

EVALUATING THE IMPACT OF TARIFF REMOVALS AND TERMS-OF-TRADE CHANGES ON THE TRINIDAD & TOBAGO ECONOMY

by

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ABSTRACT

Trinidad and Tobago is currently engaged in negotiations for entry into the Free Trade Area of the Americas (FTAA) in 2005 and, as a precondition for entry, is required to remove tariffs on certain goods. The Ministry of Finance of Trinidad and Tobago has to determine the goods on which tariffs are to be removed in the interim, and those on which tariffs are to be removed on a phased basis. Such policy measures are expected to have implications for the Central Government's revenue base and, in addition, are very likely to impact many sectors of the economy, negatively or positively.

In this paper, we construct and use a small CGE model and use it to analyze the impact of tariff removals on selected economic indicators like overall economic welfare, output of the real sector, the fiscal position of the government, the real exchange rate and the terms of trade. At the same time, we analyze the impact of such policy measures in the presence of an exogenous deterioration in the terms of trade.

Keywords: Tariff removals, terms-of-trade, CGE models

JEL Classification numbers: C68, E62

1. Introduction

Trinidad and Tobago is currently engaged in negotiations for entry into the Free Trade Area of the Americas (FTAA) in 2005 and as such is required to remove tariffs on certain goods on a phased basis as a precondition. This is very likely to impact many sectors of the economy either negatively or positively and would probably have implications for the Central Government's revenue base. Our main objective in this paper is to use a simple CGE model of the Trinidad and Tobago economy, a modified version of one constructed by Tokarick (1995), to assess the effects of such tariff removals on the various sectors of the Trinidad & Tobago economy, as well as on the real exchange rate and the overall fiscal position of the government. More generally, we determine whether the benefits to be gained from entering into a free trade agreement such as the FTAA are greater than the costs. Given the dependence of the Trinidad & Tobago economy on trade and, in particular, the price of oil, we also consider the effects of a change in the terms-of-trade, which will more than likely result from adverse movements in the price of oil.

Currently similar work is being done at the Ministry of Finance of Trinidad and Tobago. Negotiations for submissions of offers dealing with the liberalization of tariff lines have begun within the FTAA and Trinidad and Tobago has to make an offer as to which goods it would remove tariffs on in the interim, and which

goods it would remove tariffs on a phased basis. To assist with this exercise a revenue impact assessment of the effects of the removal of tariffs on Governments revenues is being undertaken.

The results obtained in this paper should help inform decision makers as to the likely impact of trade liberalization policies on the sector or industry that is targeted and the spillover effects on other sectors/industries of the Trinidad and Tobago economy.

This rest of this paper is organized as follows. In the following section, we outline the methodological approach used suggest some important limitations of the study In section 3, we use assess the impact of trade liberalization and terms of trade shocks on the real exchange rate and the overall fiscal position of the government in Trinidad and Tobago. In section 4, we conclude the paper.

2. Methodology

Tokarick's model is a "static, applied general equilibrium model of a small, open economy of the type used by Clarete and Roumasset (1987), Clarete and Whalley (1988), and Benjamin, Deverajan, and Robinson (1982) and Shoven and Whalley (1984)". It is designed to compute the equilibrium exchange rate, which is defined as the ratio of the price of tradables divided by the price of nontradables. The equilibrium exchange rate results from changes in exogenous variables and it provides an estimate of the effects of alternative trade and tax

policies on the volume of imports and exports and on the surplus and deficit of the central government.

In order to update the data set used by Tokarick, data on each variable in his model was collected from official publications such as the Central Statistical Office's (CSO) National Income and Product Accounts, and Balance of Payments Accounts, the Draft Estimates of Revenue, and the IMF's Selected Issues and Statistical publications on Trinidad and Tobago, for the year 2000. The data used, and the sources of the data, are given in an appendix to this paper. This data set was used to rebase the model. Elasticity of substitution parameters between labour and capital, and elasticities of demand was used as given in Tokarick's model, which he got from the Maxwell Stamp and Associates (1992).

The model was then recalibrated and solved using GAMS to give the initial equilibrium. Finally some counterfactual simulations were performed on certain variables to assess the effects of these changes on the government's fiscal position and the real exchange rate, among other things.

There are two main limitations to the methodology employed. Firstly, although it is not necessary to construct a Social Accounting Matrix (SAM) to be able to conduct an exercise using a CGE model, it would be extremely useful to have one. Currently there is no SAM available for Trinidad and Tobago showing all the interlinkages between economic variables, factors of production and institutions.

The second limitation is the use of elasticity parameters that were estimated in 1992 by Maxwell Stamp and Associates. Although Tokarick used them in his 1995 paper, their applicability to data nine years on is not very certain. Some of the structural characteristics of the Trinidad and Tobago economy have changed since 1992, with a greater role now played by natural gas as a driver of economic activity and the expanded role of services (especially financial services) in the country's gross output.

3 Simulation Results

The following two counterfactual simulations are carried out and the results of each presented and analyzed:

1. The imposition of a 4% point reduction in tariff rates (a trade liberalization measure) in situations where
 - The price of the non traded good is held unchanged;
 - The price of the non traded good is allowed to vary
2. .The imposition of a 5% deterioration in the terms-of-trade with and without accompanying tariff reduction.

Simulation 1: a 4% point tariff reduction (trade liberalization)

The results of this simulation, which involve a 4 percentage point decrease in the average tariff rate from 14.6%¹ to 10.6%, are shown in Table 1 below.

Table 1 Effects 4% point reduction in tariff rate
(Millions TT dollars unless otherwise noted)

| | BASE CASE | Effects of trade liberalization | | | |
|--------------------------------|-----------|---------------------------------|-------|-------------------------|-------|
| | | P _N fixed | %Δ | P _N flexible | %Δ |
| Real output | 60,798.60 | 60,824.50 | 0.04 | 60,839.90 | 0.07 |
| <i>Importables</i> | 3,219.8 | 2,806.1 | -12.8 | 3,070.2 | -4.6 |
| <i>Exportables</i> | 22,387.7 | 22,404.3 | 0.1 | 22,537.6 | 0.7 |
| <i>Nontraded</i> | 35,191.1 | 35,614.1 | 1.2 | 35,232.1 | 0.1 |
| Government revenue | 16,767.7 | 17,101.5 | 2.0 | 16,501.2 | -1.6 |
| <i>Oil tax revenue</i> | 2,114.2 | 2,072.3 | -2.0 | 2,097.0 | -0.8 |
| <i>Tariff duties</i> | 762.7 | 1139 | 49.3 | 956.27 | 25.4 |
| <i>Final goods</i> | 762.7 | 554.5 | -27.3 | 368.8 | -51.6 |
| <i>Intermediate goods</i> | 0.0 | 584.5 | | 587.47 | |
| VAT | 2,027.3 | 2,098.6 | 3.5 | 1,845.6 | -9.0 |
| <i>Labour income tax</i> | 2,236.0 | 2,164.1 | -3.2 | 1,974.8 | -11.7 |
| <i>Other</i> | 9,627.5 | 9,627.5 | 0.0 | 9,627.5 | 0.0 |
| Government expenditure | 14,938.5 | 15,606.0 | 4.5 | 14,965.6 | 0.2 |
| Government balance | 1829.2 | 1,495.5 | 18.2 | 1,535.6 | 16.1 |
| Export volume | 14,141.6 | 14,078.5 | -0.4 | 14,634.5 | 3.5 |
| Import volume | 14,735. | 16,920.9 | 14.8 | 15,228.5 | 3.34 |
| <i>Final goods</i> | 2,998.8 | 5,230.7 | 74.4 | 3,479.1 | 16.0 |
| <i>Intermediate goods</i> | 11,736.9 | 11,690.2 | -0.4 | 11,749.4 | 0.1 |
| Trade balance | -594.1 | -2,842.4 | 378.4 | -594.0 | 0.0 |
| Percentage change in real wage | - | -1.2 | - | -3.8 | - |
| Equivalent variation | - | 2,831.1 | - | 111.4 | - |
| (percent of base-year GDP) | - | 0.047 | - | 0.0018 | - |
| Real exchange rate index (% Δ) | - | 0.41 | - | 10.9 | - |

Trade liberalization results in an increase in the general welfare in the economy as measured by the equivalent variation, whether the price of the nontraded good (P_N) is inflexible and flexible. When P_N is fixed, the equivalent variation is much larger than when P_N is flexible. This is probably due to the increased consumption of the importable good whose price has now fallen relative to the price of the nontraded good. These findings are similar to those of Tokarick (1995).

¹ This figure was derived using data on more than 20,000 tariff lines on imports into Trinidad and Tobago for the year 2000.

Although real output as a whole rises, trade liberalization causes the importables component to decline in each case, but more so in the case where P_N is inflexible. This has implications for the import volumes of goods for final consumption. Imports for final consumption increase significantly for the case where P_N is fixed. This happens because both nontraded goods and imports are substitutes for each other in demand. The budget surplus deteriorates with the removal of import tariffs, either because there is a smaller increase revenues than in expenditure (P_N fixed) or because the fall in revenue is not matched by the fall in expenditure. Closer examination reveals that, although revenues from tariffs on final goods decreased as a result of the trade liberalization, revenues from other sources such as oil tax, VAT and labour income tax also decrease indirectly. In contrast revenues from taxes on the profits in the exportable sector increases as a result of real exchange rate depreciation generated from the reduction in import tariffs.

The effects of trade liberalization on the trade balance are very adverse in the case where P_N is fixed since imports are consumed in greater quantities when the real exchange rate appreciates. There seems to be no difference when P_N is allowed to vary.

Simulation 2: Deterioration in the Terms of Trade

The second simulation considers the effects of a 5% deterioration in the terms-of-trade (which may come about as a result of a reduction in the price of oil). When there is no accompanying trade liberalization measure, this deterioration results in a fall in economy's welfare as shown in Table 2 below. This occurs mainly because the deterioration in the terms-of-trade exerts downward pressure on the exportable sector, causing either output or employment (or both) to fall. Some of the excess labour supply that results from the contraction in the exportable sector may be absorbed in the importable and nontraded sectors, but the contraction in the exportable sector is greater than the absorptive capacity of these other two sectors, thus overall welfare falls.

Table 2 **Effects of a 5 % Terms-of-Trade Deterioration With and Without Trade Reform**

(Millions of TT dollars unless otherwise stated)

| | Base case | Without reform | %Δ | With reform | %Δ |
|--|------------------|-----------------------|-----------|--------------------|-----------|
| Real output | 60798.6 | 60764.9 | -0.055 | 60,818.0 | 0.032 |
| <i>Importables</i> | 3219.8 | 3,360.7 | 4.4 | 3,214.5 | -0.2 |
| <i>Exportables</i> | 22387.7 | 22,345.5 | -0.2 | 22,498.3 | 0.5 |
| <i>Nontraded</i> | 35191.1 | 35,058.7 | -0.4 | 35,105.2 | -0.2 |
| Government revenue | 16767.7 | 16,201.7 | -3.4 | 16,059.8 | -4.2 |
| <i>Oil tax</i> | 2114.2 | 1,956.1 | -7.5 | 1,937.5 | -8.4 |
| <i>Tariff</i> | | | | | |
| <i>Final goods</i> | 762.7 | 573.5 | -24.8 | 287.4 | -62.3 |
| <i>Intermediate goods</i> | - | - | | 587.9 | |
| VAT | 2027.3 | 1,909.1 | -5.8 | 1,737.6 | -14.3 |
| <i>Labour income tax</i> | 2236.0 | 2,135.5 | -4.5 | 1,881.9 | -15.8 |
| <i>Other</i> | 9627.5 | 9,627.5 | 0.0 | 9,627.5 | 0.0 |
| Government expenditure | 14,938.5 | 14,079.4 | -5.8 | 14,332.9 | -4.1 |
| Government balance | 1,829.2 | 2,122.3 | 16.0 | 1,726.9 | -16.1 |
| Export volume | 14141.6 | 14,109.5 | -0.2 | 14,605.4 | 3.3 |
| Import volume | 14,735.7 | 14,703.6 | -0.22 | 15,199.5 | 3.15 |
| <i>Final goods</i> | 2,998.8 | 2,254.7 | -24.8 | 2,710.9 | -9.6 |
| <i>Intermediate goods</i> | 11736.9 | 12,448.9 | 6.1 | 12,488.6 | 6.4 |
| Trade balance | -594.1 | -594.1 | 0.0 | -594.1 | 0.0 |
| Percentage change in real wage | - | -0.6 | - | -4.5 | - |
| Equivalent variation | - | -951.2 | - | -842.1 | - |
| (percent of base-year GDP) | - | -0.016 | - | -0.139 | - |
| Relative prices (ratio) | | | | | |
| Exportables real exchange rate (P_X/P_N) | 1.00 | 1.06 | 6.0 | 1.10 | 10.0 |
| Importables real exchange rate (P_M/P_N) | 1.25 | 1.32 | 5.6 | 1.28 | 2.4 |

When trade liberalization measures accompany the terms-of-trade deterioration, the decline in economic welfare is not as large. This seems to suggest that there is always some measure of liberalization that will attenuate the negative welfare effects of a terms-of-trade shock, such as a fall in the price of oil.

Real output also contracts as a result of the terms-of-trade deterioration, again more markedly so when there is no compensating trade liberalization measure. This contraction in real output may be as a result of the decline in petroleum export earnings which was generated from the terms-of-trade deterioration. An examination of relative prices in Table 2 above shows depreciation in both exportables real exchange rate and the importables real exchange rate.

Government revenues are severely affected by the terms-of-trade deterioration when there is no accompanying tariff reduction measures and, in this case, the overall budget deficit of the government is worsened by the deterioration of the terms-of-trade. The main reasons for this are the fall off in tax revenues from the VAT and oil tax. Since a terms-of-trade deterioration negatively affects exports and the export of petroleum is a major revenue earner for the government, tax revenues from the profits on petroleum exports will by extension be adversely affected as well.

The results show clearly that trade liberalization measures reduce many of the negative effects of the terms-of-trade deterioration alone. Under a program of trade liberalization volume of exports increases and the negative effects on consumer welfare is mitigated as shown by the smaller equivalent variation (EV) as compared to the EV under the case without trade reform. The real exchange rate, as measured by the exportables real exchange rate, depreciates causing exports to expand. Similar to the findings of Tokarick (1995) the importable and nontraded sectors contract to free labour to work in the exportable sector. This finding seems to be counter-intuitive in that the exportable sector in this model is the petroleum sector, which is very capital intensive in its production structure.

Tokarick (1995) found the fiscal position of the government worsens under the combined introduction of trade reform and a terms-of-trade deterioration. He states that "Trade reform reduces the value added in the importable and nontraded sectors, as well as wages, so revenue from value-added taxes and taxes on labour income is reduced substantially."

The overall finding here is that while trade liberalization may reduce the negative terms-of-trade shock it ultimately results in a deterioration of the budget surplus, at least in the short run. This is not very surprising in a country, like Trinidad & Tobago, that relies heavily on export and import trade taxes.

4 Conclusions

The Trinidad & Tobago economy seems ready for entry into arrangements like the FTAA if only because the economy as a whole responds positively to tariff removals. There is overall improvement in economic welfare and government revenues even increase as a result of expansion of economic activity, notwithstanding the direct loss of revenue due to the lowering of tariffs.

Unfavourable exogenous changes in the terms-of-trade have a negative impact on the Trinidad & Tobago economy. These, however, are attenuated by the tariff liberalization measures. The Trinidad & Tobago economy is a small, extremely open economy that is highly dependent on one product, petroleum, the price of which is determined on the world market. It is therefore very vulnerable to movements in the external environment and, in particular, the price of oil. Terms of trade shock will take place, therefore, as a matter of course, and trade liberalization seems to provide a cushion against such effects.

In addition to FTAA negotiations, Trinidad and Tobago and countries of the wider Caribbean are currently engaged in a number of multilateral trade negotiations, in particular with the WTO and the European Union (Cotonou/ACP). There is much concern by Caribbean Governments as to the likely impacts of such trade agreements on their country's economy. CGE models, like the one used in this

paper, may be used to analyse many of the questions policy makers in the Caribbean region are raising.

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Appendix

Data Sources for Variables in Model

| Variable | Source | | | |
|---|---|--------------------|-----------|---|
| | Publication | Page No. | Table No. | Details |
| Value Added Net of Value Added Taxes | | | | |
| Imports | CSO- National Income and Product Account. | Electronic Version | 23 | Components of Gross Domestic Product. Activity:00, 01, 04, 05, 06, 07, 08, 09 & 10 |
| Exports | CSO- National Income and Product Account. | Electronic Version | 23 | Cost Components of Gross Domestic Product. Activity:03 |
| Nontraded | CSO- National Income and Product Account. | Electronic Version | 23 | Cost Components of Gross Domestic Product. Activity:02,11,12,13,14.15,16,17,18, & 19 |
| Employment | | | | |
| Imports | CSO- National Income and Product Account. | Electronic Version | 24 | Compensation to employees by kind of economic activity. Activity:00, 01, 04, 05, 06, 07, 08, 09 & 10 |
| Exports | CSO- National Income and Product Account. | Electronic Version | 24 | Compensation to employees by kind of economic activity. Activity:03 |
| Nontraded | CSO- National Income and Product Account. | Electronic Version | 24 | Compensation to employees by kind of economic activity. Activity:02,11,12,13,14.15,16,17,18, & 19. |
| Net of Tariff Dutiable value of Imports for Consumption | IMF publication: T&T- Selected Issues & Statistics. | | 27 | Consumer Goods. (US\$ 476.0 Mn. * TT\$ 6.3) |
| Exports of Goods | The BOP of T&T 2000 | | 1C | Original figure \$2244.7 was multiplied by the average exchange rate for 2000 (TT\$ 6.30/US\$) |
| Import Tax Revenue | Draft Estimates of Revenues 2001. | | | Table- Abstract of Estimated Revenue... Head 04. |
| Export Tax Revenue | - | - | - | - |
| Government Revenue | Draft Estimates of Revenues 2001. | | | Table- Abstract of Estimated Revenue... Grand Total |
| Labour Income Tax Revenue | Draft Estimates of Revenues 2001. | | | Table- Taxes on Income and Profits, Head 01, Sub-Head 03. |
| Oil Tax Revenue | Draft Estimates of Revenue 2001. | | | Table- Taxes on Income and Profits, Head 01, Sub-Head 01. |
| Value Added Tax Revenue | CSO: National Income & Product Account 2000. | | | NET VAT |

| | | | | |
|---|--|--------------------|----|--|
| | | | | |
| Imports Share | VAT Administration Office. | | | Calculated by using the Import share of GROSS VAT in 2000 to find Import share of NET VAT in 2000. |
| Exports Share | - | - | - | - |
| Nontraded Share | VAT Administration Office. | | | Calculated by using the Domestic share of GROSS VAT in 2000 to find Domestic share of NET VAT in 2000. |
| Government Demand for Traded Goods | CSO (NIPA) | Electronic Version | 9 | Government Final Consumption Expenditure. |
| Government Expenditure on | | | | |
| Imports | - | - | - | - |
| Exports | - | - | - | - |
| Nontraded | CSO: National Income & Product Account 2001. | | | Gov't Final Consumption Expenditure by purpose. |
| Government Transfers | Draft Estimates of Revenues 2001. | | | |
| Interest Expense | Draft Estimates of Revenues 2001. | | | |
| Net of Tariff value of Imported Intermediate Goods | | | | |
| Import Good | IMF publication: T&T- Selected Issues & Statistics | | 27 | Raw Materials & Intermediate Goods. Construction materials (US\$ 127 Mn. * TT\$ 6.3) |
| Export Good | IMF publication: T&T- Selected Issues & Statistics | | 27 | Raw Materials & Intermediate Goods. Fuels (US\$ 1061.0 Mn. * TT\$ 6.3) |
| Nontraded Good | IMF publication: T&T- Selected Issues & Statistics | | 27 | Raw Materials & Intermediate Goods. Other (US\$ 675.0 Mn. * TT\$ 6.3) |
| Tariff Revenue on Imported Intermediate Goods | - | - | - | - |