

# **Impact Assessment of the SADC FTA on SACU Member States: A CGE Analysis**

**B.O. Tsheko\* and Scott McDonald**

## **Abstract**

*This paper provides a quantitative assessment of the implications for Southern African Customs Union (SACU) members of a Southern African Development Community (SADC) Free Trade Area (FTA). Specifically it addresses the following policy questions that are of concern to SACU policy makers:*

- *What are the costs and benefits of regional trade liberalisation and economic integration for individual Member States of SADC?*
- *What are the potential economic, developmental and welfare impacts of the attainment of the SADC FTA on each Member State of SACU?*

*Simulations concerning the SADC FTA indicate that the impacts on SACU members are in general positive although small. The major winner is South Africa and many of the gains that accrue to SADC members can be attributed solely to the reduction of their trade barriers with SADC members, and hence these gains could largely be realised by unilateral actions on behalf of the individual members. This indicates that South Africa is the key component of any SADC wide agreement.*

**Keywords:** Southern African Customs Union (SACU), Southern African Development Community (SADC), Free Trade Area (FTA), Social Accounting Matrix (SAM), Computable General Equilibrium Model (CGE), International Trade.

**JEL:** F17; F15; C68; E 16.

---

\* Senior Lecturer of Economics and corresponding author, University of Botswana, Gaborone.

## **1.1 Background**

The Southern African Customs Union (SACU) is the oldest customs union in the world and has been in existence since 1910. In 2002, SACU Member States signed a new agreement which sets out the broad framework for enhanced economic integration between Member States. The new Agreement, in essence, renders SACU a true international organisation with a legal personality and clear mandate, objectives, institutions, decision making and financing procedures.

SACU is currently faced with multiple global and regional developments that have serious implications for its work activities in the medium term. Over the last 20, or so, years the global economic environment has experienced a period of profound and unprecedentedly rapid change; the most obvious of these changes are the exceptional rates of economic growth achieved by China, other East Asian countries and India and the growing recognition of the potential for climatic changes. In terms of trade relationships this period of rapid changes has seen China and East Asia take an increased share of trade in manufactured commodities while expanding, enormously, the demand for natural resource based commodities, as a consequence many Africa economies have experienced large increases in export demand. At the same time there have been major changes in global trade policies.

The EU, Africa and SADC's major trade partner, has signaled a major change in its relationships with the African, Caribbean and Pacific (ACP) group of countries with a curtailing of the preferential trade agreements under the auspices of the Lomé convention, the introduction of the 'Everything-but-arms' agreement for least developed economies and the establishment of economic partnership agreements with groups of (developing) countries. These changes have taken place against the background of the establishment of the World Trade Organisation (WTO), and tentative progress with the Doha development agenda, the dismantling of the multi-fibre agreement and the establishment of large numbers of preferential trade agreements. While these bilateral trade agreements have been dominated by agreements involving OECD countries, there have been a substantial number of agreements between other countries.

## **Analytical Method, Data and Policy Questions**

### **2.1 Brief Model Description**

The GLOBE model is a member of class of multi-country, computable general equilibrium (CGE) models that are descendants of the approach to CGE modeling described by Dervis et al., (1982). The model is a SAM-based CGE model, wherein the SAM serves to identify the agents in the economy and provides the database with which the model is calibrated. The SAM also serves an important

organizational role since the groups of agents identified in the SAM structure are also used to define sub-matrices of the SAM for which behavioral relationships need to be defined. The implementation of this model, using the GAMS (General Algebraic Modeling System) software, is a direct descendant and extension of the single-country and multi-country CGE models developed in the late 1980s and early 1990s.

### ***International Trade***

Trade is modeled using a treatment derived from the Armington “insight”; namely domestically produced commodities are assumed to be imperfect substitutes for traded goods, both imports and exports. Import demand is modeled via a series of nested constant elasticity of substitution (CES) functions; imported commodities from different source regions to a destination region are assumed to be imperfect substitutes for each other and are aggregated to form composite import commodities that are assumed to be imperfect substitutes for their counterpart domestic commodities. The composite imported commodities and their counterpart domestic commodities are then combined to produce composite consumption commodities, which are the commodities demanded by domestic agents as intermediate inputs and final demand (private consumption, government, and investment). Export supply is modeled via a series of nested constant elasticity of transformation (CET) functions; the composite export commodities are assumed to be imperfect substitutes for domestically consumed commodities, while the exported commodities from a source region to different destination regions are assumed to be imperfect substitutes for each other. The composite exported commodities and their counterpart domestic commodities are then combined as composite production commodities;

Agents are assumed to determine their optimal demand for and supply of commodities as functions of relative prices, and the model simulates the operation of national commodity and factor markets and international commodity markets. Each source region exports commodities to destination regions at prices that are valued free on board (fob). Fixed quantities of trade services are incurred for each unit of a commodity exported between each and every source and destination, yielding import prices at each destination that include carriage, insurance and freight charges (cif).

There are two important features of the price system in this model that deserve special mention. First, each region has its own numéraire such that all prices within a region are defined relative to the region’s numéraire. We specify a fixed aggregate consumer price index to define the regional numéraire. For each region, the real exchange rate variable ensures that the regional trade-balance constraint is satisfied when the regional trade balances are fixed. Second, in addition, there is a global numéraire such that all exchange rates are expressed relative to this numéraire. The global numéraire is defined as a weighted average of the exchange rates for a user defined region or group of regions. In this implementation of GLOBE the basket of regions approximates the OECD economies.

### ***Production and Demand***

Production relationships by activities are defined as nested Constant Elasticity of Substitution (CES) production functions. Activity output is a CES aggregate of the quantities of aggregate intermediate inputs and aggregate value added, while aggregate intermediate inputs are a Leontief aggregate of the (individual) intermediate inputs and aggregate value added is a CES aggregate of the quantities of primary inputs demanded by each activity. Producers are assumed to maximize profits, which determines product supply and factor demand. Product markets are assumed to be competitive, and the model solves for equilibrium prices that clear the markets. Factor markets in developed countries are also assumed to have fixed labour supplies, and the model solves for equilibrium wages that clear the markets. In developing countries, however, we assume that the real wage of unskilled Labour is fixed and that the supply of unskilled Labour is infinitely elastic at that wage. So, labour supply clears the market, and aggregate unskilled employment is endogenous rather than the real wage. In this specification, any shock that would otherwise increase the equilibrium wage will instead lead to increased employment.

Final demand by the government and for investment is modeled under the assumption that the relative quantities of each commodity demand by these two institutions is fixed—this treatment reflects the absence of a clear theory that defines an appropriate behavioral response by these agents to changes in relative prices. For the household there is a well-developed behavioral theory; and the model contains the assumption that households are utility maximisers who respond to changes in relative prices and incomes. In this version of the model, the utility functions for private households are assumed to be Stone Geary functions; for the OECD countries they are parameterised as Cobb Douglas functions, i.e., there are no subsistence expenditures.

### ***Macro Closure***

All economy wide models must incorporate the standard three macro balances: current account balance, savings-investment balance, and the government deficit/surplus. How equilibrium is achieved across these macro balances depends on the choice of macro “closure” of the model. For this exercise a “neutral” or “balanced” set of macro closure rules is specified. This macro closure ensures the model is focused on the effects of changes in relative prices on the structure of production, employment, and trade.

## **2.2. DATA: Global Computable General Equilibrium Model**

The data used for the global computable general equilibrium (CGE) model are drawn from the Global Trade Analysis Project (GTAP) database version 6. The database for this paper is derived from the

GTAP database version 6.0, which is benchmarked to the year 2001 (see Dimanaran, 2006). The form of the database used for this study is a Social Accounting Matrix (SAM) representation of the Global Trade Analysis Project (GTAP) database version 6 (see McDonald and Thierfelder, 2004, for a detailed description of the core database).

The GTAP project produces the most complete and widely available database for use in global computable general equilibrium (CGE) modelling; the database has become generally accepted for global trade policy analysis. It is used by nearly all the major international institutions and many national governments. Hertel (1997) provides an introduction to both the GTAP database and its companion CGE model. The precise version of the database used for this paper is a reduced form global SAM representation of the GTAP data (see McDonald, 2007). We decided to use Version 6 because for SADC the database is the same in Version 6 and the most recent version.

The aggregation used for this application of the model includes 21 sectors (commodities and activities), 18 regions, and 4 factors of production. The accounts in the SAM, which are detailed in Table 1, and the aggregation mapping from the GTAP data were agreed with SACU at the inception phase. The sectoral aggregation seeks to achieve a balance across primary products – agriculture and extraction – manufacturing and services, while the regional aggregation emphasises SADC and SADC's trade relationships within a global context.

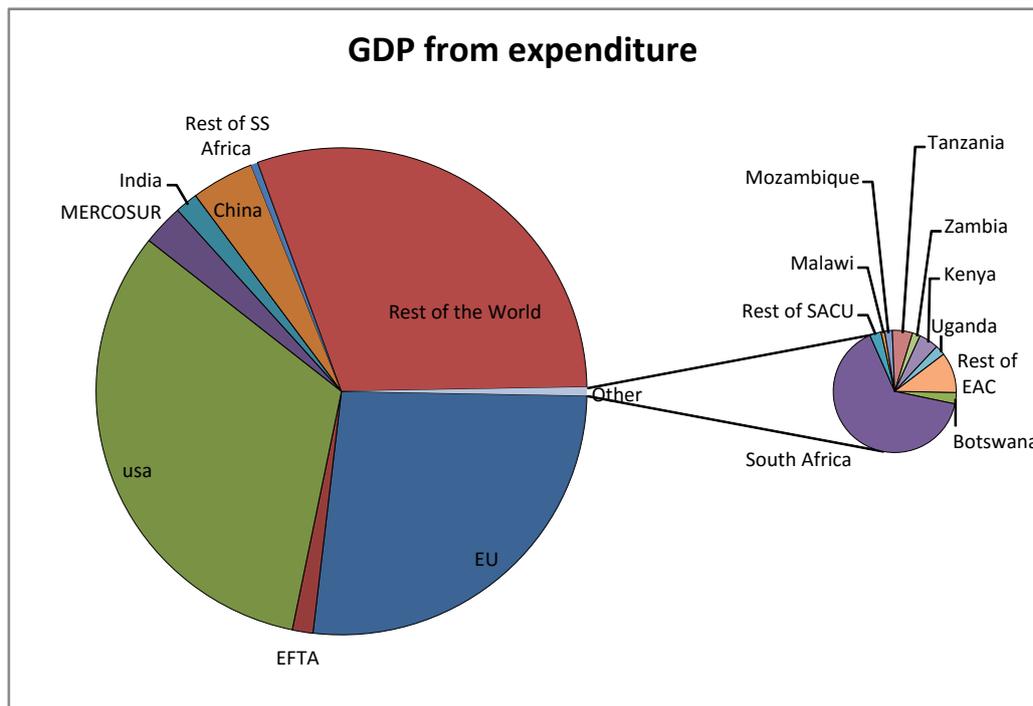
**Table 1 SAM and Model Accounts**

<b>Sectors</b>		<b>Regions</b>
Grains	Wood and paper	Botswana
Vegetables	Petroleum products	South Africa
Other agriculture	Chemical and other products	Namibia Lesotho Swaziland
Sugar	Metals and metal products	Malawi
Livestock	Vehicles	Mozambique
Coal oil and gas	Machinery	Tanzania
Minerals	Utilities	Zambia
Livestock products	Construction	Kenya
Other food products	Trade and transport	Uganda
Sugar products	Services	Rest of EAC
Textiles		European Union
		EFTA
	<b>Factors</b>	United States America
	Land and Natural Resources	MERCOSUR
	Unskilled labour	India
	Skilled labour	China and Hong Kong
	Capital	Rest of Sub Saharan Africa
		Rest of the World

### 2.3 Descriptive Statistics

In order to interpret the results from the simulations it is useful to consider briefly some of the descriptive statistics that can be extracted from the model database. The most important issues to note are that SADC constitutes a small proportion of the global economy. Only 0.6 percent of global GDP originates in SADC, and as illustrated in Figure 1, SADC is dominated by SACU that accounts for some 71 percent of SADC's GDP, which implies the possibility that SACU could provide a 'hub' for a SADC FTA.

**Figure 1**                      **Distribution of Global GDP**



Source: GTAP database version 6

The structural differences between the economies of SADC are not limited to ‘size’. In terms of the patterns of production the differences between SACU members and the other SADC countries are pronounced; manufacturing and services account for greater shares of value added in SACU members while agriculture accounts for smaller shares. While there are exceptions to this categorisation it provides a general description of a situation wherein the economies of SACU, with the partial exception of Lesotho and to a lesser extent Swaziland, are more developed than those of the remainder of SADC. A particularly important set of distinctions are the differences in the shares of trade & transport and services between the countries; service sectors are more important in SACU, with the exception of Zimbabwe, while often trade & transport is more important in the remainder of SADC. Hidden behind these simple shares of valued added are important differences in trade and transport costs associated with the fact that many of the economies are land locked with relatively underdeveloped transport infrastructures and limited scale economies.

In some respects the differences between the production structures may assist the development of a SADC FTA: if the patterns of trade between SADC members reflect these differences they may indicate the potential for synergies. The existing trade patterns suggest this is not the case. On the other hand the high trade & transport costs may effectively acts as trade barriers if they inhibit the development of inter SADC trade as opposed to trade between SADC members and third parties – again the existing data suggest that trade & transport costs are likely to inhibit the development of inter SADC trade.

While SADC is a small region in terms of global economic activity, SADC is marginally more prominent in terms of global trade, see Table 2, accounting for nearly 0.8% of total import demand (valued *cif* and exclusive of trade taxes) and 0.9 percent of export supply (valued *FOB* but inclusive of export taxes). Consequently the impact on the global economy of changes in the intra SADC trade agreements are likely to have limited implications for the global economy but a greater than ‘average’ degree of trade dependence of the SADC members may mean that SADC is more susceptible to changes in the global economy, a feature made more likely by the importance of primary and/or lightly processed commodities in SADC trade. However as important, if not more important, than aggregate trade volumes/shares are the magnitudes of intra SADC trade and extra SADC trade by SADC members; these statistics indicate that trade by SADC members is dominated by trade with Europe and that intra SADC trade is not important for many SADC members across the majority of broad commodity groups.

**Table 2 Global Trade Volumes and Shares**

	Shares (%)		Trade Dependency
	import demand	export supply	
Botswana	0.03	0.04	1.049
South Africa	0.43	0.56	0.642
Rest of SACU	0.05	0.05	1.349
Malawi	0.01	0.01	0.816
Mozambique	0.02	0.02	0.818
Tanzania	0.04	0.02	0.450
Zambia	0.02	0.02	0.869
Kenya	0.03	0.03	0.512
Uganda	0.02	0.01	0.529
Rest of EAC	0.15	0.14	1.152
EU	37.62	38.81	0.672
EFTA	2.08	2.55	0.799
USA	17.91	12.72	0.221
MERCOSUR	1.82	1.79	0.309
India	1.03	0.88	0.299
China	5.80	6.85	0.714
Rest of SS Africa	0.82	0.62	0.752
Rest of the World	32.13	34.86	0.517
Total (\$(USD)'00m	73,758	71,321	

Source: GTAP database version 6

A review of the reported trade barriers operated by SADC members – Table 3 - indicates that for most broad commodity groups the tariff barriers are relatively low. The notable exceptions are minerals, sugar and metals and this is the case for most SADC members.

Despite the fact that trade barriers are relatively low, for many SADC economies, other than SACU, import duties are important sources of government income, Table 4. Thus although the governments in

non-SACU countries account for smaller proportions of domestic absorption than in SACU they are heavily dependent on trade tax revenues; this is not surprising given the costs associated with other tax instruments, especially when per capita income levels are low. Consequently any trade agreement that appreciably reduces trade tax revenues has the potential for creating revenue difficulties for non-SAC countries.

Policy induced trade barriers, such as trade taxes and quantitative restrictions, are not the only impediments to the expansion of trade between nations. One important impediment is the trade and transport costs associated with bilateral trade relationships: other things being equal it would be expected that regions will tend to trade most with partners where the trade and transport costs are relatively low. In the context of southern Africa it has long been recognised that trade and transport costs are relatively high. Some of these high costs can be attributed to geography, such as, landlocked nations, the high African plateau, etc.; some can be attributed to the legacies of colonial history, e.g., trade routes were developed to support trade with colonising nations, historical trade patterns, etc.; and some to institutional inefficiencies that raise transaction costs between southern African nations.

**Table 3** Average Tariff Rates by Region and Commodity (%)

	Botswana	South Africa	Rest of SACU	Malawi	Mozambique	Tanzania	Zambia	Kenya	Uganda	Rest of SADC	EU
Grains	0.2	4.9	0.2	1.6	0.6	5.3	0.6	1.3	6.6	3.7	7.1
Vegetables	0.3	3.4	0.7	0.4	0.1	5.0	0.7	2.6	1.7	3.8	1.4
Other agric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4
Sugar	0.0	0.3	0.0	0.1	0.0	0.2	0.1	0.2	0.3	0.4	1.4
Livestock	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal oil and gas	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0
Minerals	4.9	28.0	2.4	12.0	9.3	28.5	19.5	27.5	36.7	29.3	5.8
Livestock products	0.2	9.8	1.9	2.4	5.7	10.4	1.4	4.4	10.4	8.4	3.9
Other food	0.1	3.2	0.2	3.5	0.4	14.7	1.1	2.6	3.7	9.1	62.1
Sugar products	5.3	21.3	10.4	17.4	17.9	23.8	12.9	15.1	16.0	21.6	2.7
Textiles	0.4	5.1	0.5	3.3	2.4	4.6	0.9	2.3	5.6	5.6	0.3
Wood and paper	0.0	1.8	0.1	0.3	0.0	1.7	0.3	0.1	1.0	1.2	0.8
Petroleum products	0.5	4.9	0.5	1.8	1.8	4.7	1.3	2.1	4.5	4.1	0.7
Chemical etc	0.2	3.8	0.7	2.2	1.3	4.0	1.0	0.9	4.7	4.3	0.8
Metals etc	5.9	11.3	3.3	6.5	7.3	11.4	7.9	6.4	11.7	12.0	1.0
Vehicles	1.0	3.3	1.0	1.7	1.6	3.0	1.7	1.7	3.1	2.9	0.5
Machinery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: GTAP database version 6

**Table 4**                      **Government Expenditure and Tariff Revenues**

	Absorption	Government consumption	Govt. Consumption /Absorption	Tariff revenue /Govt. Consumption
	USD '00m			
<b>Botswana</b>	41.8	13.6	32.4	3.0
<b>South Africa</b>	1,029.4	200.9	19.5	8.2
<b>Rest of SACU</b>	55.0	11.9	21.7	6.9
<b>Malawi</b>	17.1	2.7	15.8	21.5
<b>Mozambique</b>	37.4	3.2	8.5	34.3
<b>Tanzania</b>	101.7	5.9	5.8	42.0
<b>Zambia</b>	34.9	4.1	11.8	24.5
<b>Kenya</b>	88.0	17.1	19.5	11.4
<b>Uganda</b>	49.5	3.8	7.8	9.7
<b>Rest of EAC</b>	190.6	15.9	8.3	83.6

Source: GTAP database version 6

### 3.1 SADC FTA Policy Experiments

This group of experiments assesses the implications of full and partial bi lateral liberalisation of SADC trade. Trade tax revenues are modelled under the presumption that the destination principle holds, i.e., that all traded taxes collected on imports and exports by a region accrue to the government of that region. Implicit to this principle is a presumption that the SACU revenue pooling arrangements have been set aside and the net transfers between SACU members are frozen at their initial level. This principle is necessary in the present context, but is relaxed for the Customs Union simulation. The experiments are organised as follows.

#### 3.1.1 Full SADC FTA

This is the core simulation for this group of simulations. It is assumed that there is full bi-lateral trade liberalisation between the members of SADC, i.e., the removal of ALL bilateral trade taxes. It is assumed that trade tax rates between SADC members and non SADC countries are unchanged, i.e., it is assumed that SADC members freeze their trade barriers with non-member. This means, for instance, that countries that are members of both SADC and COMESA choose a SADC FTA over a COMESA FTA.

### **3.1.2 Partial SADC FTA**

This subset of simulations is concerned with identifying the contributions of the different dimensions of liberalisation to the benefits accruing to SADC members. The different components assessed are a full liberalisation across subsets of commodities, namely

- Agriculture
- Natural resource
- Food
- Agriculture and food
- Manufacturing
- Services

and a partial liberalisation of

- 75 percent across all commodities<sup>1</sup>

The results from these simulations are used to inform an understanding of which dimensions of the SADC FTA are responsible for the majority of the benefits accruing to the members, and how the different dimensions interact.

### **3.1.3 Incremental expansion of a SADC FTA**

The simulations start from the existing SACU membership and then add sequentially the remaining members of SADC to an FTA. These assist in identifying the potential benefits and losses associated with each member joining a SADC FTA. The general patterns of the results are commented on and the results are used to inform an understanding of the implications of the SADC FTA.

## **3.2 SADC FTA Results**

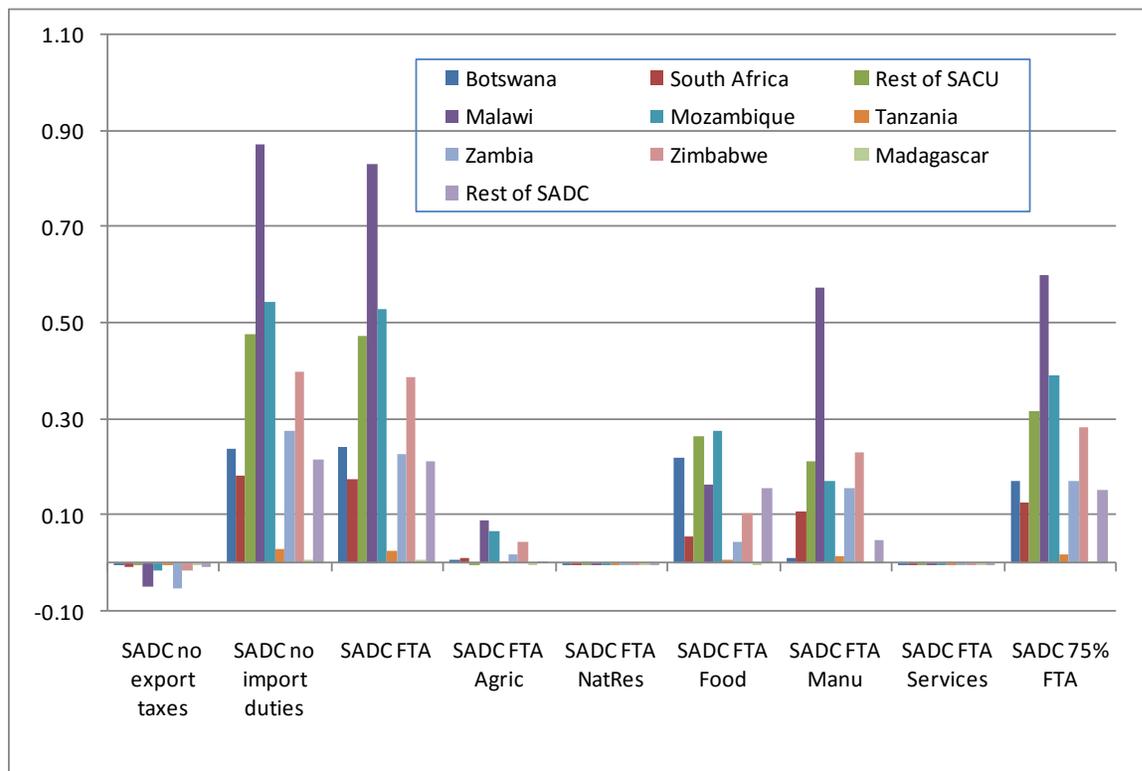
The adoption of a SADC wide free trade area (FTA) has a positive impact on the real GDP of the members – see Figure 2 SADC FTA columns – although the impacts are generally small - less than 0.5 percent except for Malawi and, marginally, Mozambique. There is however a moderately wide variation in the impacts on different regions – from 0.83 to 0.01 (Madagascar), which suggests the driving forces differ by country (see below). The other components in Figure 2 provide additional information about the sources of the GDP impacts. The dominant factor behind the increase in GDP is the removal of intra SADC import duties and primarily those on processed food products and manufactured goods, while removing bilateral export taxes

---

<sup>1</sup> While the qualitative and quantitative insights from an 85% liberalisation are the same; the 75% liberalisation scenario is preferred since it avoids an implication that these simulations have been conducted to evaluate a partial achievement of SADC target liberalisation.

produces minor negative contributions. Liberalising intra SADC trade by 75 percent produces, on average, slightly less than 75 percent of the positive impacts on GDP: this suggests – as do other unreported simulations – that there are little or no additional benefits from only partially liberalising intra SADC trade, although this does not preclude the possibility that at the tariff line level there may be arguments for limiting liberalisation.

**Figure 2** Impact of SADC FTA on Real GDP in SADC Members

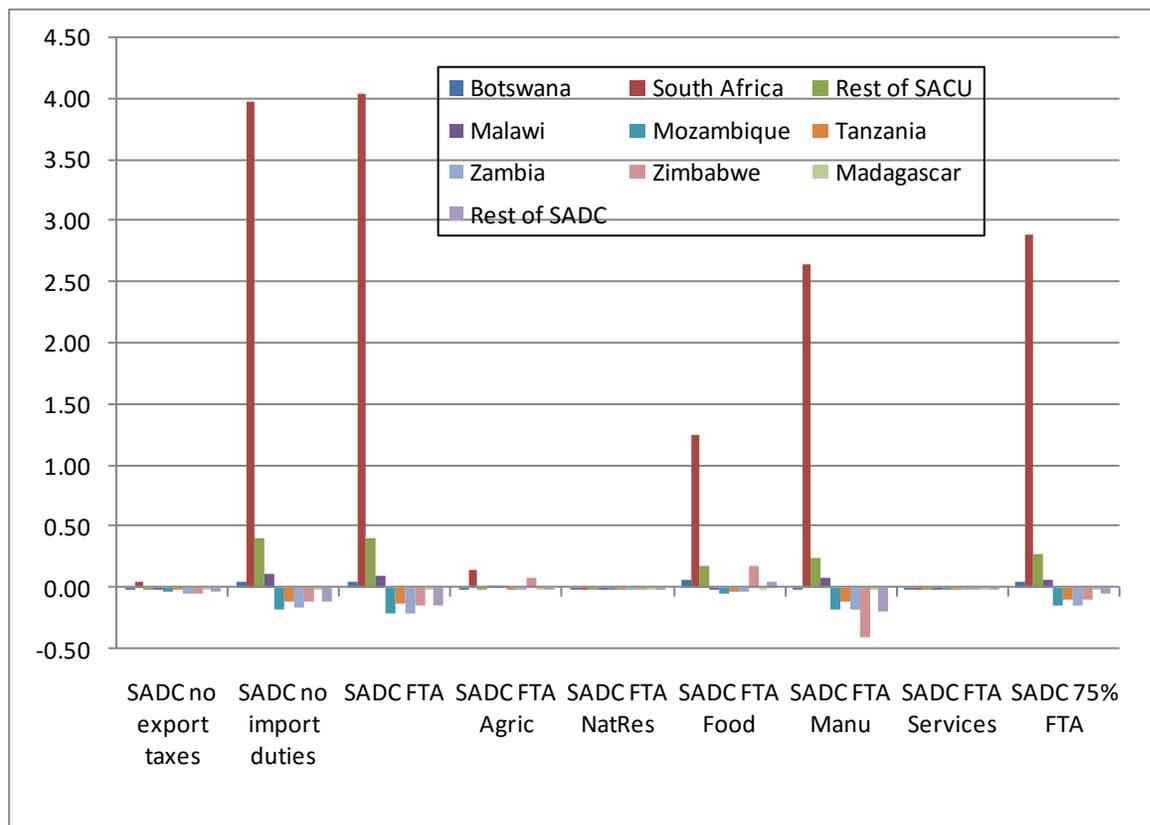


Source: Simulation results.

However there are reasons to be cautious over the interpretation of the welfare implications of apparent gains in GDP. Figure 3 reports changes in measured welfare, which captures the impacts of both changes in incomes and prices in terms of the increase or decrease in the real value of disposable incomes. This illustrates two important points. First, the distribution of benefits may not be even with SACU members gaining and the other members of SADC, except Malawi, losing out. And second, that for some members of SADC the realised impacts of an FTA may not be positive, at least in the short term. In part this is simply an effect of the different aggregate sizes, in terms of populations and average incomes, of the economies, which means that South Africa will always appear to gain disproportionately; but the reversal of the signs on the estimated impacts for non SACU members of SADC indicates that there are likely to be more fundamental underlying reasons for the differences in the signs.

The partial FTA simulations indicate that it is the liberalisation of manufactured commodity trade that primarily drives the welfare losses experienced by the non SACU members of SADC, with a small negative impact from food commodities and even smaller negative impacts from agriculture and natural resource commodities.

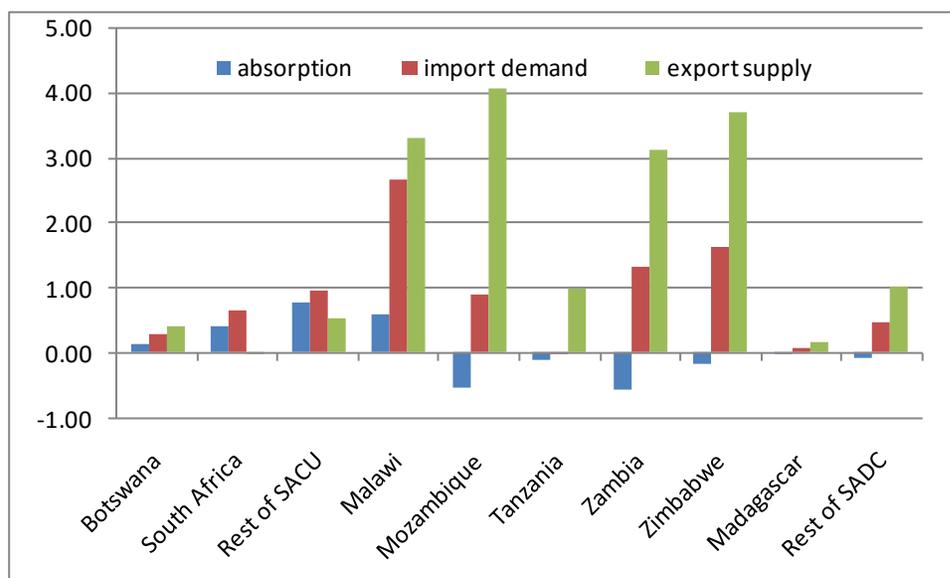
**Figure 3 Welfare Impacts of SADC FTA on SADC Members (Equivalent Variation in USDS '00 m)**



Source: Simulation results.

The extent to which SACU countries benefit relative to the other members of SADC is illustrated by the proportionate changes in real absorption (Figure 4); with the exception of Malawi the SACU members increase absorption by a greater percentage on incomes that are on average appreciably greater than those in the other member states. At the same time the other member states show appreciably greater increases in both import demand and export supply, except for Madagascar and Tanzania. This is not surprising since neither Tanzania nor Madagascar engage in any substantive amounts of trade with the other SADC countries.

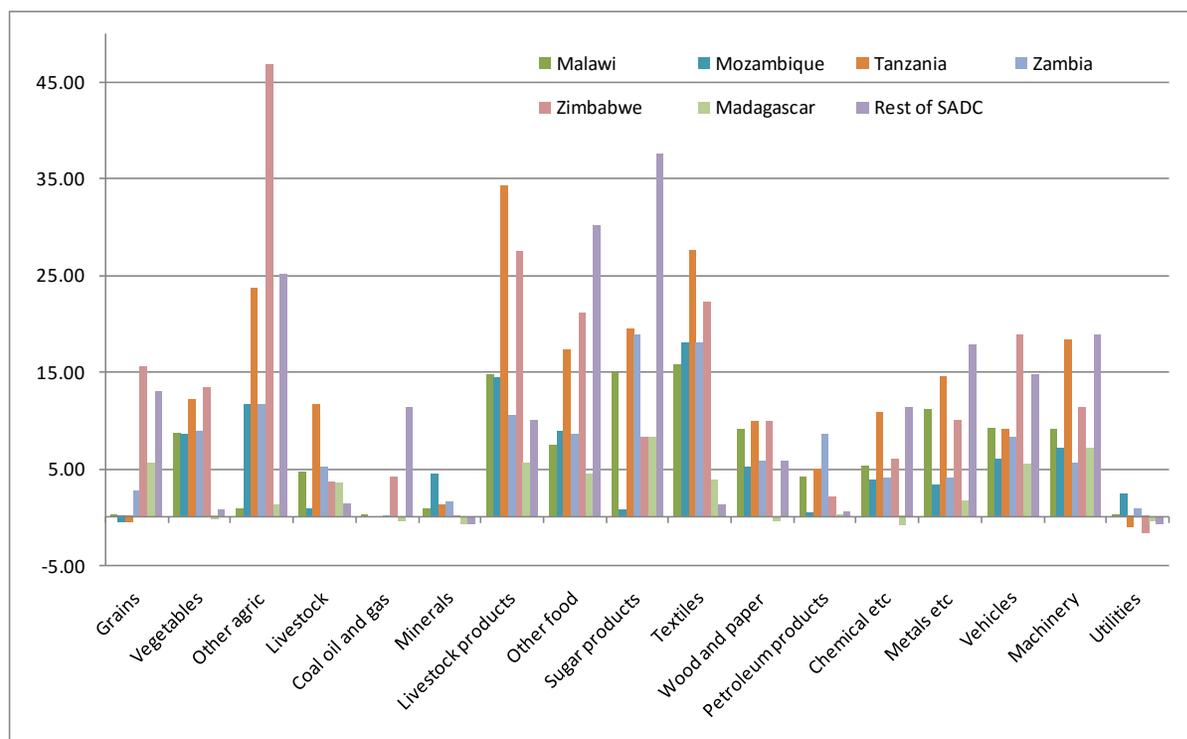
**Figure 4** Real Absorption, Import Demand and Export Supply (% changes)



Source: Simulation results.

At least part of the explanation lies in the differences in trade taxes in the base period. An inspection of the import duties in the base data indicate that for the non SACU members of SADC the adoption of a SADC FTA involves appreciable reductions in their trade barriers vis-à-vis South Africa. This, combined with the often large shares of imports sourced from South Africa, results in substantial increases in imports from South Africa. These are illustrated in Figure 5, where to increase clarity the imports in services, construction, trade and raw sugar have been eliminated. Thus an FTA can be expected to substantially increase the penetration of SADC economies by commodities produced in South Africa; but to achieve this greater penetration South Africa does not need to increase aggregate exports, which in fact decline very marginally. Hence there is evidence that South Africa would redirect at least some of its exports towards SADC and that SADC members would source more of their imports from South Africa.

**Figure 5 Imports by non SACU Regions from South Africa (% changes)**



Source: Simulation results.

The impact of the FTA on the structures of incentives and production in the SADC countries is appreciable. Table 5 reports the percentage changes in the price of value added by activity and region for the simulation with a full FTA; the changes in the price of value added are summary measures of the (relative) changes in the returns to primary factors (labour, capital and land) by activity/industry and therefore indicate the change in the average returns to factors used by an activity. These are all positive, with one exception that is the coal, oil and gas activity in South Africa, which means that the incentives to employ factors across all aggregate sectors in all SADC regions increase. But there are substantial differences: for Madagascar and, to a lesser extent, Tanzania the impacts are muted while at the other extreme – Malawi and Zimbabwe – the impacts are much larger. There is some evidence that the changes in incentives are greater for manufacturing activities, but these vary across region, e.g., manufacturing in Malawi experiences bigger changes than agriculture but the situation is reversed in Zimbabwe.

Underlying these analyses is the presumption that the economies have fully adjusted to the new set of incentives associated with the FTA. As part of that process factors of production will have been reallocated between activities and the supply of unskilled labour will have changed in those countries for which it is assumed that there are pools of unemployed labour. A scale independent indication of the extent to which the new equilibrium involves structural change is the ratio of change in the absolute factor demand by

activities to the total supply of each factor; these estimates are reported in Figure 6. Although the results for factor adjustment appear small they do represent appreciable degrees of structural adjustment and, equally importantly, appreciable differences in the magnitudes of adjustments in different regions. Factor adjustment results are also reported for non SADC regions; these confirm the virtually zero impact of a SADC FTA on the rest of the world.

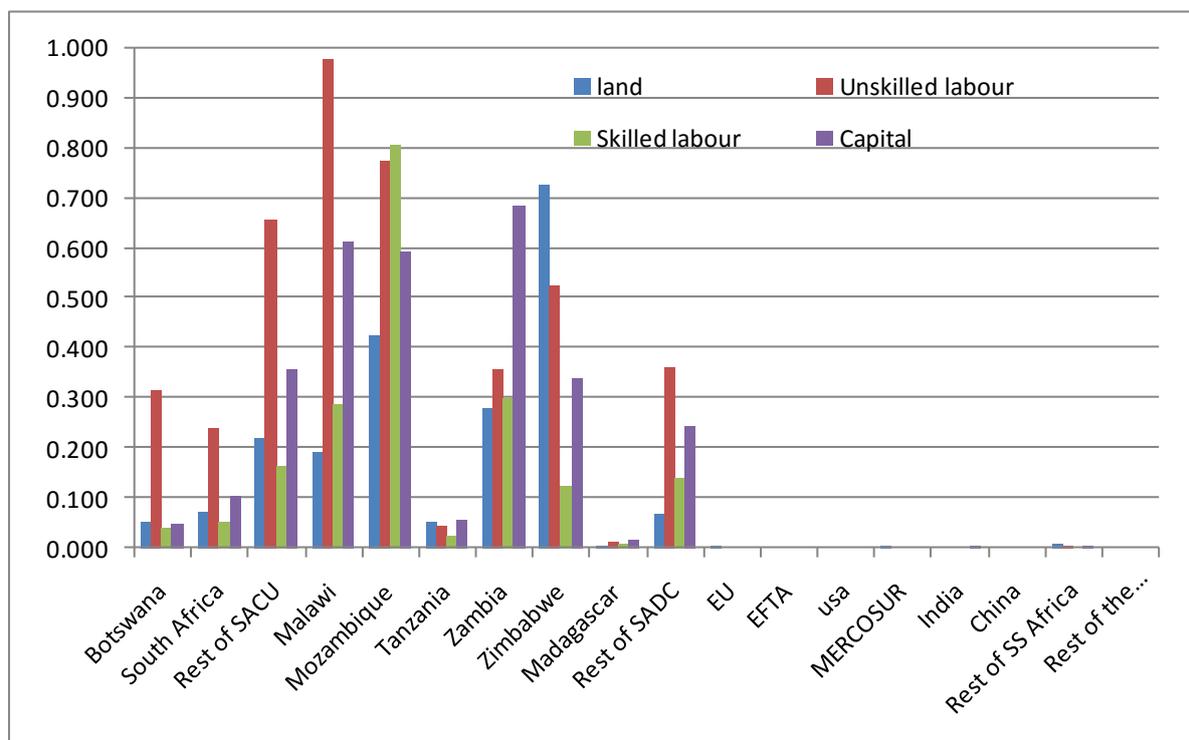
Understandably Tanzania and Madagascar experience the least changes due to their relative (trade) isolation from the rest of SADC. Similarly although they are among the beneficiaries of the FTA neither South Africa nor Botswana undergo much adjustment, whereas the Rest of SACU, Malawi, Mozambique, Zambia, Zimbabwe and the Rest of SADC undergo far greater degrees of adjustment. Consequently there are likely to be non-trivial adjustment costs in many SADC countries before they are able to realise the potential benefits of the FTA; this could be regarded as partial evidence in support of a case for progressive introduction of an FTA so that members can phase the adjustments over time.

**Table 6**                      **Changes in Price of Value Added – Full SADC FTA (% changes)**

	Botswana	South Africa	Rest of SACU	Malawi	Mozambique	Tanzania	Zambia	Zimbabwe	Madagascar	Rest of SADC
Grains	0.44	0.10	0.68	1.45	0.80	0.10	0.69	2.29	0.01	0.70
Vegetables	0.44	0.10	0.68	1.45	0.80	0.10	0.69	2.29	0.01	0.70
Other agric	0.43	0.16	0.68	1.41	0.65	0.09	0.73	2.27	0.02	0.68
Sugar	0.44	0.10	0.68	1.45	0.80	0.10	0.69	2.29	0.01	0.70
Livestock	0.44	0.08	0.69	1.60	0.98	0.13	0.79	2.37	0.01	0.78
Coal oil and gas	0.69	-0.12	0.92	2.86	1.43	0.43	1.32	6.20	0.02	1.71
Minerals	0.58	0.05	0.79	1.41	1.57	0.07	1.69	2.69	0.03	1.15
Livestock products	0.31	0.19	0.61	2.34	0.84	0.05	0.70	1.07	0.02	0.66
Other food	0.23	0.24	0.82	2.61	0.95	0.05	0.90	0.93	0.02	0.78
Sugar products	0.21	0.20	0.63	2.33	0.94	0.05	0.83	1.12	0.03	0.72
Textiles	0.19	0.15	0.58	2.19	1.39	0.06	1.26	0.69	0.03	0.58
Wood and paper	0.28	0.20	0.68	2.57	1.21	0.06	1.31	0.39	0.03	0.52
Petroleum products	0.11	0.27	0.89	2.87	0.00	0.08	2.02	1.00	0.03	0.85
Chemical etc	0.27	0.22	0.73	2.56	1.28	0.08	1.60	0.85	0.03	0.71
Metals etc	0.13	0.22	0.68	2.11	1.69	0.07	1.84	0.75	0.03	0.59
Vehicles	0.29	0.22	0.70	1.92	0.44	0.08	0.85	0.66	0.02	0.57
Machinery	0.26	0.16	0.63	2.18	0.40	0.08	1.24	0.75	0.03	0.63
Utilities	0.39	0.31	1.03	2.17	1.23	0.07	1.95	0.92	0.04	0.76
Construction	0.30	0.14	0.44	2.10	1.50	0.07	1.14	0.39	0.02	0.52
Trade and transport	0.38	0.20	0.63	1.77	1.57	0.06	0.90	0.64	0.03	0.58

Source: Simulation results.

**Figure 6** Factor Adjustment



Source: Simulation results.

The impacts of the FTA on factor returns and the employment of unskilled labour are reported in Table 7. These indicate that there would be pronounced increases in factor returns in most SADC countries for most factors, especially for land and capital in the non SACU members, except for Tanzania and Madagascar whose engagement with the FTA is very limited. Associated with these changes are small but worthwhile increases in employment of unskilled labour. It is noticeable that although South Africa experiences the largest welfare gains, the proportionate increases in factor prices and employment of unskilled labour that it experiences are appreciably lower than those for other SADC members except for Tanzania and Madagascar.

**Table 7**                      **Factor Returns and Employment of Unskilled Labour (% changes)**

	Land	Skilled labour	Capital	Employment of Unskilled Labour
Botswana	1.2	0.5	0.6	0.6
South Africa	-0.5	0.5	0.4	0.4
Rest of SACU	0.6	1.2	1.3	1.1
Malawi	3.9	3.0	3.4	1.9
Mozambique	1.6	2.6	2.2	1.4
Tanzania	0.5	0.0	0.1	0.1
Zambia	1.0	0.7	2.1	0.5
Zimbabwe	13.2	0.8	1.3	1.0
Madagascar	0.0	0.0	0.0	0.0
Rest of SADC	3.3	0.9	1.0	0.7

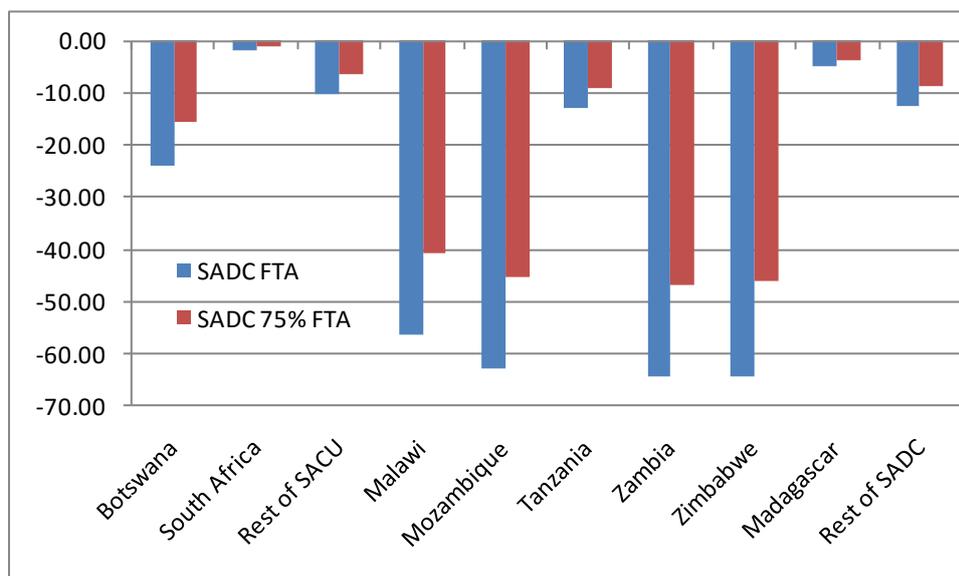
Source: Simulation results.

The elimination of import duties between SADC members inevitably implies that the revenues from import duties will fall; the combined effects depend upon both the volumes of trade and the original levels of the intra SADC import duties and these are summarised in Figure 7 for both a full and partial SADC FTA. For some regions, most notably Malawi, Mozambique, Zambia and Zimbabwe the proportionate declines in import duty revenue are very large; this mirrors the importance of SADC, and especially South Africa, as a source of imports to those countries. However, ultimately, the important question is not how large the losses of import revenue are but how difficult it might be to replace the lost revenue.

For these analyses it was assumed that governments maintained fixed (government) deficits and therefore any losses in tariff revenue needed to be replaced. The chosen tax replacement instrument was direct taxes on household incomes; this instrument has an advantage of being unambiguously less distortionary than import duties, but the disadvantage is that it may not be viable if the increase in average tax rates is substantial and/or the share of households paying direct taxes is small. As indicated in Figure 8 the increases in the proportions of household incomes taken as direct taxes need to increase appreciably in 5 regions (Malawi, Mozambique, Zambia, Zimbabwe and Rest of SADC), is not trivial in one (Tanzania) and is minimal in SACU and Madagascar. Given the limited tax bases for household taxes in the SADC countries (including South Africa) it may be unreasonable to expect all regions to be able to use direct taxes as the sole replacement instrument.

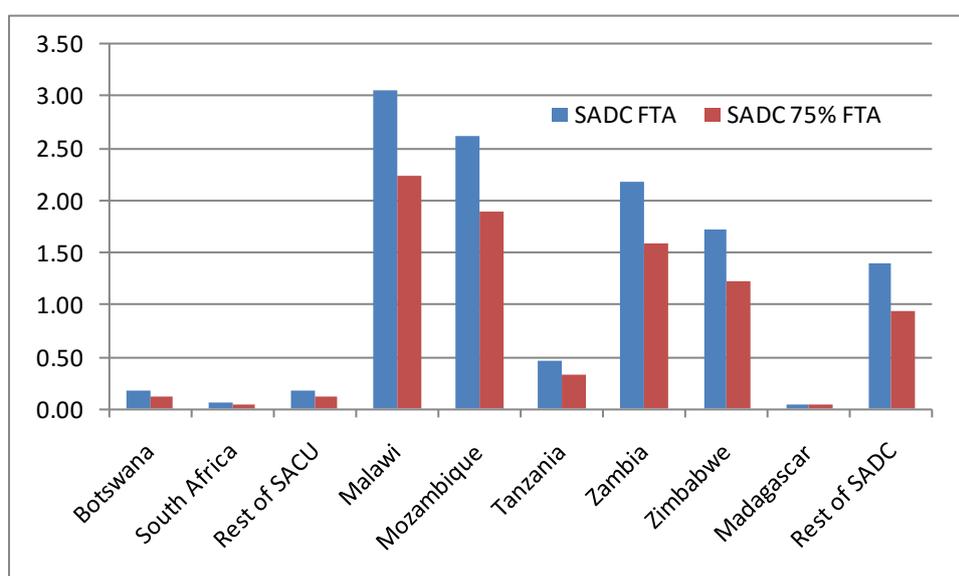
Hence it is likely that at least some governments will need to consider the use of tax replacement instruments that are potentially as distortionary as import duties and that may have undesirable implications for the costs of living of different household groups and/or put pressure on government budgets. Simulations using alternative tax replacement instruments confirm that if direct taxes are not a viable tax replacement instrument the welfare gains/losses would be less/greater and there is some, inconclusive, evidence that the cost of living impacts on poorer households may be negative.

**Figure 7** Change in Import Duty Revenue – SADC FTA (% changes)



Source: Simulation results.

**Figure 8** Changes in Proportions of Household Incomes as Direct Taxes – SADC FTA (%)



Source: Simulation results.

*Incremental expansion of a SADC FTA*

The implications of incremental expansion of SACU to form a SADC FTA indicate that the order in which countries join the FTA is not critical to the process or the welfare implications. Most new members would realise the majority of the impacts irrespective of the order in which they join although the overall impacts escalate slightly as the number of members in the FTA increase. Similarly, the impacts on SACU accumulate irrespective of the order in which other regions join the FTA: the more

a region imports from SACU the more SACU members – overwhelmingly South Africa – gain. This reflects the fact that a large proportion of expansion of intra FTA trade is due to the substitution of imports from non FTA members with imports from South Africa. This conclusion is confirmed by running a simulation in which the FTA is formed first from non SACU members of SADC and then incrementally adding members of SACU to the FTA; the impacts following the addition South Africa to the FTA dominate. These effects are largely driven by the fact that, within SADC, South Africa is the dominant producer of those commodities that account for the largest shares of imports purchased by the other members of SADC, and there are trade diversion effects towards imports from South Africa.

The two notable exceptions are Tanzania and Madagascar. Neither of these countries trade to any great extent with the other members of SADC and consequently the reduction of trade barriers between them and the other members of SADC has very limited consequences because the implied changes in prices are limited.

These results are consistent a ‘hub and spoke’ vision of intra SADC trade where South Africa provides the ‘hub’. However the welfare gains to SADC members are relatively limited although the changes in trade volumes are, in some cases, substantial, which raises questions about whether the ‘hub’ is large enough to provide sufficient impetus to promote accelerated development within the SADC region. With respect to imports there are reasons to believe that South Africa may be a large enough trade partner, except for Tanzania, Madagascar and the Rest of SADC region, but even so the EU remains a critically important trade partner. But on the export side there is less reason to believe that South Africa is a large enough source of demand: the EU is the dominant source of export demand followed by the Rest of the World region and the USA, except for Mozambique and the Rest of SACU region where South Africa is a bigger although still relatively small source of demand. This conclusion is further reinforced by a review of the commodities exported by SADC members; these are largely primary or partially processed commodities.

#### **4.1 Conclusions**

The impact on SACU members of a SADC FTA are general positive although small. The major winner is South Africa and many of the gains that accrue to SADC members can be attributed solely to the reduction of their trade barriers with SADC, and hence could largely be realised by unilateral actions on behalf of the individual members. This indicates that South Africa is the key component of any SADC wide agreement; a conclusion that derives fundamentally from the fact that South Africa is, by far, the major producer in SADC of the commodities that enter into intra SADC trade. Nevertheless it is doubtful whether the South African economy is large enough to provide a strong ‘hub’ around which

development within SADC can be stimulated. A substantial reason for that is the fact that South Africa is not a sufficiently large source of demand for the exports of other SADC members.

A number of findings/observations arise regularly throughout the analyses. Addressing these is considered crucial and hence they are highlighted.

1. Many of the non SACU members of SADC are likely to face difficulties with the efficient replacement of trade tax revenues.
2. The degrees of structural adjustment required by many SADC members of a FTA or Customs Union are often large.
3. Any SADC EU EPA is likely to increase both the structural adjustment and trade replacement difficulties that SADC member will face.
4. Multiple redistribution mechanisms can be devised that allow for transfers from gainers to losers within SADC.
5. SADC members will need to choose between SADC membership and membership of other agreements.
6. South Africa is the biggest absolute gainer and would be the primary funder of any redistribution mechanism.

Based on the results we make three key recommendations; the recommendations assume that economic integration is a dominant political objective in the region. The key recommendations are:

- A. *Recommendation 1:* The transition to a fully functioning SADC FTA should be completed before moving towards a SADC CU.
- B. *Recommendation 2:* Develop the FTA so that it provides for progress towards economic integration in SADC.
- C. *Recommendation 3:* Take actions that will enhance the benefits of the FTA by facilitating trade between members and supporting the development of markets in SADC for commodities produced by members.

## References

- African Development Bank (2005). African Development Report, 2005: Oxford University Press.
- African Integration Review, (2007). African Union Commission, Addis Ababa
- Analysis of Intra-SADC Trade: A trade and Industry Policy Strategies publication; March 2003
- Bosi, A., W. Breytenbach, T. Hartzenberg, C. McCarthy and K. Schade. 2006. Monitoring Regional Integration in Southern Africa, Yearbook Volume 6 – 2006, Tralac, Stellenbosch
- Chipeta, C. 2006. Deepening Integration in SADC – Can Malawi Meet the Challenges? Friedrich Ebert Stiftung, Botswana
- de Melo, J and Robinson, S. 1989. Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies: Journal of International Economics, 27, 47-67.
- Dervis, K., de Melo, J. and Robinson, S. 1982. General Equilibrium Models for Development Policy: Washington D.C.: The World Bank.
- Devarajan, S., Lewis, J.D. and Robinson, S. 1990. Policy Lessons from Trade-Focused, Two-Sector Models: Journal of Policy Modeling, 12, 625-657.
- Development Network Africa. 2007. Evaluation of an Appropriate Model for SADC Customs Union: SADC Secretariat
- Evans, D. 1998. Options for Regional Integration in Southern Africa. Background paper prepared for the September Forum 1998 Trade and Industrial Policy Secretariat: IDRC Johannesburg.
- Evans, D. 1996. Trade Policy Strategies for Southern Africa: Building SADC Trade Policy Capability. Report prepared for the SADC Industry and Trade Coordination Division SITCD, Institute of Development Studies, University of Sussex.
- Flatters, F. 2005. Implementing the SACU-Revenue Sharing Formula: Customs Revenue. South African National Treasury Working Paper
- Hertel, T.W. 1997. Global Trade Analysis: Modeling and Applications. Cambridge: Cambridge University Press.
- Lewis, J.D., S. Robinson and K. Thierfelder. 2001. Free Trade Agreements and the SADC Economies: Trade and Macroeconomic Division Working Paper No 80 (Washington: IFPRI).
- McDonald, S. 2006. Deriving Reduced Form Global Social Accounting Matrices from GTAP Data, mimeo.
- McDonald, S. and Sonmez, Y. 2004. Augmenting the GTAP Database with Data on Inter-Regional Transactions: Sheffield Economics Research Paper 2004:009. The University of Sheffield
- McDonald, S. Azzoni, C., Brooks, J., and Guilhoto, J. 2007. Who in Brazil Will Gain from Global Trade Reforms?: The World Economy, Vol 30(10), 2007, pp 1568-93.
- McDonald, S. S Robinson and K Thierfelder, 2008. Asian Growth and Trade Poles: India, China, and East and Southeast Asia', World Development, Vol. 36 (2), 2008, pp. 210-234.

- McDonald, S. 2002. The Commodity Protocols of the Lomé Convention: The Case of Beef Exports from Botswana: *Journal of Agricultural Economics*, July, Vol 53 (2), 2002, pp 407-427.
- McDonald, S., and Thierfelder, K. 2004. Deriving a Global Social Accounting Matrix from GTAP version 5 Data. GTAP Technical Paper 23. Global Trade Analysis Project: Purdue University.
- McDonald, S., Thierfelder, K., and Robinson, S. 2007. Globe: A SAM Based Global CGE Model using GTAP Data: USNA Economics Department Working Paper no 14. U.S. Naval Academy ([www.usna.edu/EconDept](http://www.usna.edu/EconDept)).
- Pyatt, G. 1987. A SAM Approach to Modeling: *Journal of Policy Modeling*, 10, 327-352.