log \left( \frac{y_i}{P_i} \right) \quad (5)$$

$$\text{where } \log P_i = \sum_k w_k \log P_k$$

In this particular specification,  $y_i$  represents the total amount that has been expended on imports while  $w_i$  represents the import share of the individual CARICOM member state with each of the global blocks,  $i$ .

The aggregate price index adopted in the study (i.e. the Stone Index) follows the recommendations of Deaton and Muellbauer (1980). If concavity is to be assured for this import expenditure demand function of the AIDS variety, then the matrix of second-order partial derivatives w.r.t. prices should be negative semi-definite. Shiells, Roland-Holst and Reinert (1993) argue that this property requires computation of the properties of the following matrix  $K$

$$K = \{\tilde{K}_{ij}\}$$

where

$$= \gamma_{ij} + \beta_i \beta_j \log\left(\frac{y_j}{p}\right) - w_i \delta_{ij} + w_i w_j$$

where  $\delta$  is the Kronecker delta. Negativity can be checked by establishing that each of the computed eigen-values,  $\lambda_i$ , of the K matrix are non-positive.

Since the purpose of our investigation is to determine the likely fiscal impact of a Free Trade Agreement between Europe and the member countries of CARICOM, the various AIDS models were estimated in two related stages.

In the first stage, the AIDS model, (with tariff-inclusive<sup>7</sup> prices for each member country's trade with the European Union) was utilized to compute import shares for each of the member countries of the CARICOM region. These import shares were utilized to derive import expenditure figures for each member's trade with the European Union. The estimated import expenditures were employed in the following regression equation to derive estimates for trade taxes. That is,

$$M_j^{\text{Tax}} = f(y_i) \text{ where } y_i = \sum_{i=1}^k M_i; M^{\text{Tax}} \equiv \text{revenues from trade taxes in country } j \text{ and } M \text{ represents import expenditures with each of the } i^{\text{th}} \text{ blocks (European Union and NAFTA)}$$

In the second stage, it is assumed that a Free Trade Area is formed between the European Union and CARICOM so that import tariffs on goods emanating from Europe are eliminated i.e. ( $t_k = 0$ ). Import shares using the AIDS model (with tariff-exclusive prices for each member country's trade with the European Union) are then computed. These import shares are transformed into import expenditure figures for each CARICOM member's trade with the EU and utilized to re-compute trade taxes in the Trade Tax Equation. Finally, the impact on fiscal revenues is ascertained as follows:

$$DM^{\text{Tax}} = M^{\text{Tax}(t_i=0)} - M^{\text{Tax}(t_i=1)}$$

where DM – Change in revenues from trade taxes

where  $M^{\text{Tax}(t_i=0)}$  ~ Trade taxes in an FTA

$M^{\text{Tax}(t_i=1)}$  ~ Trade taxes without an FTA

The computed values for  $DM^{\text{Tax}}$  indicate whether the proposed FTA between Europe and CARICOM results in a loss (-) or gain (+) in revenues from import taxes.

## SECTION 4: PRELIMINARY RESULTS

### TENTATIVE ESTIMATION RESULTS OF THE AIDS SHARE EQUATIONS

The import share equations for the ALMOST IDEAL DEMAND SYSTEM (EQUATION 5) were estimated by Full Information maximum likelihood following the work of Ray and Chatterjee (1993). The estimation results in this paper are limited to three CARICOM territories, namely Trinidad and Tobago, Jamaica, and the OECS group. The first of these countries is characterized by relatively low dependence on trade taxes as a source of government revenue while the remaining countries are characterized by moderate and high dependence on trade taxes, respectively.

For each of these countries, import prices from the European Union and NAFTA along with the real value of expenditures on all imports from the two blocks, NAFTA and the EU, were utilized to explain import shares of selected SITC product groups. In the model therefore, declines in export prices for the respective SITC trade groups in the EU will be accompanied by increases in the exports of the EU to the CARICOM member states relative to the exports from the NAFTA block. Estimation results using the unrestricted AIDS specification for Trinidad and Tobago, Jamaica and the OECS group are reported in Tables 1, 2 and 3, respectively.

<sup>7</sup> By tariff inclusive price we are referring to the ad-valorem tariffs,  $P_k = P_k + t_k P_k$  where  $t_k$  is the tariff charged by a member country of CARICOM on imports from the European Union.

In the context of the model for Jamaica, the coefficients on prices and import expenditures for SITC categories 0, 5 and 6 generally carried the correct signs and were statistically significant at the 10% level. However, the coefficients of determination for these equations were relatively low. Similar results were also obtained for Trinidad and Tobago and for the OECS group. With respect to the importation of machinery and transport equipment, the coefficients on import expenditures were insignificant in three countries and carried the wrong signs.

*Table 1*  
**FULL INFORMATION MAXIMUM LIKELIHOOD (FIML) ESTIMATION FOR UNCONSTRAINED IMPORT SHARE MODEL (IMPORTING COUNTRY: JAMAICA) (Before FTA)**

<b>SITC 0: Food and Live Animals</b>				
<i>Region</i>	<i>a</i>	<i>β</i>	<i>γ<sub>1</sub></i>	<i>γ<sub>2</sub></i>
EU	0.508 (0.039)	0.068 (0.0074)	-0.0007 (0.0001)	0.0006 (0.0001)
NAFTA	0.492	-0.068	0.0007	-0.0006
<b>SITC 5: Chemicals</b>				
<i>Region</i>	<i>a</i>	<i>β</i>	<i>γ<sub>1</sub></i>	<i>γ<sub>2</sub></i>
EU	0.627 (0.08)	0.049 (0.017)	-0.0003 (0.00019)	0.0008 (0.0002)
NAFTA	0.373	-0.049	0.0003	-0.0008
<b>SITC 6: Manufactured Goods</b>				
<i>Region</i>	<i>a</i>	<i>β</i>	<i>γ<sub>1</sub></i>	<i>γ<sub>2</sub></i>
EU	0.418 (0.021)	0.082 (0.013)	-0.00055 (0.0001)	0.00071 (0.0002)
NAFTA	0.582	-0.082	0.00055	-0.00071
<b>SITC 7: Machinery and Transport Equipment</b>				
<i>Region</i>	<i>a</i>	<i>β</i>	<i>γ<sub>1</sub></i>	<i>γ<sub>2</sub></i>
EU	0.833 (0.069)	-0.011 (0.015)	-0.027 (0.0006)	0.0004 (0.240)
NAFTA	0.167	0.011	0.027	-0.0004

*Note: No standard errors are reported for the cases in which the parameter values are calculated using the adding-up condition.*

Table 2

FULL INFORMATION MAXIMUM LIKELIHOOD (FIML) ESTIMATION FOR  
UNCONSTRAINED IMPORT SHARE MODEL  
(IMPORTING COUNTRY: TRINIDAD AND TOBAGO) (Before FTA)

SITC 0: Food and Live Animals				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.644 (0.066)	0.047 (0.014)	-0.0007 (0.0003)	-0.0005 (0.0004)
NAFTA	0.356	-0.047	0.0007	0.0005
SITC 5: Chemicals				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.679 (0.046)	0.046 (0.010)	-0.0006 (0.0001)	-0.0004 (0.0003)
NAFTA	0.321	-0.046	0.0006	0.0004
SITC 6: Manufactured Goods				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.681 (0.063)	0.032 (0.014)	-0.0011 (0.0003)	-0.0006 (0.0002)
NAFTA	0.319	-0.032	0.0011	0.0006
SITC 7: Machinery and Transport Equipment				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.912 (0.266)	-0.071 (0.061)	-0.00043 (0.0014)	-0.0025 (0.240)
NAFTA	0.088	0.071	0.00043	0.0025

Note: No standard errors are reported for the cases in which the parameter values are calculated using the adding-up condition.

Table 3

FULL INFORMATION MAXIMUM LIKELIHOOD (FIML) ESTIMATION FOR  
UNCONSTRAINED IMPORT SHARE MODEL (IMPORTING COUNTRY:  
OECS GROUP)

SITC 0: Food and Live Animals				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.462 (0.0363)	0.082 (0.0808)	-0.0067 (0.0003)	0.0004 (0.0009)
NAFTA	0.538	-0.082	0.0067	-0.004
SITC 5: Chemicals				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.912 (0.018)	0.043 (0.039)	-0.0018 (0.0012)	-0.00026 (0.00037)
NAFTA	0.088	-0.043	0.0018	0.00026
SITC 6: Manufactured Goods				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.712 (0.032)	0.028 (0.008)	-0.074 (0.0019)	-0.0058 (0.0041)
NAFTA	0.287	-0.028	0.0074	0.0058
SITC 7: Machinery and Transport Equipment				
Region	$\alpha$	$\beta$	$\gamma_1$	$\gamma_2$
EU	0.836 (0.068)	-0.024 (0.019)	-0.00098 (0.00041)	-0.00067 (0.00032)
NAFTA	0.164	0.024	0.00098	-0.00067

The estimates of the coefficients from the AIDS model in the Pre-FTA regime were utilised to compute import shares for each of the member territories of CARICOM. These import shares were then utilised to compute data on import expenditures for each CARICOM member country's trade with the European Union. Furthermore, taxes on imports were regressed against these import expenditures and the resulting fitted values from the tax regression models were utilised as estimates of trade taxes. These models were utilised to derive projected tax revenues for the years 1999 and 2000.

In the post-FTA regime, the various AIDS models were re-estimated under the assumption of no import tariffs between trade with the given member of CARICOM and the European Union.<sup>8</sup> Estimates of trade taxes were then computed under this assumed FTA regime using the simple regression tax model. The post-FTA regression models were also utilised to derive projected tax revenues for the period 1999-2000 under the assumption that an FTA existed.

Table 4 contains results on the impact of tariff removal (under a presumed FTA) on the revenues from trade taxes. The results indicate that revenues from trade taxes fell in all the importing member countries of CARICOM following the formation of an FTA with the European Union. In Jamaica and Trinidad and Tobago, revenues from trade taxes fell by 3.4 and 2.36 per cent respectively, while in the OECS region, revenues declined by 8.4 per cent.

**TABLE 4**  
**IMPACT OF TARIFF REMOVAL BY IMPORTING COUNTRY ON REVENUES FROM TRADE TAXES**

Importing country	1998-2000 (Average % Change over Base Simulation)	IMPACT
OECS	-0.0843	Low
JAMAICA	-0.0341	Low
TRINIDAD & TOBAGO	-0.0236	Low

<sup>8</sup> This amounts to deducting  $t_k \cdot P_k$  from the existing import prices in the share equations (i.e.  $P_k - (t_k \cdot P_k)$ ).

## SECTION 5: CONCLUSION

This study has attempted to forecast the fiscal impact of a potential impact of a Free Trade Area between the European Union and CARICOM. The preliminary results from the investigation suggest a loss in fiscal revenues for the member countries of the CARICOM region over the period 1999-2000 if an FTA is formed with the European Union. The fiscal loss for the OECS group is projected to be much larger than for the other member territories of CARICOM. It should be noted however that although fiscal losses are projected for the each of the member states of CARICOM, these figures do not represent significant proportions of government current tax revenues for the various territories under consideration.

The analysis seems to suggest however that any FTA arrangement between the CARICOM and the European Union may have to consider some mechanism for distributing the gains in such a manner so that the negative impact of a fall in government revenues could be alleviated.

APPENDIX TABLE 1 (A1)  
THE FISCAL DEPENDENCE OF THE CARICOM REGION ON THE TRADE TAXES

Country	Ratio: Import Taxes to Tax Revenue			Ratio of Import Taxes to Current Revenue			Ratio: Import Taxes to Current GDP			Level of Dependence
	1997	Aver <sup>1</sup>	Coeff <sup>2</sup>	1997	Average <sup>1</sup>	Coeff <sup>2</sup>	1997	Average <sup>1</sup>	Coeff <sup>2</sup>	
Antigua and Barbuda	66.6	65.5	5.7	57.2	53.9	4.7	32.1	31.4	5.7	High
Bahamas	50.5	62.8	10.8	45.5	33.0	9.4	10.5	10.4	11.5	High
Barbados	9.3	15.5	35.9	8.8	14.0	35	2.9	3.8	29.3	Low
Dominica	54.2	58.3	5.7	46.0	51.3	6.8	14.4	15.2	10.9	High
Grenada	64.6	55.0	25.1	58.3	49.3	25.6	13.7	12.5	18.7	High
Guyana	11.7	9.1	33.5	10.9	8.2	34.2	3.5	2.9	28.6	Low
Jamaica	26.8	13.3	66.3	24.3	12.0	64.3	6.7	3.5	64.2	Moderate
Montserrat	47.2	40.7	28.2	42.5	36.0	28.9	10.8	9.0	31.9	High
St. Kitts and Nevis	53.3	63.6	15.4	39.3	45.2	15.3	12.0	12.1	37.4	High
St. Lucia	57.9	57.9	4.6	51.6	5.25	5.8	12.7	12.6	9.1	High
St. Vincent and the Grenadines	50.8	54.0	5.4	42.2	44.6	6.4	12.3	13.3	11.4	High
Trinidad and Tobago	7.5	9.0	16.9	6.2	7.6	16.6	1.6	2.4	22.4	Low
OECS	60.6	59.9	4.4	51.7	50.7	5.6	17.8	17.1	5.2	High
Caricom Region	26.9	20.4	28.6	23.8	17.8	28.9	6.7	5.1	24.6	Moderate

Sources: IMF Government Finance Statistics, various years.  
Statistical reports and Bulletins, Central Banks of the CARICOM Region

Notes: 1/ For MDCs and the Bahamas averages are computed for the period 1976 to 1997. However, for OECS territories, due to a lack of data, averages are computed for the period 1980 to 1997. Accordingly, Aggregate CARICOM data is also analyzed for the period 1980 to 1997.

2/ Coeff represents the Coefficient of Variation

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Year	Jamaica (US\$ '000s)			Trinidad and Tobago (US\$ '000s)			Import Duty as a % of:		
	Import Duty	Tax Revenue	GDP	Import Duty	Tax Revenue	GDP	Current Revenue	Tax Revenue	GDP
1976	43,344.3	729,262.9	780,968.1	2,972,497.2	5.9	1.5	5.6	7.1	2.5
1977	33,385.7	733,538.6	807,953.4	2,256,252.6	4.5	1.0	4.7	9.3	2.8
1978	35,385.7	755,838.6	799,716.9	2,653,220.1	4.7	1.3	5.6	9.2	3.0
1979	35,660.6	627,195.5	650,991.5	2,432,294.6	5.8	1.5	5.6	9.7	2.7
1980	24,143.7	745,087.0	775,968.6	2,679,955.1	3.2	0.9	3.1	8.6	2.8
1981	51,094.9	890,510.9	938,798.4	2,979,786.6	5.7	1.7	5.4	8.1	2.8
1982	52,543.4	915,756.3	965,412.7	3,294,216.7	5.7	1.6	5.4	9.3	2.9
1983	122,153.2	889,234.0	952,898.6	3,619,565.2	13.7	3.4	12.8	10.3	2.9
1984	42,860.8	686,239.4	727,319.8	2,373,319.8	6.2	1.8	5.9	8.3	2.5
1985	49,712.9	649,217.5	727,962.8	2,100,018.0	6.7	2.1	6.5	9.1	3.0
1986	52,698.8	806,090.0	822,611.0	2,537,057.3	6.5	2.1	6.4	11.9	2.8
1987	61,641.3	951,799.2	960,730.1	3,032,622.6	6.5	2.0	6.4	9.0	2.2
1988	131,162.9	898,742.9	1,010,530.2	3,544,908.0	14.6	3.7	17.0	8.6	1.9
1989	178,833.8	1,078,886.0	1,225,848.6	4,073,107.0	16.6	4.4	14.6	8.7	1.9
1990	149,540.6	1,078,549.6	1,242,845.2	4,245,684.9	13.9	3.5	12.0	9.8	2.1
1991	177,063.4	947,821.1	1,115,178.3	3,731,842.2	18.7	4.7	15.9	9.7	2.4
1992	181,541.8	829,716.9	953,305.7	3,353,615.0	21.9	5.4	19.0	10.9	2.5
1993	301,831.7	1,160,275.0	1,291,330.3	4,300,933.9	26.0	7.0	23.4	5.8	1.3
1994	274,097.8	1,150,683.1	1,280,786.4	4,313,667.4	23.8	6.4	21.4	9.4	2.0
1995	408,442.9	1,430,271.5	1,611,826.3	5,250,981.7	28.6	7.8	25.3	7.1	1.6
1996	391,619.1	1,486,834.6	1,651,382.0	5,928,717.7	26.3	6.6	23.7	6.2	1.5
1997	447,579.4	1,672,813.8	1,841,421.9	6,684,075.2	26.8	6.7	24.3	6.2	1.6
Mean	147,326.7	959,746.3	1,049,158.3	3,607,200.5	13.3	3.5	12.0	9.0	2.4
Stdev	134,859.7	279,622.3	328,105.5	1,168,736.1	8.8	2.3	7.7	1.5	0.5
CV	91.5	29.1	31.3	32.4	66.3	61.3	64.3	16.9	22.4
Max.	447,579.4	1,672,813.8	1,841,421.9	6,684,075.2	28.6	7.8	25.3	11.9	3.0

Year	Barbados (US\$ '000s)			Guyana (US\$ '000s)			Import Duty as a % of:		
	Import Duty	Tax Revenue	GDP	Import Duty	Tax Revenue	GDP	Current Revenue	Tax Revenue	GDP
1976	21,233.0	105,423.0	122,422.8	442,499.9	22.5	2.2	20.2	4.9	4.7
1977	22,899.5	108,866.4	108,866.4	442,499.9	22.0	1.9	19.5	5.4	3.5
1978	27,278.4	135,110.1	151,916.7	489,235.8	20.2	1.8	18.0	5.6	2.7
1979	36,792.1	158,296.3	176,121.3	670,213.3	23.4	2.1	21.8	5.5	2.7
1980	44,638.8	204,642.6	204,415.1	860,637.4	22.2	2.1	21.8	5.2	2.5
1981	44,523.3	206,821.0	233,397.3	947,148.6	21.5	1.9	19.1	4.7	2.9
1982	37,133.2	217,140.2	246,463.5	989,409.8	17.1	1.5	15.1	3.8	2.0
1983	44,580.1	226,005.6	1,050,564.3	1,050,564.3	18.8	1.6	16.6	4.2	2.0
1984	41,822.2	251,671.1	284,803.3	1,145,030.6	16.6	1.4	14.7	3.7	1.7
1985	48,162.9	286,836.9	319,999.5	1,198,230.0	16.8	1.5	15.1	4.0	1.6
1986	57,525.5	296,350.0	363,150.0	1,323,000.0	19.5	1.6	17.2	4.4	2.3
1987	58,019.5	342,348.5	363,360.5	1,457,000.0	16.9	1.6	16.0	4.0	2.3
1988	59,915.0	409,457.5	441,191.5	1,549,500.0	14.6	1.3	13.6	3.9	2.2
1989	62,830.0	428,024.5	493,814.5	1,713,500.0	13.7	1.2	12.7	3.7	3.0
1990	58,893.5	474,748.5	1,720,000.0	1,720,000.0	13.2	1.2	12.4	3.4	3.5
1991	42,553.0	461,594.0	1,696,500.0	1,696,500.0	9.4	0.8	8.8	2.6	3.5
1992	37,031.5	458,238.0	1,591,500.0	1,591,500.0	8.1	0.7	7.4	2.3	3.5
1993	37,700.5	466,617.5	1,650,500.0	1,650,500.0	8.1	0.7	7.5	2.3	4.5
1994	42,259.0	489,587.5	1,737,000.0	1,737,000.0	8.6	0.7	7.9	2.4	3.8
1995	46,571.5	540,764.5	1,864,000.0	1,864,000.0	8.6	0.7	8.0	2.5	2.9
1996	45,715.5	565,586.0	1,996,500.0	1,996,500.0	8.1	0.7	7.4	2.3	3.9
1997	63,922.5	690,598.0	2,185,500.0	2,185,500.0	9.3	0.8	8.8	2.9	3.5
Mean	44,750.2	341,564.6	371,997.7	1,305,142.8	15.5	1.4	14.0	3.8	2.9
Stdev	11,991.5	165,814.4	174,940.1	517,257.7	5.6	0.4	4.9	1.1	0.8
CV	26.8	48.6	48.6	39.7	35.9	35.0	35.0	29.3	28.6
Max	63,922.5	690,598.0	729,135.0	2,185,500.0	9.3	0.8	8.8	2.9	3.5

	Organization of Eastern Caribbean States (US\$ '000s)				Import Duty as a % of:			Caricom (US\$ '000s)				Import Duty as a % of:		
	Import Duty	Tax Revenue	Current Revenue	GDP	Tax Revenue	Current Revenue	GDP	Import Duty	Tax Revenue	Current Revenue	GDP	Tax Revenue	Current Revenue	GDP
1976	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1977	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1978	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1979	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1980	87,998.9	142,791.1	173,494.4	521,137.0	61.6	50.7	16.9	495,084.9	3,540,709.6	4,037,772.4	12,177,462.9	14.0	12.3	4.1
1981	97,868.1	161,473.0	200,915.6	592,622.2	60.6	48.7	16.5	556,044.4	4,067,672.4	4,681,517.7	13,429,981.3	13.7	11.9	4.1
1982	107,148.9	183,831.5	227,405.6	648,770.4	58.3	47.1	16.5	591,245.3	4,145,151.7	4,745,086.9	14,906,196.9	14.3	12.5	4.0
1983	111,753.3	194,335.6	237,327.8	702,470.4	57.5	47.1	15.9	701,436.2	4,013,885.8	4,647,774.5	15,131,083.2	17.5	15.1	4.6
1984	124,370.0	222,077.0	266,640.0	782,514.8	56.0	46.6	15.9	607,147.6	3,913,100.2	4,491,372.6	14,101,883.6	15.5	13.5	4.3
1985	137,281.5	265,588.9	309,738.9	842,311.1	51.7	44.3	16.3	706,959.6	3,860,817.1	4,450,590.2	14,085,764.5	18.3	15.9	5.0
1986	190,018.5	310,255.6	364,018.5	1,034,070.4	61.2	52.2	18.4	690,025.3	3,140,492.8	3,651,035.6	12,286,551.2	22.0	18.9	5.6
1987	218,960.7	353,397.8	410,022.2	1,169,225.9	62.0	53.4	18.7	718,516.9	3,286,621.7	3,720,716.7	13,110,877.3	21.9	19.3	5.5
1988	253,894.1	402,056.3	464,301.5	1,344,003.7	63.1	54.7	18.9	820,573.3	3,284,352.8	3,750,336.2	13,927,863.8	25.0	21.9	5.9
1989	262,574.1	430,444.4	488,770.4	1,497,307.4	61.0	53.7	17.5	886,141.2	3,403,739.8	3,940,535.7	14,930,552.7	26.0	22.5	5.9
1990	288,329.6	465,896.3	538,785.2	1,729,974.1	61.9	53.5	16.7	908,360.0	3,672,047.1	4,209,452.2	16,207,141.2	24.7	21.6	5.6
1991	294,292.6	484,277.8	559,140.7	1,712,629.6	60.8	52.6	17.2	917,609.5	3,744,278.2	4,346,807.2	15,685,704.9	24.5	21.1	5.8
1992	305,700.0	503,851.8	593,696.3	1,835,229.6	60.7	51.5	16.7	938,036.8	3,636,214.4	4,173,490.1	15,450,846.0	25.8	22.5	6.1
1993	319,914.8	526,344.4	622,711.1	1,901,314.8	60.8	51.4	16.8	1,035,551.6	3,909,977.4	4,453,055.9	15,749,810.3	26.5	23.3	6.6
1994	341,025.6	567,358.9	665,638.5	2,021,514.8	60.1	51.2	16.9	1,080,918.7	3,977,711.2	4,535,821.3	16,558,744.4	27.2	23.8	6.5
1995	358,406.8	598,024.4	703,363.9	2,094,485.2	59.9	51.0	17.1	1,223,401.4	4,532,255.4	5,164,081.0	18,051,642.0	27.0	23.7	6.8
1996	391,543.5	645,412.0	771,212.2	2,211,063.0	60.7	50.8	17.7	1,263,885.3	4,891,039.4	5,562,809.7	19,554,481.8	25.8	22.7	6.5
1997	411,139.0	678,605.5	795,439.4	2,314,825.9	60.6	51.7	17.8	1,392,930.7	5,170,858.7	5,856,652.6	20,853,556.3	26.9	23.8	6.7
Menu	239,012.2	396,445.7	466,256.8	1,386,415.0	59.9	50.7	17.1	862,992.7	3,899,495.9	4,467,717.1	15,344,452.5	22.0	19.2	5.5
Stdev	107,762.4	174,220.0	202,336.8	612,352.4	2.7	2.8	0.9	258,028.1	540,113.1	601,191.9	2,319,898.8	5.1	4.5	1.0
CoVa	45.1	43.9	43.4	44.2	4.4	5.6	5.2	29.9	13.9	13.5	15.1	22.9	23.2	17.3
Max	411,139.0	678,605.5	795,439.4	2,314,825.9	63.1	54.7	18.9	1,392,930.7	5,170,858.7	5,856,652.6	20,853,556.3	27.2	23.8	6.8
Min	87,998.9	142,791.1	173,494.4	521,137.0	51.7	44.3	15.9	495,084.9	3,140,492.8	3,651,035.6	12,177,462.9	13.7	11.9	4.0



