The EU Economic Partnership Agreements with Southern Africa
A Computable General Equilibrium Analysis

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I hereby declare that this thesis has not been and will not be, submitted in whole or part to another University for the award of any other degree.

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SUMMARY

This thesis examines the potential impacts of the Economic Partnership Agreements (EPAs) between the EU and the Southern African Development Community (SADC). It provides a quantitative assessment of the prospective implications for welfare, output and trade structures, resource allocation, prices and fiscal revenue.

The thesis undertakes country- and sector-specific analyses using the multi-region, multi-sector computable general equilibrium (CGE) GLOBE model. The model is calibrated to the Global Trade Analysis Project (GTAP) Database- version 7 for 2004.

Different scenarios are implemented in order to simulate the alternative EU-SADC EPA scenarios in addition to their WTO-compatible alternatives.

The thesis aims to contribute novel insights to the ongoing debate on the EU-SADC EPAs. It provides detailed country- and sector-specific impact projections within an internally consistent modelling framework. Furthermore, it contemplates the other WTO-compatible arrangements for SADC-EU trade in the case of not signing final EPAs.

The simulation results inform answers for several research questions, as follows. Who gains and who loses from the EU-SADC EPAs? Do the agreements help SADC to effectively integrate into the world economy? What type of structural change might SADC experience under the EU-SADC EPA scenarios? How significant are potential adjustment costs for the SADC members likely to be? Are the WTO-compatible alternatives preferable for SADC members compared to the EU-SADC EPAs scenario?

The simulation results suggest that a comprehensive EPA scenario is welfare-improving for many SADC members. The agreements, however, do not serve as a stumbling block towards more integration for SADC members into the world markets. Overall, SADC production structures become more concentrated in export-oriented sectors. These structural changes are accompanied by a high degree of adjustment in factor markets and substantial fiscal losses. A comprehensive EPA scenario is the best option vis-à-vis the WTO-compatible alternatives for SADC non-LDCs, whereas the results for SADC LDCs are mixed.

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List of Abbreviations

ACP	African, Caribbean and Pacific
BLNS	Botswana, Lesotho, Namibia and Swaziland
CES	Constant Elasticity of Substitution
CET	Constant Elasticity of Transformation
CGE	Computable General Equilibrium
COMESA	Common Market for Eastern and Southern Africa
CPA	Cotonou Partnership Agreement
CPI	Consumer Price Index
EAC	East African Community
EBA	Everything But Arms
EC	European Commission
EPAs	Economic Partnership Agreements
ESA	Eastern and Southern Africa
EU	European Union
GATT	General Agreement on Tariffs and Trade
GSP	Generalized System of Preferences
GTAP	Global Trade Analysis Project
IEPAs	Interim Economic Partnership Agreements
LDCs	Least Developed Countries
LES	Linear Expenditure System
MAT	Mozambique, Angola and Tanzania
MFN	Most Favoured Nation
MIRAGE	Modeling International Relationships in Applied General Equilibrium
NTBs	Non-Tariff Barriers
RoOs	Rules of Origin
RTAs	Regional Trade Agreements
SACU	Southern African Customs Union
SADC	Southern African Development Community
SADCC	Southern African Development Coordination Conference
SAM	Social Accounting Matrix
TDCA	Trade, Development and Co-operation Agreement
UN-ECA	United Nations-Economic Commission for Africa
WTO	World Trade Organization

1 Introduction

1.1 Research Background

In June 2000, representatives of the African, Caribbean and Pacific (ACP) states and the European Union (EU) met in the economic capital of Benin (Cotonou). The two negotiating sides agreed on the most comprehensive partnership agreement between the EU and developing countries – the Cotonou Partnership Agreement (CPA).[1] In 2003, the Cotonou Agreement effectively replaced the Lomé Convention that has governed EU-ACP trade since 1977.[2]

The Cotonou Agreement was implemented through a World Trade Organization (WTO) waiver. According to this waiver, the EU was allowed to provide non-reciprocal trade preferences to the ACP states until December 2007. The pre-2008 Cotonou trade preferences are not WTO-compatible for two reasons. Firstly, the EU does not provide equivalent preferences to all non-ACP countries at the same level of development. This violates the WTO-principle under the Most Favoured Nation (MFN) clause.[3] Secondly, these non-reciprocal preferences are not granted to all developing countries and, hence, cannot be covered by the 'Enabling Clause'.[4] Therefore, the Cotonou Agreement (Article 37.1) has to declare that the non-reciprocal preferences will be replaced by reciprocal trade commitments in compliance with Article XXIV of the General Agreement on Tariffs and Trade (GATT).[5]

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[1] For the full documentation of the Cotonou Agreement, see European Commission (2000).

[2] Lomé is the capital of Togo. Four Lomé Conventions were signed by the EU and the ACP states: Lomé I was signed in 1975 and came into force in 1976, Lomé II was signed in 1979 and covered the period (1981-1985), Lomé III was signed in 1985 and Lomé IV was signed in December 1989 and covered a ten-year period (1990-2000).

[3] According to the MFN principle, WTO members cannot discriminate between their trading partners. That is to say, countries that are accorded MFN treatment should not be treated less advantageously than other WTO members.

[4] The 'Enabling Clause', which was announced in 1979, allows for providing non-reciprocal preferences to products originated in developing countries, albeit without discriminating between groups of developing countries.

[5] The GATT 1994 is legally distinct from the GATT 1947. According to Annex 1A of the GATT 1994, the original agreement dealing with trade in goods (i.e. the GATT 1947) is incorporated into the GATT 1994. See World Trade Organization (1994, p. 23).

The Southern African Development Community (SADC) is one of the oldest regional trade agreements (RTAs) in Africa. The SADC region is a mixture of diverse economies encompassing fifteen members. The Southern African Development Coordination Conference (SADCC) was originally launched in 1980 by nine countries: Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. In the 1990s, the membership of SADC increased to fourteen members: Namibia (1990), South Africa (1994), Mauritius (1995), Congo, D.R. and Seychelles (1997). The Seychelles ceased its membership in 2004 and then was readmitted in 2008. Madagascar was granted full membership in 2005, but its membership is currently suspended from all community institutions and organs until the country returns to constitutional order.[6]

According to the constitutional framework described above, the SADC trade relations with the EU have been based on the non-reciprocal Cotonou preferences. Alongside the Cotonou Agreement, the EU launched its negotiations on Economic Partnership Agreements (EPAs) with SADC in 2002. The EU-SADC EPAs vision goes beyond securing reciprocal market access and aims at establishing inclusive frameworks with a wide set of trade and development components.

At the end of 2007, when the WTO waiver for the Cotonou preferences expired, the EU has initialled region-to-region interim EPAs (hereinafter referred to as IEPAs) with eleven out of the fifteen SADC members. Both signatory sides agreed on resuming negotiations over final EPAs. Nevertheless, the evolution of the negotiation process casts a cloud over the possibility of concluding final EPAs between the EU and SADC.

[6] In 2009, Madagascar experienced political instability when the former mayor Andry Rajoelina led a coup d'état and seized power with backing by the army. This has been met by strong international condemnation. The African Union (AU) suspended Madagascar's membership. At its Extraordinary Summit in March 2009, the SADC Heads of State and Government decided not to recognize Mr. Rajoelina declaring that "… his appointment did not only violate the Constitution of Madagascar and democratic principles, but also violated the core principles and values of the SADC Treaty, the African Union Constitutive Act and the United Nations Charter" (Southern African Development Community 2010a). The EU has considered suspending Madagascar access to the EU markets granted under the Cotonou Agreement. In May 2010, the EU council decided to apply 'appropriate' measures for a year while resuming the negotiations with Madagascar (Council of the European Union 2010). The United States cuts off non-humanitarian aid and suspended Madagascar's membership from the African Growth and Opportunities Act (AGOA) in December 2009.

In the case of not reaching final EPAs with the EU, SADC-EU trade has to be organized by WTO-compatible alternative frameworks. The SADC least developed countries (LDCs) could maintain their duty-free, quota-free access to the EU markets under the 'Everything But Arms' (EBA) initiative. The SADC non-LDCs will switch to the EU-Generalized System of Preferences (GSP). South Africa has already a FTA with the EU called Trade, Development and Co-operation Agreement (TDCA).

1.2 Research Objectives and Questions

Given this background, the thesis aims to provide an in-depth quantitative assessment of the prospective implications of the EU-SADC EPAs for welfare, trade and structural change. Furthermore, the thesis examines the possible ways for different SADC members to liberalize their trade with the EU in the case of not agreeing on final EPAs. It evaluates the EU-SADC EPAs by means of a comparison with the relevant WTO-compatible alternative options. The thesis undertakes detailed country- and sector-specific impact projections for individual SADC members.

The study aims at tackling an interrelated set of research questions. Who gains and who loses from the EU-SADC EPAs? What are the determinants for the potential outcomes of the EU-SADC EPAs? Will liberalizing intra-SADC trade affect the potential impacts and, if so, in what direction? Do the EU-SADC EPAs help SADC to effectively integrate into the world economy? Do the EU-SADC EPAs offer export opportunities for SADC products in the EU markets? How do the EU-SADC EPAs affect SADC trade with third parties and with other SADC partners? What type of structural change might SADC experience under the EU-SADC EPA scenarios? How significant are potential adjustment costs for the SADC members likely to be? Do the EU-SADC EPAs help SADC members to diversify their export structures? Furthermore, as different SADC members face different alternative options to a completion of the EU-SADC EPAs, the thesis addresses the important question whether, for any of the SADC members, a complete breakdown of the EPA negotiations is actually a preferable option.

1.3 Methodological Approach and Simulation Design

Evidently, answering these research questions requires contemplating individual SADC members, the EU, as well as SADC's main non-EU trade partners within an internally consistent modelling framework. Therefore, the thesis uses a comparative static multi-region, multi-sector computable general equilibrium (CGE) model. The model captures not only first order effects but also feedback effects generated by the simulated trade shocks. The model is calibrated to the most recent version of the Global Trade Analysis Project (GTAP) database; i.e. GTAP version 7, which is referenced to 2004.[7]

The core quantitative assessment is conducted in two simulation phases. The first simulation phase quantifies the potential impacts of the envisaged EPA liberalization scenarios in comparison to the 2004 benchmark equilibrium. This phase addresses the interesting question how the EPAs compare to the status quo ante prior to the expiry of the WTO waiver for the Cotonou preferences. This is more than a purely academic question, given that some critics of the EU EPA process have, indeed, proposed that the EU should have applied for an extension for the WTO waiver.[8] The second simulation phase, in turn, takes into account that a return to the status quo ante is actually not a politically feasible fall-back option at this stage and compares the EU-SADC EPAs with the WTO-compatible alternative options that reflect other possible ways for individual SADC members to liberalize their trade with the EU in the case of not reaching agreement on final EU-SADC EPAs.

[7] The GTAP8 database, which is referenced to both 2004 and 2007, has been recently released in March 2012. GTAP is coordinated by the Center for Global Trade Analysis, Department of Agricultural Economics at Purdue University, West Lafayette, USA. See the Center for Global Trade Analysis, https://www.gtap.agecon.purdue.edu/.

[8] Indeed, the Ministerial Monitoring Committee (MMC) for West Africa's EPA negotiations has requested the European Commission (EC) to extend the WTO waiver "in order to pursue the negotiations in a non-pressured atmosphere and to achieve a mutually advantageous agreement", (Olympio, Sacko and Fifatin 2008, p. 12).

1.4 Examined Impacts and Targeted Variables

The thesis examines the implications of the EU-SADC EPAs for welfare, output and trade structures, resource allocation, prices and fiscal revenue.

Within the general equilibrium framework of this study, the overall economy-wide and sectoral impacts are examined. The generated results are examined at both aggregate and sectoral levels for individual SADC members. Welfare impacts are examined at the aggregate levels and, thereby, winners and losers are identified. Terms of trade impacts are analyzed in order to gain better understanding of the likely welfare impacts.

Interpreting the changes in bilateral trade balances, captured by the model, requires more detailed analyses of the underlying changes in price as well as industrial and trade structures at the sectoral level. The study, consequently, undertakes a close investigation of trade impacts on SADC members, covering total trade, trade with the EU, intra-SADC trade and trade with third parties.

The analysis proceeds by measuring fiscal losses SADC members will have to endure by liberalizing trade with the EU. Furthermore, the study provides indications of the potential costs each economy would have to bear during its adjustment process to a policy shock.

Rigorous diagnostic analyses are undertaken for the experienced trade effects in order to quantify trade diversion and trade creation effects. Obviously, this requires more detailed sectoral analyses of price and structural change in the industrial and trade structures in each SADC economy. In addition, hypothetical scenarios are implemented in order to trace the potential changes in trade prices and levels if all SADC trade partners were treated equally.

CGE models are often described as 'black boxes' referring to the complex transmission channels through which the model findings are delivered. The simultaneous interdependence among the endogenous variables makes it difficult, sometimes even for the modellers themselves, to diagnose the causality links and to identify the main determinants of the model findings. Panagariya and Duttagupta (2001, p. 40) argue that

> "Unearthing the features of CGE models that drive …. [the gains from preferential liberalization] is often a time-consuming exercise. This is because their sheer size, facilitated by recent advances in computer technology, makes it difficult to pinpoint the precise source of a particular result. They often remain a black box. Indeed, frequently, authors are themselves unable to explain their results intuitively and, when pressed, resort to uninformative answers such as "trade creation dominates trade diversion" or vice versa".

By acknowledging this difficulty, the thesis aims to contribute better understanding of the generated results from multi-region, multi-sector CGE models. The main simulation scenarios are decomposed into two components according to the source of the simulated tariff cuts; the SADC and the European side. This helps to gain clear insights of the results and their determinants. The generated welfare impacts are decomposed according to the component of the simulated trade shock that derives the impact. Furthermore, detailed country- and sector-specific analyses are used to open up these boxes in such a way that allows for tracing the transmission channel of the impacts. The simulation results are interpreted on the basis of previously implemented descriptive analyses of SADC production structures and trade relationships at the baseline equilibrium. Accordingly, rigorous insights on the causes of the simulation results are provided.

1.5 Research Relevance, Importance and Contributions

The thesis aims to contribute novel insights to the ongoing debate on the EU-SADC EPAs. The impact of the EPAs on SADC members has been the subject of contentious debate in the relevant literature as well as at the negotiating table. This stems from, at least, three grounds: theoretical debate, complexities in the regional architecture of SADC as well as rigidities and distortions embodied in SADC production and trade structures.

The envisaged EU-SADC EPAs adopt a set of various objectives. The salient ones are promoting development, reinforcing regional integration and helping SADC members to effectively integrate into the world economy. The relevant theoretical framework shows long debate of whether regional integration is a pro-development strategy. Furthermore, no clear-cut linkage from preferential liberalization and multilateral liberalization is provided.

The debate becomes more complicated as regards SADC integration with the EU. The SADC region is a classic example for a 'spaghetti bowl' of overlapping trade arrangements in which trade is eligible for 'crisscrossing' trade preferences. Therefore, two questions need to be addressed. Firstly, to what extent does SADC efficiently utilize these preferential arrangements? Secondly, is the underlying approach of the envisaged EPAs effective in helping SADC to rationalize this multiplicity and eventually integrate into the world economy?

SADC production structures are, to a great extent, homogenous. This is reflected in their undiversified exports and, consequent, weak trade complementarity within the region. In addition, SADC trade balances are skewed towards the EU. These structural features make the task of reciprocal trade liberalization with the EU particularly challenging for individual SADC members.

This ongoing debate emphasizes the importance of this study. The thesis findings serve to illustrate the prospective impacts in individual SADC member states. They thus enable SADC members to identify the scenarios that maximize gains from the EPAs. Besides, the thesis provides a comparative analytical framework for the situation under different WTO-compatible alternatives to the EPAs. From SADC's perspective, the research provides cost-benefit analysis of alternative EPA scenarios.

Given the premised goal to promote development in SADC members, the results are also useful for the EU in conducting an impact assessment of the envisaged EPAs.

This study provides novel, detailed country- and sector-specific analyses of the prospective effects of the EU-SADC EPAs on individual SADC members. Furthermore, it contemplates other alternatives to the EU-SADC EPAs as well as the major likely changes in the relevant multilateral trade agreement. To the best of my knowledge, there is no work yet that examines the effects of the EU-SADC EPAs on the individual SADC countries at this level of sectoral detail using the most recent version of the GTAP database.

1.6 Structure of the Thesis

In addition to this introductory chapter, the thesis is organized into six core chapters followed by a concluding chapter.

Chapter 2 aims at contextualizing the EU-SADC EPAs. It describes the institutional background of the envisaged agreements and portrays the alternative frameworks for liberalizing SADC-EU trade. It presents the EPAs objectives, negotiation configurations and evolutions; and provides detailed analyses of the agreed liberalization programmes between the EU and all SADC members. Furthermore, it reviews the WTO-compatible alternative frameworks for SADC trade with the EU (the EU-GSP, the EU-EBA and the EU-South Africa TDCA) and describes more broadly the EU sugar trade liberalization and reforms.

Regional integration is a central aspect of both international trade theory and applied trade policy analysis. The impacts of discriminatory trade liberalization depend mainly on the pre-liberalization economic features and trade relationships among member countries as well as their trade linkages with the rest of the world. Furthermore, the institutional features of the regional group itself are main determinants for the integration outcomes.

Chapter 3 places the thesis in its appropriate position within the relevant literature. It provides a critical review for both theoretical and empirical studies. It discusses the theoretical foundations and the analytical issues that surround the exercise of analysing the impacts of RTAs. Furthermore, it reviews a list of selected studies that examine the impacts of the EU-SADC EPAs. The studies included in the review are chosen to represent different methodological frameworks: partial equilibrium analysis, general equilibrium analysis and complementary approaches. The review thus serves to shed light on various perspectives and differentiated conclusions for the thesis research topic.

For a given economy, the structural features, trade relationships as well as the initial protection conditions are among major determinants of its response to the changes in trade policy. Therefore, a close inspection of these features for the economies under consideration provides preliminary suggestions on the potential welfare and trade effects of the simulated changes in trade policy. Furthermore, they are essential in identifying the main transmission channels and, thus, in understanding the dominant causal mechanisms that drive the results of the quantitative simulation analysis.

Chapter 4 examines the main features of the SADC economies. After introducing the GTAP database, it analyzes the structural characteristics and initial conditions for SADC economies as captured by the baseline equilibrium, which serves as the starting point for the simulation analysis in subsequent chapters. The chapter provides detailed examinations for the nature of SADC trade and protection profiles at three levels: within the region, with the EU and with other major trade partners. These analyses give preliminary initial indications of potential impacts induced by the envisaged EPAs with the EU.

Chapter 5 provides a detailed description of the employed CGE model. It describes the behavioural specification for the different agents in the model and presents the different closure rules that are adopted under the simulation scenarios provided in Chapters 6 and 7. Furthermore, macroeconomic indicators employed by the study in order to measure welfare, terms of trade as well as the adjustment degree in factor markets are explained. The chapter concludes with a discussion of the rationale behind choosing this model as an analytical framework for the study and the limitations of the analysis.

Chapter 6 quantifies the potential effects of the alternative EU-SADC EPA scenarios on individual SADC members. It assesses the implications for welfare, output and trade structures, resource allocation, prices and fiscal revenue. The chapter carries out a series of three simulation sets; each set consists of two liberalization scenarios. The first scenario simulates the case in which the EPA negotiations are confined to the SADC-EPA group only whereas the second main simulation scenario considers all SADC members in a comprehensive EPA scenario. The second simulation set represents the case in which SADC liberalizes its trade with the EU according to the previous two scenarios and simultaneously completes its intra-regional trade liberalization. The last simulation set assumes that tariff revenue losses generated by each of the two main scenarios are offset through a rise in domestic sales tax rates. In addition, the chapter runs a series of sensitivity analyses in order to test the robustness of the model results with respect to variations in the model settings and the liberalization degree and coverage.

While the preceding chapter examines the impacts of alternative EU-SADC EPA scenarios, Chapter 7 deals with the alternative scenarios to the EU-SADC EPAs. It aims to examine the possible ways for different SADC members to liberalize their trade with the EU in the case of not agreeing on final EPAs. It employs three alternative simulation scenarios. The first one simulates the EU-EBA (for SADC LDCs), the EU-GSP (for SADC non-LDCs) and the EU-South Africa TDCA (for South Africa). In addition to these alternative trade arrangements, the EU sugar reforms and the Doha Round are simulated to examine their implications for the assessment of the EU-SADC EPAs.

Finally, Chapter 8 revisits the research questions posed above and provides answers. It compiles the generated simulation results under different scenarios and gives inferences that serve to answer the underlying research questions. Furthermore, it reflects on some policy implications and acknowledges the limitations of the analyses. Based on these reflections, the chapter concludes with suggestions for areas for future research.

The quantitative results generated by the thesis are presented in a consistent framework that facilitates comparison between the simulated scenarios and the baseline scenario on one hand and comparison across scenarios on the other. To facilitate the exposition, results at the aggregate level are included in the main text while further disaggregated results are relegated to separate appendices to Chapters 4, 6 and 7 at the end of the thesis. Tables provided in the appendices are tagged by the letter 'A'.

2 The EU-SADC Economic Partnership Agreements

2.1 Introduction

EU-SADC trade has been governed by the Cotonou Agreement. The Cotonou Agreement was implemented through a WTO waiver that allowed the EU to provide non-reciprocal trade preferences to the ACP states until December 2007. Alongside the Cotonou Agreement, the EU launched negotiations with SADC on EPAs in 2002. These envisaged EPAs are not the only WTO-compatible framework. If final EPAs with the EU are not concluded, the SADC LDCs could maintain their duty-free, quota-free access to the EU markets under the EBA initiative. The SADC non-LDCs would face the EU-GSP tariffs which entail a reduction in their preferential access to the EU markets granted under the Cotonou Agreement. South Africa already has a FTA with the EU, i.e. the EU-South Africa TDCA.

This chapter aims at contextualizing the EU-SADC EPAs. It describes the institutional background to the envisaged EPAs and outlines the alternative frameworks for liberalizing SADC-EU trade.

The chapter is structured as follows. Section 2.2 introduces the EPAs objectives, negotiation configurations and evolution over time. It also presents the nature and extent of the overlap between SADC and other regional groupings and examines the implication of SADC multiple memberships for intra-SADC integration and for the EU-SADC EPAs. Section 2.3 provides detailed analyses of the agreed liberalization programmes between the EU and all SADC members. It also summarizes the development components of the agreements as well as the challenges surrounding the negotiation process for the EPAs. Section 2.4 reviews the WTO-compatible alternative frameworks for SADC trade with the EU. It starts with the preferential trade arrangements available for SADC members: the EU-GSP, the EU-EBA and the EU-South Africa TDCA. Then, it describes more broadly the EU sugar trade liberalization and reforms. Finally, Section 2.5 provides some policy implications.

2.2 The EU-SADC EPAs

The EU has been granting non-reciprocal preferences to the ACP states under the Cotonou Agreement since 2000. According to the WTO Cotonou waiver, the EU was allowed to provide non-reciprocal preferences until December 2007, and thereafter non-reciprocal preferences should be replaced by reciprocal trade commitments in compliance with Article XXIV of the GATT. The Cotonou non-reciprocal preferences are not directed to all developing countries and they therefore cannot be covered by the 'Enabling Clause' and have to be operated under the WTO waiver.

Consequently, the EU launched negotiations with the ACP states in 2002 on EPAs that were supposed to be completed by the end of 2007. The negotiations are organized into two phases. The first phase operates at an all-ACP level whereas the second phase, which started in 2004, targets different regional groups. The Cotonou Agreement (Article 37.5) states that the EPA negotiations should be undertaken with the ACP countries "… at the level they consider appropriate and in accordance with the procedures agreed by the ACP Group, taking into account regional integration process within the ACP", (European Commission 2000). Accordingly, geographic configurations were originally identified to organize seventy seven ACP states into six negotiating groups: West Africa-EPA, Central Africa-EPA, Eastern and Southern Africa (ESA)-EPA, SADC-EPA, Caribbean-EPA, and Pacific-EPA groups. In September 2007, the East African Community (EAC)-EPA was formed as an additional negotiating group. Table 2-1 lists the member countries for each of these groups.

Table 2-1: ACP-EPA Negotiating Groups

EPA Group	Member States	Regional Group
West Africa-EPA Group	Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo	UEMOA & ECOWAS
	Gambia, Ghana, Guinea, Liberia, Nigeria, Sierra Leone	WAMZ & ECOWAS
	Cape Verde	ECOWAS
	Mauritania	
Central Africa-EPA Group	Cameroon, Central African Republic, Chad, Congo (Brazzaville), Equatorial Guinea, Gabon, São Tomé and Principe	CEMAC & ECCAS
	Congo, D.R. (2005)	CEMAC, ECCAS & SADC
ESA-EPA Group	Congo, D.R. (2004)	CEMAC, SADC & COMESA
	Kenya (2004), Uganda (2004)	IGAD, EAC & COMESA
	Djibouti, Ethiopia, Eritrea, Sudan	IGAD & COMESA
	Malawi, Mauritius, Madagascar, Seychelles, Zambia, Zimbabwe	SADC & COMESA
	Burundi (2004), Rwanda (2004)	ECCAS & COMESA
	Comoros	COMESA
SADC-EPA Group	Botswana, Lesotho, Namibia, Swaziland, South Africa	SACU & SADC
	Angola, Mozambique, Tanzania (2004)	SADC
EAC-EPA Group (2007)	Tanzania (2007)	EAC & SADC
	Burundi (2007), Kenya (2007), Rwanda (2007), Uganda (2007)	EAC
Caribbean-EPA Group	Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St. Lucia, St. Vincent and the Grenadines, St. Kitts and Nevis, Suriname, Trinidad and Tobago	CARICOM
Pacific-EPA Group	Cook Islands, The Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu	Pacific Island Forum

Source: Compiled by the author.

2.2.1 Objectives and Instruments

The Cotonou Agreement (Article 1) states that "The partnership shall be centred on the objective of reducing and eventually eradicating poverty consistent with the objectives of sustainable development and the gradual integration of the ACP countries into the world economy", (European Commission 2000). Therefore, the vision for the envisaged EU-ACP EPAs goes beyond securing reciprocal market access and aims at establishing inclusive frameworks with a wide set of trade and development components. The EU-SADC EPAs are supposed to help SADC members to reduce poverty, maintain sustainable development and to effectively integrate into the world economy. Based on this vision, provisions for trade in goods and services, competition and investment policies, and other pro-development measures are planned to be included in the full EU-ACP EPAs, (European Commission 2007a).

Despite these declared objectives, there is no clear consensus about the appropriate instruments that should be implemented by the EU-SADC EPAs in order to accomplish these objectives. In practice, the EPA negotiations reveal a great deal of dispute among the SADC representatives, on one hand, and between them and their European counterparts on the other. These disputes stem, *inter alia*, from different perspectives regarding the agreements' objectives, provisions and the embodied development components. Indeed, "… different readings of the 'development component' of EPAs are symptomatic of an increasing division between the EU and the ACP as a result of the EPA negotiating process", (Meyn 2008, p. 516).

A clear-cut example is how the objective of 'integration into the world economy' and the role of regional integration are perceived within the EU-SADC EPAs context. As aforementioned, enabling SADC countries to effectively integrate into the world economy is a main objective of the EU-EPAs. Furthermore, the Cotonou Agreement (Article 35.2) recognizes enhancing regional integration as "… a key instrument for the integration of ACP countries into the world economy", (European Commission 2000). Nevertheless, the two negotiating parties adopt different approaches in achieving this goal.

Based on its own integration experience, the EU presumes that SADC countries will be able to integrate effectively into the world economy by opening up their markets with the EU. This liberalization policy per se is expected to lead to more diversified production structures, create a reliable economic climate and attract foreign investment, with these changes eventually enabling SADC to integrate into the world economy. On the other side of the negotiating table, SADC negotiators have different views of effective integration into the world economy. SADC members aim to attract foreign investment and resources required for enhancing their integration into the world economy. Their perspective is that foreign investment should directly target manufacturing activities, particularly export-oriented manufacturing. In a study that examines the role of FTAs in stimulating foreign direct investment (FDI) and promoting integration into the world economy, Robles Jr (2008, p. 188) argues that the EU-SADC and Mercosur EPAs "… will not necessarily encourage EU FDI into these two regions and might not even increase the resources available to members of these two organisations for supporting local firms".[1]

2.2.2 Negotiation Configurations

According to the EPA negotiation configurations, SADC members were originally allocated into two negotiating groups (i.e. SADC-EPA and ESA-EPA). D.R. Congo joined the Central Africa-EPA group in 2005 and, then, the EAC-EPA group was formed in September 2007. The point to highlight here is that these geographical configurations cut across different regional trade groups in the SADC region. Figure 2-1 depicts the overlapping RTAs for SADC members as of 2004.

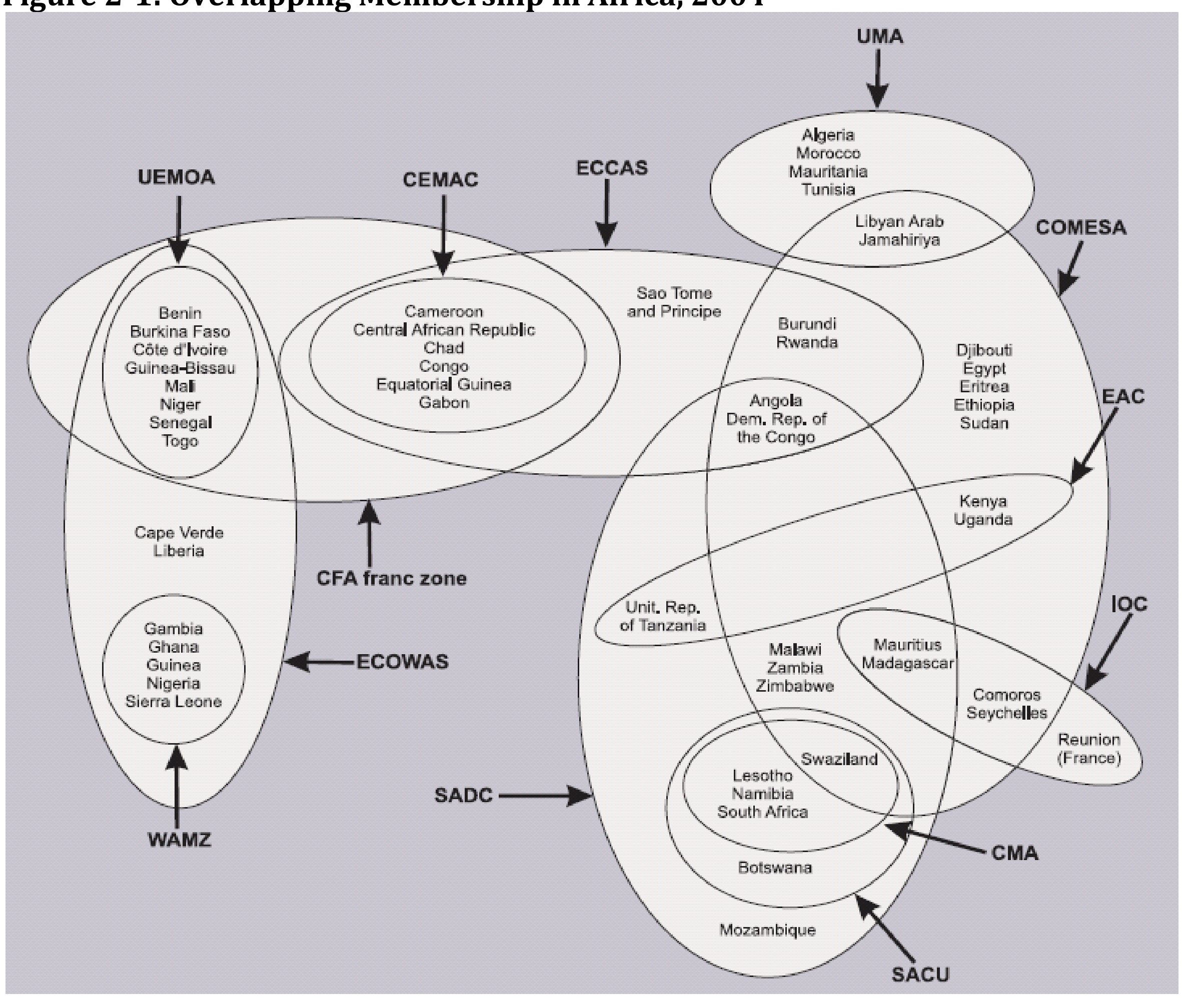
Overlapping membership for SADC members has important implications for the progress of SADC negotiation with the EU and for the SADC regional integration process. Furthermore, the EU-ACP EPAs aim at enhancing existing regional integration. The integration approach of the EU-SADC EPAs provides opportunities and incentives for SADC members to resolve this overlapping complexity. It is, thus,

[1] There is a voluminous strand of literature that examines whether enhancing regional integration eventually enables country members to effectively integrate into the world economy. This literature is presented in detail in Chapter 3.

pertinent to examine the interaction between SADC multiple memberships and the EU-SADC EPAs.

This sub-section starts by describing the different regional groups with which SADC overlaps (Sub-section 2.2.2.1) before moving to analyzing the implications for SADC integration (Sub-section 2.2.2.2). Sub-section 2.2.2.3 examines how this overlapping membership affects the EPA negotiations. It aims at answering the question how different SADC-EPA configurations can be reconciled in a way that does not violate various regional commitments and facilitates the progress of the negotiations. The analysis is confined to the most important three regional organizations with which SADC overlaps: the Southern African Customs Union (SACU-CU), EAC-CU and the Common Market for Eastern and Southern Africa (COMESA-CU).

Figure 2-1: Overlapping Membership in Africa, 2004



Source: United Nations Conference on Trade and Development (2007), p. 99.

2.2.2.1 Overlapping Trade Agreements

All SADC members, except Mozambique, participate in more than one regional integration grouping and are engaged in a number of other bilateral and multilateral agreements. Five SADC members form the SACU-CU, Tanzania is a member of the EAC-CU and eight SADC states are members of the COMESA-CU. D.R. Congo is a member of the Economic and Monetary Community of Central Africa (CEMAC).[2]

Furthermore, SADC members are involved in several regional initiatives, which do not officially form regional organizations, and other bilateral trade agreements. Nine members (i.e. Madagascar, Malawi, Mauritius, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe) are involved in the Cross Border Initiative (CBI) that aims at promoting trade and investment. Madagascar, Mauritius and Seychelles are involved in the Indian Ocean Commission (IOC).[3] D.R. Congo is a member of the Economic Community of the Great Lakes Countries (ECGLC). In addition, SACU members have a FTA with Malawi and three of them (Botswana, Namibia and South Africa) have a FTA with Zimbabwe.

2.2.2.1.1 SADC-FTA

The SADC Protocol on Trade was established in 2000 when the majority of SADC members approved the free trade accord.[4] In March 2004, SADC announced an ambitious integration plan that includes establishing SADC-CU by 2010,[5] launching a common market by 2012 and, eventually, establishing a central bank and issuing

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[2] CEMAC, which is an abbreviation of its French name Communauté Économique et Monétaire de l'Afrique Centrale, was established in 1994 and entered into force in 1999. CEMAC members along with Angola are also members of the Economic Community of Central African States (ECCAS), which is known in French as Communauté Économique des États d'Afrique Centrale (CEEAC). ECCAS has broader objectives that include peace promotion and political cooperation. In 2007, Rwanda terminated its membership of ECCAS and withdrew its application to join SADC in order to join EAC.

[3] IOC is known in French by the Commission de l'Océan Indien. It is an inter-governmental organization that encompasses Comoros beside France as a representative for Réunion Islands. ECGLC is known in French as Communauté Économique des Pays des Grand Lacs (CEPGL).

[4] For the full documentation of the SADC Protocol on Trade, see Southern African Development Community (2010b).

[5] Arndt et al. (2007) examine different modalities for the planned SADC-CU. The study finds that intra-SADC trade liberalization has potential gains for SADC economies, among which is improving their international competitiveness. The study, however, highlights the importance of complementary policies that improve infrastructure and rationalize transaction costs within the region. It concludes that creating a SADC-CU will significantly enhance trade facilitation in the region.

SADC common currency by 2016.[6] Twelve members established the SADC-FTA in August 2008. Angola and D.R. Congo expressed their intention to join in the near future. Seychelles, which rejoined the community later in 2008, is considering the FTA-formalities.

According to the SADC Protocol on Trade, tariffs on 85 percent of intra-SADC trade lines were to be phased out beginning in 2001 and entirely removed by the end of 2007. Asymmetric liberalization schedules were implemented by SADC members, and members were classified *ad hoc* according to levels of development into three groups. The ‘Front Loading Group’ includes SACU members, i.e. Botswana, Lesotho, Namibia, South Africa and Swaziland. This group immediately applied trade liberalization, beginning in 2001. The ‘Mid Loading Group’ that comprises the two developing non-SACU SADC members (i.e. Mauritius and Zimbabwe) started removing tariffs in 2004. Finally, the ‘Back Loading Group’ includes SADC LDCs (i.e. Angola, D.R. Congo, Malawi, Madagascar, Mozambique, Tanzania and Zambia) and this group did not begin liberalizing intra-SADC trade until 2006.

The remaining tariff lines, which include textiles, clothing and motor vehicles, are planned to be phased out by 2012. As a special non-reciprocal arrangement, non-SACU SADC sugar exports are granted duty-free access to the SACU markets, with full reciprocal liberalization planned for 2012, taking into consideration the status of the world sugar markets.[7] Furthermore, all members are supposed to entirely eliminate non-tariff barriers (NTBs) and not to impose any new ones, with the exception of NTBs for health and safety purposes.

As noted above, the tariff elimination provisions have been implemented under a gradual annual schedule since 2001. Nevertheless, many empirical studies (e.g. Niekerk and Moreira 2002) argue that intra-SADC trade liberalization process fell behind its planned schedule. Indeed, a Mid-Term Review of the Implementation of the SADC Protocol on Trade shows that Malawi, Mozambique, Zimbabwe and Tanzania

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[6] According to the African Economic Outlook (OECD et al. 2011, p. 58), SADC-CU is expected to take place in 2011.

[7] This arrangement is governed by the SADC Sugar Cooperation Agreement launched under the Annex VII of the SADC Protocol on Trade. For further information, see Southern African Development Community (2010b).

are behind their planned liberalization schedules.[8] Back-loading of liberalization arrangements entails that these members will have to liberalize more than half of their tariff lines in only one year, the procedure that will yield sharp fiscal losses.

Moreover, the removal of NTBs has proved to be challenging for SADC, the region that contains many landlocked countries whose trade has to cross several borders. Using gravity model estimations, Behar, Manners and Nelson (2009) find a positive significant impact of improving neighbours' logistics (e.g. efficiency of the clearance process, shipment facilities and transport and information technology infrastructure) on exports. This finding is particularly relevant for the landlocked SADC states. Simplifying and harmonizing trade regulations among SADC members would enhance the efficiency of the clearance and shipment process for trade that crosses several borders and would, thereby, stimulate SADC trade. Interestingly, Behar and Edwards (2011) suggest that NTBs, when controlled to income levels and geography, are not particularly restrictive to intra-SADC trade in comparison to countries at similar development stage. The study presents variations in the extent and type of NTBs among SADC members. NTBs are relatively low in Madagascar, Mauritius, Mozambique and Tanzania. However, complicated logistics (for Angola, Botswana, Namibia, Mauritius and Zambia) and the required time and cost of trade (for SACU, Angola, Zambia and Malawi) prove to be major trade impediments. The weak performance of the intra-SADC integration process is also attributed, *inter alia*, to fragmented markets, lack of institutional capacity and conflicting political interests.[9]

An important analytical question in the EU-SADC EPAs context is, thus, to what extent, and in what direction, will the envisaged EPAs affect the intra-SADC integration process. In other words, will the EU-SADC EPAs facilitate SADC regional integration or will they impose further challenges to the already slack regional group?

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[8] The Review is undertaken in 2004 by the USAID funded Southern Africa Global Competitiveness Hub (SA Trade Hub), see The USAID – The Services Group (2007).

[9] There is large body of literature on the political economy of regional integration in the region. As a recent example, Hansohm and Adongo (2008) examine the political dynamics behind the actual implementation of regional integration in eastern and southern Africa. The study provides useful insights on the political, economic and social governance for different regional groups, among which are SADC and COMESA.

2.2.2.1.2 SADC Inclusion of SACU-CU

SACU-CU comprises five of the SADC members, i.e. Botswana, Lesotho, Namibia, Swaziland and South Africa.[10] SACU internal trade is fully liberalized and it employs a common external tariffs (CET) on its external trade. In addition, SACU pursues a revenue-sharing formula to collect and distribute the region tariff revenues.

Lesotho, Namibia and Swaziland expressed concerns about a diminishing revenue pool as a result of launching the TDCA-FTA between South Africa and the EU; this agreement will be dealt with in detail in Sub-section 2.4.1.3. Consequently, a new formula was launched in 2002 aiming to compensate the less developed and fragile SACU economies.[11]

The revised formula contains three components. First, customs revenues are distributed according to the members' shares in intra-SACU imports. This entails compensating those members who depend more on imports from within the region. Nevertheless, Edwards and Lawrence (2008) argue that this criterion causes contentions, since member countries tend to overestimate their intra-SACU trade, as well as instability in customs revenues for BLNS countries. Second, revenues from excise duties are distributed according to the economy size after allocating a fixed portion to the development component. The latter is evenly distributed across members. As such, the members that provide larger contributions benefit the least from the development fund and vice versa. Indeed, South Africa provides the bulk of the development component and acquires only a quintile of it.[12]

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[10] SACU is the oldest CU in the world, dating back to 1910. SACU Agreement was approved in 1969. In November 1994, negotiations were launched to amend the Agreement. Eight years later, the new SACU Agreement was concluded in 2002.
In 2005, SACU signed a FTA with the USA called Trade, Investment and Development Cooperation Agreement (TIDCA). The agreement entered into force in 2008. SACU-Mercosur Preferential Trade Agreement was signed in 2004 and it is expected to enter into force in 2010.

[11] For more details, see Alden and Soko (2005, pp. 371- 373).

[12] For an assessment of the SACU-new Agreement, sharing formula and, more broadly, the included compensation instruments, see Kirk and Stern (2005, pp. 169-190).

2.2.2.1.3 SADC Intersection with EAC-CU

Tanzania, Uganda and Kenya announced the EAC-CU on 1st January 2005. Burundi and Rwanda joined in 2007. On 20th November 2009, the five member states signed a common market protocol for goods, labour and capital that came into force in July 2010. The East African Monetary Union (EAMU) is planned to be established by 2012 that is envisaged as a step towards a political federation of the East African States at a later stage of the EAC integration process.

The immediate provisions of the EAC-CU protocol are full liberalization of total imports by Kenya as well as the majority of imports by Uganda and Tanzania. Gradual tariff elimination is to be applied to sensitive imports for the two countries until full liberalization that was supposed to take place in 2010.

Since 2005, Tanzania has had to follow a CET with its EAC partners. The EAC-CET contains three tariff bands: 0 percent, 10 percent and a maximum rate of 25 percent, while the latter will be revised after 5 years and likely reduced to 20 percent. Tariff rates higher than the maximum CET rate are applied to imports of sensitive goods into the EAC region.

According to the SADC-FTA, Tanzania is expected to provide free access for imports originated in the SADC states. This poses a contradiction with its EAC arrangements. As a compromise to this conflict, the EAC partners agreed to temporarily exempt the tariff preferences that have been granted to third countries prior to announcing the EAC-CU protocol from their CET.[13] However, by the time the SADC-CU enters into force, Tanzania would have to consider terminating one of its two CU memberships.

[13] This exemption was valid also for the tariff preferences granted for Kenya's and Uganda's previously COMESA-FTA partners.

2.2.2.1.4 SADC Overlaps with COMESA-CU

Eight SADC states (D.R. Congo, Madagascar, Malawi, Mauritius, Seychelles, Swaziland, Zambia and Zimbabwe) are concurrently members of COMESA.[14] Five of the eight COMESA/SADC members were part of the COMESA-FTA that was launched in 2000. D.R. Congo and Seychelles were eligible only for limited duty-free access to the other COMESA members. Swaziland, which is a member of the SACU-CU, was exempted from opening its markets to the other COMESA members.

At the 13th Summit of the COMESA Heads of State and Government in June 2009, the COMESA-CU was launched between 19 members. The member states were granted three years to adapt their tariffs in accordance with the COMESA-CET that is scheduled for 2012. The full removal of barriers to the movement of goods, services, capital and people is supposed to take place in 2025.

The COMESA-CET contains four tariff bands: zero-rate for raw materials and for capital goods, 10 percent for intermediate goods and 25 percent for finished goods. Members identify sensitive products on which different rates than the CET rates are applied. Khandelwal (2005) assesses the impact of applying the COMESA-CET on member states. The study shows that the CET will generate high adjustment costs for Angola, Madagascar, Mauritius, Seychelles and Zimbabwe in addition to sizable revenue losses for Madagascar, Mauritius and Zimbabwe.

The launch of the COMESA-CU has important implications for SADC/COMESA members. Taking into consideration that the potential for the harmonization of the SADC-CU and the COMESA-CU is limited, the launch of the COMESA-CU implies that SADC/COMESA members will need to make serious decisions about their membership in the planned SADC-CU. In accordance with these decisions, COMESA and SADC members will need to adapt their EPA liberalization programmes.

[14] Beside the eight the SADC states, Burundi, Comoros, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Rwanda, Sudan and Uganda are also members of COMESA. Another four SADC states terminated their COMESA membership (i.e. Lesotho and Mozambique (1997), Tanzania (1999), Namibia (2004)) and, in 2007, Angola suspended its membership.

2.2.2.2 Implications for Intra-SADC Integration

Notionally, overlapping membership for members of CUs is unsustainable. In the SADC context, three CUs (i.e. SACU, EAC and COMESA) are already operating. SADC overlaps with the COMESA-CU and the EAC-CU is a challenge since their integration agendas are dynamic and compete with the SADC agenda.

USAID - the Services Group (2007, pp. 8-17) shows that intra-SADC trade outside the SACU region is organized by either COMESA or various bilateral preferences. Afesorgbor and Bergeijk (2011) employ a modified version of the gravity model to quantify the impact of overlapping membership on intra-regional trade for SADC and COMESA during the period 1995-2006. Interestingly, the study demonstrates that being a member of another regional group augments intra-COMESA bilateral trade by 0.83 percent. Conversely, overlapping membership does not stimulate bilateral trade among SADC members. It might also hinder the process of implementing SADC trade regulations. The study explains this by inconsistent trade regulations and conflicting RoOs between SADC, on one side, and the regional groups with which SADC overlaps (i.e. COMESA, ECCAS and EAC) on the other.

Harmonizing the tariff schedules and ensuring coherence in the regional agendas of COMESA and SADC are particularly crucial for the eight SADC/COMESA members. If SADC-CU is proceeding as planned, its provisions (e.g. CET and RoOs) need to be reconciled with those of COMESA-CU. A failure to fulfil such reconciliation would mean that SADC/COMESA members will have to terminate one of their memberships by the time SADC-CU is launched. For that reason, Jakobeit et al. (2005) suggest merging SADC and COMESA in one FTA.[15]

Indeed, the idea of merging SADC, COMESA and EAC into a joint FTA was proposed at the first COMESA-EAC-SADC Tripartite Summit in 2008. A Draft Tripartite FTA Agreement was revised in 2010 and the member states agreed on the principles of the

[15] In a study on different pathways for the EAC members, Stahl (2005) argues that the differences between the EAC and the COMESA configurations, in terms of CETs and RoOs, are less pronounced compared to those between EAC and SADC.

negotiations and laid out a roadmap for provisions and action plans at the second COMESA-EAC-SADC Tripartite Summit in 2011.[16]

2.2.2.3 Implications for the EPA Negotiations

Overlapping membership for SADC countries continues to impose challenges to their negotiation progress. As of 2004, both SADC and COMESA were intending to establish CUs; this imposed fundamental conflict for the countries intertwined in both regional communities. As a compromise to resolve their conflicting interests, two EPA configurations were established: the SADC-EPA and the ESA-EPA groups.

These configurations merged the only two operating CUs, at the time, into broader regional groups: SACU into the SADC-EPA group and EAC into the ESA-EPA group.[17] Participating in the SADC-EPA group is exclusive for SADC members whereas the ESA-EPA group is an amalgamation of several regional groups. As seen in Table 2-1, the ESA-EPA includes members of COMESA, SADC, EAC, CEMAC and the Inter-governmental Authority on Development (IGAD).[18]

The SADC-EPA group originally included Botswana, Lesotho, Namibia and Swaziland (the so-called BLNS sub-group); and Mozambique, Angola and Tanzania (the so-called MAT sub-group). In addition, South Africa, who initially participated as an observer, became a full member of the negotiations in February 2007.

Some complications within the SADC-EPA group stream from the TDCA-FTA between South Africa and the EU. BLNS members *de facto* have reciprocal access to the EU markets through their SACU-CU with South Africa. According to the Cotonou principles, no ACP country should be worse off as a result of concluding an EPA with the EU. This, thus, imposes challenges to their negotiation process.

In addition, MAT members had an option to negotiate separately with the EU. Since their bargaining position *versus* the EU is extremely weak, they considered joining

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[16] For more details, see COMESA-EAC-SADC Tripartite Summit (2008) and COMESA-EAC-SADC Tripartite Summit (2011), respectively.

[17] Two CUs (i.e. the West African Economic and Monetary Union (WAEMU) that is known in French as Union Économique et Monétaire Ouest-Africaine (UEMOA) and the West African Monetary Zone (WAMZ)) are merged into the West Africa-EPA group. The West-Africa-EPA group, thus, includes all members of the Economic Community of West African States (ECOWAS) along with Mauritania.

[18] IGAD is known in French as Autorité Intergouvernementale pour le Développement.

either SACU or the ESA-EPA negotiating group. Furthermore, Tanzania and Angola had options to negotiate as members of the EAC and COMESA, respectively. This would imply that Mozambique, which has an option to sustain its non-reciprocal trade relations under the EBA, would have had to negotiate with the EU independently.

In light of these complications, the SADC-EPA group has been shrinking over the course of the negotiations, and is now centred on SACU members and Mozambique only.[19] Tanzania left the SADC-EPA group and has opted to negotiate, and to provide a common offer, with its trade partners in the EAC-EPA group. Angola has chosen to continue benefiting from duty-free market access to the EU market through the EBA initiative.

The rest of SADC members (i.e. D.R. Congo, Madagascar, Malawi, Mauritius, Seychelles, Zambia and Zimbabwe) initially participated in the negotiations as part of the ESA-EPA group. In 2005, D.R. Congo left the ESA-EPA group and joined the Central Africa-EPA group. The ESA-EPA group eventually came to be confined primarily to LDCs when the other EAC members deserted the group in 2007.

Throughout the negotiation process, SADC members have aligned themselves with four different configurations. As seen in Table 2-2, these configurations are the SADC-EPA, the EAC-EPA, the ESA-EPA and the Central Africa-EPA groups. The SADC members that are negotiating outside the SADC-EPA group are mainly LDCs. These two factors together profoundly undermine the bargaining power for SADC and raise concerns about the importance of the community's common interests within the different agendas for the negotiating groups. Meyn (2004) finds that the limited institutional capacity for SADC members to negotiate collectively with the EU does not allow them to seize the implicit opportunities provided by the EPAs process.

Arguably, the EU-EPA approach in enhancing regional integration is to put pressure on the negotiating parties to choose one regional scheme. Hansohm, Adongo and

[19] Mozambique expressed its interests in joining SACU. Mushiri (2006, pp. 59-70) suggests that, if this was the case, Angola and Tanzania would have found it useful to join SACU as well. The USAID - the Services Group (2004) provides detailed analyses of the impacts on Mozambique in the case of joining SACU. For a recent doctoral dissertation on the effects of the SADC-FTA on Mozambique, see Delpiazzo (2009/2010). Interestingly, the study contrasts the results generated under three different theoretical CGE frameworks and demonstrates the significance of the chosen closure rule in determining the models' outcomes.

Tutalife (2005) argue that this approach was effective in rationalizing multiple memberships for some countries in the region. The example taken by the study is Namibia's decision to terminate its COMESA membership in 2004. Nevertheless, SADC's negotiation experience demonstrates that the EPA configurations, which cut across regional groups, can also produce further complications alongside the existing overlapping memberships. Serious concerns are voiced by the SADC negotiators about establishing cross-cutting EU-SADC EPAs, given their potentially adverse implications for completing the envisaged SADC-CU. In light of these complexities, and the observed sluggish progress of the negotiation process, further problems at the implementation stage are expected.

Table 2-2: SADC Overlapping Membership

SADC Members	SACU-CU	EAC-CU	COMESA-CU	EPA Group	Region Classification	The EU-Preferential Regime
Angola				SADC-EPA	LDC	EBA
Botswana	X			SADC-EPA	Non-LDC	GSP
Congo, D.R.			X	Central Africa-EPA	LDC	EBA
Lesotho	X			SADC-EPA	LDC	EBA
Madagascar			X	ESA-EPA	LDC	EBA
Malawi			X	ESA-EPA	LDC	EBA
Mauritius			X	ESA-EPA	Non-LDC	GSP
Mozambique				SADC-EPA	LDC	EBA
Namibia	X			SADC-EPA	Non-LDC	GSP
Seychelles			X	ESA-EPA	Non-LDC	GSP
South Africa	X			SADC-EPA	Non-LDC	TDCA
Swaziland	X		X	SADC-EPA	Non-LDC	GSP
Tanzania		X		EAC-EPA	LDC	EBA
Zambia			X	ESA-EPA	LDC	EBA
Zimbabwe			X	ESA-EPA	Non-LDC	GSP

Note: Here and hereafter, shading indicates SADC non-LDCs and vice versa.
Source: Compiled by the author.

2.3 Negotiation Outcomes and Contentions

2.3.1 Trade Liberalization Programmes

Towards the expiry date of the WTO waiver for the Cotonou preferences (November 2007), none of the negotiating groups was able to conclude a comprehensive EPA. The only exception is the Caribbean-EPA Group.[20] In response to the complexities surrounding the negotiation process, the EC pushed to launch IEPAs at the region-to-region level.[21]

The EU initialled IEPAs with countries from the SADC-EPA, EAC-EPA and ESA-EPA groups.[22] Eleven out of the eighteen African countries that have agreed on region-to-region IEPAs with the EU are SADC members. As seen in Table 2-3, among the signatory SADC members, five are from the SADC-EPA group, another five participate as part of the ESA-EPA group, while Tanzania participates as a member of the EAC-EPA group.

The non-signatory SADC members, excluding South Africa, are all LDCs who have preferential access to the EU under the EBA initiative and, arguably, do not face urgent pressure to conclude agreements. A study on lessons from the EU-ACP EPA negotiations criticizes the EC's approach in negotiating with both LDCs and non-LDCs who are involved in different regional groups with different and, arguably, conflicting interests. Makhan (2009, pp. 6-7) argues that "[d]iverging interests were furthermore emphasised by competing incentives created by EU trade policies for developing countries" and consequently "… there was little incentive for LDCs – i.e. most countries on the African continent – to fully engage in the EPA negotiations". Nevertheless, five LDCs (i.e. Madagascar, Mozambique, Lesotho, Tanzania and Zambia) had voluntarily initialled IEPAs. Lui and Bilal (2009) argue that, overall, the signatory ACP members are those who would have lost their preferential access to the EU markets if they had not agreed on IEPAs.

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[20] At the most recent, only the CARIFORUM countries (except Haiti) have reached a comprehensive EPA covering trade in goods and services, investment as well as other trade-related areas (European Commission 2009).

[21] For a detailed description of the negotiation dynamics and political tensions, see Lorenz (2011). Based on an interview in 2008, Lorenz (2011, p. 132) quotes the ACP Secretary General Sir John Kaputin in his description of this negotiation phase as "fraught with panic, confusion and disagreement".

[22] Further IEPAs have been initialled with key trade partners in the Pacific.

The IEPAs provide largely WTO-compatible market access for trade by both parties, though many trade related issues are still under consideration. The participating SADC members are granted duty-free, quota-free access to the EU markets. Exports by the signatory SADC countries have been eligible for duty-free, quota-free access to the EU markets as of 1st January 2008, with transition periods for rice and sugar. While the transition period for rice is quite short, it lasts until 2015 for sugar.

From their part, the IEPAs signatories are supposed to gradually open their markets to EU exports. According to Article XXIV of the GATT, WTO members can provide preferential market access in the form of a CU or a FTA conditioned that "… the duties and other restrictive regulations of commerce … are eliminated on substantially all the trade" and provided that the formation of this CU or FTA is concluded "… within a reasonable length of time", (World Trade Organization 1986, pp. 41-44). The precise interpretations of 'substantially all the trade' and of 'a reasonable length of time' have been subject to contentious debate at the negotiating table. Precedent suggests that 90 percent of trade is considered 'substantially all trade'. Yet, this share of trade is measured between each pair of partners and, as a result, the actual liberalized trade depends on bilateral trade balances. Therefore, the degree of liberalization differs across the negotiating groups and across the members within a group as well. For example, in the cases of Mauritius and Seychelles, economies which are better off compared to the other SADC members, liberalization coverage is more than 90 percent of their imports from the EU. Table 2-3 presents the liberalization schedules, timeframes and other features of the IEPAs for different SADC states.

2.3.1.1 The SADC-EPA Group

Within the SADC-EPA group, Botswana, Lesotho, Swaziland and Mozambique initialled the IEPA on 23rd November 2007 in Brussels. Namibia initialled the IEPA later, on 11th December 2007, stating that

> "Republic of Namibia has initialled the Interim Economic Partnership Agreement on the understanding that concerns which Namibia had identified throughout the negotiations of the Interim Economic Partnership Agreement would be addressed through the negotiations towards a comprehensive Economic Partnership Agreement", (Republic of Namibia - Ministry of Trade and Industry 2007, p. 1).

The IEPA was signed by all participants but Namibia in June 2009. Both the IEPA signatory sides agreed on resuming negotiations over an inclusive EPA formula that accommodates all SADC members.

As shown in Table 2-3, the IEPA includes liberalizing 86 percent of imports from the EU by Botswana, Lesotho, Namibia and Swaziland by 2015 at the latest. This liberalization arrangement is in line with the EU-South Africa TDCA that calls for liberalizing 86 percent of South African imports from the EU over twelve years; this agreement is described later in detail. Mozambique is only required to liberalize 80.5 percent within 16 years, while sensitive imports include agricultural products and textiles, (European Commission 2007b).

The IEPA provides potential opportunities for the SADC-EPA group. Examples include removing the remaining special duty (8 percent) on Botswana beef exports to the EU and waiving the quota restrictions on Swaziland sugar exports in October 2009. The envisaged improvements in RoO for textile exports have special importance for Botswana and Swaziland. Mozambique has already been granted duty-free, quota-free access to the EU markets under the EBA initiative. However, attracting multinational enterprises to invest in sugar and bananas exporting sectors could be potential opportunities for the country, (Agritrade 2010b).

Table 2-3: The EU-SADC IEPAs: Liberalization Programmes

	Countries	Initialling	Signing	Liberalization Coverage	Liberalization Schedule	Goods Excluded	Other Features
SADC-EPA Group	Botswana, Lesotho, Namibia, Swaziland	23 November 2007	4 June 2009, except Namibia	86% over four years or by 2015 at the latest	44 sensitive tariff lines by 2015, 3 lines by 2018	Agricultural, processed Agricultural & Textiles products	Cooperation on trade in goods, supply-side competitiveness, business enhancing infrastructure, trade in services, trade-related issues, institutional capacity building, fiscal adjustments Negotiations on competition & government procurement will be resumed after building the required capacity
	Mozambique	23 November 2007	15 June 2009	80.5% by 2023	100 sensitive tariff lines by 2018		
	Angola	EBA Initiative					
	South Africa	TDCA Agreement					
EAC-EPA Group	Tanzania	23 November 2007	July 2009	82% by 2033; covers 74% of EAC tariff lines	64% in 2 years, 80% in 15 years, 82% in 25 years	Agricultural products, Wines & spirits, Chemicals, Plastics, Wood-based paper, Textiles & clothing, Footwear, Glassware	Cooperation on sustainable use of resources in the fisheries sector New and extended RoO for farming, fishing & clothing

Table 2-3 (cont.)

	Countries	Initializing	Signing	Liberalization Coverage	Liberalization Schedule	Goods Excluded	Other Features
ESA-EPA Group	Madagascar	23 November 2007	29 August 2009	80.7%	37% after 5 years, the remaining 43.7% liberalized progressively until 2022	Meat, Fish, Products of animal origin, Vegetables, Cereals, Beverages, Plastics & rubber, Articles of leather & Fur-skins, Paper, Metals	ESA Development Cooperation Strategy Cooperation in areas like: Mobilizing resources Expanding aid-for-trade commitments relating to EPA support requirements & adjustment costs An inclusive Chapter for fisheries sector include provisions for sustainable use of resources in the fisheries sector
	Mauritius			95.6%	24.5 % in 2008, 53.6% by 2017, the remaining 42% by 2022	Live animals & meat, Edible products of animal origin, Fats, Edible preparations, Beverages, Chemicals, Plastics & rubber, Articles of leather & fur-skins, Iron & steel, Consumer electronic	
	Seychelles			97.5% by 2022	62% after 5 years, 77% by 2017, the remaining 20.5% by 2022	Meat, Fisheries, Beverages, Tobacco, Leather articles, Glass & ceramics, Vehicles	

Table 2-3 (cont.)

	Countries	Initializing	Signing	Liberalization Coverage	Future Schedule	Goods Excluded
ESA-EPA Group (cont.)	Zambia	September 2008	consult with other LDCs	80%		Meat, Milk & cheese, Vegetables, Cereals, Oils & fats, Edible preparations, Sugar, Chemicals, Plastic & rubber articles, Scratch cards, Textiles, Ceramic products, Metal articles, Machinery, Vehicles & furniture
	Zimbabwe	23 November 2007	29 August 2009	80% by 2022	45% by 2012, the remaining 35% liberalized progressively until 2022	Products of animal origin, Cereals, Beverages, Paper, Plastics & rubber, Textiles & clothing, Footwear, Glass & ceramics, Consumer electronics, Vehicles
	Malawi	EBA Initiative				
Central Africa-EPA Group	Congo, D.R.	EBA Initiative				

Source: Compiled with amendments by the author from different sources.

As of 2009, it seemed implausible to conclude an EPA as planned. Concerns that the EU-SADC EPAs, if they were to adopt the IEPA outlines, would have adversely affected the SADC industrialization strategy and regional integration process remain relevant. Furthermore, the potential adjustment costs are relatively high for many SADC economies.[23]

Angola, Namibia and South Africa have voiced concerns over key provisions of the IEPA text "… that profoundly impede prospects for deepening the processes of sustainable integration and development within and between the countries of Southern Africa" (Governments of Angola, Namibia and South Africa 2009, p. 1). The three countries have jointly called for a more comprehensive EPA that encompasses all SADC members, with emphasis on inclusion of South Africa, in one common arrangement to access the EU markets.

Consequently, Namibia decided not to sign the initialized IEPA. Being eligible for the EBA initiative, Angola did not have incentives to initialize the IEPA. It rather expressed its intention to join a full EPA after finalising its tariff offer and reaching a compromise regarding the previous concerns. South Africa also has not signed the IEPA and has not shown full commitments regarding trade in services. During their negotiation round in November 2008, South Africa and the EC agreed to provide a modified market access offer by December 2008, (European Commission 2009).

In order to keep South Africa at the negotiating table, the EU granted it more advanced market access provisions, especially for agricultural products, compared to its current market access under the TDCA-FTA. Nevertheless, this would not be expanded to full duty-free, quota-free treatment, since South Africa is a major and competitive exporting partner for the EU, particularly in agricultural markets. In its turn, South Africa is negotiating some tariff reductions with the EU.

[23] For more information on the most recent developments in the negotiation outcomes, see the most up-to-date versions of the African Economic Outlook by OECD, African Development Bank (AFDB) and United Nations-Economic Commission for Africa (UN-ECA) (2010, pp. 50-53) and OECD et al. (2011, pp. 55-57).

2.3.1.2 The EAC-EPA Group

Tanzania, along with its EAC partners, signed an IEPA in 2007. The agreement called for gradual liberalization of 82 percent of imports from the EU over 25 years. This liberalization is scheduled as: 64 percent in 2010, 16 percent in 2023 and 2 percent in 2033. The remaining 18 percent of imports from the EU covers sensitive products for EAC including coffee, tea and spices, fish, meat, dairy products, certain vegetables and oils, (European Commission 2007b).

2.3.1.3 The ESA-EPA Group

Within the ESA-EPA group, Madagascar, Mauritius, Seychelles and Zimbabwe, along with Comoros, agreed on an IEPA at the end of 2007. The Zambian tariff schedule was not initialled until September 2008 and, as a result, its exports to the EU were treated according to the EBA provisions until December 2008. In August 2009, Madagascar, Mauritius, Seychelles and Zimbabwe signed the IEPA whereas Zambia was still indecisive.

The degree of liberalization that was agreed varies among the participants: 98 percent (Seychelles), 96 percent (Mauritius), 81 percent (Madagascar) and 80 percent (Zambia and Zimbabwe), (European Commission 2007b).

In October 2009, exports by the members of the ESA-EPA group started benefiting duty-free, quota-free access to the EU markets either under the IEPAs or the EBA initiative. Removing barriers to sugar exports is expected to boost sugar production and exports for Zambia, Malawi and Tanzania. For the non-LDC members, Agritrade (2010c, p. 7) finds that

> "… the granting of duty-free, quota-free treatment under the IEPAs comparable to that extended under the EBA appears to have removed the disadvantage that non-LDCs have faced in terms of their attractiveness to external investment since the announcement of the EBA initiative in 2001, previously, the EBA initiative led to extensive investment flows into LDCs, notably in the sugar sector, and left non-LDCs at a disadvantage for attracting such investment".

Pulling together the strands of the liberalization programmes for different SADC members, some points are revealed. Different tariff schedules are in use and, most importantly, some countries are gradually eliminating tariff barriers for their EU trade while neighbouring countries maintain those barriers. The excluded products are heterogeneous across members. This situation will continue to pose a serious challenge to the integration process in the region. Braude (2008) demonstrates that these differentiated liberalization schedules impose new barriers to intra-SADC integration rather than enhancing it.

2.3.2 The Development Dimensions

As aforementioned, the EPAs are not meant to be merely conventional trade agreements. The agreements are supposed to deal with supply-side constraints, enhance production capacities, stimulate competitiveness and ensure sustainable development. These broad objectives require comprehensive agendas that cover trade in goods and services, the 'Singapore issues' (i.e. trade facilitation, trade and investment, competition policy and transparency in government procurements) and other components (e.g. export taxes, MFN clause, RoO and movements of people).[24]

Indeed, utilizing the EPAs as an instrument for development is crucial for SADC members to exploit the opportunities provided by the EPAs. The envisaged EPAs will provide free access for SADC products into the EU markets. The actual gains in market share depend, *inter alia*, on SADC production capacity and competitiveness. Therefore, if market access gains are to be seized by SADC members, issues like supply-side constraints, enhancing competitiveness and building regional production and trade capacities have to be dealt with up-front. Persson (2008) examines the potential impacts of the trade facilitation provisions on the ACP-negotiating groups. The study finds that trade transaction costs are influential for the SADC-EPA and ESA-EPA groups. Curran, Nilsson and Brew (2008, pp. 542-546) review the non-trade components of the EPAs and discuss potential impacts on ACP states.

[24] The 'Singapore issues' were firstly discussed at the WTO Ministerial Conference in 1996 in Singapore.

Furthermore, the proliferation of multilateral liberalization entails diminishing the potential preference margins for SADC members in the EU markets. As such, the longer the EU-SADC EPA negotiations continue, the less likely it is for SADC members to realize significant benefits related to preferential trade access and, hence, the more important are the development components of the EPAs.

The IEPAs include provisions on the MFN clause, infant industry protection and safeguards, NTBs, export subsidies and taxes. The IEPA signatory parties agreed to resume negotiations over the remaining issues, (European Commission 2009). As can be seen in Table 2-3, these provisions are not transmitted into precise action plans. Moreover, most of these provisions are subject to long debate, as described in the following sub-section.

2.3.3 Challenges and Contentious Issues

Serious concerns about the potential adverse impacts of the EPAs on SADC members, as well as various contentious issues, have been raised in the course of the negotiation process. This study does not aim to provide an exhaustive list of the contentious issues, but rather illustrative discussion of the relevant arguments.[25]

One of the main concerns raised by the SADC negotiators is the consequences of exposing domestic industries to intensified competition from European substitutes. A WTO-compatible trade liberalization scenario that covers 'substantially all trade' would cause unbalanced competition for SADC products. This concern has a special importance for agricultural producers who, on one hand, export to the EU markets and, on the other hand, will face competition from subsidized European farmers.

Among the important contentious issues are the IEPAs provisions on infant industry protection and safeguards. In the EU-SADC IEPA text, the infant industry provisions are available only for twelve years (or fifteen years in the case of LDCs). This means that these provisions are designed as limited safeguards against potential surges in imports during the liberalization phase rather than being flexible measures to protect

[25] Some areas of disagreement are already discussed throughout the previous discussion of the negotiation objectives, evolution and outcomes. For a detailed discussion of the contentious issues, see Lui and Bilal (2009).

an infant industry until accomplishing a certain degree of competitiveness. The eight-year time restriction implies that the infant-industry measure will be ineffective starting 2016. This has profound implications for the SADC LDCs. Such provisions have the potential to prevent the emergence of new industries and to impede the progress of already undiversified production structures. Indeed, negotiators have raised demands for amending the SADC-IEPAs infant industry provisions in such a way that serves the purposes of protecting infant industries in the region.[26]

The potential revenue losses for SADC economies, and the appropriate compensation measures, continue to pose challenges on the EPA negotiations. The IEPAs imply asymmetrical liberalization that allows SADC members to maintain protection for some sensitive sectors. However, the criteria for determining sensitive products and the associated transition periods are unclear and vary across countries. In addition, the aid-for-trade component is one of the most debated issues in the EPA negotiations. SADC negotiators are pushing for more effective financial compensation for the potential tariff revenue losses. On the other side of the negotiating table, the EC insists on keeping the aid-for-trade component outside of the formal EPAs, as voluntary packages.

Other debatable issues include trade in services and investment. With respect to trade in services, the SADC-EPA negotiating parties agreed on several steps in order to implement the IEPA provisions. These include liberalizing one services sector for all members in the SADC-EPA group, except Namibia and South Africa, and aiming to progressively liberalize the substantial services trade within three years following the full EPA. Focusing on the ESA-EPA group, a study by the South Centre (2007, p. 5) argues that “It is difficult to see how a reciprocal Agreement on trade in services with the EU (a fully integrated regional block); can work to the benefit of ESA ….”.

Regarding investment, it was agreed to negotiate investment provisions between the SADC-EPA group and the EU before 2009, taking into consideration the SADC Investment Protocol, (European Commission 2009). Foreign investment is viewed as

[26] For more on the implications of the IEPAs infant industry provisions along with other contentious issues for SADC, see Agritrade (2008). For a recent review of the WTO/GATT safeguards provisions, see Finger (2010, pp. 289–318).

one of the opportunities available for SADC members from launching the EPAs with the EU. As aforementioned, the EC argues that the policy reforms associated with the EPAs will stimulate FDI and create the required resources to fund investment.

Among other important issues under negotiations are the IEPA provisions on reducing subsidies on agricultural production and exports, the MFN clause, intellectual property rights and RoO. The EC has tended to postpone these issues to the comprehensive EPA phase, whilst some SADC negotiators insist on tackling them up-front and have called for modifying the existing IEPAs. The point to notice here is the evident pertinence of these contentious IEPA issues to the Doha Round agenda. This distinct linkage highlights the importance of examining how concluding the Doha Round would affect the EU-SADC EPAs outcome and which of the two arrangements should come first. Hinkle and Schiff (2004) argue that concluding the Doha Round in advance of signing final EPAs is beneficial for sub-Saharan African countries.

2.4 Alternative Trade Arrangements to the EU-SADC EPAs

SADC trade is eligible for different preferential schemes, and the importance and value of trade preferences vary significantly across countries and sectors. Overall, the EU is main provider of trade preferences for SADC members.[27] The EU-GSP to all developing countries was first implemented in 1971.[28] In February 2001, the special scheme of the EU-GSP, i.e. the EBA initiative, was launched to target LDCs.[29] Two non-reciprocal regimes are, thus, available for SADC members: the EU-GSP (for SADC non-LDCs) and the EBA (for SADC-LDCs). South Africa is a special case since it already has a reciprocal trade arrangement with the EU through its TDCA-FTA.

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[27] The second important preferences provider for SADC is the USA who grants African Growth and Opportunity Act (AGOA) to Sub-Saharan African countries. Thirty-eight African countries are eligible for AGOA preferences, among which are thirteen SADC members. Zimbabwe is exempted from this arrangement and Madagascar's membership was suspended in 2009, as aforementioned. For more information on membership and eligibility, see African Growth and Opportunity Act (AGOA) (2000).

[28] The GSP could also refer to the whole system of preferences provided by the Quadrilateral group (known as the Quad countries: the EU, USA, Japan and Canada) that was first formed during the 7th G7 summit in July 1981.

[29] Another sub-regime of the EU-GSP is called the EU-GSP+. The EU-GSP+ provides additional tariff reductions to the most vulnerable developing countries. None of SADC members is eligible for the EU-GSP+. For more details, see CARIS (2010, pp. 39-42).

Improving market access for SADC sugar exporters is one of the most contentious issues in the EPA negotiations. The EU domestic sugar sector has been protected through the policies pursued by the Common Organization of the Markets in Sugar (Com Sugar). Recently, internal and external motivations have led the EU to launch several reform policies for sugar production and trade. It is, thus, interesting to examine the EU sugar trade and reforms and their implications for the EU-SADC EPAs.
It is against this background that this section presents the alternative trade arrangements for SADC-EU trade in the case of not agreeing on final EPAs. It deals first with the alternative preferential trade agreements provided by the EU to SADC members (i.e. GSP, EBA and TDCA) and, then, it considers more broadly the EU sugar trade liberalization and reforms.

2.4.1. The EU-SADC Preferential Agreements

2.4.1.1 The EU-GSP for SADC non-LDCs

In terms of trade coverage, the EU-GSP is the most important preferential trade scheme for SADC members. Despite its importance, the GSP program has a limited product coverage and validation period. The GSP covers 7200 products. It provides duty-free access to all non-sensitive products, which are mainly manufactured products. Agricultural products and some labour-intensive manufacturing are not eligible for duty-free market access. Sensitive products are eligible for a tariff reduction of 3.5 percentage points of the *ad valorem* MFN tariff rate or a 30 percent tariff reduction of the specific MFN tariff rate. The tariff reduction in the case of textiles and clothing is 20 percent of the *ad valorem* MFN tariff rate.
The GSP is subject to periodic revisions and can be unilaterally terminated. The most recent substantial changes took place in 2006.[30]

[30] For a comprehensive assessment of the GSP using complementarity methodologies, see CARIS (2010).

2.4.1.2 The EU-EBA Initiative for SADC LDCs

The EBA initiative grants duty-free, quota-free access to exports, except arms and munitions, by LDCs to the EU markets.[31] The EBA proposal includes 919 tariff lines that are mainly agricultural products, e.g. vegetables, fruits, food and meat products. However, limited transition periods were applied to three sensitive products: bananas (2006) rice and sugar (2009).

The remaining duties on bananas were reduced by 20 percent per annum beginning in January 2002 and were fully eliminated in January 2006. Duties on rice were reduced by 20 percent in September 2006, by 50 percent in September 2007, by 80 percent in September 2008 and fully eliminated in September 2009. In addition, rice exports were granted immediate duty-free access within quota limits. The quota quantity was initially determined by previous export levels to the EU and was then phased out by 15 percent each year until all tariffs and quotas were fully removed in 2008/09. Duties on sugar were supposed to be reduced by 20 percent in July 2006, by 50 percent in July 2007, by 80 percent in July 2008 and fully eliminated in July 2009.

The EBA is a non-reciprocal trade agreement in the sense that the beneficiary countries export duty-free, quota-free without obligation to open their markets to European exports in return. Although it is regulated by the GSP scheme, the EBA initiative departs from these general rules regarding its coverage, duration and limitation. The EBA is more comprehensive and provides greater certainty for the beneficiary exporters; it is not subject to any changes and none of the EBA's parties can unilaterally terminate it.[32]

In terms of statutory tariff rates, the EBA is the best arrangement available for LDCs exports to the EU. Unlike the EU-GSP, the EBA preferences are granted for an indefinite time period and are not subject to revision. Nevertheless, the EBA utilization rate is low.[33] Some authors (e.g. Candau and Jean 2009) attribute this underutilization for the EBA preferences to the availability of more favourable

[31] Some non-LDCs (e.g. Bosnia, Herzegovina and Moldova) benefit from similar preferential treatment to the EBA's through bilateral agreements with the EU.

[32] For a detailed description of the EBA initiative, see Bjørnskov and Krivonos (2001).

[33] Candau and Jean (2009, pp. 75-79) estimate the actual utilization rates for the EBA preferences by all Sub-Saharan African LDCs to be 2.8 percent in 2002.

preferential arrangements granted to LDCs under the Cotonou regime. Others (e.g. Brenton 2003) argue that the EBA's tight RoOs and complicated administrative constraints impede its utilization.

2.4.1.3 The EU-South Africa TDCA

The EU and South Africa began negotiations on a bilateral trade arrangement in 1995 and eventually agreed on their TDCA-FTA in 1999, which came into operation in 2004.[34] The agreement provisions are applicable for 'substantially all trade' between the EU and South Africa. The interpretation of 'substantially all trade' in the context of the TDCA-FTA implies asymmetric liberalization of trade between South Africa and the EU. It is agreed that 95 percent of South African exports will enter EU markets duty-free after ten years and 86 percent of EU exports to South Africa will be liberalized after a transition period of twelve years. Accordingly, the full FTA should be in force in 2012.

Some sensitive products are excluded from the immediate liberalization schedule while others are partially liberalized. For South Africa, sensitive sectors include some textiles and clothing products and motor vehicles. Liberalizing motor vehicles trade did not start until 2006. With respect to the EU, sensitive sectors are mainly agricultural products.[35]

The EU-South Africa TDCA raises concerns that regional exports to the South African markets will face unbalanced competition from subsidized EU agricultural products. Using a partial equilibrium model, Thurlow and Holden (2002) find that the EU-South Africa TDCA's impact on South Africa imports from COMESA is limited. Mauritius exports to South Africa are the most affected; particularly textiles, clothing, footwear and leather products.

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[34] Some of the agreement provisions were operating since January 2000, but were not ratified by the South Africa's SACU trade partners until 2002. One reason of this late implementation is the concerns raised by BLNS countries regarding the impact of TDCA on their economies.

[35] For a full list of the products that are not included in the liberalization schedule and those to be reviewed after a certain length of time, see European Commission (1999). For a list of hypothetically excluding sectors and mapping them to the GTAP sectors, see McDonald and Walmsley (2008).

2.4.1.4 The EU Preference Utilization Rates

The question to be raised here is to what extent are the EU preferential arrangements actually effective in improving market access. Indeed, the actual significance of the EU preferential trade arrangements is an empirical exercise. This sub-section gives some empirical evidence on SADC utilization rates for the EU preferential trade regimes.

Data on EU imports from SADC members according to the different import regimes is derived from the Eurostat database for 2004 and 2008. According to the database, imports are classified into four import regimes: 'MFN Zero', 'MFN Non Zero', 'Any Preference Zero' and 'Any Preference Non Zero'. Imports under the first two regimes are then distinguished according to imports eligible for 'Only MFN' and imports eligible for 'GSP and/or Preferences'. The import regime is 'Unknown' for some import flows.

Based on these data, EU duty-free imports as ratios to total imports by country are calculated, Table 2-4. These duty-free import ratios are calculated for the two duty-free import regimes: 'MFN Zero' and 'Any Preference Zero'. It is worth noting here that the former includes imports eligible for 'Only MFN' and imports eligible for 'GSP and/or Preferences'. Furthermore, preference utilization rates are measured as the ratios of imports under any preference regime; whether zero or non-zero rates, to total imports eligible for the preference regimes. These calculations are undertaken for the three dutiable trade regimes: 'Normal', 'Outward Processing' and 'Economic Processing Arrangements for Textile'.

The bulk of EU imports from SADC in 2004 enter duty-free. Mozambique is the only exception, as duty-free trade constitutes only 35 percent of its total exports to the EU. In 2008, more than three-quarters of exports to the EU were duty-free. Preference utilization rates differ in 2008 compared to 2004 for many of the cases. The most striking case is Angola, where the utilization rate increases from merely 10 percent in 2004 to 63 percent in 2008.

Table 2-4: The EU Duty-free Imports and Preference Utilization Rates

	2004, percent				2008, percent			
	Duty-free Imports as Ratio to Total Imports by Import Regime			Preference Utilization Rate	Duty-free Imports as Ratio to Total Imports by Import Regime			Preference Utilization Rate
	MFN Zero	Any Preference Zero	Total		MFN Zero	Any Preference Zero	Total	
Angola	98.4	0.1	98.5	9.7	98.5	0.8	99.3	62.5
Botswana	97.1	0.8	97.9	90.5	90.5	9.0	99.4	95.8
Congo, D.R.	94.6	1.1	95.7	73.0	92.3	1.8	94.0	80.1
Lesotho	93.9	2.6	96.5	45.0	98.4	1.2	99.6	87.4
Madagascar	25.9	66.1	92.0	95.9	24.5	72.7	97.2	96.8
Malawi	20.6	66.0	86.9	93.9	28.4	57.5	93.9	83.4
Mauritius	13.4	73.5	86.6	91.3	8.9	85.0	85.9	94.9
Mozambique	2.5	32.4	34.8	99.0	7.5	89.0	96.5	99.6
Namibia	63.7	25.5	89.1	97.7	22.9	72.9	95.8	95.8
Seychelles	12.6	73.4	86.0	96.0	3.3	95.5	98.8	99.4
Swaziland	5.8	82.9	88.7	98.2	3.2	79.6	82.7	83.5
Tanzania	69.0	24.0	92.9	93.4	40.3	56.9	97.3	98.1
South Africa	57.3	18.6	75.9	80.4	59.8	26.3	86.1	87.7
Zambia	29.6	29.1	58.7	100.0	59.6	15.6	75.2	87.7
Zimbabwe	30.1	54.4	84.5	94.8	33.2	62.1	95.3	94.5

Source: Calculated by the author based on the Eurostat Database (2010).

2.4.2. The EU Sugar Trade and Reforms

Interestingly, the EU is both a major sugar importer and a major sugar exporter. This is attributed to intertwining schemes of preferential arrangements. The EU sugar trade has been organized by two preferential arrangements: the EU Sugar Protocol (SP) for a group of ACP countries and the EBA initiative for LDCs. These arrangements involve protective policies in favour of the EU sugar producers. This creates a dilemma to EU sugar trade liberalization within the EU-EPA context. If all ACP sugar exporters were to be equally treated as ACP-SP or LDC-EBA beneficiaries, the EU sugar sector would experience sudden volatilities. Arguably, these changes would have occurred at the expense of the SP beneficiaries. The argument is that the EU cannot guarantee the intervention price for ACP-SP exporters without stabilizing sugar price in its domestic markets.

Therefore, sugar liberalization within the EPA framework has to be undertaken gradually and a transition period during which market reforms are underway is needed. The European Commission (2005a, p. 8) states that the

> "The Sugar Protocol should be integrated into EPAs in such a way that does not prejudice the EU's commitment to LDCs for full market access for sugar from 2009 and that ensures full compatibility with WTO rules. This will be covered by the review of the Sugar Protocol, to be negotiated jointly with the ACP in the framework of EPA negotiations".

This commitment to liberalization of trade in sugar puts pressure on the EU to reform its domestic sugar sector. Other motivations for reform arise from the required elimination of export subsidies either as an element of the Doha liberalization agenda or in response to the WTO decision regarding the dispute raised by Australia, Brazil and Thailand against the EU protective policies.

The following two sub-sections deal with the EU sugar trade arrangements and its unilateral sugar reforms.

2.4.2.1 Preferential Sugar Trade Arrangements

The SP is a bilateral, non-reciprocal preferential agreement granted to a group of 19 ACP countries. It was established in 1975 and then renewed in 2000 under the Cotonou Agreement.[36] The SP signatory countries are granted duty-free access to European markets for their sugar (cane, raw and white) exports within quota limits. These export flows receive a price higher than the price in the world market.[37] This differential pricing scheme yields substantial income transfers for the SP exporters.

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[36] The previous Commonwealth Sugar Agreement was transmitted to the EU by the UK accession to the community in 1973 and two years later during the first Lomé Convention it is shaped into the SP. Eight SADC members (Congo DR, Madagascar, Malawi, Mauritius, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe) with other eleven ACP countries (Barbados, Belize, Fiji, Guyana, Ivory Coast, Jamaica, Kenya, St. Kitts and Nevis, Suriname, Trinidad and Tobago, Uganda) benefit from the SP. In 2005 onwards, the EC included Mozambique in the list of the ACP-SP beneficiaries. See European Commission (2005a) and European Union (2006). The same preferential treatment was simultaneously granted to India and ever since the Sugar Protocol is called the ACP/India Sugar Protocol.

[37] Sugar price is determined each year in a way that reflects sugar price in the European markets.

In 1986, the EC introduced the concept of Maximum Supply Need (MSN) that sets a ceiling for raw sugar imports that are allowed to enter the European markets under preferential arrangements. This import ceiling is meant to control sugar imports by EU members that have sugar refining industries, i.e. Finland, France, Portugal and the UK. The MSN for sugar is primarily met from ACP/India SP beneficiaries, overseas countries and territories (OCTs)[38] and MFN exporters.[39] Any additional imports of raw sugar for processing above the MSN limits are imported under the Special Preferential Sugar (SPS) arrangements. The SPS is a less favourable preferential arrangements compared to the SP. EU Sugar imports under the SPS are granted preferential market access at a reduced or zero tariff rate and are sold at a lower price compared to the SP imports.

As reported in Table 2-5, sugar import quotas allocated to SADC members sum up to 691 thousand tonnes in 2003/04. The bulk of the SADC sugar quota (70 percent) is assigned to Mauritius. A quota of around 200,000 tonnes is opened annually for the ACP/India SP beneficiaries.

According to the EBA initiative, sugar imports from LDCs within the quota limits enter the European market duty-free during a transition period (2001-2006) and these quotas are subject to a 15 percent annual increase. After this transition period, tariffs on sugar imports from LDCs are to be gradually reduced without quantity limits. These tariff cuts are scheduled to start in July 2006 by rates of 20, 50 and 80 percent until reaching duty-free, quota-free access by July 2009.

Two points are worth highlighting here. First, these increases in sugar quotas do not entail increases in total EU sugar imports. Similar reductions are scheduled for the SPS quotas.[40] As shown in Table 2-5, the SADC quota allocation is roughly the same under both regimes. In this context, Gibb (2006) examines the welfare impacts of the EBA sugar arrangements. The study demonstrates that the initiative will not affect EU

[38] Some EU members have trade links with these OCTs (e.g. the French overseas terrorises of Reunion). Sugar imports from these OCTs enter the European markets duty-free.

[39] The Finland preferential agreement of sugar imports from Cuba and Brazil was transmitted to the EU in 1995 by the Finland's accession to the EU. These imports are granted reduced tariff and sold at the EU intervention price.

[40] The European Commission (2001, L 60/44) states that "Imports of sugar under the ACP-EC Sugar Protocol should be excluded from the above calculations so as to uphold the viability of this protocol". Chaplin and Matthews (2005, p. 5) argue that these reductions might be valid until closer to 2009.

sugar producers and any increase in LDC market share will be at the expense of other developing countries. Secondly, the EBA does not guarantee a minimum price for these import flows. However, sugar imports under this transition system of tariff rate quotas (TRQs) are sold at the same price provided for sugar imports under the SPS, (Chaplin and Matthews 2005, p. 5). This might make it profitable for some LDCs who are net importers of sugar to export sugar in order to benefit from the higher intervention price in European markets, while meeting their domestic needs by importing from other partners.

Table 2-5: The EU Sugar Import Quotas

(2003/04, tonnes, white sugar equivalent)

Country	Sugar Protocol Sugar Allocations			Special Preferential Sugar Allocations with EBA		
	Quota Allocation	% of SADC Quota	% of Total Quota	Quota Allocation***	% of SADC Quota	% of Total Quota
Congo, D.R.	10,186	1.5	0.8			
Madagascar	10,760	1.6	0.8	2,055	1.9	1.0
Malawi	20,824	3.0	1.6	10,000	9.3	5.0
Mauritius	491,031	71.1	37.6	26,551.8	24.6	13.3
Mozambique*						
Swaziland	117,845	17.1	9.0	30,000	27.8	15.0
Tanzania	10,186	1.5	0.8	2,014.6	1.9	1.0
Zambia	0	0.0	0.0	12,238.3	11.3	6.1
Zimbabwe	30,225	4.4	2.3	25,000	23.2	12.5
Total SADC Quotas	691,057	100.0	53.0	107,860	100.0	53.9
Total Beneficiaries Quotas**	1,304,700			200,000		

* Mozambique was not an EU-SP beneficiary until 2005. ** Including India that is allocated 10,000 tonnes.
Source: European Commission (2004) *** Gibb (2006, p. 12).

Only SADC LDCs that initialized the EBA Sugar Framework Agreement with the EU are eligible for these planned increases in sugar quotas. Seven out of the eight SADC/EBA members (i.e. Angola, D.R. Congo, Madagascar, Malawi, Mozambique, Tanzania and

Zambia) are included in the LDC Sugar Supplying States.[41] Apart from Angola, these members are also SP beneficiaries. This means that their sugar export quotas are not effectively affected by phasing out sugar quotas during the transition period. However, all EBA/SADC members benefit from the post-2006 full liberalization arrangements.

Sugar import quotas assigned to the SADC EBA beneficiaries were enlarged from 36,557 tonnes (of white-sugar equivalent) in 2001/02 to 43,768 tonnes in 2005/06. Three SADC members (i.e. Mauritius, Swaziland, Zimbabwe) are SP beneficiaries but not eligible for the EBA provisions. Their sugar exports, as well as exports by the other SP non-LDC signatories, were equivalently deducted during the transition period in order to allow for phasing out the LDCs sugar quotas.

In addition to these restrictions, the European Council imposes safeguard provisions on LDC sugar exports to the EU. According to these provisions, any preferences that have been granted can be suspended if sugar imports significantly disrupt EU sugar markets.

2.4.2.2 The EU Unilateral Sugar Reforms

The EU has controlled sugar production through a system of shared quotas among its members. Three types of quotas were assigned to each EU member: ‘A’ quotas were determined according to domestic consumption, ‘B’ quotas were set for potential export supply and ‘C’ quotas are for out-of-quota sugar that could be either exported or shifted to the next marketing year. Minimum prices were set for sugar of type ‘A’ and ‘B’ whereas the price of ‘C’ quota sugar was negotiated between growers and manufactures. Export subsidies were provided to compensate producers for the gap between domestic and world prices.

In 2005, the EC launched initiatives for sugar reform that deal with interventions in domestic markets as well as preferential trade arrangements.[42] A fixed cut of 36

[41] Lesotho only does not sign the agreement. For more information, see Agritrade (2011).

[42] Initial reform proposal (European Commission 2004) and a subsequent modified version (European Commission 2005b) were issued before reaching a final agreement on reform policies in November 2005. For a more detailed description of sugar reforms and their scope and measures, see European Commission (2006a).

percent in the EU intervention sugar price was planned spanning four years beginning in 2006/07. The annual price cuts were scheduled to be 20 percent in 2006/07, 27.5 percent in 2007/08, 35 percent in 2008/09 and 36 percent in 2009/10. These price cuts were to be reflected in reduced export subsidies, as a result of a reduced price wedge between world and domestic prices.[43] Compensation funds amounting to 60 percent of the estimated revenue losses due to these price cuts were planned to be provided to producers. In order to facilitate reductions in domestic subsidies, a plan was put in place to merge type 'A' and 'B' production quotas. Quota 'C' producers were allowed to purchase an additional 1 million tonne quota, and quotas were reduced by a buy-out scheme. In addition, improved market access for preferential sugar trade was to be achieved by reducing tariffs and phasing out TRQs. During this transition period (i.e. 2006-2009), ACP- and India-SP beneficiaries were granted free access to 75 percent of their previously assigned quotas.

Restructuring the EU sugar sector has major implications for ACP sugar producers and traders. A recent report by Agritrade (2010a) provides an example in the expansion of Associated British Foods (ABF). In 2006, ABF purchased 51 percent of the issued share capital of one of the major sugar companies in Southern Africa called Illovo, which operates in Malawi, Mozambique, South Africa, Swaziland, Tanzania and Zambia. According to the report, the cooperation with ABF has led to a substantial expansion in sugar production in Southern Africa.

2.5 Policy Implications: What are the Main Negotiating Issues to be Examined?

This detailed description of the context for the EU-SADC EPAs highlights several important issues relevant to analyzing the impact of the envisaged agreements. These issues can be summarized in three main categories. First, impact analyses of the EU-SADC EPAs should be undertaken in a way that assesses how far the underlying objective of helping SADC members to effectively integrate into the world economy is achieved. Second, given that enhancing existing regional integration is one of the

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[43] The potential impact of the EU sugar reforms on the sugar world markets has been extensively addressed in the literature. See, for example, Elobeid and Beghin (2006).

announced objectives of the EU-ACP EPAs, examining how SADC regional integration will be affected by different EPA scenarios is crucial. These two aspects jointly highlight the significance of employing general equilibrium analysis that encompasses different SADC members, the EU and other main trade partners within an internally consistent modelling framework. Eventually, a third important issue for any critical evaluation of the impact of the EU-SADC EPAs lies in identifying appropriate counterfactual scenarios to the agreements. Bearing in mind that the *status quo* prior to the agreements is unsustainable, the consequences of the EPAs should be contrasted with available WTO-compatible alternatives to the EU-SADC EPAs.

3 Regional Integration Agreements: Theoretical Foundations and Analytical Approaches

3.1 Introduction

The static theory on preferential trade liberalization does not provide a clear-cut proof of the sign of the potential welfare impact on the participant countries and their trade partners, let alone the magnitude of the impact. The impacts of discriminatory trade liberalization depend mainly on the pre-liberalization economic features and trade relationships among member countries. Furthermore, the institutional features of the regional group itself and its trade linkages with the rest of the world are main determinants for integration outcomes. A large strand of literature examines the different types of RTAs and how their institutional features influence potential outcomes.

This chapter provides a systematic discussion of the theoretical foundations and analytical issues that surround the analysis of impacts of RTAs. Section 3.2 reviews the theoretical literature on RTAs, starting with identifying potential trade and welfare effects in member countries, non-member countries and the world at large. Subsequently, attention turns to the associated changes in the economic structure, leading to a discussion of potential adjustment costs. Section 3.3 presents the various analytical approaches adopted in the relevant literature for assessing RTAs, and provides thoughts on how this diversity in approaches leads to complexity in interpreting findings taken from different studies. Section 3.4 provides a critical review of selected studies that examine the impacts of the EU-SADC EPAs. Finally, Section 3.5 concludes with a summary of syntheses of the literature.

3.2 Regional Trade Agreements in Theory

Welfare implications of preferential trade liberalization have been widely discussed in the theoretical literature. This section outlines the main themes of the literature on the impacts of preferential trade liberalization and the underlying transmission channels that bring forth these effects.

3.2.1. Trade Creation and Trade Diversion Effects

The theoretical debate on welfare implications of trade liberalization stems from the pioneering work of Viner (1950), Meade (1955) and Lipsey (1957) on the theory of customs unions. Regional integration implies trade liberalization among member countries and trade protection vis-à-vis the rest of the world. The generated welfare effects within this model of 'second best' are ambiguous. Trade liberalization entails trade expansion, which is not necessarily welfare-improving. Whether or not trade expansion is welfare-improving depends on the source of the increments in trade. Viner (1950) demonstrates that forming a CU is welfare-improving in sectors that experience trade creation whereas it causes welfare-decreasing trade diversion in other sectors. Trade creation enhances welfare since it implies replacing high-cost domestic production with imports from a partner country. Trade diversion, on the other hand, occurs when imports are diverted from a non-member country to less efficient products in a member country and, thereby, reduces welfare. If member and non-member countries were treated equally, the non-member country would be the lower-cost import source. The relative magnitude of these two effects determines the net welfare effect of forming a CU. Viner's partial equilibrium analysis does not provide such economy-wide net welfare implications.

The fundamental departure of Meade's model from Viner's work is that it goes beyond the assumption of 'small country' in examining the welfare effects for the world as a whole within a general equilibrium framework. Meade (1955) points out that the relative magnitudes of trade creation and trade diversion are not sufficient to determine the economy-wide net welfare effects. He demonstrates that net-welfare effects depend on the relative changes in cost per unit for created and diverted trade. Pre-liberalization tariff levels and the degree of cross-product complementarity are, *inter alia*, the main determinants of welfare outcomes. He also argues that with continuing tariff cuts, world welfare gains from trade creation shrink with higher probability of trade diversion.[1]

Lipsey criticizes Viner's work, arguing that trade-diverting CUs can be welfare-improving. Based on the assumption of substitution in consumption, Lipsey (1957, p. 43) demonstrates that "… [A] country … might gain by entering a customs union whose sole production effect was to divert her import trade from lower- to higher-cost sources of supply". The author (Lipsey 1957, p. 43) explains that

> "The possibility stems from the fact that whenever imports are subject to a tariff, the position of equilibrium must be one where an indifference curve cuts (*not* is tangent to) the international price line. From this it follows that there will exist an area where indifference curves higher than the one achieved at equilibrium lie below the international price line".

By diverting imports to a member country, consumer prices drop by the tariff rate on pre-CU imports from a non-member country. This might offset price differences between member and non-member countries. Lipsey (1957, pp. 41-44) graphically shows a trade diversion case where the generated consumer surplus offsets the generated terms of trade loss and, therefore, the net welfare impact is positive.

Bhagwati (1971) seconds Lipsey's argument for the possibility that a trade-diverting CU generates welfare gains. However, Bhagwati criticizes Lipsey's analysis as insufficient to validate the argument. Instead, he introduces variability in production as a source of the gains derived from trade diversion. Bhagwati (1971, p. 585) explains that

> "The trade diversion, in the sense of a shift of imports to a higher-cost source of supply, implies a terms of trade loss. On the other hand, the price-ratio facing domestic consumers and producers moves closer to the "true" (least-cost) international price-ratio so that there is a consumption gain and a production gain respectively. In so far as the aggregate of these

[1] Influenced by Meade's work on the effects of RTAs on third parties and world welfare, Lipsey and Lancaster (1956–1957) develop the theory of second-best. Panagariya (1996b) provides an extensive discussion of Meade's work on regional integration.

> gains outweighs the terms of trade loss, a trade-diverting customs union will show welfare-improvement".

The basic foundations of welfare analysis of CUs were not concluded until Mundell's contribution on the terms of trade effects. As such, the main components of welfare impacts (i.e. production, consumption and terms of trade changes) are elaborately explained in the literature. The next sub-section presents the terms of trade effects in detail.

Potential welfare effects of the EU-SADC EPAs on SADC members seem ambiguous. Providing preferential access to EU products in SADC markets entails discriminatory liberalization for imports from the EU at the expense of non-EU exporters, including other SADC partners. In light of pre-EPAs SADC trade and protection structures, launching an FTA with the EU might generate welfare gains for SADC members that impose high tariff protection on imports from the EU. This preferential trade liberalization might, however, imply fewer imports from other SADC partners; South Africa in particular. Potential export expansions and market share gains depend, *inter alia*, on comparative advantage and competition in the EU markets. The net welfare impacts are expected to vary across SADC countries and, for that reason, a comprehensive country- and sector-specific analysis that accounts for intra-SADC trade and tariff structures is required.

3.2.2. Terms of Trade Effects

Discriminatory tariff reductions by a member country generate changes in its terms of trade vis-à-vis both other members in the regional group and trade partners outside the region. Mundell (1964) examines the terms of trade effects driven by discriminatory tariff reductions. Presuming substitutability in the domestic market, he proves that terms of trade for the partner country improves vis-à-vis both the tariff-reducing country and the rest of the world. In other words, discriminatory tariff reductions by a member country generates terms of trade gains for its regional trade partner. The higher the pre-liberalization tariffs, the greater are the accrued terms of trade gains by the partner country.[2]

It is ambiguous, though, whether terms of trade for the tariff-reducing country improves or deteriorates with respect to the rest of the world. Mundell (1964, p. 7) argues that "… the terms of trade for the rest of the world worsens with respect to at least one and perhaps both of the member countries". He highlights the importance of the elasticity of substitution for member countries between imports from inside and from outside the region in determining the associated terms of trade effects. For a member country, the less the elasticity of substitution between imports originated inside the region and their substitutes from outside the region, the higher is the probability of deteriorating its terms of trade with respect to the rest of the world.[3]

Such term of trade changes entail changes in welfare. Favourable changes in terms of trade mean that each export unit is being sold in the world market for more import units and vice versa. Accordingly, changes in terms of trade lead to income redistribution among member countries; some members gain while others lose.[4] Bhagwati and Panagariya (1999, pp. 38-56) demonstrate that whether a member country gains or not depends on the degree of preferential access it gives to its trade partner in the region vis-à-vis the preferential access it receives from them.

Drawing on this theoretical review, discriminatory trade liberalization generates terms of trade and, hence, welfare impacts not only in member countries but also in the rest of the world. Impacts on third parties are driven through several channels including trade diversion, terms of trade and rules of origin (RoOs); the latter will be dealt with in the next sub-section. The magnitude of the terms of trade effects is

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[2] Nevertheless, if exports by the partner country and exports by the non-member country are complementary for domestic consumers, the terms of trade for both member countries might deteriorate with respect to the rest of the world. This influential article was republished in 1999, see Mundell (1999, pp. 145-156).

[3] The author provides some specific types of tariff reductions that lead to improvements in the terms of trade for both member countries with respect to the rest of the world.

[4] Despite the high importance of terms of trade effects in trade theory, less attention has been given to measuring the impact of forming a RTA on export prices for non-member countries. Chang and Winters (2002, pp. 889-904) econometrically examine the impact of forming the Southern Common Market (MERCOSUR) on the prices of imports from outside the region. They demonstrate a substantial decline in the prices of imports from non-members and conclude that "… the price effects of integration can be quantitatively significant for nonmember exporters supplying an integrating market …".

determined, *inter alia*, by the pre-liberalization trade patterns and protection structures not only among member countries but for third parties as well. Furthermore, the degree of substitutability between imports from member countries and imports from non-member countries affects the direction of potential changes in terms of trade with respect to the rest of the world. Therefore, welfare impacts for regional integration can only be properly grasped within a general equilibrium framework that encompasses all members in the regional group, as well as their trade partners in the rest of the world.

Reciprocal trade liberalization in the context of the EU-SADC EPAs yields terms of trade changes in opposite directions. For SADC members, reducing tariffs on imports from the EU entails terms of trade deterioration, whereas the EU tariff removal improves terms of trade. The net terms of trade effect is determined, *inter alia*, by SADC pre-liberalization trade relationships and protection and the degree and pattern of tariff cuts.

Some concerns on deterioration in SADC terms of trade vis-à-vis both the EU and third parties are legitimate here. As we will see in Chapter 4, the EU is the main source of SADC imports in many sectors where high tariff protections are imposed. On the export side, the EU is the primary exporting market for many SADC products. Nevertheless, pre-liberalization EU tariffs on SADC exports are relatively low. Overall, SADC markets are more protected than EU markets. Reciprocal trade liberalization, therefore, means that SADC gives a greater preference margin to EU products (vis-à-vis SADC imports from other partners) than the preference margin SADC exports are granted in the EU markets (vis-à-vis EU imports from other partners). In addition, the envisaged EU-EPAs with other ACP states and completing the Doha Round of multilateral liberalization mean yet lesser preference margins are likely to be given to SADC products in the EU markets. It is thus unlikely for the EU SADC EPAs to generate sensible terms of trade gains for SADC members.

The effects on SADC terms of trade with respect to third parties are ambiguous too. Launching a FTA between the EU and SADC entails discriminatory liberalization for EU-SADC trade while keeping tariffs on SADC imports from other partners. SADC tariff removal might entail terms of trade deteriorations with respect to non-EU partners.

This proposition is based on an inference of low elasticity of substitution in SADC markets between EU products and their equivalents from outside the EU, as suggested later in Chapter 4. Furthermore, the SADC-EPA group does not cover all SADC members. It is therefore possible for some SADC members to experience terms of trade losses, if the EU discriminatorily removes tariffs on imports from their SADC partners.

3.2.3. Trade Deflection Effects

The trade effects of different types of preferential trade arrangements have long been examined using the traditional CU framework, with little distinction made between CUs and FTAs. The analytical framework for trade effects should, however, account for the different theoretical elements of each type of integration scheme. At the region's border, FTAs are more discriminatory against third parties exports than CUs and, as such, different trade distorting effects are FTAs-specific.[5]

In the absence of CET, indirect trade flows from non-member countries can enter the region through the member with the lowest tariffs, and are then transhipped to other members, i.e. trade deflection.[6] Arguably, this trade deflection effect is welfare-improving for both member and non-member countries. It induces positive consumption effects for member countries and alleviates the negative effects of discriminatory trade liberalization for excluded countries. Nevertheless, it yields distribution effects within the regional group. Tariff revenues are transferred from members with higher tariffs to members with lower tariffs.

In order to prevent trade flows from accessing the region indirectly through its lower tariff border, RoOs need to be established.[7] It is worth mentioning that RoOs are distorting trade measures, per se. They prohibit trade flows that are potentially sourced from more efficient producers. Krueger (1993, pp. 8-9) argues that "… ROOs

[5] Many studies examine trade effects driven by FTAs, albeit a few studies contrast them with those of CUs, e.g. Krueger (1995).

[6] Recent empirical studies examine trade deflection effects. For example, Bown and Crowley (2007) find substantial trade deflection flows of Japanese exports away from the US market, in which they face antidumping and safeguard tariffs, to third countries.

[7] In addition to preventing trade deflection, RoOs give incentives to producers to use inputs that are originated within the region rather than imported inputs from third countries.

can constitute a source of bias toward economic inefficiency in FTAs in a way they cannot do with customs unions". She demonstrates that imposing RoOs, in the context of FTAs, effectively broadens trade barriers from the most protective member to the least protective member in the region. Krueger (1993, p. 2) points out that "… not only must a country's trade barriers be low, but so also must its partner's, to insure that these costs are avoided". Presuming that the effective rate of protection does not rise after launching a CU, Krueger (1995, p. 15 and p. 4) demonstrates that "… an FTA cannot lead to any more trade creation than can a customs union and, when ROOs export any protection, an FTA leads to more trade diversion than does a customs union" and "[t]herefore, all else equal, customs union arrangements are strictly Pareto superior to free trade agreements".

Trade deflection effects are particularly relevant in the EU-SADC EPAs context. As we will see in Chapter 4, trade patterns and tariff structures are heterogeneous among SADC members, and for SADC, on one side, and the EU on the other. Overall, SADC members impose higher tariff restrictions against exports from third parties than the EU does. Third party products can potentially be re-exported through EU borders into SADC markets. This effect entails consumer welfare gains and tariff losses for SADC members. Trade deflection effects in the opposite direction are also valid for the highly protected sector in the EU market. Third country exports can enter EU markets through SADC borders and thereby tariff revenue will be transferred from the EU to SADC importers. Furthermore, the EU EPAs that exclude South Africa inevitably result in deflecting EU products to BLNS and re-exporting them to South Africa. South Africa can also deflect the exports that face high tariffs barriers in the EU to its BLNS partners. In the case of signing EPAs with the SADC-EPA group only, the EU products can be deflected away from non-participant SADC members to low tariff borders in the SADC-EPA group. Likewise, non-participant SADC exports will have access to EU markets through their SADC partners. Therefore, RoOs in the context of the EU-SADC EPAs, as well as intra-SACU trade, can play an important role in keeping the potential trade deflection effects at low levels.[8]

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[8] Despite this importance, very few empirical studies on the impact of the EPA RoOs on SADC trade are conducted. Section 3.4 reviews one of these studies.

3.2.4. Changes in Production Structure and Efficiency

The World Bank (2000, pp. 29-62) interestingly classifies the impacts of regional integration into trade and location effects versus competition and scale effects. The former refers to associated changes in the pattern of trade and location of production that eventually generate changes in real incomes for consumers, producers and government; whereas the latter deals with trade policy effects under new trade theory. This sub-section elaborates on how regional integration influences production and resource allocation decisions under both perfectly and imperfectly competitive market structures.

Regional integration and the associated changes in trade provide impulses to the production system in member countries and the rest of the world. Ricardian and Heckscher-Ohlin theories propose that resources are reallocated across activities according to comparative advantage for member countries relative to each other, on the one hand, and relative to non-member countries on the other. Under the assumption of inter-sectoral factor mobility, the Stolper-Samuelson theorem demonstrates that increases in relative prices of goods intensive in a factor induce income distribution effect in favour of this factor. That is to say, trade liberalization benefits the owners of the relatively abundant factor and harms those who hold the scarce factors.

> "Traditional theory based on the perfect competition paradigm had very little good to say about any measures to interfere with free trade. A tariff could benefit one country that was large enough to improve its terms of trade, even if this resulted in a net economic loss to the world as a whole", (Dixit 1993, p. 180).

In their survey of trade-focused CGE models, Robinson and Thierfelder (2002, p. 596) emphasize that "[a]nalysis with neoclassical models seems to get the sign right, but the magnitude wrong …". This is because models based on the conventional trade theory are inadequate for explaining an important phenomenon in international economy - intra-industry trade.

New trade theory goes beyond neoclassical market structure and contemplates features such as imperfect competition, economies of scale and trade externalities.[9] Krugman (1979 and 1980) demonstrates that trade occurs even without the traditional comparative advantage impulses. Combining markets into a regional entity enables individual members to pursue gains from economies of scale in a setting with intra-industry differentiation and monopolistic competition. Dixit and Norman (1980, pp. 265-294) provide models in the same class that show that increased competition fosters efficiency gains among firms in different member states. This, however, might adversely affect welfare since firms specialize in a narrow product variety. Under the assumption of product differentiation and monopolistic competition, they demonstrate that the more homogenous the economic structures for member countries, the more pronounced is their intra-industry trade. These contributions provide an elegant account of the determinants of trade under economies of scale and imperfect competition.[10]

To summarize, the theoretical literature on trade liberalization highlights the importance of associated changes in the production and trade mixes. The relevant question is whether these changes are desirable from a development economics perspective. The next sub-section addresses this question.

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[9] Willenbockel (1994, pp. 63-106) provides step-by-step explanations for partial and general equilibrium models with new trade theory features. The study analyzes the determinants of the effects for the UK of EC integration under economies of scale and imperfect competition.

[10] The introduction of imperfect competition to trade theory and applied trade policy analysis has triggered a voluminous body of literature exploring trade liberalization under alternative market structures. A review of this literature is beyond the scope of the present study. Willenbockel (2004) studies the robustness of results from trade liberalization scenarios to alternative market structure assumptions in a CGE context. The study concludes that "For a given demand nesting structure, the simulated responses to a trade policy shock are far more sensitive to the direct or indirect selection of demand substitution elasticity figures and benchmark mark-ups at the calibration stage than to the choice of firm conduct specification at the theoretical model design stage", (Willenbockel 2004, pp. 1092-1093).

3.2.5. Efficient Re-allocation or De-industrialization?

There is controversy in the literature around the impact of trade liberalization on development. One school of thought argues that trade liberalization produces more diversified output and export structures and lifts the economy to the industrialisation phase of the development ladder. For example, Krueger (1998, pp. 1515-1516) points out that

> "… a liberalised trade regime permits low-cost producers to expand their output well beyond that demanded in the domestic market. Whereas industrialisation based on protection of domestic industries thus results in ever-higher capital intensity of production … the open trade regime permits enjoyment of constant returns to scale over a much wider range".

Greenaway, Morgan and Wright (1998) also advocate the long term structural effects of liberalization policy.[11]

In contrast, proponents of protectionism argue that short-term protection enables new industries to exploit economies of scale and, thereby, enhances production efficiency. Moreover, some scholars have doubts about trade liberalization impacts on industrialization and growth. Rodrik (1988) analytically criticizes various arguments that link trade liberalization with productivity and growth. The study interestingly concludes with the disclaimer: "Warning! Trade liberalization cannot be shown to enhance technical efficiency; nor has it been empirically demonstrated to do so".

More importantly, some empirical studies provide evidence of de-industrialization effects in developing countries that pursue trade liberalization policies. Wangwe (1995) points out that competitive pressure is not sufficient to diversify export base and direct it towards manufacturing sectors in Sub-Saharan Africa. He also highlights the importance of applying a 'managed' liberalization strategy that offers chances for firms to cope with a more competitive environment and provides incentives to build up their production capabilities. In contrast, Lewis (2001) demonstrates that trade liberalization and the associated structural change in South Africa during the nineties

[11] The authors highlight the importance of distinguishing between trade liberalization and openness in assessing these changes in the export and production structures. They conclude that "… it is vital not to equate liberalisation with openness and equally vital to remember that openness is a function of many factors not just liberalisation". Trade liberalization measurements have been extensively discussed in the literature. See, for example, Iapadre (2004).

do not entail de-industrialization. Moreover, Edwards and Lawrence (2006) demonstrate that trade liberalization during the nineties stimulates and diversifies South African exports. Based on the estimated long term export function, the study identifies two channels through which liberalization promotes export capabilities: reducing inputs costs and enhancing profitability of exporting relative to domestic sales. Retrospectively, tariff protection during the Apartheid period negatively affects exports of non-commodity manufactured goods. The study, accordingly, attributes the acquired comparative advantage in capital-intensive primary and manufactured commodities to both natural resource endowments and the protection pattern.

Inferences on de-industrialization effects in developing countries should be treated with caution, though. It is important to distinguish between de-industrialization and efficient reallocation of resources. Trade liberalization might cause contraction in some manufacturing sectors that had previously expanded under protective policy without justification on the grounds of dynamic comparative advantage. This type of de-industrialization might seem reasonable if it is transitory and efficiency-enhancing.[12]

Such changes in output and trade structures are particularly important in the context of the EU-SADC EPAs. The agreements endeavour to help SADC to maintain sustainable development and to integrate into the world economy. Some studies argue that opening SADC markets and exposing domestic production to high competition from EU products enhance supply capacity and production efficiency and, eventually, help to diversify industry and export structures. On the other hand, some scholars express concerns about potential de-industrialization effects in SADC economies. Relative to the EU, SADC countries have comparative advantage in agricultural and agro-processing activities. Accordingly, reciprocal liberalization with the EU is likely to reallocate resources away from manufacturing activities towards the sectors with comparative advantage. Indeed, a study by the United Nations-Economic Commission for Africa (UN-ECA) (2005) suggests contractions in heavy

[12] For a more detailed discussion, see Shafaeddin (2005).

industries, low- and medium- technologies, textiles and clothing in Sub-Saharan Africa under a full reciprocity scenario with the EU.[13]

Even for the studies that advocate favourable structural effects of the EU-SADC EPAs, clear acknowledgments on the associated adjustment costs are provided. But, what is the nature of these adjustment costs and how are they dealt with in the literature?

3.2.6. Structural Change: At What Adjustment Costs?

Trade liberalization generates structural change, for both the output and trade mix, which is likely to be associated with high adjustment costs. After liberalizing trade, production factors move across sectors, mainly towards export-oriented sectors. The displaced factors and the economy as a whole incur adjustment costs. Examples of factor-displacement costs are expenses associated with searching for job opportunities, and costs incurred acquiring new skills. Furthermore, in the case of market imperfections, e.g. price rigidity and factor immobility, the economy as a whole incurs net welfare costs of adjustment associated with income losses and underemployment.[14]

Literature on adjustment costs suffers from ill-defined concepts, lack of required data and complexities in the provided measures. Baldwin, Mutti and Richardson (1980, pp. 406-413) provide an eloquent discussion of potential adjustment costs as a result of multilateral trade liberalization. Empirical studies on developing countries in general, and SADC countries in particular, are few. Milner and Wright (1998) examine labour market adjustment to trade liberalization policies implemented during the 1980s in Mauritius.

Adjustment costs could be particularly influential for SADC economies should they undertake reciprocal liberalization with the EU. In these economies, unskilled labour-intensive sectors are predominant with salient features of factor market rigidity. Indeed, Davidson and Matusz (2000) demonstrate that, under factor rigidity assumptions, adjustment costs might outweigh generated gains. In spite of this

[13] Results provided by this study are presented later in detail in Section 3.4.

[14] In this context, Mussa (1974) specifies the determinants of factor income responses to changes in commodity prices in both the short and long terms. He highlights the importance of factor specificity, substitutability and intensity.

important impact, empirical studies on welfare effects of trade liberalization tend to neglect, or at least underestimate the associated adjustment costs. This is attributed, *inter alia*, to lack of required data at a sufficiently disaggregated level, avoiding any additional complexity to welfare analysis or adopting assumptions about market perfections and fully adaptable factors/activities.

Indeed, concerns on adjustment costs associated with the EU-SADC EPAs are discussed in the relevant literature. Some studies attempt to estimate the potential adjustment costs, e.g. Milner (2006), and others assess complementary measurements to compensate these estimated costs, e.g. Silva and Grynberg (2006) and Braun-Munzinger (2009).

3.3 Regional Trade Agreements: Different Analytical Perspectives

At this stage of developing the analytical framework and before turning to the empirical work on the EU-SADC EPAs, it is worth distinguishing between different approaches to dealing with the impacts of RTAs. In this literature, one could identify different analytical approaches. The first one examines the impacts of RTAs and addresses the question whether the RTA is welfare-improving for the RTA partners or not. This type of analysis is already discussed in Section 3.2.

Another strand of studies considers more comprehensive impacts on the global liberalization process. Studies in this category are concerned with the questions whether RTAs bring the global economy closer to the ideal of globally unrestricted trade or RTAs impose additional distortions on the global trade system, and to what extent a RTA is compatible with the WTO objectives. This analytical approach of viewing regionalism is dealt with in Sub-sections 3.3.1 and 3.3.2. The last group of studies considers the distribution of gains and losses between member countries and how the institutional features of an RTA could affect its outcomes and their distribution. Clearly, this task is not straightforward in light of the observed overlapping trade arrangements and criss-cross trade preferences. Sub-sections 3.3.3 and 3.3.4 provide a review of these analytical issues.

3.3.1. Building or Stumbling Blocks?

FTAs are preferential arrangements that liberalize trade among member countries but, in effect, impose trade protection against non-member countries. From this perspective, a large number of studies examine whether the proliferation of RTAs will eventually lead to non-discriminatory trade liberalization or whether it adds further distortions to the world trading system. Many scholars argue against preferential, both bilateral and regional, trade liberalization since it undermines the multilateral trade liberalization process. Panagariya (1996a, p. 485) finds that "… discriminatory liberalisation under FTAs may *increase rather than decrease* protection and may, indeed, make the countries undertaken the liberalisation as well as the world as a whole worse off". Along this line, Crawford and Fiorentino (2005, p. 16) point out that "… RTAs may pose a threat to a balanced development of world trade through increased trade and investment division …".

In his seminal paper, Bhagwati (1991) introduces the concept of a 'building block' describing a PTA that contributes to global free trade in contrast to a 'stumbling block' that fragments world trade. Lawrence (1991) specifies some criteria for a PTA to serve as a 'building block', among which are expanding its membership and urging multilateral trade liberalization. DeRosa (1998) asserts that reducing trade barriers with non-member countries would generate more welfare gains and support multilateral trade liberalization.

Baldwin (2006) introduces a novel political economy mechanism, termed the 'spaghetti bowls as building blocs' mechanism, of the proliferation of RTAs. Employing the 'domino theory' of regionalism, the study explains that after an immediate impact that deepens integration within a new preferential trading area, non-members tend to join the regional group.[15] This entails more discriminatory trade liberalization against other non-members and, thereby, stronger political incentive to integrate. This iteration eventually leads to the 'multi-lateralization of regionalism'.

[15] The 'domino theory' of regionalism was first introduced by Baldwin (1993). For applications of the 'domino theory' to US-Mexico integration and the EU, see Baldwin (1997).

Interestingly, Richard Blackhurst, in the context of commenting on Bhagwati (1993, pp. 56-57), concludes that

> "… the fundamental issue in this area is not regionalism versus multilateralism, but rather interventionism versus liberalism. In other words, the fact that regional economic integration can be either supportive of or antagonistic toward the multilateral trading system, depending on the details, suggests that regional economic integration *per se* is not the basic issue".

3.3.2. The Natural Trading Bloc Argument

Another school of thought argues that although discriminatory tariff reductions are not the optimal solution, regional integration can be desirable under the observed distortions in the world trade system. In this vein, Krugman (1991) and Summers (1991) note that countries in the same geographical region form a 'natural trading bloc' which is more likely to create, rather than divert, trade and even in the case of trade diversion, more influential welfare gains stem, *inter alia*, from realizing economies of scale. Krugman (1999) supports the 'natural trading bloc' argument and demonstrates that the greater the number of trading blocs and the less their sizes, the greater are the induced welfare gains for the world as a whole. The crux of the argument is that the higher the trade share with the potential partner in a RTA, the greater is the probability that the agreement is welfare-enhancing.

Nonetheless, a great debate surrounds the argument of 'natural trading bloc'. In their critical work, Bhagwati and Panagariya (1999, p. 46) argue that

> "… the larger the initial quantity of imports from a trading partner, the greater (not smaller) the loss to the country liberalizing preferentially, ceteris paribus. That is to say, the more natural the trading partner according to Summers' definition, the larger the loss from a discriminatory trade liberalization with it!"

Furthermore, empirical evidence suggests low trade shares between neighbour countries in many cases. Bhagwati (1999) demonstrates that substitution elasticities, not only trade shares, between domestic goods and imports sourced in member and non-member countries are a crucial determinant of the potential welfare effects induced by any regional arrangement. Schiff (1996 and 1999) challenges both arguments by considering the revenue loss in the welfare analysis. Using a partial equilibrium framework, the author finds that the higher import shares from a trading partner, the more likely it is for the tariff losses to outweigh the gains in consumer surplus.

An important issue that is intensively discussed in the EU-SADC EPAs literature is the effectiveness of the EPAs in integrating SADC into the world market. That is to question the extent to which the EU-SADC EPAs are 'building blocks'. Although the EU is not geographically a 'natural trading bloc' for SADC, the EU is a primary exporting market for many SADC countries. The theoretical literature does not provide a clear-cut answer on whether this pattern of integration entails potential gains for SADC or predominant losses. This issue, indeed, merits a thorough empirical, rather than analytical, examination.

In this context, Hinkle and Schiff (2004) argue that the EU-EPA provides an opportunity for Sub-Saharan African countries to effectively integrate into the global market. The pressure on Sub-Saharan African countries to liberalize trade with the EU accelerates their own regional integration and reform policies. Besides, liberalizing trade in services and the associated regulatory reforms generate strong second-round effects for other sectors and attract foreign investment. The study emphasizes that the EU-EPA's potential as a pro-development device for Sub-Saharan Africa lies in its non-trade components. These include liberalizing RoOs, relaxing labour movement regulations as well as providing adequate technical and financial support.

3.3.3. Spaghetti Bowl of Trade Agreements and Trade Preferences

Empirical evidence shows that countries tend to participate in RTAs to avoid exclusion. This general tendency towards regionalism generates a 'domino effect' of proliferating RTAs, which eventually forms a 'spaghetti bowl' of overlapping agreements with a 'crisscrossing' of trade preferences.[16]

This *ad hoc* proliferation of RTAs makes the task of examining the effects of RTAs particularly complicated. In order to properly assess a RTA, the preferential access granted to its members should be evaluated and contrasted to alternative preferential arrangements to which members are eligible. The potential benefits of preferential liberalization arrangements depend, *inter alia*, on the size of preference margins. Preference margins should be large enough to serve as economic incentives for the recipient country to invest in export-oriented sectors. Arguably, the WTO logic is that the current wave of globally lowering trade restrictions makes market access less important.

> "These MFN tariff reductions have diminished considerably the incentive to obtain preferential market access in developed country markets. Margins of preference – the gap between the MFN tariff rate and duty-free treatment – have declined, and indeed been eliminated over a large range of products", (World Trade Organization 1995, p. 56).

Product coverage also matters in assessing preferential liberalization arrangements. The higher the product shares in total exports for the recipient country, the greater are the potential export expansions and revenue gains. Other factors are either related to the program design, e.g. the criterion of country eligibility and other regulatory rules; or attributed to production and export capacities for the preference recipients.

[16] The terms 'spaghetti bowl' of RTAs and 'crisscrossing' of trade preferences were first used by Bhagwati (1995) and Bhagwati and Panagariya (1996, pp. 1-78).

3.3.4. North -South versus South -South Agreements

An important group of studies concerns how the institutional features of a RTA could affect its outcomes and the distribution of gains and losses among member countries. There is no clear-cut evidence on this issue. Some studies argue that RTAs between developing countries may emphasise trade diversion over trade creation. Summers (1991, p. 297) states that "Agreements within groups of small, highly distorted, and protectionist countries that diminish momentum for greater overall liberality are clear candidates for welfare worsening regional agreements".

The literature offers a variety of justifications that advocate North-South regional integration. Harrison, Rutherford and Tarr (2003) argue that developing countries have greater opportunities to gain from increased competition and economies of scale compared to the developed members in the regional group.[17] Other scholars, e.g. Venables (1999), note that divergence of member countries' incomes occurs in the case of integration between developing countries and that convergence to high income levels does not occur unless the integration scheme contains at least one developed country.[18] Vamvakidis (1998) argues that being with open and developed countries in the same region fosters growth rate in the home country. Schiff and Wang (2010) provide evidence of strong productivity gains experienced by developing countries in North-South RTAs.

There is a long-standing debate in the literature around the issue of overlapping membership for SADC members. The majority of empirical studies attribute observed low intra-SADC trade to SADC multiple memberships. This issue has important implications for the EU-SADC EPAs as well. As we saw in Chapter 2, the EU-EPAs configuration assigns SADC members into different negotiating groups. The focal point is, therefore, to what extent the current configuration facilitates the integration efforts within the SADC region, on the one hand, and with the EU on the other. This configuration, *prima facia*, entails fragmenting intra-SADC regional integration.

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[17] Hinojosa-Ojeda, Robinson and Lewis (1995) reveal larger dynamic impacts of NAFTA on Mexico compared with the US.

[18] In a study on regional integration in Europe, Ben-David (1993) shows a strong negative relationship between trade liberalization and the degree of income disparity across countries.

In this context, some scholars argue that intra-SADC regional integration is a prerequisite for SADC members to benefit from the EU-EPAs. Meyn (2004) raises concerns about welfare losses induced by the North-South arrangement that is embodied in the EU-SADC EPAs. The study finds that opening markets to EU imports generates trade diversion and de-industrialization effects for Botswana, Mauritius and Mozambique. Therefore, it concludes that strengthening the South-South integration up-front is essential for the EU-EPAs to benefit SADC. The study, however, follows an analytical, rather than empirical, framework. It does not provide evidence to support that SADC benefits from the EU-EPAs if intra-SADC integration was completed first, let alone empirical findings on the optimal level of SADC integration that maximizes its gains from the EPAs.

3.4 The EU-SADC EPAs in the Literature

The EU-ACP EPAs have been empirically examined in the literature mostly at a regional level according to the negotiating regional groups. Examples are Keck and Piermartini (2008) for SADC-EPA; Milner, Morrissey and McKay (2005) for ESA-EPA; Ngeleza and Muhammad (2009) for Central Africa-EPA; Busse, Borrmann and Grossmann (2004) for West Africa-EPA; Gasiorek and Winters (2004) and Stevens, Kennan and Meyn (2009) for the Caribbean-EPA and Pacific-EPA groups. More comprehensive studies consider the ACP negotiating regions altogether, e.g. Fontagné, Laborde and Mitaritonna (2010).

The literature on the EU-SADC EPAs shows a wide spread variations in terms of regional and sectoral coverage, adopted methodology and analytical approach. Most of the empirical studies conduct analyses at a regional level, covering the two negotiating regions in which SADC members are assigned: the SADC-EPA and ESA-EPA groups. Yet, several SADC members are dealt with either as an individual negotiator (i.e. South Africa) or as part of another negotiating group. Examples for the latter are Ngeleza and Muhammad (2009), which considers D.R. Congo as a member of CEMAC, and Milner, Morrissey and McKay (2005) that deals with Tanzania as a member of EAC. Few studies conduct country-specific analyses, either for each SADC member (e.g. Tekere and Ndlela 2003) or for a specific member (e.g. Milner, Morrissey and Zgovu 2007).

Empirical examinations for the effects of the EU-SADC EPAs are generally undertaken within a partial equilibrium framework, fewer studies employ general equilibrium analyses and very few complement both methodologies. Most of analyses consider liberalizing trade in goods without giving adequate attention to trade in services, let alone to non-trade aspects of the EPAs. As an exception, Jansen (2007) assesses the potential benefits and losses for the Eastern and Southern African countries from liberalizing services trade with the EU in the EPAs context.

Studies tend to conduct comparative analyses of the effects driven by variant EPA scenarios. They often do not consider the legal situation, i.e. that the *status quo* for SADC-EU trade is no longer sustainable. From this perspective, Hinkle and Schiff (2004) presume that the EU-EPAs are the only available scenario for Sub-Saharan Africa and, thereby, explore the required conditions under which Sub-Saharan African countries benefit the most from the EU-EPAs. It is, however, an analytical rather than an empirical study. Few empirical studies contrast the effects of the EU-SADC EPAs with the effects of alternative trade arrangements in the case of not signing final EPAs with the EU, e.g. Fontagné, Laborde and Mitaritonna (2010).

In light of these variations, reviewing the conclusions abstracted from the literature is not a straightforward task. The impacts of different studies vary in magnitude and, more importantly, contradict in content. This is attributed, *inter alia*, to employing different methodologies with variation in assumptions. This section therefore seeks to elucidate the main trends in the ongoing debate in the literature, and the striking inconsistencies, without attempting to conduct comparison between specific outcomes. The review is based on selected *ex-ante* empirical studies that examine the EU-EPAs effect on SADC members, whether within the EU-SADC EPA configuration or in a different EU-ACP EPA group.

3.4.1. Partial Equilibrium Analysis

Milner, Morrissey and McKay (2005) follow partial equilibrium analysis to evaluate the trade and welfare effects of the EU-EAC EPAs, including Tanzania.[19] The study introduces a novel method for decomposing the induced welfare impacts into three components: consumption effects, trade creation and trade diversion effects. The study identifies three types of sector-specific effects. For those sectors where the EU is the main supplier, consumption effects are estimated. Secondly, for sectors where imports are mainly originated in third parties (i.e. non-EU and non-EAC members) potential trade diversion and consumption effects are quantified. Finally, trade creation and the associated consumption effects are calculated for those sectors where intra-EAC trade dominates.

The results for Tanzania show that trade diversion effect, i.e. the second type, dominates leading to net welfare losses equivalent to 0.5 percent of GDP. The study identifies the most affected sectors by each type of the generated effects. While both consumption effect and trade creation effect are primarily reported in the manufacturing sectors, many agro-processing sectors (i.e. food products; coffee, cotton and sugar; manufactured food and beverages and tobacco), as well as all manufacturing sectors, are subject to trade diversion. Furthermore, the study finds that more than half of the Tanzanian tariff revenue is estimated to vanish.

The study adopts strong assumptions on perfect competition and perfect substitutability between domestic products and imports, as well as between imports from different origins. Such assumptions entail that changes in trade measures, e.g. tariff reductions, are entirely transmitted into price and quantity changes in domestic markets. Therefore, the study's findings are interpreted as the upper bound of the potential effects of the EU-EAC EPAs. Another limitation is that the analysis does not provide quantitative assessment for the associated changes in production.

[19] The analytical framework of the study is an extension of Panagariya's (1998, pp. 89-95) approach. Panagariya develops an analytical framework in order to examine the impacts of moving from non-discriminatory trade barriers to preferential trade liberalization. He demonstrates that the home country gains from entering a RTA are mainly induced by the preferential access it receives to its partner's market rather than opening its own market.

Milner (2006) examines the different types of adjustment costs associated with the EU-ACP EPAs. The study identifies five sources of adjustment costs: fiscal adjustment, trade facilitation and export diversification, production and employment adjustment, skills development and productivity enhancement, and negotiating and legislative costs. Instead of employing intensive modelling work, the study composes a range of practical indicators for each type of adjustment costs in individual ACP states. It thus provides proxies for the potential adjustment costs for each economy.

Milner, Morrissey and Zgovu (2007) examine the potential welfare, trade and production effects as well as the associated adjustment implications of the Mauritius-EU EPA. In order to quantify the trade and production changes, they follow the partial equilibrium analysis developed by Milner, Morrissey and McKay (2005).[20] Building on the model estimations of the potential changes in Mauritian production and trade structures, they provide inferences on the associated adjustment costs. For this purpose, they follow the approach introduced by Milner (2006) in defining and examining different types of adjustment costs. Milner, Morrissey and Zgovu (2007) find that under a full EPA scenario, Mauritius experiences substantial resource losses due to diverting imports from more efficient producers in the rest of the world to less efficient EU producers. These losses are estimated at 361 million - Mauritian rupee 2002. The experienced resource losses are, however, offset by welfare gains, the bulk of which (274 million - Mauritian rupee 2002) is driven by efficiency gains from resource reallocation. Net welfare gains are thus limited. The study highlights the importance of substantial adjustment costs that are primarily driven by fiscal losses and reductions in employment, particularly in manufacturing sectors.

Fontagné, Laborde and Mitaritonna (2010) develop a partial equilibrium model to examine the effects of the ACP-EU EPAs in contrast with the corresponding effects drawn under a counterfactual scenario. The study is comprehensive not only in terms of country coverage, but also regarding analytical perspective. It covers the six ACP negotiating regions, including all SADC members except South Africa. The study

[20] Milner, Morrissey and Zgovu (2008) combine the results on trade and welfare effects for EAC along with the induced effects and adjustment costs for Mauritius and provide overall conclusions and policy implications. Milner, Morrissey and Zgovu (2009) provide some inferences on potential adjustment costs for EAC and ACP members as a whole.

specifies the WTO-compatible counterfactual scenario that applies the EBA for LDC ACP and GSP for non-LDC ACP.

The study results are computed as deviations from the counterfactual scenario that gives SADC less preferential access to the EU markets compared to the *status quo*. Results show that SADC exports to the EU increase by 30 percent in volume terms in 2022 whereas SADC imports from the EU rise by only 11 percent. At the sectoral level, results show substantial export expansions to the EU for few products. In 2022, sugar exports to the EU increase by 511 (from Mauritius), 398 (from Swaziland) and 145 (from Zimbabwe) million euro - 2004. In addition, the study shows an increment in Mauritian textiles and apparel exports to the EU worth euro 108 million.

The study examines trade diversion and creation effects (as well as fiscal impacts) in isolation of the induced terms of trade and resource reallocation effects. Accordingly, it does not provide inferences on EPA welfare implication. These exclusions might lead to flawed results. It is difficult to conceive a situation where liberalizing trade affects only consumer prices, whereas production prices remain unchanged. Trade policy instruments have direct and indirect impacts on relative prices of domestic production. Increased competitive imports push domestic prices to decline. Demand is switched to imports away from domestic products. Depending on the forward and backward linkages across sectors, the new production mix is defined. Simultaneously, factor demand and supply decisions for different sectors are made. These entail changes in factor prices (in the case of limited factor supply) or factor employment (in case of abundant factors). In the course of production process, relative prices of primary inputs change, which in turn generate second round effects on relative prices of final products.

These interlinked relationships between agents, forward and backward linkages across sectors and the associated second round economic effects cannot be grasped properly within partial equilibrium framework. From general equilibrium perspective, empirical studies demonstrate important terms of trade effects in the case of the EU-SADC EPA. For example, Keck and Piermartini (2008) argue that, under a complete EU-SADC EPA scenario, changes in terms of trade are the driving element of the incurred welfare impacts for almost all SADC regions.

In one of a series of the EU-ACP Sustainability Impact Assessment (SIA) studies, the European Commission (2006b) employs a partial equilibrium model to assess the effects driven by relaxing RoOs in the context of the EU-EPAs compared to those prevailing under the pre-EPA RoOs. Two case studies are conducted for the SADC-EPA group: garments sector in Lesotho and fisheries in Namibia. The results demonstrate that the members of the SADC-EPA group can reap gains from liberalizing RoOs. Trade expands in both sectors not only for the economies under consideration but also for other members in the group. Furthermore, processed fish exports increase for Namibia and Mozambique with potential development for the other coastal countries in the group, i.e. Angola and Tanzania.

3.4.2. General Equilibrium Analysis

Perez (2006) calibrates the CGE GTAP model to a global SAM derived from the GTAP database version 6 (hereafter referred to as GTAP6) that is referenced to 2001.[21] The study contrasts the effects of the EU-ACP EPAs with those induced under alternative trade arrangements with the EU, i.e. EBA for LDCs and GSP and GSP+ for non-LDCs. The analysis covers all ACP groups, including South Africa, SADC and Sub-Saharan African (SSA) regions.[22]

The study finds substantial terms of trade and welfare losses, particularly for SSA region. Asymmetric liberalization for ACP trade alleviates these adverse effects. Removing tariff on only 50 percent of ACP imports from the EU reduces the experienced welfare losses for SSA region under a symmetric scenario by 73 percent. This asymmetric liberalization barely affects output and welfare for the SADC region. By contrasting welfare and GDP results with the corresponding consequences driven by the EBA/GSP scenario, the study concludes that the EU-EPA is the best option for the SADC region. In contrast, SSA, ACP regions and the world as a whole are better off

[21] The GTAP model is widely implemented in analyzing trade policy and other issues. The model specification is documented in Hertel (1997). The model is implemented using the GEMPACK software as documented in Harrison and Pearson (1996).

[22] SADC region identified by the study includes four GTAP regions: Botswana, Mozambique, Rest of SACU and Rest of SADC. The latter is counted here since Angola was firstly part of the SADC-EPA negotiating group. The remaining five SADC members as represented in GTAP6 (Malawi, Tanzania, Zambia, Zimbabwe and Madagascar) are lumped together with the other Sub-Saharan African countries in one region.

under the EBA/GSP scenario. Not only do they experience less welfare and output losses, but industrialization and regional trade integration are also enhanced.

Curran (2007) criticises the way Perez (2006) identifies and simulates those ACP products that graduate to GSP+. She demonstrates some contradictions with the WTO regulations. More importantly, she argues that excluding both sugar and bananas from the GSP+ privileged list of exports leads to misleading conclusions on the GSP+ as an alternative trade arrangement to the EU-EPAs.

Bouët, Laborde and Mevel (2007) calibrate the Modeling International Relationships in Applied General Equilibrium (MIRAGE) model to a global SAM for 2001 derived from GTAP6.2.[23] The study examines the effects of the EU-EPAs in contrast with the results driven under alternative scenarios for ACP regions. Among the ACP regions are: South Africa, SADC (according to the EPAs negotiation configuration), part of ESA (including Malawi, Mauritius, Zambia, Zimbabwe and Madagascar) and Angola, Seychelles and D.R. Congo as one region. Results for 2018 and 2035 are contrasted with the findings in the baseline year, i.e. 2008.

The study finds that the SADC region experiences substantial export expansions, mostly as a result of removing EU tariffs on meat and sugar, whereas imports increase proportionally less leading to appreciation of real exchange rate. The same findings, albeit in smaller magnitudes, are reported for ESA region. Assuming constant current account balance, these changes entail increasing imports from other partners and more tariff revenue. Interestingly, the study quantifies a 5 percent long term increase in real income for SADC, relative to the baseline level, under the EPA scenario. In contrast to the EPA scenario, effects induced by the GSP scenario for the SADC region are negligible. For Angola, Seychelles and D.R. Congo, EPA does not provide an improvement in access to EU markets. Therefore, their imports increase proportionally higher than exports, yielding real depreciations with substantial tariff losses. The GSP scenario alleviates tariff losses, albeit the long term declines in real income remain unchanged.

[23] The MIRAGE model is developed by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), available at http://www.cepii.fr/. For a detailed description of the model, see Bchir et al. (2002). In addition to GTAP6.2, the study uses data on tariff for 2004 abstracted from MAcMapsHS6-v2.

In another study that employs MIRAGE model in examining EU-EPA impacts, with particular attention given to Senegal, Berisha-Krasniqi, Bouët and Mevel (2008) second these results for SADC and ESA regions. The study provides results on increasing exports, to the EU as well as to other partners, and imports from all partners. Therefore, it concludes that the EU-EPAs are trade-creating for SADC and ESA regions. It also finds that terms of trade, allocation efficiency and real income gains for the SADC region are substantially lower under a multilateral trade scenario. Clearly, these findings contradict the negative change in GDP (in both value and volume terms) for the SADC region concluded by Perez (2006).

Keck and Piermartini (2008) analyze the effects on SADC members using a CGE model. The study comprises all SADC non-EU trade partners into two aggregated groups only, i.e. rest of developed and developing countries. The study's innovation is examining how other EU-EPAs (namely with the EU-Mercosur EPA) could possibly affect the induced effects on SADC. The sectoral breakdown is highly aggregated. Within the four agricultural sectors, sugar is added to other crops. All manufacturing is represented by only three sectors without giving special focus on important industrial sectors.

Assuming an ambitious liberalization scenario, they find that the EU-EPAs are welfare-improving for SADC, which accrues gains worth US$ 1.5 billion. The study emphasizes that intra-SADC trade liberalization enhances the accrued gains, whereas the EU tariff removal for other ACP countries reduces SADC gains. Sectoral results show that SADC welfare gains are primarily driven by improving its access to EU markets, particularly for the animal agriculture and processed food sectors. The study, however, provokes concerns about de-industrialization risks[24] and argues that multilateral liberalization lessens the reported welfare gains.

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[24] In an earlier version of the study, Keck and Piermartini (2005) argue that multilateral liberalization would instead enhance some manufacturing sectors, e.g. textile and clothing and light manufacturing sectors.

3.4.3. Complementary Approaches

In a comprehensive study, United Nations-Economic Commission for Africa (UN-ECA) (2005) adopts complementary partial and general equilibrium analyses to quantify the effects of the EU-EPAs on African countries. The study uses both the CGE GTAP model and the partial equilibrium Software on Market Analysis and Restrictions on Trade (SMART) model.[25] The study provides results on the induced impacts for fourteen SADC members; either as members of the SADC-EPA region (i.e. Angola, Botswana, Lesotho, Mozambique, Namibia, Swaziland and Tanzania) or as part of the ESA-EPA region (i.e. D.R. Congo, Madagascar, Malawi, Mauritius, Seychelles, Zambia and Zimbabwe).

The study finds trade creation effects outweigh trade diversion in all SADC regions and the highest net gains are reported for Angola, Mauritius followed by D.R. Congo and Tanzania. The study quantifies the part of the diverted trade that is originally sourced in the regional group, i.e. COMESA in the case of the ESA-EPA region and SADC for the SADC-EPA region. Diversion of trade sourced in the region is far higher for SADC members in the ESA-EPA compared to the SADC-EPA group. The study argues that reciprocity occurs at the expense of deeper regional integration for both regions.

Increases in imports from the EU are more profound for SADC members in the ESA-EPA compared to those in the SADC-EPA. Imports from the EU rise by more than 70 percent for Mauritius and 30-40 percent for Seychelles, Zimbabwe and Malawi. For the SADC-EPA region, the highest increase in imports from the EU roughly ranges between 28 and 33 percent for Tanzania, Swaziland and Namibia.

In addition to the welfare gains associated with trade creation, the study reports positive changes in consumer surplus for all SADC members in both regions. The gains accrued by SADC members in the ESA-EPA group are higher, in value terms, compared to the corresponding results for the SADC-EPA group, the result that is perceivable in

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[25] The SMART model is developed by United Nations Conference on Trade and Development (UNCTAD) and the World Bank in order to quantify trade effects generated by changes in market access. Owing to its simplicity, the model is widely employed in analyzing various types of trade liberalization. For an empirical example on constructing the SMART model and a critical discussion of the model outcomes, see Jachia and Teljeur (1999).

light of the reported trade effects. SMART model employed by the study does not capture the changes in producer surplus associated with the experienced trade effects. The study, therefore, does not provide insights on overall net welfare impacts.

The study estimates substantial tariff losses, particularly for Angola, Mauritius and Tanzania. Accordingly, the study highlights the importance of tax reforms and the associated adjustment costs. Similar results on substantial fiscal losses for Mauritius, Tanzania and Zimbabwe are also obtained by the SMART model in Tekere and Ndlela (2003).

3.5 Syntheses of the Literature

This chapter provides a detailed review of the main strands of the theoretical literature of preferential trade liberalization and highlights the different underlying analytical approaches. It also presents a list of selected empirical studies on the EU-SADC EPAs. These studies adopt different methodological frameworks: partial equilibrium analysis, general equilibrium analysis and complementary approaches.

Based on this review, four main conclusions that are relevant to this study can be drawn. First, preferential trade liberalization not only generates welfare impact in member countries but it also affects third parties and the world as a whole. Second, among the main determinants of the net effect of preferential trade liberalization are the degree of trade liberalization, the pre-liberalization trade patterns and protection structures and the degree of substitutability between imports from member and imports from non-member countries. Third, removing barriers to trade alters the production mix in relation to the prevailing forward and backward linkages across sectors in a given economy. The induced structural change might entail immediate shrinkages in manufacturing sectors. This type of effect does not necessarily imply de-industrialization. Fourth, discriminatory trade liberalization embodied in RTAs can fragment free world trade. Nevertheless, under certain circumstances the proliferation of RTAs can eventually enhance multilateral trade liberalization.

4 Main Structural Features of the SADC Economies

4.1 Introduction

For a given economy, structural features, trade relationships as well as initial protection conditions are among major determinants of its response to changes in trade policy. Therefore, a close inspection of these features for the economies under consideration provides preliminary suggestions on potential welfare and trade effects of the simulated changes in trade policy. Furthermore, they are essential for identifying the main transmission channels and thus for understanding the dominant causal mechanisms that drive the results of the quantitative simulation analysis.

Therefore, this chapter aims to provide detailed analyses of SADC production and trade structures. The objective is twofold. First and foremost, it portrays SADC economies at the baseline scenario. This provides a sound background against which to contrast the post-simulation economic status. Secondly, rigorous descriptive analysis of SADC economies provides indications of potential implications of the envisaged EU-SADC EPAs.

The chapter starts by deriving and aggregating data from the GTAP database (Section 4.2). Section 4.3 analyzes the structural characteristics and initial conditions of SADC economies as captured at the baseline scenario. Section 4.4 provides detailed examination of the nature of SADC trade and protection profiles at four levels: total trade, SADC trade with the EU, intra-SADC trade and SADC trade with other major trade partners. Drawing from the thematic analyses conducted in Sections 4.3 and 4.4, inferences around the likely implications of the EPAs on SADC economies are provided. Section 4.5 summarizes potential implications of the EU-SADC EPAs.

4.2 Global Social Accounting Matrix (SAM)

The underlying database for CGE models is typically represented as a social accounting matrix (SAM) where flows of income and expenditure for different agents are recorded.[1]

> “The relationship between SAMs and models is twofold. On the one hand, modeling is a major area of application of SAMs … On the other hand, models are important as a formalization of particular conceptual frameworks. Without such frameworks, data gathering is largely an empty exercise”, (Pyatt and Round 1985, p. 8).

The model implemented in this study, which is described in detail in the following chapter, is calibrated to a global SAM derived from the GTAP database version 7 (hereafter referred to as GTAP7) that is referenced to 2004. The GTAP database is sorted in a Header Array (HAR) file format. The model employed in this study is coded and implemented using the General Algebraic Modeling System (GAMS). Therefore, the GAMS – Data Exchange (GDX) tool is used to extract data from GTAP7 and to transform it into a GAMS-compatible format.[2]

The next sub-section provides an overview of the main components of the GTAP7 database and its limitations. The aggregation schemes and the global SAM dimensions used in this study are then described. Lastly, benchmark parameters are declared.

4.2.1. GTAP7 Database: Coverage and Limitations

The GTAP database is widely used in multi-region, multi-sector trade-focused CGE modelling. It is characterised by its comprehensive regional coverage and high sectoral disaggregation. GTAP7 includes data on 113 regions, 57 sectors and 5 production factors.[3]

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[1] For a detailed description of SAMs, see Pyatt (1988, pp. 329-337). One of the earliest applications of SAMs to developing countries is provided by Pyatt and Round (1977, pp. 339-364).

[2] I participated in two live forums organized by the Center for Global Trade Analysis: GTAP7 Data Base (13th January 2009) and Bilateral Services Trade Data in the GTAP7 Database (18th Feb 2010). For a detailed description of the GTAP7 database, see Narayanan and Walmsley (2008). For a detailed, technical explanation on deriving a global SAM from the GTAP database, see McDonald and Thierfelder (2004).

[3] The GTAP Sectoral Classification (GSC) follows the Central Product Classification (CPC) for agricultural and food processing sectors. It, however, defines all other sectors according to the

Bilateral trade flows are at the core of the GTAP database. Trade transactions are recorded by both country of origin and country of destination. Due to lack of information, data on trade and transportation margins as well as remittances is identified by either the source or the destination only, rather than by both.[4]

The GTAP7 database provides information on protection for merchandise trade. This includes bilateral applied tariff rates, *ad valorem* equivalents (AVEs) of specific and compound tariffs and TRQs (measured on the basis of the binding tariff, i.e. in- or out-of-quota tariffs). The estimated tariff quota rents, for the filled quotas, are supposed to be reaped by exporters.[5]

In addition, data on anti-dumping, domestic and export subsidies and export tax equivalents (ETE) is also included in GTAP7. Data on agricultural domestic support are based on the OECD Producer Support Estimate (PSE) for four support measures, i.e. output subsidies, intermediate input subsidies, land-based payments and capital-based payments. Data on agricultural export taxes and subsidies are based on country notifications to the WTO Secretariat. For the EU-25 members, data derived from the Financial Report on the European Agricultural Guidance and Guarantee Fund (FREAGGF) is used to calculate agricultural export subsidies.[6]

It is worth mentioning that the GTAP7 database includes updated estimations of ETE of export quotas on textiles and clothing covered by the Agreement on Textile and Clothing (ATC). Among the updates introduced into the GTAP7 database are EU enlargement and phasing out of the Multi-Fibre Arrangement (MFA). Many of the

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International Standard Industry Classification (ISIC, Rev. 3). For the mapping between GTAP sectors and the corresponding CPC and ISIC3 sectors, see Narayanan, Dimaranan and McDougall (2008).

[4] Trade data is mainly sourced from the United Nations Commodity Trade (UN-COMTRADE) database supplemented by trade data from IMF, FAO and WB.

[5] Data on tariff and the estimated tariff equivalents are based on the Market Access Maps (MAcMapHS6) – version 2.1 database that compiles information from UNCTAD-TRAINS, WTO, the Agricultural Market Access Database (AMAD), and the national customs databases. The MAcMap database is jointly developed by International Trade Centre (ITC UNCTAD-WTO) and The Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), available at http://www.cepii.fr/. MAcMapHS6 - version 2.1 provides comprehensive data on trade protection detailed at the 6 digit level of the harmonized system (HS6, Rev. 1) for 2004. Trade protection data includes *ad valorem* equivalents of MFN tariffs for 169 countries, preferential provisions for 220 countries and bound tariffs. For a detailed description of the MAcMapHS6 - version 2 database, see Boumellassa, Laborde and Mitaritonna (2009).

[6] In 2007, the EAGGF was replaced by the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD).

working reciprocal and non-reciprocal preferential arrangements are also considered in calculating the GTAP7 tariff rates.

Bilateral services trade data has been improved in GTAP7 in the way that different data sources (i.e. IMF and OECD/Eurostat) are compiled to ensure data quality. In addition, different indices are employed to test reliability of the data. Furthermore, the most recent arrangements for trade in services (e.g. intra-EU services directives that has been in force in 2004) are taken into account.[7] One of the main limitations with GTAP7 is the lack of estimations of barriers to trade in services. This, however, is a common limitation among most multi-region, multi-sector trade-focused CGE studies.

Another limitation for GTAP7 is related to income taxes. In the GTAP database, private income taxes are represented as factor income taxes. Personal income tax is assigned to skilled and unskilled labour income taxes whereas corporate income tax is assigned to land, natural resources and capital income taxes. This data limitation restricts the model's ability to examine trade shock impacts on personal income distribution.

The issues of data availability and reliability are particularly relevant in the SADC context. The GTAP7 database suffers from lack of up-to-date data for African countries. Input-output tables for Botswana, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe are for early/mid nineties. This implies low quality data for African regions.[8]

There are also reasons of concerns with respect to the quality of data on intra-African trade. Using the earlier version GTAP6 database, Villoria (2008) estimates $300 million of missing intra-Africa manufacturing exports in 2001. This represents nearly 41 percent of the potential bilateral trade flows in Africa. The extent of the missing data issues varies by region. Southern Africa shows the lowest estimated incidences for missing exports compared to low income countries of Central and West Africa. Once again, unrecorded trade data is problematic for all international trade databases.

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[7] For a detailed discussion of constructing data on trade in services in GTAP7 and its quality, see Lejour, van Leeuwen and McDougall (2008) and Lejour, van Leeuwen and ten Cate (2008).

[8] The GTAP database relies mainly on contributions by researchers on single-country input-output tables. As a step towards improving data quality, for African regions in particular, a special version of the GTAP6 database called the GTAP Africa database has been released.

In an effort to overcome this problem, the Famine Early Warning System (FEWS) monitors informal cross border trade in Africa. As for Southern Africa, the FEWS, however, reports informal trade flows for only three major crops, i.e. maize, rice and beans.[9]

By acknowledging wide discrepancies in reported bilateral trade flows, the GTAP7 database examines merchandise trade data reliability using the reliability index provided by Gehlhar (1996). The index employs several tests for trading reporter reliability based on reports provided by all trade partners as well as reliability indicators for sectoral trade flows for reporting countries. The relatively less reliable trade transactions are selected and bilateral trade flows are, accordingly, reconciled.[10] Among the least reliable importing/exporting reporters in 2004 are Botswana, Lesotho, Madagascar, Mozambique, Seychelles, Tanzania and Zimbabwe.

4.2.2. Aggregation Scheme

In trade policy analysis, the aggregation scheme should be elaborated to a level sufficient for pinpointing the targeted variables, and transparent enough to enable the modeller to trace generated results and identify underlying transmission channels. This dilemma reflects the common trade-off between policy relevance and transparency in the context of CGE models.[11]

As noted above, GTAP7 covers data on 113 regions, 57 sectors and 5 production factors. For the purposes of this study, GTAP7 is aggregated into 17 regions (i.e. 11 SADC sub-regions, European Union, ‘United States of America’, ‘East Asia’, ‘Southeast and South Asia’, ‘Rest of Sub-Saharan Africa’ and ‘Rest of the World’) 20 sectors (i.e. 10 agricultural, 7 industrial and 3 service sectors) and five production factors, i.e. natural resources, land, unskilled labour, skilled labour and capital. The adopted level of

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[9] For the most recent monthly report on informal cross border trade in Southern Africa, see Famine Early Warning System (FEWS) and USAID (2011).

[10] For a detailed description of the adopted selection procedures and reconciliation approaches, see Gehlhar, Wang and Yao (2008: pp. 1- 23).

[11] In an interesting review of the CGE policy models, Devarajan and Robinson (2002, pp. 2-3) suggest that “The issue of transparency argues for the use of stylized models, since it is relatively easy to describe the results and the causal chains involved. Policy relevance, however, often requires more sectoral and institutional detail, which mandates the use of applied models that are larger and more complex”.

aggregation for regions and sectors along with associated mappings from GTAP7 into the model regions and sectors are provided in Tables A4-1 and A4-2.

4.2.2.1 Region Aggregation

For the purposes of this study, the individual regions that represent SADC members are kept at the most detailed disaggregation level supported by the GTAP7 database. Nine (Botswana, Madagascar, Malawi, Mauritius, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe) out of the fifteen SADC members are identified separately in the database. Two composite regions are retained as they are in GTAP7: 'Rest of SACU' region, which contains Lesotho, Namibia[12] and Swaziland, and 'Rest of SADC' region that includes Angola and D.R. Congo. Due to lack of data, Seychelles, which is lumped into 'Rest of Eastern Africa' region in GTAP7, is not identified as a SADC region by the model.[13] This detailed representation of SADC members allows for undertaking an accurate country-specific analysis. The analysis distinguishes country-specific effects induced by the simulated scenarios and captures implications for intra-SADC trade, giving special attention to the sectors of interest for each SADC member.

The purpose of the study is to examine impacts of the EU-SADC EPAs on SADC members. The effects on individual EU member states are beyond the scope of this study. Therefore, the 27 EU members (i.e. the original 15 members in addition to the 12 new members) are combined into one region; 'EU-27'.

In order to accurately examine welfare and trade implications of a trade shock, the model should represent the main trade partners of the economies under consideration, albeit without losing transparency. SADC's main non-EU trade partners are identified and, accordingly, the remaining 75 GTAP regions are grouped into five separate regions: 'United States of America', 'East Asia', 'Southeast and South Asia', 'Rest of Sub-Saharan Africa' and 'Rest of the World'.[14]

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[12] Namibia is identified as a separate region in the GTAP8 database; which has been recently released in March 2012.

[13] By the time GTAP7 was being constructed, Seychelles membership in SADC was still ceased.

[14] Within the overall framework of the EU-ACP EPAs, other EU-ACP EPA groups should be separately identified, however, due to lack of detailed data, no clear-cut geographical representation of the EU-ACP EPA configuration is provided by GTAP7. A collaborative project between the EC and the World Bank

4.2.2.2 Sector Aggregation

The 57 GTAP7 sectors are aggregated into 20, half of which are agricultural and agro-processing sectors. In this sectoral decomposition, three sectors represent agro-processing activities (i.e. beverages, 'food products' and 'meat and dairy products'), whereas the sugar sector is identified separately. The model specifies 7 industrial sectors. Extracting activities are represented by 'oil and minerals', while petroleum and other mineral products are specified as 'chemical and mineral products'. Two sectors represent light manufacturing activities, i.e. textiles and 'other manufactures'. Heavy manufacturing activities are split into three sectors: 'metals and metal products', vehicles and 'electronic equipments'. Services activities are represented by three sectors: 'public utilities', 'trade and communication' and 'other services'.

The chosen sectoral aggregation scheme is sufficiently detailed to capture distinctive features and structural differences across SADC economies, and to reflect trade compositions of SADC members and their main trade partners. The detailed agricultural representation reflects the importance of agricultural and agro-processing activities for SADC economies. It also allows for considering specific arrangements for agricultural trade and for simulating Doha commitments regarding European agriculture. Furthermore, the chosen sectoral scheme permits identification of sensitive sectors that might be excluded from the simulated trade liberalization arrangements.[15]

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aims to disaggregate the GTAP database according to the EPA/ACP regions. The aforementioned GTAP Africa database is a provisional output of this project.

[15] Some preliminary experiments with alternative sectoral aggregation schemes have been employed in order to define the appropriate aggregation scheme that best serves the study objectives.

4.2.2.3 Production Factor Aggregation

Production factors are maintained at the disaggregated level provided by GTAP7. Five factors are represented separately: 'natural resources', land, 'unskilled labour', 'skilled labour' and capital. Within the sectoral aggregation scheme for this study, two activities (i.e. livestock and 'oil and minerals') are the only natural resources-using activities. Land is allocated across nine out of the ten agricultural and agro-processing activities. The only exception is beverages activity that is not a land-using activity. All sectors are unskilled labour-, skilled labour- and capital-using activities.

4.2.3. Benchmark Parameters

Three types of elasticities are extracted from the GTAP7 database: elasticities of substitution between domestic products and imports (Armington elasticities), elasticities of substitution between imports from different origins and elasticities of substitution between production factors.[16]

The GTAP database sets the elasticities of substitution between imports from different origins, for a given product, to be double the corresponding values of Armington elasticities. This is known as the 'rule of two'.[17]

Armington elasticities taken from GTAP7 are aggregated according to the sector aggregation scheme employed by the study. The aggregated Armington elasticities are measured as weighted averages of the GTAP7 Armington elasticities. The employed weights are the shares for the individual GTAP7 sectors in domestic demand (valued at producer price) for the corresponding aggregated sector by region. Armington elasticity value for an aggregated sector, thus, varies across regions, according to the relative weight of the GTAP7 sector in domestic demand for the corresponding aggregated sector for each region.

Similarly, the GTAP7 elasticity values for import from different origins are weighted according to the shares for the individual GTAP7 sectors in total import (valued at

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[16] The import elasticity values derived from GTAP7 are based on confidence intervals estimations provided by Hertel et al. (2007).

[17] Liu, Arndt and Hertel (2001) use an econometric approach to test the validity of trade elasticities in the earlier GTAP database, version 4. The study rejects the GTAP4 trade elasticity values, although it supports the underlying 'rule of two' for calculating the elasticities of substitution among imports from different sources.

market price) for the corresponding aggregated sector by region. Import elasticity value for an aggregated sector is, thus, varied across regions according to the relative weights of the GTAP7 sectors in import demand for the corresponding aggregated sector for each region. Tables A4-3 and A4-4 present the aggregated Armington and import elasticities extracted from GTAP7.

The model applies the same values for both types of import elasticities on the export side keeping the 'rule of two' valid. The elasticities of transformation between exports to different destinations are set at double the corresponding values of the elasticities of transformation between domestic supply and exports.

Elasticities of substitution between production factors are extracted from GTAP7 and aggregated according to the sector aggregation scheme employed by the study. The weights employed are the shares for the individual GTAP7 sectors in total value added of the corresponding aggregated sector. Table A4-5 presents the aggregated elasticities of substitution between production factors.

Due to lack of data, the model applies the same values of elasticities of substitution between production factors to the elasticities of substitution between aggregated valued added and aggregated intermediate demand at the top level of production function.

4.3 SADC Economies: Systematic Analyses

4.3.1. Country Size and Development Level

As depicted in Table 4-1, SADC countries vary considerably in terms of geography and demographics. The 15 SADC members together cover 9,641 thousand square km, with a combined population of 237 million. D.R. Congo is the largest country both in terms of area and population. The Seychelles is the smallest. The island covers only 455 square km and has the smallest population, not only in SADC but in Africa as a whole, with only 86,525 inhabitants.

Furthermore, the region includes 6 landlocked states, i.e. Botswana, Lesotho, Malawi, Swaziland, Zambia and Zimbabwe. D.R. Congo has a short coastline whereas the other 7 members are advantaged by very long coastlines. This topographic feature has important implications for SADC trade. Landlocked countries face challenges in accessing world markets since they rely on coastal neighbours for transmitting trade, thereby facing high transportation costs.

The heterogeneity among SADC members is not limited to size and topography. The region represents a mixture of diversified economies in terms of income level and distribution as well as development stage. SADC economies are classified, according to the World Bank, into three income groups: low income (D.R. Congo, Madagascar, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe), lower-middle income (Angola, Lesotho and Swaziland) and upper-middle income (Botswana, Mauritius, Namibia, Seychelles and South Africa). The GNI per capita ranges widely from US$ 110 (Congo, D.R.) to US$ 8,190 (Seychelles). In addition, eight members (Angola, D.R. Congo, Lesotho, Madagascar, Malawi, Mozambique, Tanzania and Zambia) are LDCs whilst the remaining seven (Botswana, Mauritius, Namibia, Seychelles, Swaziland, South Africa and Zimbabwe) are non-LDC developing countries.[18]

Another salient feature of the SADC region is the dominance of South Africa, which is by far the largest economy in the region. As shown in Figure 4-1, South Africa alone constitutes around three quarters of total GDP of SADC and more than 90 percent of SACU GDP in 2004. South Africa also plays a crucial role in SADC trade; this is explained in detail in Section 4.4. The country is an important gateway for other members' trade. Within SACU, Lesotho is entirely enclosed by South Africa; part of Swaziland's trade and most of Botswana's passes through South Africa.[19] Furthermore, Malawi's trade with the rest of the world is shipped from Durban port in South Africa passing through Mozambique and Zimbabwe, where the latter also depend on South African ports.

[18] The UN Committee for Development Policy (CDP) graduated Botswana from LDC status in 1994. In 2006, the committee identified Zimbabwe to be downgraded to LDC status. This recommendation, however, is not yet in force since Zimbabwe does not give its consent (United Nations, 2006). In the Cotonou Agreement, therefore, Zimbabwe is not classified as an LDC.

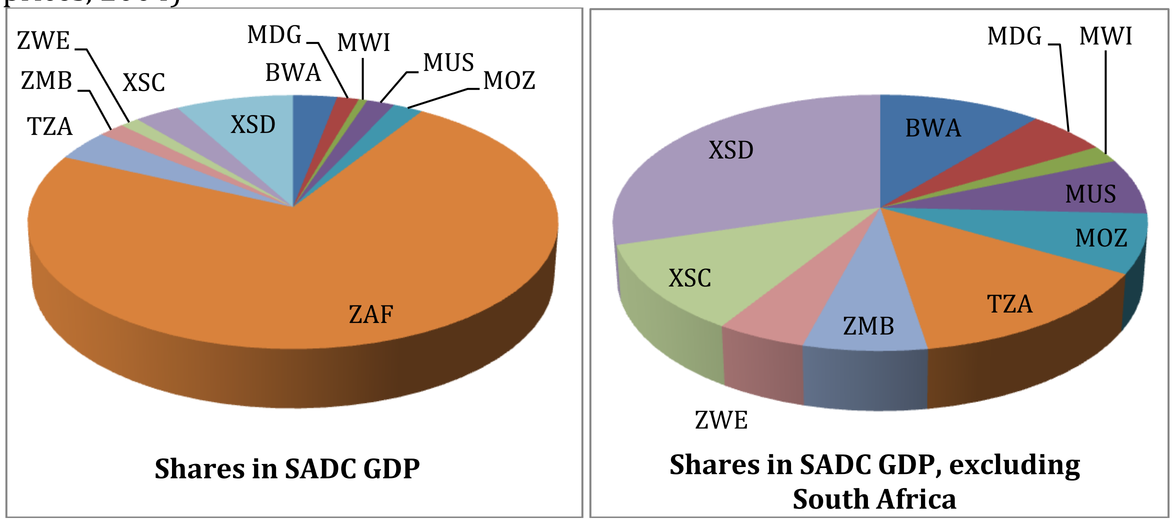
[19] Lee (2003) provides a critical assessment of South African hegemony in SACU.

Table 4-1: Macroeconomic Indicators, 2004

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Population (millions)*	1.8	18.1	12.6	1.2	19.4	45.5	37.6	11.5	12.9	4.9	71.4
Land Area (000 of sq km)*	567	582	94	2	784	1,214	884	743	387	870	3,514
GNI per capita, dollars*	4,360	290	160	4,640	270	3,630	320	400	620		
	GDP and Trade Flows** (Million US$)										
GDP, market price	8677.2	4300.8	1704.0	5517.1	5902.2	210387.6	11145.4	5261.4	3796.1	8922.5	23248.2
Exports	4246.7	2097.2	738.4	3986.2	2131.8	61637.5	2465.1	2129.3	2318.0	6729.4	13435.1
Imports	3588.4	1825.5	1198.3	4220.2	2513.4	59431.7	4244.1	2215.0	2575.0	5863.7	13727.9
	Trade Dependency and Trade Balance** (% GDP)										
Exports	48.9	48.8	43.3	**72.3**	36.1	29.3	22.1	40.5	**61.1**	**75.4**	**57.8**
Imports	41.4	42.4	**70.3**	**76.5**	42.6	28.2	38.1	42.1	**67.8**	**65.7**	**59.0**
Net Exports	7.6	6.3	**-27.0**	-4.2	-6.5	1.0	-16.0	-1.6	-6.8	9.7	-1.3
	Public Revenue** (%)										
Import Tariffs	5.7	**27.8**	15.1	**37.9**	14.7	5.0	14.3	14.7	**25.8**	10.6	12.2
Export Taxes	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	4.1	0.0
Sales Taxes	0.0	0.0	21.2	37.6	21.4	25.0	10.7	6.9	0.0	32.9	9.3
Taxes on Output	-1.4	27.2	0.0	0.0	-0.5	7.1	8.8	43.7	24.6	22.6	18.4
Factor Use Taxes	0.4	2.8	29.7	11.7	10.1	8.1	10.4	0.2	2.4	1.1	9.4
Factor Income Taxes	95.3	42.2	34.1	12.8	54.3	53.5	55.8	34.5	47.2	28.8	50.7

Source: * World Bank (2006), p. 25.
** Calculated by the author from the GTAP7 Database.

Figure 4-1: Relative Economic Size of SADC Members (% of SADC GDP at market prices, 2004)



'Rest of SADC' is the second largest economy in the region followed by Tanzania, Botswana and 'Rest of SACU'. Malawi, Zimbabwe and Madagascar are the smallest economies, each with a GDP of less than US$ 5 billion. Given this disparity, it is expected that the EU-SADC EPAs yield differential implications for different SADC members. This highlights the importance of conducting thorough country-specific analyses of the EU-SADC EPA outcomes.

4.3.2. Economic Structures

Economic structures across SADC are also heterogeneous. Figure 4-2, which is based on Table A4-6, presents activity shares in total gross output value by country in 2004.[20] The figure classifies SADC domestic activities into three plot areas; the agricultural and agro-processing activities, the manufacturing and mining activities, and the services activities, respectively. The columns next to the back wall present the aggregated figures for each of the three sub-groups.

As reflected in the figure, some SADC economies are either agricultural-based or mineral-based whereas others have a relatively more industrialized base. Agricultural and agro-processing are the main activities for Madagascar, Malawi and Tanzania.

[20] Since the study contemplates impact analyses of eleven SADC regions at a disaggregation level of twenty sectors, transferring tables onto figures presents a logical means for displaying the content of the underlying tables.

Within this group, some activities have particular importance, e.g. rice, beverages and livestock in Madagascar; 'other crops' in Malawi and 'food products' in Tanzania. For Mauritius, sugar is the main agricultural and agro-processing activity. Excluding these sectors from EPA liberalization programmes, based on infant industry protection arguments, as well as issues like reducing the EU support for agricultural production and exports within the Doha Round agenda is crucial for these cases.

'Rest of SADC' (namely Angola) as well as Botswana relies primarily on 'oil and minerals' (mainly oil and diamonds); the sector that solely contributes 21 percent and 30 percent of the total domestic output value for these economies, respectively.

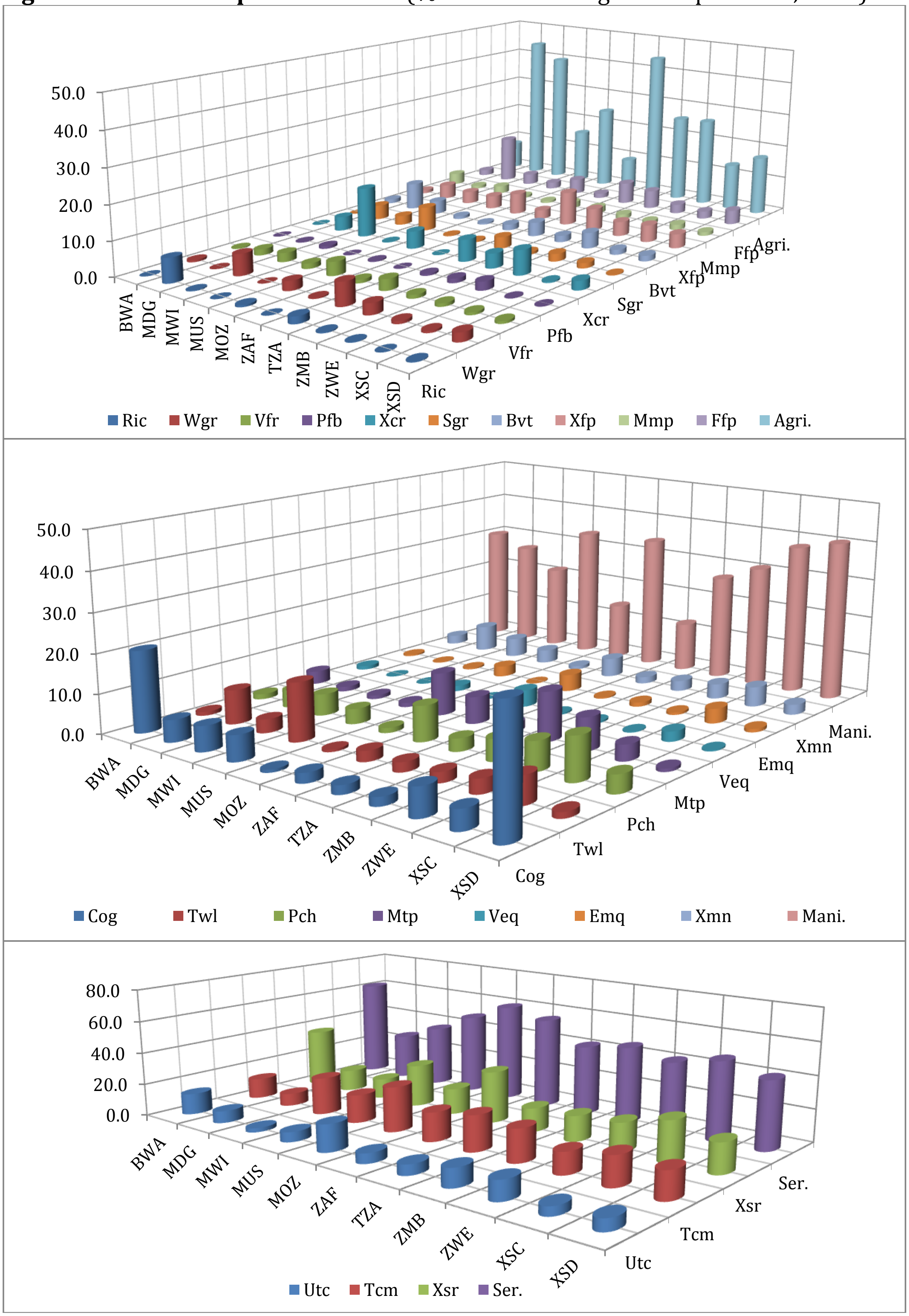
Overall, manufacturing activities in SADC are undiversified and the associated technologies are unsophisticated. However, for the cases of Mauritius, South Africa, Zambia, Zimbabwe and 'Rest of SACU', production structures are more diversified with relatively more advanced manufacturing activities. Within this category, textiles, 'chemical and mineral products' and 'metals and metal products' are among the main activities.

Services sectors constitute major shares of domestic output for many SADC economies; Botswana, Mozambique and South Africa in particular. In the context of the EU-SADC EPAs, liberalizing trade in services will have important implications for these economies.

Economic structures reflect the production factor abundance in different SADC economies. Tables A4-7 and A4-8 present factor intensity and factor allocation in SADC economies, respectively. The former reflects the prevailing technology in different activities while the latter represents factor usage across activities. These two indicators are essential for understanding any potential change in factor rents and the consequent changes in factor allocation after a trade policy shock.

Unskilled labour constitutes high shares of total value added in Madagascar, Malawi, Tanzania and Mozambique. As we saw above, Madagascar, Malawi and Tanzania are primarily agricultural-based economies. For these cases, agricultural and agro-processing activities are highly unskilled labour-intensive and utilize the bulk of unskilled labour. In Mozambique, unskilled labour is mainly allocated to services; the activities that altogether contribute the majority of domestic output.

Figure 4-2: SADC Output Structures (% shares in total gross output value, 2004)



In light of the importance of unskilled labour, special attention should be given to potential efficiency gains and adjustment costs associated with reallocation of this factor in response to trade shocks. Furthermore, issues like low factor mobility and elasticity of substitution as well as under-employment are worth special examination in the context of the EU-SADC EPAs.

Manufacturing and mining are highly capital intensive. Therefore, manufacturing- and mining-based economies exhibit high capital share in total value added. That is in particular the case for South Africa, Zimbabwe and 'Rest of SACU' where capital accounts for more than 45 percent of total value added. In Botswana and 'Rest of SADC', where mining activities dominate, high overall capital intensity of production prevails.

The point to highlight here is that capital returns derived from the GTAP database include remunerations for self-employed labour. This might overvalue capital shares in value added for some sectors. In effect, high capital intensity reflects the importance of self-employment labour that is observed in some SADC agricultural and agro-processing activities. This is particularly the case for rice activity in Zimbabwe and beverages activity in Malawi, each with capital intensity of more than 80 percent.[21] Overall, these variant factor intensities for activities across different producers might imply potential for complementarities among SADC economies on the production side.

4.4 Trade Structures and Protection Profiles

The importance of trade for many SADC economies is worth highlighting in the context of this study. As seen in Table 4-1, trade openness ratio is particularly high in 'Rest of SACU', Mauritius, Zimbabwe and 'Rest of SADC'. In addition, Malawi is highly dependent on imports and reports a sizable baseline trade deficit equivalent to more

[21] Hertel et al. (2003) employ household survey data for Malawi, as well as Chile and Vietnam, in order to examine the impact of trade liberalization on poverty within a micro-simulation model and the GTAP model. The study provides empirical evidence on the importance of self-employed labour in agricultural activities in Malawi. According to the Malawi's Integrated Household Survey for 1998 cited by the study, wage labour accounts for only 15 percent of the population.

than a quarter of its GDP. These figures entail high degrees of vulnerability for SADC economies to external trade shocks and, thereby, provide indication of the likely important impacts of the EPAs. It is worth noting here that, in general, small economies tend to have large trade openness ratios.

High dependency on trade is reflected in the structure of public revenue, Table 4-1. Tariff revenue share in total public revenue ranges from 26 to 38 percent for Mauritius, Madagascar and Zimbabwe and exceeds 10 percent for all SADC countries except Botswana and South Africa. Tariff shares are the lowest for Botswana, South Africa and 'Rest of SACU'. As described in Chapter 2, the SACU-CU pursues a revenue-sharing formula for pooling and distributing tariff revenue which is not entirely based on trade shares.

This brings to the forefront concerns about the potentially sizable fiscal losses resulting from reciprocal trade liberalization with the EU. Taking these potential fiscal losses into consideration gives issues like *ex-ante* structural reforms, adoption of compensation instruments and aid-for-trade great prominence in the context of the EU-SADC EPAs.

The next four sub-sections provide country- and sector-specific analyses of SADC trade classified according to the quantifiable EPAs trade effects under the study's considerations. In addition, Sub-section 4.4.4 examines the most recent trends in intra-SADC trade beyond the 2004 benchmark equilibrium; i.e. the period 2004-2008.

4.4.1. Total Trade

Import shares for SADC members, and for SADC as a whole, in world imports are small. As is apparent in Table A4-9, none of the individual SADC members' sectoral imports accounts for more than 2 percent of total world imports. Furthermore, SADC total demand for any of the importing commodities is less than 5 percent of total world imports. Similarly, SADC shares in world export supply are evidently small, except for sugar, Table A4-10. SADC sugar exports, which are primarily provided by Mauritius, South Africa and 'Rest of SACU', account for 9 percent of world sugar exports. Overall, SADC's small trade shares in world markets entail that SADC economies are price takers and have little influence on the world prices.

South Africa is the largest importer and exporter in the region. At the aggregate level, South Africa constitutes 60 percent of total SADC trade, Tables A4-11 and A4-12. Nevertheless, trade contributions by other SADC members in specific commodity markets are more important than South African shares in those markets. These include imports of beverages ('Rest of SADC') and exports of 'oil and minerals' ('Rest of SADC'); sugar (Mauritius and 'Rest of SACU'); 'plant fibres' (Zimbabwe, Zambia and Tanzania) and 'other crops' (Zimbabwe, Malawi and Tanzania).

Figure 4-3 presents SADC trade composition based on commodity shares in imports and exports given by Tables A4-13 and A4-14, respectively. SADC imports are concentrated in a few commodities and yet, the import structures are, to a great extent, similar across members. SADC imports are mainly manufacturing and mining commodities, which constitute more than half of total imports for all cases. Moreover, for most of the cases, the three main imports are 'chemical and mineral products', 'metals and metal products' and 'electronic equipments'.

SADC export structures exhibit high levels of concentration in a narrow range of commodity groups, Table A4-14. Manufacturing and mining exports contribute more than half of total exports for all SADC members, except Malawi and Tanzania. Within this group, 'oil and minerals' is among the main export for most of the cases, particularly Botswana and 'Rest of SADC'. Other important manufacturing exports include textiles for Madagascar, Mauritius and 'Rest of SACU'; 'metals and metal products' for Zambia, Mozambique, South Africa and Zimbabwe and 'chemical and mineral products' for 'Rest of SACU' and South Africa.

The homogeneity of import and export structures across SADC members has important implications for SADC regional integration. It entails limited potential for export expansion and, more broadly, weak trade complementarity within the region. Similarity in import structures implies that SADC import demand is very likely to be met by third parties. The opportunities for creating trade as a result of removing barriers to intra-SADC trade are small.

These inferences are in line with the results derived from an ex-ante analysis of the SADC-FTA welfare impacts conducted by Pratt, Diao and Bahta (2009). The study employs a partial equilibrium model using the SITC four- digit level data over the period 2000-2005. For most of the cases, the estimated welfare effects are small, which is attributed to low diversification of intra-SADC exports. Based on measures of revealed comparative advantages, the study identifies industries with high trade complementarity. Consequently, potential export expansions are reported for the net exporters of products of these industries, i.e. SACU, Zimbabwe and Tanzania. In contrast, Angola and DR Congo, who experience comparative disadvantages for agricultural products, would be affected negatively by the SADC-FTA.

From an economic policy perspective, SADC structural features suggest that removing barriers to intra-SADC trade is not the most effective measure for deepening SADC regional integration. Reforms aimed at diversifying production and export structures, stimulating investment and pursuing trade facilitation policies, on the other hand, have great merit in this regard.

Using United Nations Commodity Trade (UN-COMTRADE) data at the two-digit classification level, Khandelwal (2005) measures bilateral product complementarity indices among SADC members. The index value ranges from zero (i.e. no complementarity between bilateral trade balances) to one hundred, i.e. perfect complementarity. The measured indices show weak trade complementarity (less than 30 percent) between exports for individual SADC members and imports by their other SADC partners. South Africa is the only exception where exports have a high degree of complementarity (50 percent or more) with imports by its other SADC members.

Tables A4-15 and A4-16 depict import shares in total demand by commodity and export to domestic output ratios by activity, respectively. Together with the import and export compositions, these indicators determine the importance of tradable sectors for SADC economies.

Manufacturing and mining commodities are not only the main imports for SADC, but the bulk of their demand is met by importing. Among the main imports for Botswana, Malawi, Mauritius, Mozambique, Zimbabwe and ‘Rest of SADC’, more than 70 percent of total domestic demand is imported.

Likewise on the export side, the main agricultural and agro-processing, and manufacturing and mining exports are simultaneously export-oriented sectors. For the main exports in almost all SADC members, more than half of the domestic output values are directed to export. As aforementioned, the textiles sector is one of the few manufacturing activities and exports for SADC. Textiles activity is particularly important for Mauritius where it is predominantly export-oriented.

Overall, the main imports and exports constitute high ratios of import to total demand and export to total supply for most of the cases. These indicate that potential trade effects will be accompanied by strong consumption effects and structural changes in SADC economies.

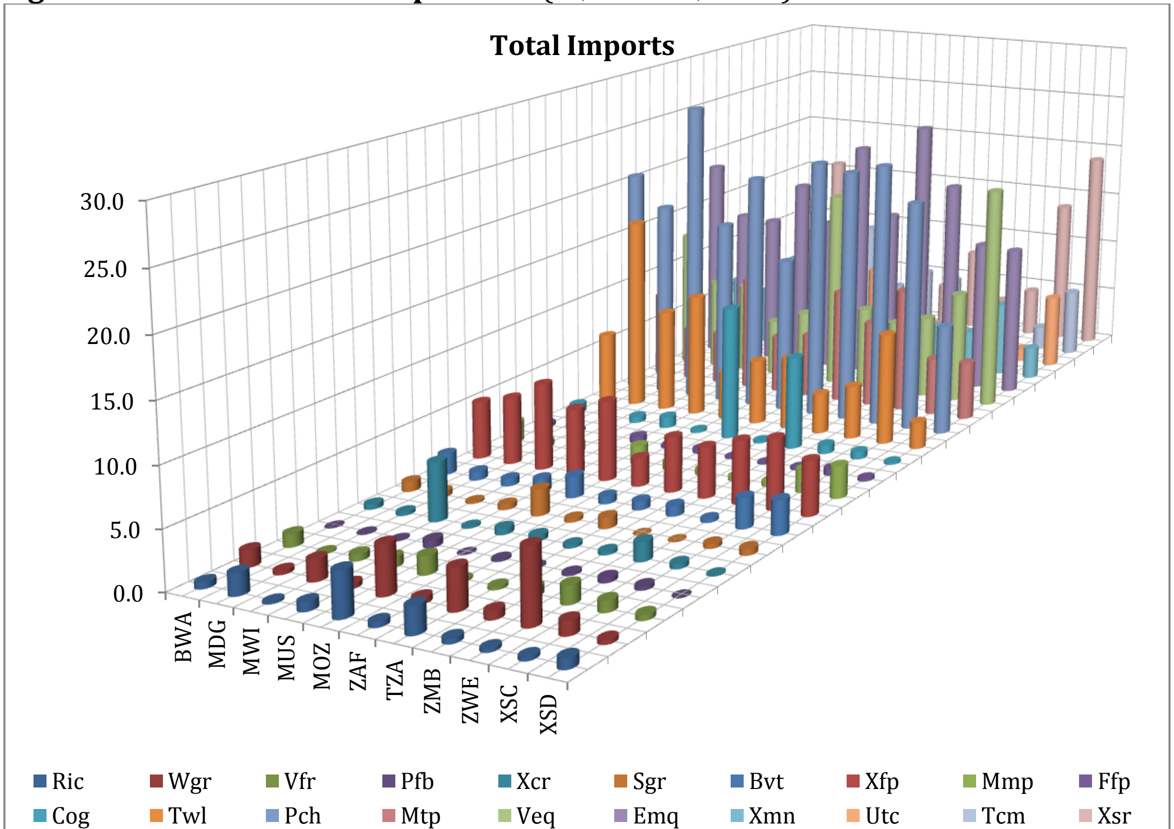
4.4.2. SADC-EU Trade

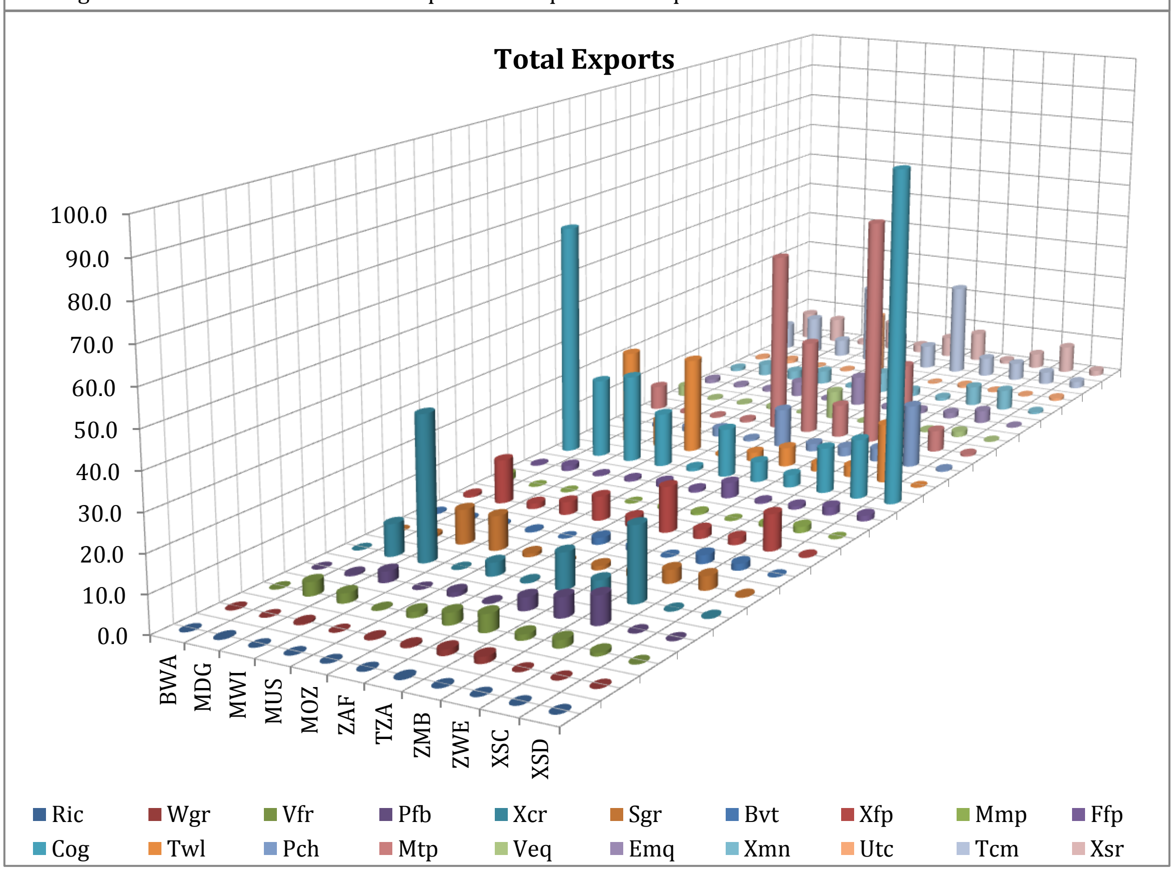
SADC imports from the EU are dominated in most cases by ‘chemical and mineral products’, ‘electronic equipments’ and ‘other services’, Table A4-17. ‘Rest of SACU’ is an exceptional case where 58 percent of imports from the EU are ‘other services’.

The EU accrues sizable shares in SADC markets, particularly for heavy manufacturing and services. As shown in Table A4-18, heavy manufacturing imports from the EU make up more than 40 percent of total heavy manufacturing imports for countries like ‘Rest of SADC’, South Africa and Madagascar. Besides, services imports from the EU range from 40 to 60 percent of total services imports for all SADC countries, except Zimbabwe. The EU also has considerable shares in specific agricultural and agro-processing markets. For example, more than half of Madagascan grains and beverages imports are sourced in the EU.

From the EU perspective, SADC commodity imports comprise very small portions of total EU commodity exports, Table A4-19. However, some SADC markets absorb relatively large shares of EU trade with non-EU partners. This is the case for EU vehicle and ‘oil and minerals’ exports (South Africa) and EU ‘public utilities’ exports (‘Rest of SADC’), Table A4-20.

Figure 4-3: SADC Trade Composition (%, volume, 2004)





Trade concentration is more pronounced on the export side where the three main exports constitute more than two-thirds of total exports to the EU in most of the cases, Table A4-21. In extreme cases, only one commodity group makes up for more than three quarters of total exports to the EU. This is the case for ‘oil and minerals’ exports (Botswana and ‘Rest of SADC’) as well as ‘metals and metal products’ exports (Mozambique). SADC exports to the EU are basically agricultural, agro-processing and mining products with a small portion of light manufacturing.

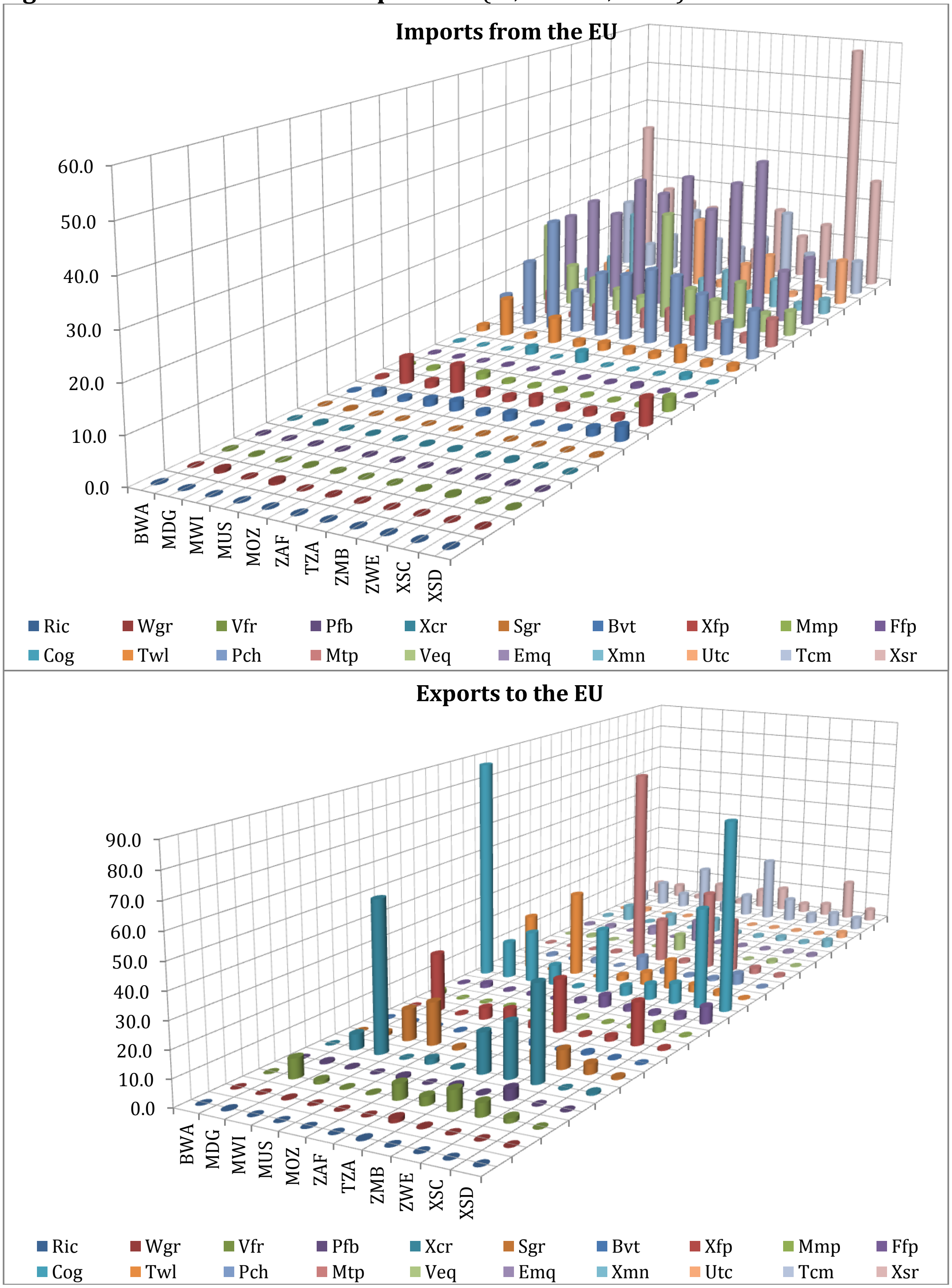
Among these main exports to the EU, EU exporting markets are particularly important for ‘other crops’ (Malawi, Tanzania, Zambia and Zimbabwe), sugar (Mauritius), ‘food products’ (Madagascar, Mozambique and Tanzania), ‘oil and minerals’ (Botswana, South Africa and ‘Rest of SACU’), textiles (Mauritius and Zambia), ‘metals and metal products’ (Mozambique) and ‘other services’ (‘Rest of SACU’), Table A4-22.

This compatibility in SADC export bundles to EU markets provides indication for potential increases in competition between SADC exporters in EU markets due to the EU tariff removal. In other words, potential export expansions for some SADC members in EU markets are very likely to occur at the expense of exports by other SADC members.

Despite the overall importance of the EU market for SADC exporters, SADC shares in the EU market are noticeably small, Table A4-23. The only exception is Mauritius, which has a share of over 8 percent in total EU sugar imports.

At this stage of descriptive analysis, it is important to examine the protection levels and structures that prevail at the benchmark scenario for SADC-EU trade. Tables A4-24 and A4-25 portray the applied tariff rates on SADC imports from the EU and on EU imports from SADC, respectively. These figures serve as a benchmark for assessing the simulated trade liberalization scenarios, and help to illustrate potential welfare impacts on individual SADC members.

Figure 4-4: SADC-EU Trade Composition (%, volume, 2004)



The structure of tariffs imposed on EU products in SADC markets reveals different protection profiles. Some members are protective (e.g. Mauritius, Tanzania and Zimbabwe), whereas tariff levels in other cases are relatively low (e.g. Botswana, Madagascar and Malawi). Generally, tariff profiles reflect SADC industrial strategy to protect specific sectors (mainly agro-processing and light manufacturing) against competition from EU substitutes. This applies particularly to sugar and beverage (Mauritius), 'meat and dairy products' (South Africa and 'Rest of SACU') and textiles (Zimbabwe, Tanzania and Mozambique).

These high tariffs together with the low importance of agro-processing imports from the EU might imply that such imports are suppressed and, consequently, indicate high probability of experiencing import surge as a result of liberalizing trade with the EU. In order to explore possibilities for trade creation and diversion effects, SADC tariff profiles with their non-EU partners should be examined thoroughly, which will be dealt with in Sub-sections 4.4.3 and 4.4.5.

EU applied tariffs on imports from SADC are fairly low with a few high tariff peaks, Table A4-25. As shown in Chapter 2, most SADC members are granted duty-free access for the majority of their MFN tariff lines, whereas a few members have some non zero-rated lines. Extremely high protection levels are imposed on sugar imports from all SADC members, 'Rest of SACU', Zimbabwe and Madagascar in particular. High tariffs are also imposed on rice imports (from Malawi, Mauritius and South Africa) and on 'meat and dairy products' imports from 'Rest of SACU' and Botswana. These high protection rates reflect EU import quotas for these product groups. Tariff rates on other non zero-rated lines are fairly low, e.g. grains, beverages and 'food products'.

Taking into consideration comparative advantage for SADC economies vis-à-vis the EU in these protected activities, it is plausible to expect strong reallocation effects as a result of EU tariff removal. Production factors are expected to be reallocated away from manufacturing activities towards activities like sugar, rice and 'meat and dairy products'.

Table A4-26 shows the EU applied tariffs on imports from non-SADC exporters. Analogue high tariff levels are imposed on EU imports of sugar ('Rest of the World', 'Rest of Sub-Saharan Africa' and 'East Asia'), rice ('East Asia', 'Southeast and South

Asia', 'United States of America' and 'Rest of the World') and 'meat and dairy products' ('Rest of the World', 'Southeast and South Asia' and 'United States of America').

These protection profiles provide indications of the potential export expansion for SADC products in these protected EU markets due to the EU-SADC EPAs. In effect, SADC opportunities to gain shares in EU markets depend, *inter alia*, on production capacity and export capability of SADC economies. In addition, the proliferation of the EU unilateral sugar reforms and trade liberalization (as described in detail in Chapter 2) as well as the envisaged EU-EPAs with non-SADC ACP countries influences the potential preference margins SADC trade will acquire in EU markets.

4.4.3. Intra-SADC Trade

Table A4-27 illustrates market shares for SADC exporters in different SADC commodity markets. Evidently, South Africa is the main supplier for many imports particularly in the other SACU markets. Some evidence on trade deflection within the SACU region supports that EU products flow through South Africa to its SACU-CU partners. This partially explains extremely high South African shares and low EU shares (shown in Table A4-18) in the SACU markets.[22]

South Africa also acquires sizable market shares in Mauritius, Mozambique, Zambia and Zimbabwe. These large shares refer, *inter alia*, to agricultural and agro-processing markets where South African products face high tariffs, Table A4-28. This might entail high risk for South Africa in terms of losing its regional market shares as a result of launching EPAs with the EU, particularly in the absence of intra-SADC trade liberalization.

Other SADC members are of great importance as sources of regional imports. As shown in Table A4-27, 'Rest of SACU', Zimbabwe, Zambia, and, to a lesser extent, Mozambique and Malawi seize large shares in SADC markets. Among the main regionally traded commodities are grains, vegetables, 'other crops', beverages, sugar and livestock. Clearly, none of these products provides substitutes for SADC's main imports from the EU. This makes the potential import surge due to the reciprocal

[22] Lack of adequate capacity and operative RoO to monitor such indirect trade prove to be serious challenges in the SADC and SACU contexts.

trade liberalization with the EU inevitable for many SADC members even with liberalizing intra-SADC trade.

SADC markets are also important destinations for regional exports. South Africa is an important market for many SADC exporters, Table A4-29. Furthermore, substantial shares of SADC exports are destined for Zimbabwe, Zambia, Malawi, 'Rest of SACU' and 'Rest of SADC'. Among the important exporting regional markets are those for rice, grains, vegetables, 'other crops' and 'food products'. These exporting markets are transformable with SADC's main exporting markets in the EU. Therefore, potential expansions in SADC exports to EU markets as a result of the envisaged EPAs are likely to be at the expense of intra-SADC exports.

This argument is also supported by the figures on intra-SADC tariff profiles, Table A4-28. High protection levels are imposed on exports by Mozambique, South Africa, Tanzania and 'Rest of SACU'. It is, thus, rational to expect large variance in the EPA's impacts when intra-SADC trade is liberalized.

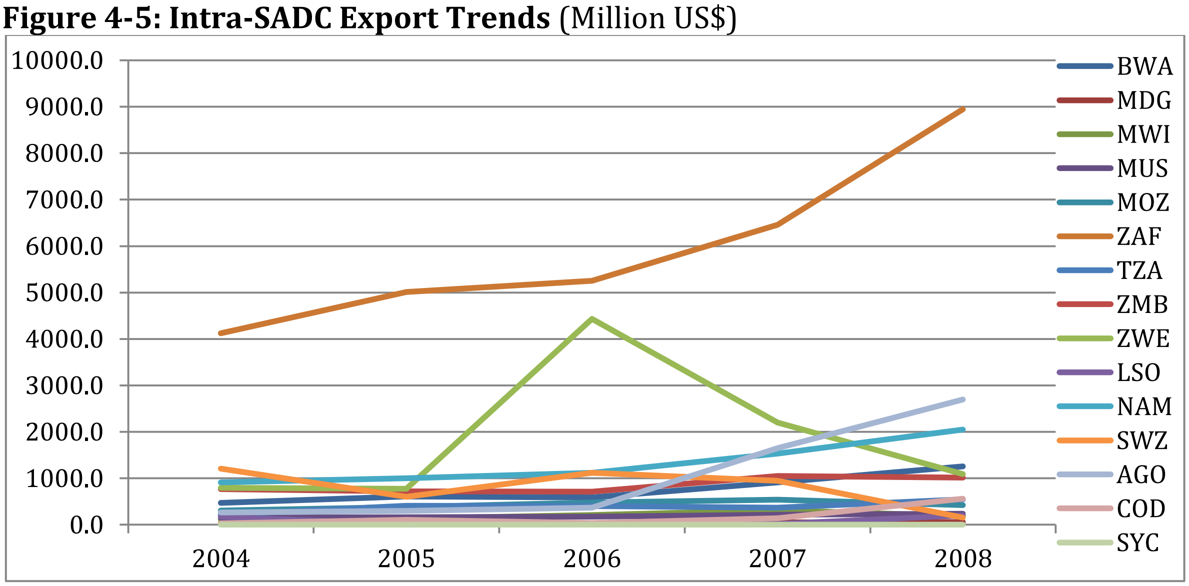
These inferences are in line with empirical evidence provided by Chauvin and Gaulier (2002). Using World Trade Analyzer Data at SITC 2-digit level, the study calculates indices of revealed comparative advantage (1999) and export diversification (1996-1999) for ten SADC members. For most of the cases, the reported sectors with comparative advantage are not the sectors of interest to SADC imports, e.g. machinery and transport equipments. Furthermore, the measured export diversification indices are lower than the indices values reported for other emerging economies like Malaysia and Chile. This is the case for all SADC members considered by the study except South Africa, Tanzania and Zimbabwe.

The question to be raised here is whether these intra-SADC trade relationships have changed in recent years. The next sub-section addresses this question.

4.4.4. Recent Trends in Intra-SADC Trade[23]

As depicted by Figure 4-5, South Africa exports to the region have increased considerably over the period 2004-2008. Nevertheless, the South African share of total intra-SADC exports has remained within a range of 35-50 percent, Table 4-2. Besides, it is worth noting that the South African importance as a source of regional imports is still far greater than its importance as a market for regional SADC exports, as we will see next. Zimbabwe regional exports increased considerably in 2006 and have diminished thenceforth. This trend is reflected in the outstanding accretion in the Zimbabwean share of intra-SADC exports to almost 30 percent in 2006. Both the Swazi and the Angolan shares in regional exports were volatile over the period 2004-2008. Swaziland, which was the second SADC regional exporter in 2004, contributes only 1 percent of intra-SADC exports in 2008, whereas Angola, whose intra-SADC export share was 3 percent in 2004, becomes the second SADC regional exporter in 2008. Trends in intra-SADC export flows and shares for all other members have not experienced significant changes over this period.

Figure 4-5: Intra-SADC Export Trends (Million US$)



Source: Aggregated by the author based on the UN-COMTRADE Database.

[23] Data used in this sub-section is derived from the UN-COMTRADE database for all SADC members during the period 2004-2008. For some cases, the database does not provide trade data reported by SADC importers. In these cases, I have used available 'mirror data' reported by exporters to SADC members.

Table 4-2: Intra-SADC Export Shares, (Percent)

Exporters		2004	2005	2006	2007	2008
BWA		4.9	5.9	3.9	5.6	6.5
MDG		0.4	0.2	0.2	0.3	0.3
MWI		1.2	1.3	1.4	1.9	1.0
MUS		1.6	1.6	1.2	1.3	1.2
MOZ		3.2	3.7	3.2	3.3	2.2
ZAF		43.0	48.9	35.2	39.4	46.0
TZA		2.3	4.0	2.7	2.2	2.8
ZMB		8.0	7.0	4.8	6.4	5.2
ZWE		8.3	7.6	29.7	13.4	5.6
XSC	LSO	1.8	0.1	0.1	0.1	1.1
	NAM	9.5	9.8	7.5	9.4	10.6
	SWZ	12.7	5.9	7.5	5.8	0.8
XSD	AGO	2.8	2.9	2.5	10.1	13.9
	COD	0.3	1.0	0.3	0.8	2.9
SYC		0.0	0.0	0.0	0.0	0.0
		100.0	**100.0**	**100.0**	**100.0**	**100.0**

Source: Calculated by the author based on the UN-COMTRADE Database.

Table 4-3: Intra-SADC Exports to Total Exports Ratios, (Percent)

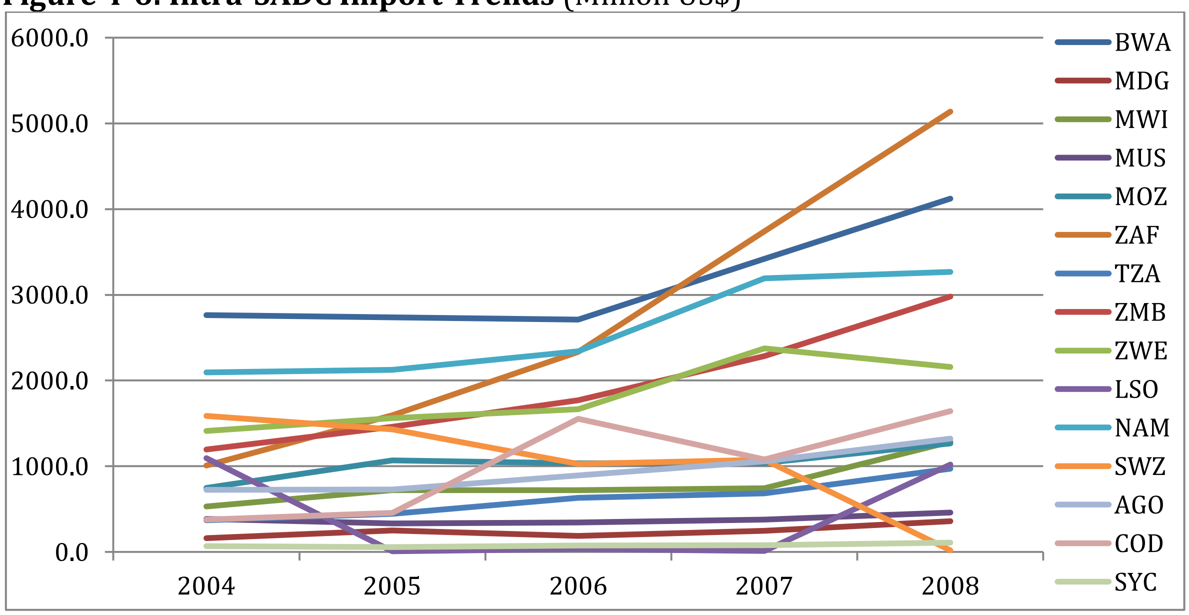
		2004	2005	2006	2007	2008
BWA		13.4	13.7	13.0	18.0	26.0
MDG		3.9	2.8	2.7	3.7	3.4
MWI		24.3	27.2	31.3	35.7	21.8
MUS		7.7	7.6	7.5	9.7	9.8
MOZ		20.3	22.0	20.2	22.5	15.9
ZAF		10.2	10.7	10.0	10.1	12.1
TZA		14.9	24.5	21.7	17.2	17.6
ZMB		48.6	39.7	18.8	22.8	20.0
ZWE		41.2	55.6	69.0	66.6	64.3
XSC	LSO	18.1	n.a.	n.a.	n.a.	14.9
	NAM	37.4	40.1	33.1	38.0	43.4
	SWZ	56.7	47.1	76.6	85.0	n.a.
XSD	AGO	n.a.	n.a.	n.a.	n.a.	n.a.
	COD	n.a.	n.a.	n.a.	n.a.	n.a.
SYC		0.9	1.0	0.4	0.7	0.9

Source: Calculated by the author based on the UN-COMTRADE Database.

As seen in Table 4-3, few countries (e.g. SACU and Zimbabwe) become more dependent on SADC as a market for their exports whereas many member countries maintain relatively stronger trade ties with the rest of the world. Swaziland and Namibia depend mainly on the South African markets for their exports. Interestingly, SADC absorbs the bulk of total Zimbabwean exports. This is partly attributed to sanctions imposed on Zimbabwean extra-regional trade, which push the country to intensively sell its trade regionally.[24]

Trends in intra-SADC imports show fluctuations over the period 2004-2008, Figure 4-6. Regional imports for South Africa, Botswana, Namibia as well as Zambia and Zimbabwe have increased steadily. These trends are corroborated by the increments in their shares in intra-SADC imports for most of the cases, Table 4-4.

Figure 4-6: Intra-SADC Import Trends (Million US$)



Source: Aggregated by the author based on the UN-COMTRADE Database.

[24] Economic sanctions on Zimbabwe were introduced by the USA in 2001, after declaring the Zimbabwe Democracy and Economic Recovery Act (ZIDERA), and were then adopted by the EU in 2002.

Table 4-4: Intra-SADC Import Shares, (Percent)

Importers		2004	2005	2006	2007	2008
BWA		19.0	18.3	15.6	16.0	15.8
MDG		1.1	1.7	1.1	1.1	1.4
MWI		3.7	4.8	4.2	3.5	4.9
MUS		2.7	2.2	2.0	1.8	1.8
MOZ		5.1	7.1	6.0	4.9	4.8
ZAF		6.9	10.6	13.5	17.5	19.7
TZA		2.5	3.0	3.6	3.2	3.7
ZMB		8.2	9.8	10.2	10.7	11.4
ZWE		9.7	10.4	9.6	11.1	8.3
XSC	LSO	7.5	0.1	0.2	0.1	3.9
	NAM	14.4	14.2	13.5	14.9	12.5
	SWZ	10.9	9.5	5.9	5.0	0.1
XSD	AGO	5.0	4.9	5.2	4.9	5.1
	COD	2.6	3.0	9.0	5.1	6.3
SYC		0.5	0.4	0.4	0.4	0.4
		100.0	**100.0**	**100.0**	**100.0**	**100.0**

Source: Calculated by the author based on the UN-COMTRADE Database.

Table 4-5: Intra-SADC Imports to Total Imports Ratios, (Percent)

		2004	2005	2006	2007	2008
BWA		85.5	86.6	88.8	85.8	80.8
MDG		9.7	15.0	10.7	10.1	9.3
MWI		57.4	62.0	59.8	53.9	58.3
MUS		13.9	10.5	9.5	9.6	9.9
MOZ		36.8	44.4	36.1	34.1	31.6
ZAF		2.1	2.9	3.4	4.7	5.9
TZA		14.5	13.7	13.9	11.6	12.0
ZMB		55.6	57.2	57.6	57.1	58.9
ZWE		64.1	75.4	64.6	69.0	76.2
XSC	LSO	78.3	n.a.	n.a.	n.a.	17.0
	NAM	86.8	84.5	83.7	79.3	69.7
	SWZ	89.6	86.4	82.8	84.6	n.a.
XSD	AGO	n.a.	n.a.	n.a.	n.a.	n.a.
	COD	n.a.	n.a.	n.a.	n.a.	n.a.
SYC		13.4	8.6	9.8	9.1	10.9

Source: Calculated by the author based on the UN-COMTRADE Database.

SADC is the main supplier for imports by many member countries, Table 4-5. This is particularly the case for Botswana, Zambia, Zimbabwe and Malawi. Over the period 2004-2008, SADC's importance has increased for some importers, e.g. Zambia and Zimbabwe. These increasing trends in regional import flows and dependency might indicate that SADC-FTA has already promoted intra-SADC imports. But, does this inference per se mean that SADC becomes more integrated?

Behar and Edwards (2011) address this question. The study examines the extent to which SADC is integrated into the regional and world markets over the period 1991-2005. Using the gravity model,[25] the study demonstrates that intra-SADC trade level is more than double the estimated level that is regressed against the prevailing incomes and distances for SADC trade partners. In addition, the model results, as well as a 'thickness' of trade measure, show that intra-SADC trade is more diversified vis-à-vis extra-SADC trade.[26] Accordingly, the study concludes that SADC experiences high degree of regionalization.

This conclusion is in line with the results provided by Afesorgbor and Bergeijk (2011). The study estimates a modified version of the gravity model that includes, in addition to the traditional controlling variables, dummy variables for RTAs and overlapping membership. The model is estimated for 35 African countries, among which are SADC members, over the period 1995-2006. Gravity model estimates demonstrate that SADC integration enhances intra-SADC trade by 6.2-10.4 times in comparison to no-RTA reference scenario.

[25] The study employs the gravity model used by Behar and Manners (2010).

[26] The study adopts a modified version of the trade 'thickness' measure developed by Knetter and Slaughter (2001).

4.4.5. Trade with Third Parties

Table A4-30 presents the shares for non-SADC non-EU partners in SADC markets. 'East Asia' and 'Southeast and South Asia' acquire significant shares in many SADC markets. Therefore, liberalizing trade with the EU might mean reduced markets shares for third parties in the SADC region. This means more geographic concentration for SADC trade. In effect, these non-SADC non-EU products face high levels of protection in SADC markets, Table A4-31. This indicates potential for adverse trade diversion effects as a result of discriminatory trade liberalization with the EU.

On the export side, Table A4-32 presents the importance of non-SADC non-EU markets for SADC trade. 'United States of America' and 'Southeast and South Asia' are among main destinations for SADC exports. Significant levels of protection are imposed on SADC agricultural and agro-processing exports. This is particularly the case for sugar, 'other crops', beverages and 'meat and dairy products'.

Zambia destines more than half of its sugar exports for 'Rest of Sub-Saharan Africa'; this portion exceeds its sugar exports to the EU. In contrast, Malawi destines 37 percent of its sugar exports for 'Rest of Sub-Saharan Africa'; this portion is less than its exports to the EU (45 percent). Zambia and Malawi are among the main sugar suppliers within the COMESA region, Kenya in particular. Sugar exports above the export ceiling are eligible for a special safeguard duty of 40 percent.

The bulk of Zimbabwean sugar exports are destined for the EU markets, i.e. 59 percent. The second exporting market for Zimbabwean sugar are SADC markets; 'Rest of SACU', Botswana and South Africa in particular. As mentioned in Chapter 2, the SADC Protocol on Trade includes a non-reciprocal arrangement that grants non-SACU SADC sugar exporters duty-free access to SACU markets. SACU sugar exports, however, face a high degree of protection in SADC markets, South African exports to Mauritius in particular.

4.5 Conclusions: What Difference Can the EU-SADC EPAs Make?

Based on the detailed descriptive analysis undertaken in this chapter for individual SADC economies, three main conclusions can be drawn. Firstly, there are reasons to expect that the EU-SADC EPAs will yield a wide range of impacts across SADC economies. Secondly, in light of strong trade ties with the EU, reciprocal trade liberalization is likely to have strong welfare and trade impacts for many SADC members. Lastly, intra-SADC liberalization and the evolution of multilateral trade arrangements are influential in shaping the final impacts generated by the envisaged EPAs. Measuring the net welfare and trade effects is, thus, an empirical exercise that requires thorough country- and sector-specific impact analyses and considers crucial changes in regional and international trade policy.

5 GLOBE Model: Analytical Methodology for Regional Integration Analysis

5.1 Introduction

As explained in detail in Chapter 3, trade theory provides ambiguous conclusions about the signs and orders of magnitudes for the final welfare impact of preferential trade liberalization. The descriptive empirical analyses of SADC economic and trade structures presented in Chapter 4 suggest that the potential impacts of the envisaged EU-SADC EPAs will vary widely across SADC members. Quantifying the magnitudes of the effects assigned by trade theory and the resulting net welfare impacts requires therefore detailed systematic empirical analysis. The adopted framework for conducting such exercise should be based on relevant theoretical foundations and accommodate particular empirical propositions. CGE models provide a theoretically consistent and empirically sensible framework for regional integration analysis, given that the choices for the behavioural parameters in the model are informed by secondary empirical studies.

Since the EU-SADC EPAs affect multiple countries and sectors simultaneously, the adoption of a multi-region, multi-sector general equilibrium framework appears preferable to the use of partial equilibrium approaches of the type reviewed in Sub-section 3.4.1. The underlying assumption of partial equilibrium studies that cross-price effects, economy-wide factor-price effects, aggregate income and terms-of-trade effects as well as input-output linkage effects are negligible and can safely be ignored is hardly defendable in the context of the EU-SADC EPAs.[1]

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[1] As Willenbockel (1994: p. 27 and p. 39) puts it, "if the policy scenario under consideration is a multisectoral ... trade liberalization plan, ... failure to take account of cross-industry linkages and general-equilibrium feedbacks may result in seriously misleading predictions …". "The resort to successive sector-by-sector partial equilibrium analyses in situations where the implied ceteris paribus assumptions do not even approximately apply is a controvertible practice. The preferability of a coherent quantitative multisectoral general equilibrium approach ... has long been acknowledged by protagonists of the traditional partial approaches" in such situations.

On the other hand, partial equilibrium analysis allows a finer level of commodity disaggregation than what CGE models do. Recently, Narayanan, Hertel and Horridge (2010) have proposed to link CGE and partial equilibrium models to capture the advantages of both approaches.

In this chapter, a comparative static version of the multi-region, multi-sector CGE GLOBE model is calibrated to a global SAM referenced to 2004. Deriving data from the GTAP7 database and constructing the global SAM are already presented in Chapter 4.

This chapter is set out as follows. Section 5.2 describes the behavioural specification for the different agents in the model. Section 5.3 describes the different closure rules employed under the simulation scenarios, which are implemented later in Chapters 6 and 7. Section 5.4 introduces macroeconomic indicators employed by the study in order to measure welfare, terms of trade and the adjustment degree in factor markets. Section 5.5 discusses the rationale behind choosing the GLOBE model as an analytical framework for the study and the limitations of the analysis.

5.2 GLOBE Behavioural Specification

The study uses a comparative static version of the multi-region, multi-sector CGE GLOBE model. The GLOBE model is a developed version of the U.S. Department of Agriculture (USDA), Economic Research Service (ERS) CGE model (Robinson, Kilkenny and Hanson, 1990) and its extension; the NAFTA-FTA CGE model (Robinson et al. 1993). By and large, the model is based on the basic principles of trade treatment within the CGE framework that are established in an early 'minimalist' 1-2-3 model by de Melo and Robinson (1989) and Devarajan, Lewis and Robinson (1990).[2] A complete exposition of the model is documented in McDonald, Thierfelder and Robinson (2007).[3]

The core specification of the GLOBE model is based on neo-classical real trade theory, albeit it embodies some structuralist features. It drops into the neo-classical

[2] 1-2-3 model is a simple CGE model for one region with two activities and three commodities. The model serves as a good representation of the majority of trade-focused CGE models since it embodies their main analytical foundations.

[3] The GLOBE model is extensively used to examine regional trade arrangements, e.g. McDonald, Robinson and Thierfelder (2008) and McDonald and Willenbockel (2008). Among the most recent applications of the model are studies by Willenbockel and Robinson (2009a) and (2009b) on the impacts of the current financial crisis on developing countries and the mid-term evaluation of the EU-GSP (CARIS, 2010). For an interesting application of the model in health economics, see Keogh-Brown et al. (2009).

structuralist category of CGE models.[4] The model allows for adopting assumptions that reflect imperfections and rigidities in some markets. As we will see later, the model specification assumes imperfect substitutability between domestically produced and imported commodities as well as between imports from different sources. It also differentiates between domestic and export supply and between exports to different destinations. Furthermore, the model allows for adopting assumptions on factor immobility and assumption on underemployment and factor price rigidity.

The model is a powerful tool for analyzing trade policy within a general equilibrium framework that considers the structural features, trade patterns and trade compositions not only for the countries under examination but also for their trade partners and the world as a whole. These aspects are of particular importance for analyzing regional trade policy that has price and quantity implications in the world markets. "The strength of the multi-country CGE model is that it elegantly incorporates the features of neoclassical general equilibrium and real international trade models in an empirical framework, …", (McDonald, Robinson and Thierfelder 2008, p. 216).

Within this multi-region, multi-sector framework, international markets are linked through bilateral trade flows only, which implies no factor mobility across borders.[5] Due to lack of information, some inter regional transactions (i.e. bilateral trade data on trade and transportation margins) are defined by either the region of origin or the region of destination whereas the other is missing. To deal with this missing data, the model distinctively defines a dummy region known as 'Globe' where these transactions are recorded.[6]

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[4] Robinson (1991) classifies CGE models into macro structuralist and neo-classical structuralist CGE models. The equilibrating variables in the neo-classical CGE models are commodity and factor prices that adjust to clear markets. These models assume, *inter alia*, perfect mobility for production factors and savings-driven closure rule. On the other hand, structuralist CGE models reflect the structural characteristics of the economy under discussion. Taylor (1990) provides detailed presentation of the structuralist CGE models and their applications in developing countries.

[5] McDonald, Sonmez and Perraton (2006) have introduced remittance flows as an additional channel that links international markets.

[6] From this perspective, *inter alia*, the GLOBE model differs from the multi-region, multi-sector CGE GTAP model, which is widely implemented in analyzing trade policy and other issues.

5.2.1. Production Block

Figure 5-1 depicts the nesting structure for output flows in a typical region in the model. Output in each activity $QX_{a,r}$ is specified as a two-level nested constant elasticity of substitution (CES) function. At the top level, aggregate intermediate inputs $QINT_{a,r}$ and aggregate primary inputs $QVA_{a,r}$ are compounded through a CES aggregator.[7]

$$QX_{a,r} = ADX_{a,r} \left(\left(\delta^{x}_{a,r} * QVA_{a,r} \right)^{-\rho^{x}_{a,r}} + \left(\left(1 - \delta^{x}_{a,r} \right) * QINT_{a,r} \right)^{-\rho^{x}_{a,r}} \right)^{-1/\rho^{x}_{a,r}}$$

$$\forall\, a \in aqx, r \in rgn \qquad 1$$

where $ADX_{a,r}$ is the shift parameter and $\delta^{x}_{a,r}$ is the share parameter for $QX_{a,r}$. The elasticity of substitution between value added and intermediate demand is given by $\sigma^{x}_{a,r} = 1/\left(1 + \rho^{x}_{a,r}\right)$.

Price for composite output for an activity $PX_{a,r}$ is a weighted average of producer prices for the domestic commodities produced by this activity $PXC_{c,r}$ where the weights are the volume shares of different commodities in this activity output; $ioqxcqx_{a,c,r}$. In this version of GLOBE model, $ioqxcqx_{a,c,r}$ is an identity matrix since one-to-one mapping sets from activities to commodities are declared.

$$PX_{a,r} = \sum_{c} ioqxcqx_{a,c,r} * PXC_{c,r} \qquad \forall\, r \in rgn \qquad 2$$

The first order condition for profit maximization determines the optimal mix of $QINT_{a,r}$ and $QVA_{a,r}$ as follows,

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[7] The model allows for assuming perfect complementarity between value added and intermediate inputs by using a Leontief aggregator at this top level of the production function. For this purpose, a sub-set of activities and/or regions $aqxn_{a,r}$ is defined and then the Leontief aggregator compiles aggregate intermediate inputs and aggregate primary inputs for the members of this sub-set as follows

$$QINT_{a,r} = ioqintqx_{a,r} * QX_{a,r} \qquad \forall\, a \in aqxn, r \in rgn$$

$$QVA_{a,r} = ioqvaqx_{a,r} * QX_{a,r} \qquad \forall\, a \in aqxn, r \in rgn$$

where $ioqintqx_{a,r}$ and $ioqvaqx_{a,r}$ are the volume share of aggregate intermediate and value added in output by activity.

$$QVA_{a,r} = QINT_{a,r} * \left(PINT_{a,r}/PVA_{a,r}\right) * \left(\delta^x_{a,r} / \left(1 - \delta^x_{a,r}\right)\right)^{1/\left(1+\rho^x_{a,r}\right)}$$

$$\forall\, a \in aqx, r \in rgn \qquad 3$$

where $PINT_{a,r}$ and $PVA_{a,r}$ are the prices for aggregate intermediate input and for aggregate primary input, respectively.

$PINT_{a,r}$ is defined as a weighted average of the domestic prices for the corresponding intermediate commodities ($PQD_{c,r}$) where the weights are the fixed intermediate input/output coefficients $ioqint_{c,a,r}$.

$$PINT_{a,r} = \sum_c \left(ioqint_{c,a,r} * PQD_{c,r}\right) \qquad \forall\, r \in rgn \qquad 4$$

In this general equilibrium framework, not only direct effects but also feedback effects generated by the simulated external shock are considered. Feedback effects from using imported intermediate inputs are particularly important for trade policy analysis. In this context, specifying price of intermediate inputs according to domestic price of intermediate commodity entails considering effective protection rate in the analysis since the latter incorporates import tariffs, as we will see later in Equation 24. Value added payments (i.e. price of aggregate value added $PVA_{a,r}$ times aggregate volume of primary inputs) is the residual of output value after paying the indirect tax on activity (rated at $TX_{a,r}$) and after deducting the intermediate inputs cost.

$$PX_{a,r} * \left(1 - TX_{a,r}\right) * QX_{a,r} = \left(PVA_{a,r} * QVA_{a,r}\right) + \left(PINT_{a,r} * QINT_{a,r}\right)$$

$$\forall\, r \in rgn \qquad 5$$

At the bottom level of the production function, a composite intermediate commodity is specified as a Leontief aggregate of its individual intermediate inputs according to the fixed intermediate input/output coefficients.

$$QINTD_{c,r} = \sum_{a} ioqint_{c,a,r} * QINT_{a,r} \qquad \forall\, c \in cintd, r \in rgn \qquad 6$$

At this bottom level also, a CES production technology specifies the aggregate value added as a function of the primary inputs demand in each activity, i.e. $FD_{f,a,r}$.

$$QVA_{a,r} = ADVA_{a,r} * \left(\sum_{f} \delta_{f,a,r}^{va} * \left(ADFD_{f,a,r} * FD_{f,a,r} \right)^{-\rho_{a,r}^{va}} \right)^{-1/\rho_{a,r}^{va}}$$

$$\forall\, r \in rgn \qquad 7$$

where $ADVA_{a,r}$ is the shift parameter and $\delta_{f,a,r}^{va}$ is the share parameter for $QVA_{a,r}$ and $ADFD_{f,a,r}$ are the shift parameters for factor efficiency in each activity. The elasticity of substitution between production factors is given by $\sigma_{a,r}^{va} = 1/\left(1 + \rho_{a,r}^{va}\right)$.

The tangency condition for the production function at this level is given by

$$WF_{f,r} * WFDIST_{f,a,r} * \left(1 + TF_{f,a,r}\right) = \frac{PVA_{a,r} * QVA_{a,r} * \left(\delta_{f,a,r}^{va} * ADFD_{f,a,r}\right)^{-\rho_{a,r}^{va}} * \left(FD_{f,a,r}\right)^{-\rho_{a,r}^{va}-1}}{\sum_{fp} \delta_{fp,a,r}^{va} * \left(ADFD_{f,a,r} * FD_{fp,a,r}\right)^{-\rho_{a,r}^{va}}}$$

$$\forall\, r \in rgn \qquad 8$$

where $WF_{f,r}$ is the average price for factor f in region r, $WFDIST_{f,a,r}$ are the ratios for factor price in each activity to the average factor price and $TF_{f,a,r}$ is the factor use tax rate.[8]

By maximizing profit, producers determine the optimal supply level of output according to the production technology prevailing in each activity. This per se

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[8] The model allows for simulating changes in the values of the production function shift parameters at both the top and bottom levels (i.e. $ADX_{a,r}$, $ADVA_{a,r}$). This can be done in two ways: either adding/deducting a uniform change to/from the parameters values or scaling the parameters values up/down according to a certain rate. Furthermore, different simulation exercises can be conducted for factor efficiency parameter, i.e. $ADFD_{f,a,r}$.

specifies their derived demand levels for production factors. Producers demand a production factor at the level that equalizes the value of its marginal product with its wage rate in each activity.

Total factor income $YF_{f,r}$ is computed by summing the factor payments over different activities. The residual income after deducting depreciation allowance $deprec_{f,r}$ and direct tax on factor income (rated at $TYF_{f,r}$) is the factor income available for distribution to households according to specific shares, as we will see later in Equation 31, i.e. $YFDIST_{f,r}$.

$$YF_{f,r} = \sum_{a} WF_{f,r} * WFDIST_{f,a,r} * FD_{f,a,r} \qquad \forall\, r \in rgn \qquad 9$$

$$YFDIST_{f,r} = \left(YF_{f,r} - \left(deprec_{f,r} * YF_{f,r}\right)\right) * \left(1 - TYF_{f,r}\right) \qquad \forall\, r \in rgn \qquad 10$$

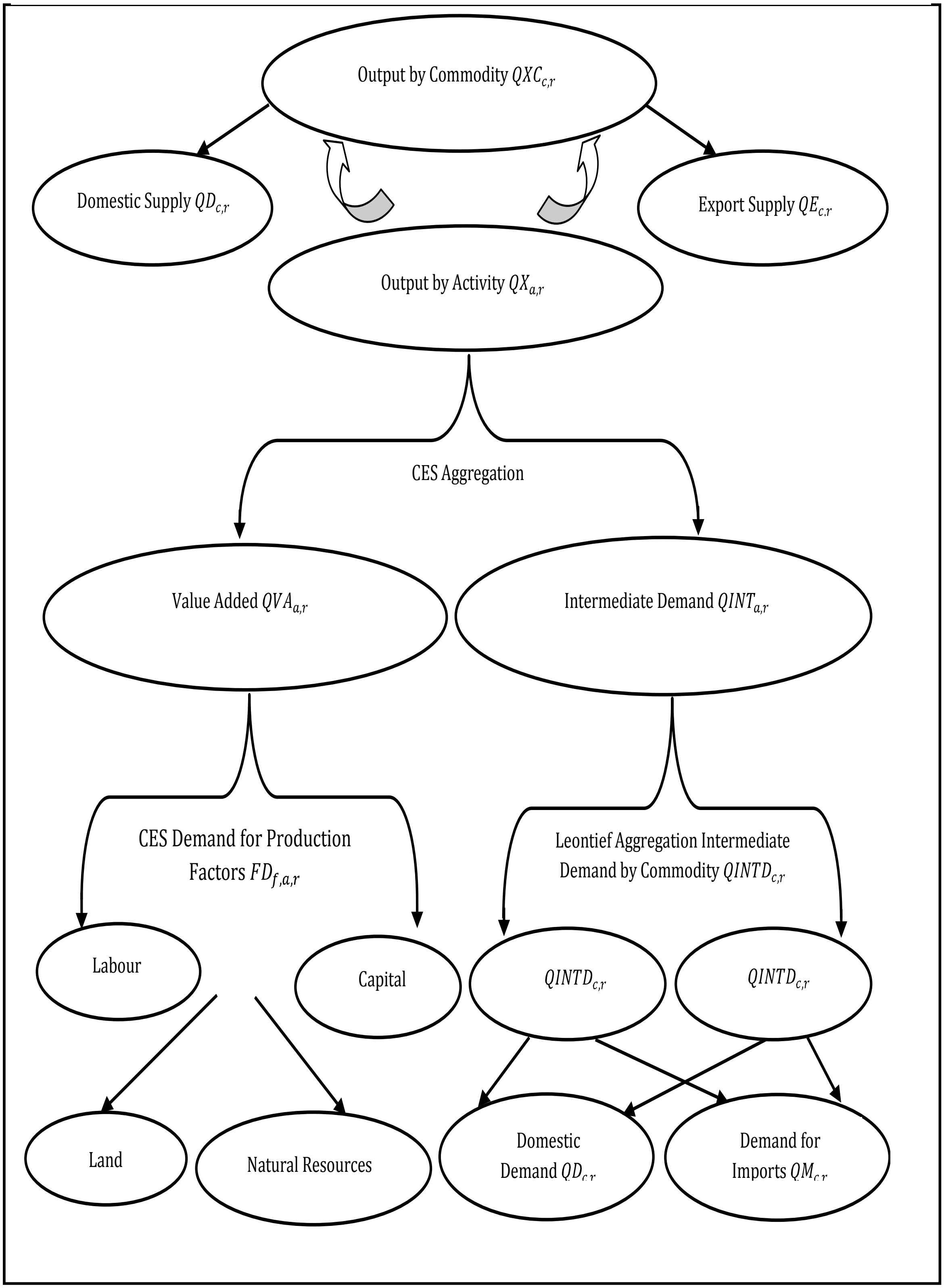
Domestic production for a commodity $QXC_{c,r}$ is determined according to the shares of the commodity in output produced by each activity, $ioqxcqx_{a,c,r}$. As explained above, $ioqxcqx_{a,c,r}$ used in this version of the model is an identity matrix.

$$QXC_{c,r} = \sum_{a} ioqxcqx_{a,c,r} * QX_{a,r} \qquad \forall\, r \in rgn \qquad 11$$

Supply of each composite commodity is a constant elasticity of transformation (CET) aggregation of the output supplied in the domestic market and a composite commodity of exports to different destinations.[9] This part is explained in detail in the Sub-section (5.2.2.2) on export supply.

[9] The CET function is originated by Powell and Gruen (1968).

Figure 5-1: Production Flows in GLOBE Model



5.2.2. International Trade Block

In common with most of the trade-focused CGE models, the GLOBE model assumes imperfect substitution/transformation for import demand/export supply functions. Domestically produced commodities are imperfect substitutes to imports and to exports and sectoral imports and exports are differentiated by country of origins and by country of destinations. This approach in modelling trade was first developed by Armington (1969, p. 171) who argues that "…the assumption that products are distinguished by place of production is a very convenient point of departure toward a rigorous theory of market growth and share adjustment". The assumption was then extended to the export side such that imperfect transformability is assumed between supply in the domestic and export markets, (Derviş, de Melo and Robinson 1982, pp. 224-230). De Melo and Robinson (1989, pp. 47-67) provide general justification for extending product differentiation to the export side and conclude that "An external closure with symmetric product differentiation for imports and exports is theoretically well behaved and gives rise to normally shaped offer curves".

Armington specification is commonly used in trade-focused CGE models. "It is a theoretically consistent generalization of the "standard" trade model with nontraded goods, introducing degrees of substitutability and transformability rather than assuming a rigid dichotomy between tradable and nontradable goods" (Robinson 2006, p. 211). Furthermore, imperfect substitutability between domestic products and both imports and exports entails more plausible domestic price and, thereby, quantity responses to the simulated trade shocks vis-à-vis the generated responses under perfect substitutability assumption. For a given trade policy shock (e.g. tariff removal) changes in domestic price do not reflect the full external shock. Changes in domestic prices depend on the degrees of substitutability between domestic and imported commodities. This specification also allows for intra-industry trade (i.e. cross hauling), which is of particular importance for developing countries.[10]

The following two sub-sections provide detailed description for import demand and export supply specifications and Figure 5-2 outlines import and export components of domestic demand and domestic output, respectively, in the model.

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[10] For a detailed explanation, see Derviş, de Melo and Robinson (1982, pp. 219-254).

5.2.2.1 Import Demand

In this version of GLOBE model, import demand is represented by a three-level nested CES function.[11] For each commodity, imports from different sources are imperfect substitutes and their aggregated composite commodity is an imperfect substitute for its domestic equivalent. The imperfect substitutability assumption between imports from different regions, at the bottom level of the nest, draws only on commodity imports from source regions that account for large shares of a commodity imports by the region of destination.[12]

At the top level, demand for composite imports and demand for domestic production are imperfect substitutes.[13]

$$QQ_{c,r} = ac_{c,r} * \left(\delta_{c,r} * \left(QM_{c,r}\right)^{-\rho^{c}_{c,r}} + \left(1-\delta_{c,r}\right) * \left(QD_{c,r}\right)^{-\rho^{c}_{c,r}}\right)^{-1/\rho^{c}_{c,r}}$$

$$\forall\, c \in (cx \cap cm), r \in rgn \qquad 12$$

In this CES aggregation, $QQ_{c,r}$ denotes the composite good for domestic consumption, $QM_{c,r}$ is the composite import commodity, $QD_{c,r}$ is the domestic supply commodity, $ac_{c,r}$ and $\delta_{c,r}$ are the shift and share parameters.[14] The elasticity of substitution between composite imports and the domestic substitute (Armington elasticity) is given by $\sigma^{c}_{c,r} = 1/1 + \rho^{c}_{c,r}$.

Using a CES aggregation function implies that preferences between imports and domestic commodity in each sector are homothetic while preferences between

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[11] Product differentiation embodied in the model specification is implemented 'at the border' and, thus, is not agent-specific according to the product differentiation classification by Hertel, Ianchovichina and McDonald (1997, pp. 262-266).

[12] The model allows for alternative formulations for CES import demand and CET export supply functions expressed in share forms and in forms where prices are dependent variables. See McDonald, Thierfelder and Robinson (2007, pp. 72-74).

[13] For the commodity accounts where there is no imports and all domestic consumption is domestically produced (i.e. $c \in cmn$) and for the commodity accounts where there is no domestic production and all domestic consumption is imported (i.e. $c \in cxn$), a homogeneous aggregator for import and domestic demand is specified as follows,

$$QQ_{c,r} = QD_{c,r} + QM_{c,r} \qquad \forall\, c \in (cx \cap cmn), r \in rgn$$
$$\text{OR} \; \forall\, c \in (cxn \cap cm), r \in rgn$$

[14] As Willenbockel (1999) clarifies, in his reply to some critiques on using Armington aggregator in CGE models, the term 'share parameter' should not be interpreted as the value share of the imported commodity $QM_{c,r}$ in the composite consumption commodity $QQ_{c,r}$.

different commodities are not. In other words, the import composition of domestic demand for a given commodity is determined by relative prices of domestic and import commodities in the domestic market $\left(PD_{c,r}/PM_{c,r}\right)$ and not by income. The tangency condition for minimizing cost according to this function is as follows,

$$QM_{c,r} = QD_{c,r} * \left(\left(PD_{c,r}/PM_{c,r}\right) * \left(\delta_{c,r}/\left(1-\delta_{c,r}\right)\right)\right)^{1/1+\rho^{c}_{c,r}} \qquad \forall c \in (cx \cap cm), r \in rgn \qquad 13$$

Supply price of a composite commodity $PQS_{c,r}$ can be expressed as a weighted average of the consumer price for domestic commodity $PD_{c,r}$ and the domestic price of its imported substitute $PM_{c,r}$ where the weights are the correspodening commodity quantities.

$$PQS_{c,r} * QQ_{c,r} = \left(PD_{c,r} * QD_{c,r}\right) + \left(PM_{c,r} * QM_{c,r}\right) \quad \forall c \in (cd \cup cm), r \in rgn \qquad 14$$

By adding sales tax rated at $TS_{c,r}$, that is imposed on domestic demand as we will see later in Equation 36, consumer price of composite commodity $PQD_{c,r}$ is computed.

$$PQD_{c,r} = PQS_{c,r} * \left(1 + TS_{c,r}\right) \qquad \forall c \in (cd \cup cm), r \in rgn \qquad 15$$

For each region of destination, the model distinguishes between imports from regions that comprise ‘large’ shares and imports from regions that comprise ‘small’ shares, each has a different specification.[15]

At the second level, Leontief function is used to aggregate ‘big’ share imports ($QML_{c,r}$) and ‘small’ share imports ($QMS_{c,r}$) that form the composite import commodity.

[15] In the present study, value shares of imports by the region of destination are computed and the source regions that account for greater/less than 0.00001 of import value of a specific commodity by the region of destination are assigned to the large/small share imported commodity sub-set. For example, if the ratio of Botswana rice imports from the EU relative to Botswana total rice imports is less than 0.00001, then the EU is a ‘small’ share source region for Botswana rice imports.

$$QML_{c,r} = ioqmlqm_{c,r} * QM_{c,r} \qquad \forall\, c \in cml \qquad 16$$

$$QMS_{c,r} = ioqmsqm_{c,r} * QM_{c,r} \qquad \forall\, c \in cms \qquad 17$$

where $ioqmlqm_{c,r}$ and $ioqmsqm_{c,r}$ are the ratios of aggregate 'big' share imports and 'small' share imports in $QM_{c,r}$.

Domestic price of composite commodity $PM_{c,r}$ can, thus, be expressed as a weighted average of the domestic price of 'large' share imports ($PML_{c,r}$) and the domestic price of 'small' share imports ($PMS_{c,r}$) where the weights are the corresponding import volumes.

$$PM_{c,r} * QM_{c,r} = \left(PML_{c,r} * QML_{c,r}\right) + \left(PMS_{c,r} * QMS_{c,r}\right) \qquad \forall\, c \in cm \qquad 18$$

At the bottom level, imperfect substitutability between imports from different sources ($QMR_{w,c,r}$) is assumed for imports from 'big' share regions only (i.e. $cmrl \subset cm$) as follows,

$$QMR_{w,c,r} = QML_{c,r} * \left(\left(PMR_{w,c,r} * \left(acr_{c,r}\right)^{\rho_{c,r}^{m}} / PML_{c,r} * \delta_{w,c,r}^{r}\right)\right)^{-1/1+\rho_{c,r}^{m}}$$

$$\forall\, c \in cmrl \qquad 19$$

where $PMR_{w,c,r}$ is the price of imports c from region w in the domestic market of region r. The shift and share parmeters for this CES nest are $acr_{c,r}$ and $\delta_{w,c,r}^{r}$, respectively. The elasticity of substitution between imports from different origins is given by $\sigma_{c,r}^{m} = 1/1 + \rho_{c,r}^{m}$.

It is noteworthy here that the standard version of the model applies the same elasticity of substitution to imports from different regions. However, an additional nest can be introduced to the CES import demand function in order to distinguish groups of regions that have different elasticity of substitution.[16]

Domestic price of a composite import commodity $PML_{c,r}$ is a weighted average of domestic price of the import commodities from different 'big' share regions where the weights are the quantities imported from these regions.

$$PML_{c,r} = \sum_{w} \left(PMR_{w,c,r} * QMR_{w,c,r}\right)/QML_{c,r} \qquad \forall\, c \in cmrl \qquad 20$$

For 'small' share imports (i.e. $cmrs \subset cm$) a fixed import share (Leontief) aggregator is implemented as follows,

$$QMR_{w,c,r} = ioqmrqms_{w,c,r} * QMS_{c,r} \qquad \forall\, c \in cmrs \qquad 21$$

where $ioqmrqms_{w,c,r}$ represents the volume ratios of imports from different 'small' share regions in $QMS_{c,r}$.

Domestic price of a composite 'small' share import commodity $PMS_{c,r}$ is a weighted average of domestic price of the import commodities from different 'small' share regions where the weights are the fixed quantity shares for these regions.

$$PMS_{c,r} = \sum_{w} ioqmrqms_{w,c,r} * PMR_{w,c,r} \qquad \forall\, c \in cms \qquad 22$$

In order to calculate *cif* price of import commodity c from region w in region r ($PWM_{w,c,r}$), the total value of trade and transportation service required to import this commodity is added to its *fob* price ($PWMFOB_{w,c,r}$) as follows,

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[16] In order to reduce the restrictiveness of applying common elasticities between imports from different regions, McDonald and Thierfelder (2006) adopt a three-level nested CES function that distinguishes imports from regions that have common CES elasticities. They argue that the model results are sensitive to the embodied degree of product differentiation in different regions.

$$PWM_{w,c,r} = PWMFOB_{w,c,r} + \sum_{cp} margcor_{w,cp,c,r} * PT_{cp,r} \qquad \forall\, c \in cmr \qquad 23$$

where $margcor_{w,cp,c,r}$ is the quantity of trade and transport commodity cp required for each unit of import commodity c by region r from region w and $PT_{cp,r}$ is the price for trade transport commodity cp.

Price of import commodity c from region w in the domestic market of region r ($PMR_{w,c,r}$) is computed by converting its *cif* import price after adding tariffs rate $TM_{w,c,r}$ into domestic currency units using the prevailing exchange rate ER_r.

$$PMR_{w,c,r} = PWM_{w,c,r} * \left(1 + TM_{w,c,r}\right) * ER_r \qquad \forall\, c \in cmr \qquad 24$$

5.2.2.2 Export Supply

The GLOBE model specifies a two-level nested CET export supply function.[17] For each export commodity, exports to different destinations are imperfect substitutes and that specific composite export commodity is an imperfect substitute to its counterpart supplied in the domestic market.[18]

At the top level, producers allocate their output between domestic and foreign markets according to the following CET export supply function.

$$QXC_{c,r} = at_{c,r} * \left(\gamma_{c,r} * \left(QE_{c,r}\right)^{\rho^t_{c,r}} + \left(1-\gamma_{c,r}\right) * \left(QD_{c,r}\right)^{\rho^t_{c,r}}\right)^{1/\rho^t_{c,r}}$$

$$\forall\, c \in (cd \cap ce), r \in rgn \qquad 25$$

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[17] For the commodity accounts where there is no exports and all domestic production is directed to domestic supply (i.e. *cen*), for the commodity accounts where there is no domestic supply and all domestic production is exported (i.e. *cdn*) or for homogeneous domestic/export supply, the specification is as follows,

$QXC_{c,r} = QD_{c,r} + QE_{c,r}$ $\qquad \forall\, c \in (cd \cap cen), r \in rgn$

OR $\forall\, c \in (cdn \cap ce), r \in rgn$

[18] Here is another difference between the GLOBE model and the GTAP model where export supply is not specified by a CET function. The CET export function is, however, commonly used in the majority trade-focused CGE models.

where $QD_{c,r}$ is the domestic supply, $QE_{c,r}$ is a composite export commodity, $at_{c,r}$ and $\gamma_{c,r}$ are the respective intercept and share parameters for the CET function. The elasticity of transformation between a composite export commodity and its domestic supply is given by $\tau^{t}_{c,r} = 1/\left(\rho^{t}_{c,r} - 1\right)$.

The tangency condition implies that export supply decision depends on changes in the relative prices of exported and domestically supplied commodities $\left(PE_{c,r}/PD_{c,r}\right)$.

$$QE_{c,r} = QD_{c,r} * \left(\left(PE_{c,r}/PD_{c,r}\right) * \left(\left(1-\gamma_{c,r}\right)/\gamma_{c,r}\right)\right)^{1/\left(\rho^{t}_{c,r}-1\right)}$$
$$\forall\, c \in (cd \cap ce), r \in rgn \qquad 26$$

Producer price of a composite output commodity $PXC_{c,r}$ can be expressed as a weighted average of the consumer price for domestic supply of the commodity ($PD_{c,r}$) and the domestic price of its exported equivalent ($PE_{c,r}$) where the weights are the correspodening commodity quantities.

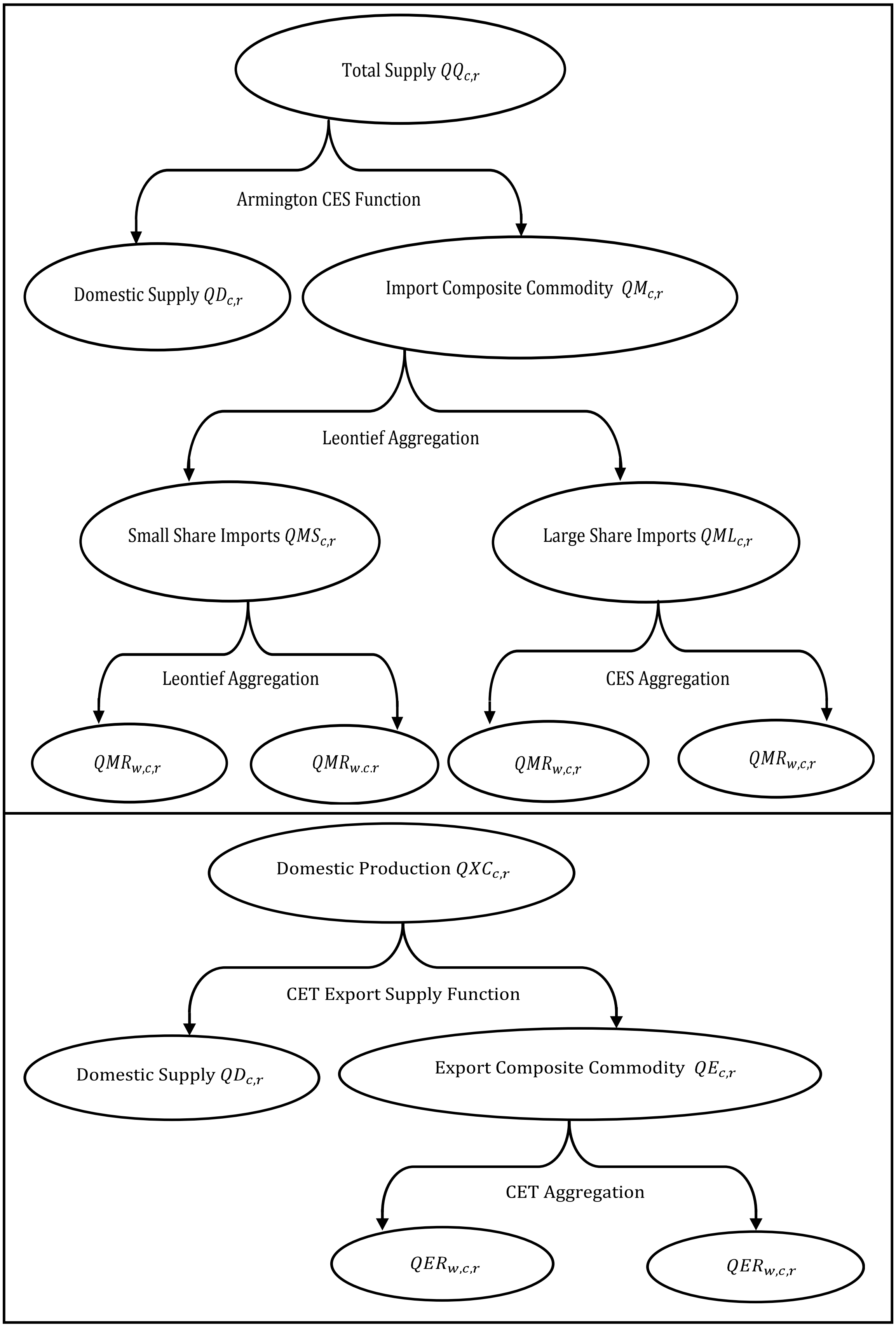
$$PXC_{c,r} * QXC_{c,r} = \left(PD_{c,r} * QD_{c,r}\right) + \left(PE_{c,r} * QE_{c,r}\right) \quad \forall\, c \in cx, r \in rgn \qquad 27$$

At the second level of export function, imperfect transformability is assumed between exports to different destinations. The first order condition for the optimal choice of exports to each region ($QER_{c,w,r}$) is given by

$$QER_{c,w,r} = QE_{c,r} * \left(PER_{c,w,r} / \left(PE_{c,r} * \gamma^{r}_{c,w,r} * \left(atr_{c,r}\right)^{\rho^{e}_{c,r}}\right)\right)^{1/\left(\rho^{e}_{c,r}-1\right)}$$
$$\forall\, c \in cer, r \in rgn \qquad 28$$

where $atr_{c,r}$ and $\gamma^{r}_{c,w,r}$ are the shift and share parameters for this CET function. The elasticity of transformation between exports to different destinations is given by $\tau^{e}_{c,r} = 1/\left(\rho^{e}_{c,r} - 1\right)$.

Figure 5-2: Domestic Demand and Domestic Output in GLOBE Model



Domestic price of export commodity c to region w by region r ($PER_{c,w,r}$) is computed by converting its world price $PWE_{c,w,r}$ into domestic currency units, after deducting export tax rate $TE_{c,w,r}$, using the prevailing exchange rate ER_r.

$$PER_{c,w,r} = PWE_{c,w,r} * \left(1 - TE_{c,w,r}\right) * ER_r \qquad \forall\, c \in cer \qquad 29$$

Domestic price of composite export commodity c by region r ($PE_{c,r}$) is measured as weighted average of domestic prices for exports to different destinations where the quantities exported to regions are the weights.

$$PE_{c,r} = \sum_{w} \left(PER_{c,w,r} * QER_{c,w,r}\right) / QE_{c,r} \qquad \forall\, c \in ce, r \in rgn \qquad 30$$

5.2.3. Institutions Block

This sub-section deals with the model accounts that represent the domestic institutions in the economy at hand: household, government and capital accounts.[19] Demand by these accounts for private consumption, public expenditure and capital final commodities compose total absorption.

5.2.3.1 Household Account

In the words of Shoven and Whalley (1984, p. 1017), "… demand and production functions in all the applied models … [should] be both consistent with the theoretical approach and analytically tractable". These two prerequisites limit the options of the employed demand function in CGE models to be Cobb-Douglas, CES, LES or (Constant Difference of Elasticity) CDE functions.[20]

In this version of GLOBE model, the private consumer demand decision is undertaken by a representative household in each region. Households receive income from

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[19] For each region r, the 'Rest of the World' institution account is represented by a whole set of regions w where one-to-one mapping sets, from regions r to trade partners w and vice versa, are declared.

[20] More flexible utility functions (e.g. translog function) could have been used. However, they might complicate the analysis. For different functional forms, see Annabi, Cockburn and Decaluwé (2006, pp. 7-17).

production factors according to the household share ($hvash_{h,f,r}$) in factor income after depreciation and direct tax on factor income ($YFDIST_{f,r}$). Household income ($YH_{h,r}$) is represented as follows,

$$YH_{h,r} = \sum_{f} hvash_{h,f,r} * YFDIST_{f,r} \qquad \forall\, r \in rgn \qquad 31$$

Households pay income taxes rated at $TYH_{h,r}$ and save according to a ration of their disposable income, $SHH_{h,r}$.[21] Household consumption expenditure ($HEXP_{h,r}$) is, thus, determined by

$$HEXP_{h,r} = YH_{h,r} * \left(1 - TYH_{h,r}\right) * \left(1 - SHH_{h,r}\right) \qquad \forall\, r \in rgn \qquad 32$$

Each household maximizes a Stone-Geary utility function subject to its budget constraint. The resulting linear expenditure system (LES) represents two demand components for each consumption commodity; subsistence and discretionary demand. As its name suggests, LES specifies expenditure of each commodity as a linear function of prices and total non-subsistence expenditure.

$$\begin{aligned} QCD_{c,h,r} * PQD_{c,r} &= \left(qcdconst_{c,h,r} * PQD_{c,r}\right) + \beta_{c,h,r} \\ &* \left(HEXP_{h,r} - \sum_{c}\left(qcdconst_{c,h,r} * PQD_{c,r}\right)\right) \end{aligned} \qquad \forall\, r \in rgn \qquad 33$$

In this LES demand function, $qcdconst_{c,h,r}$ is subsistence consumption volume and $\beta_{c,h,r}$ is the marginal budget share according to which the supernumerary income (the

[21] The model specification does not allow for any transfers from the other institution accounts to household. This implies that selling factor service is the only income source for household.

excess of total spending over subsistence consumption) is divided among different commodities.

5.2.3.2 Government Account

Government income YG_r consists of tax revenues only. The model does not allow for transfers from other institution accounts, located either inside or outside the region, to the government. Seven types of taxes are identified by the model: import *ad valorem* tariffs ($TM_{w,c,r}$), export taxes ($TE_{c,w,r}$), sales taxes on domestic demand ($TS_{c,r}$), indirect production tax on activity output ($TX_{a,r}$) and indirect tax on activity use of production factors ($TF_{f,a,r}$), direct taxes on household income ($TYH_{h,r}$) and direct taxes on factor income ($TYF_{f,r}$).[22] The following Equations represent government revenues from these taxes in a respective order.

$$MTAX_r = \sum_{c,w} TM_{w,c,r} * PWM_{w,c,r} * ER_r * QMR_{w,c,r} \qquad \forall\, r \in rgn \qquad 34$$

$$ETAX_r = \sum_{c,w} TE_{c,w,r} * PWE_{c,w,r} * ER_r * QER_{c,w,r} \qquad \forall\, r \in rgn \qquad 35$$

$$STAX_r = \sum_{c} TS_{c,r} * PQS_{c,r} * \left(QINTD_{c,r} + \sum_{h} QCD_{c,h,r} + QGD_{c,r} + QINVD_{c,r}\right) \qquad \forall\, r \in rgn \qquad 36$$

$$ITAX_r = \sum_{a} TX_{a,r} * PX_{a,r} * QX_{a,r} \qquad \forall\, r \in rgn \qquad 37$$

$$FTAX_r = \sum_{f,a} TF_{f,a,r} * WF_{f,r} * WFDIST_{f,ar} * FD_{f,a,r} \qquad \forall\, r \in rgn \qquad 38$$

$$HTAX_r = \sum_{h} TYH_{h,r} * YH_{h,r} \qquad \forall\, r \in rgn \qquad 39$$

$$FYTAX_r = \sum_{f} TYF_{f,r} * \left(YF_{f,r} - \left(deprec_{f,r} * YF_{f,r}\right)\right) \qquad \forall\, r \in rgn \qquad 40$$

[22] As discussed before in Chapter 4, tariff data extracted from the GTAP7 database covers AVEs of specific and compound tariffs as well as TRQs. In this stage, import-weights derived from the GTAP7 database are used to aggregate import duties before calibrating the model.

$$YG_r = MTAX_r + ETAX_r + STAX_r + ITAX_r + FYTAX_r + HTAX_r + FTAX_r \quad \forall\, r \in rgn \qquad 41$$

The model allows for altering the tax rates through two types of scaling factors. The first is an additive scaling factor that imposes a uniform scalar to all rates for a specific tax in the region. Using this scalar entails altering the relative rates for a specific tax in the region. The other is a multiplicative scaling factor that scales all rates for a specific tax in the region whilst keeping its relative rates fixed. For the purposes of this study, different simulation scenarios, undertaken in Chapters 6 and 7, apply uniform changes to import and export tax rates. Therefore, additive factors are used to scale tax rates up/down.

Government expenditure EG_r is given by

$$EG_r = \sum_c QGD_{c,r} * PQD_{c,r} \qquad \forall\, r \in rgn \qquad 42$$

$$QGD_{c,r} = qgdconst_{c,r} * QGDADJ_r \qquad \forall\, c \in qgdconst, r \in rgn \qquad 43$$

where $QGD_{c,r}$ and $qgdconst_{c,r}$ are the variable and parameter that represent government demand volume and $QGDADJ_r$ is a multiplicative scaling factor for government consumption.

5.2.3.3 Capital Account

Capital account collects savings from different sources and allocates them to different capital commodities. Total savings $TOTSAV_r$ comprises of four components: private savings, depreciation, government savings $KAPGOV_r$ and trade balance surplus $KAPWOR_r$ as follows,

$$TOTSAV_r = \left(\sum_h \left(YH_{h,r} * \left(1 - TYH_{h,r}\right) * SHH_{h,r} \right) \right) + \left(\sum_f \left(deprec_{f,r} * YF_{f,r} \right) \right) + KAPGOV_r + \left(KAPWOR_r * ER_r \right) \quad \forall\, r \in rgn \qquad 44$$

By summing values of investment demand by commodity ($QINVD_{c,r}$), total investment expenditure ($INVEST_r$) is computed.

$$QINVD_{c,r} = \sum_c qinvdconst_{c,r} * IADJ_r \qquad \forall\, c \in qinvdconst, r \in rgn \qquad 45$$

$$INVEST_r = \sum_c PQD_{c,r} * QINVD_{c,r} \qquad \forall\, r \in rgn \qquad 46$$

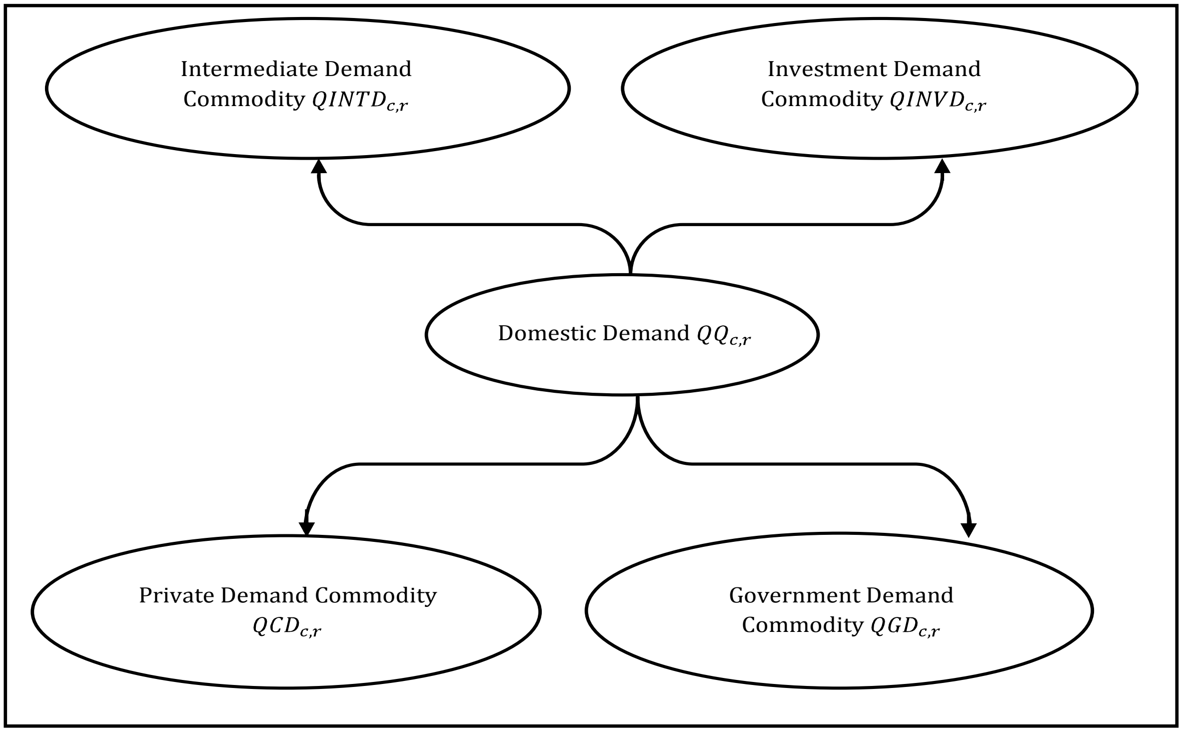
5.2.3.4 Total Domestic Demand

Demand for each composite consumption commodity is a CES aggregation of the domestically produced commodity and a composite of its imported substitutes, as seen in Figure 5-3. Domestic demand consists of intermediate demand, private consumer demand $QCD_{c,h,r}$, government demand $QGD_{c,r}$ and investment demand $QINVD_{c,r}$.

$$QQ_{c,r} = QINTD_{c,r} + \sum_h QCD_{c,h,r} + QGD_{c,r} + QINVD_{c,r} \qquad \forall\, c \in (cd \cup cm), r \in rgn \qquad 47$$

We have seen how the intermediate demand decision is taken by firms in the course of the production process. Household and government accounts represent how income is generated and spent by the domestic institutions in the model. Furthermore, capital account handles savings and investment demand. The following figure summarizes the functional specifications for domestic demand components.

Figure 5-3: Domestic Demand Flows in GLOBE Model



5.2.1. Exchange Rate and Multiple Numéraire

Exchange rate in the GLOBE model is expressed as units of domestic currency per a unit of foreign currency. It is not a financial variable in the sense that it is solely determined by the relative prices of tradable and non tradable commodities in the domestic markets.[23]

Neoclassical CGE models are money-neutral; models are solved for relative prices where the absolute price levels are specified exogenously.[24] In other words, neoclassical CGE models are homogenous of degree zero in nominal prices. As such, one nominal price variable is specified as exogenous and all other prices are measured relative to this chosen numéraire.

The GLOBE model identifies a global numéraire to which foreign transactions and regional exchange rates are calculated in relative terms. This global numéraire is specified as the exchange rate index for a reference region chosen by the modeller. In this version of the model, a single region is assigned to the reference region sub-set i.e. 'United States of America'.[25]

$$ERPI = \sum_{r}(tradtotsh_r * ER_r) \qquad \forall\, r = \{\text{ref}\} \qquad 48$$

$$\overline{ERPI} \qquad \text{A.}$$

[23] Devarajan, Lewis and Robinson (1993, pp. 45-63) present different approaches for measuring the equilibrium real exchange rate (ERER), i.e. purchasing power parity (PPP) and Salter-Swan model approaches. The authors argue that the framework that incorporates product differentiation for imports and exports generates ERER that is consistent with both approaches. For an elaborated explanation of exchange rate and its role within the CGE framework, see De Melo and Robinson (1989).

[24] Money-neutrality implies that changes in money supply only affect nominal variables. Changes in money supply generate proportional changes in all nominal prices (including factor prices) leaving real variables constant.

[25] Choosing a group of countries, instead of a single country, as the model reference region might facilitate the iteration process for the model to find its new equilibrium point and, thereby, enhance the model performance.

In addition, the model introduces consumer price indices (CPI_r) as a price numéraire for each region. CPI_r is measured as a weighted average of consumer prices of composite commodities where the weights are the value shares of each commodity in the total private consumer demand, $comtotsh_{c,r}$. CPI_r are specified exogenously and, for each region, prices are normalized to the region numéraire.[26]

$$CPI_r = \sum_c \left(comtotsh_{c,r} * \ PQD_{c,r}\right) \qquad \forall\, r\ \in\ rgn \qquad 49$$

$$\overline{CPI_r} \qquad \forall\, r\ \in\ rgn \qquad \text{B.}$$

As such, all results are expressed in real terms. Intra-region transactions are measured relative to the CPI_r in each region whereas inter-region transactions are measured relative to the constant global numéraire.[27] In the words of Lewis, Robinson and Thierfelder (1999, p. 13)

> "The advantage of this choice is that solution wages and incomes are in real terms. The solution exchange rates in the sub-regions are also in real terms, and can be seen as equilibrium price-level-deflated (PLD) exchange rates, using the country consumer price indices as deflators".

[26] Alternatively, the GLOBE model allows for identifying producer price indices (PPI_r) as the region numéraire. In such case, PPI_r is calculated as a weighted average of consumer price of domestic supply $PD_{c,r}$ according to the value shares of each commodity in the total domestic output; $vddtotsh_{c,r}$. Prices for each region are, then, normalized to the exogenous region numéraire as follows,

$$PPI_r = \textstyle\sum_c \left(vddtotsh_{c,r} * \ PD_{c,r}\right) \qquad \forall\, r\ \in\ rgn$$

$$\overline{PPI_r} \qquad \forall\, r\ \in\ rgn$$

[27] Likewise, the Global Trade and Environment Model (GTEM) CGE model identifies multiple numéraire. The GTEM model is documented in Pant (2007).

5.3 GLOBE Closure Rules

At this stage of methodology development, a set of closure rules are specified in the way that ensures the mathematical consistency required to solve a model of simultaneous equations,[28] reflects the embodied assumptions on economic behaviour and represents the economic logic on how the general equilibrium is achieved. These "… "system constraints" … must be satisfied, but … are not taken into account by any agent in making his decisions" (Robinson 1989, pp. 907-8). The choice of macro and factor market closure rules has substantial influence upon the model findings.

5.3.1. Total Absorption Closure

The present study adopts a 'balanced' closure rule that implies constant total absorption shares. In other words, proportions of private consumption, government expenditure and investment to domestic final demand are fixed at their benchmark ratios. The term 'balanced' refers to the closure rule function in maintaining the total absorption shares and hence the generated changes in domestic final demand, in response to exogenous shocks, are evenly distributed among its components.[29]

The following three Equations determine total value of domestic final demand ($VFDOMD_r$) and the value shares for two of its components (i.e. government expenditure $VGDSH_r$ and investment demand $INVESTSH_r$).

$$VFDOMD_r = \sum_c PQD_{c,r} * \left(\left(\sum_h QCD_{c,h,r}\right) + QGD_{c,r} + QINVD_{c,r}\right) \quad \forall\, r \in rgn \qquad 50$$

$$VGDSH_r * VFDOMD_r = \sum_c \left(PQD_{c,r} * QGD_{c,r}\right) \quad \forall\, r \in rgn \qquad 51$$

$$INVESTSH_r * VFDOMD_r = INVEST_r \quad \forall\, r \in rgn \qquad 52$$

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[28] For the model to be squared and therein has a general equilibrium solution, the number of independent equations should equal the number of endogenous variables.

[29] For more details and alternative closure rules, see Lofgren, Harris and Robinson (2001, pp. 13-17).

Setting the proportions of government expenditure and investment in total absorption fixed (i.e. Inequalities C and D) entails that the complementary share (i.e. ratio of private consumption in total absorption) is necessarily fixed.

$$\overline{VGDSH_r} \qquad \forall\, r \in r \qquad \text{C.}$$

$$\overline{INVESTSH_r} \qquad \forall\, r \in r \qquad \text{D.}$$

Two points are worth mentioning here. Firstly, total absorption shares are fixed in nominal terms. This implies that volumes of domestic final demand components (i.e. $QCD_{c,h,r}$, $QGD_{c,r}$ and $QINVD_{c,r}$) change as the result of changes in relative prices; $PQD_{c,r}$. Secondly, this 'balanced' closure rule has considerable implications in the context of this study. Trade policy and, more specifically, tariff changes do not affect public spending directly. The model assumes fiscal exogeneity, thereby excluding the government spending channel from the trade liberalization-welfare linkages by assumption.

5.3.2. Government Account Closure

For the purposes of this study, two closure rules are implemented to government account. The main simulation scenarios undertaken in Chapter 6 and all the scenarios provided in Chapter 7 adopt the basic closure rule. A separate set of simulation scenarios, which is provided in Chapter 6, adopts an alternative closure rule for government account. The following is a detailed explanation for these closure rules.

5.3.2.1 Basic Closure Rule

As discussed before, value share of government expenditure in total absorption is set to be fixed; Inequality C. Government savings is endogenously determined as the residual difference between government income and government expenditure.

$$KAPGOV_r = YG_r - EG_r \qquad \forall\, r \in rgn \qquad 53$$

Taxes that are not targeted by the simulation shock are fixed at their baseline rates. This is undertaken by setting the relevant additive and multiplicative scaling factors for each tax type fixed at their baseline values which are 1 for the multiplicative scaling factor and 0 for the additive scaling factor.

5.3.2.2 Alternative Closure Rule

In an alternative closure rule, the study assumes that tariff revenue losses generated by the simulated tariff reductions are offset through a rise in domestic sales tax rates.[30] Accordingly, government income is set to be fixed while allowing sales tax rate to endogenously adjust through its additive scaling parameter, DTS_r. The next two conditions are added.

$$\overline{YG_r} \qquad \forall\, r \in rgn \qquad \text{E.}$$

$$-\infty \leq DTS_r \leq +\infty \qquad \forall\, r \in rgn \qquad \text{F.}$$

5.3.3. Savings-Investment Closure

Two alternative closure rules could be employed: the Johansen investment-driven and the neo-classical savings-driven closure rules. The former assumes that savings level adjusts endogenously in order to generate the required fund to finance the base year fixed investment. In contrast, the neo-classical closure assumes that investment adjusts endogenously in order to match the fixed savings level. Robinson and Lofgren (2005, p. 274) demonstrate that both closure rules do not rigorously represent the savings/investment behaviour in the model. However, the authors argue that they "… are theoretically coherent within the flow-equilibrium specification of the CGE model".

[30] This alternative closure rule is adopted in Chapter 6 for the two main scenarios under the simulation set (Set3), i.e. Sim13 and Sim23.

This version of the model adopts investment-driven closure. Savings level adjusts to generate the required savings to finance the base year fixed investment. As aforementioned, investment demand by commodity alters in response to relative price changes (Equation 46) keeping value share of investment expenditure in total absorption fixed; Inequality D. The required changes in total savings are generated through endogenous changes in private and government savings levels. Both variables are set to be endogenous; Equations 32 and 53. Foreign savings level is fixed according to the external balance closure rule, as we will see in the following sub-section.

5.3.4. External Account Closure

The two alternative closure rules are either to fix exchange rate and specify foreign savings as the equilibrating variable that clears the foreign exchange market or to fix foreign savings while permitting exchange rate to adjust endogenously. The choice between these two alternatives has been a subject of debate in the literature.

Welfare implication is one of the key elements in this study. It is, therefore, important to specify endogenous changes in terms of trade and fix current accounts (i.e. foreign savings). This specification ensures that trade partners do not accrue a 'free lunch' when a country liberalizes its trade.

Trade balance for a region r (i.e. $KAPWOR_r$) is computed by summing its bilateral trade balances with all trade parterns w (i.e. $KAPREG_{w,r}$). Trade balances for all non-'Globe' regions are fixed at their initial benchmark levels and real exchange rates are allowed to vary in such a way that clears the foreign exchange markets, i.e. trade balances.[31]

[31] Three points are worth noting here. Firstly, current and trade balances are identical since there are no remittances or foreign transfers in this version of the model. Secondly, trade/current account deficits, which are evaluated in terms of the global numéraire, must sum to zero for the whole world in order to equilibrate the model. Finally, the model specification allows for assigning flexible external balances, and hence fixed exchange rates, for chosen regions.

$$KAPREG_{w,r} = \sum_{c}\left(PWMFOB_{w,c,r} * QMR_{w,c,r}\right) - \sum_{c}\left(PWE_{c,w,r} * QER_{c,w,r}\right) \qquad \forall\, w \in wgn \qquad 54$$

$$KAPWOR_{r} = \sum_{w} KAPREG_{w,r} \qquad 55$$

$$\overline{KAPWOR}_{r} \qquad \forall\, r \in rgn \qquad \text{G.}$$

From this perspective, any external shock that might decrease export earnings for a region, e.g. reducing tariffs on its imports, generates, *ceteris paribus*, an increase in real exchange rate. This real depreciation improves competitiveness of exports in foreign markets whereas import-competing products become more expensive in domestic markets. Such changes entail export expansions and import decreases, keeping the trade account balanced.

5.3.5. Commodity Trade Account Closure

In order to ensure consistency across bilateral trade accounts, import volume of commodity c by region r from region w is, by definition, equalized with export volume of the same commodity by region wp to region rp. Likewise, *fob* price of import commodity c by region r from region w is, by definition, equalized with the world price of the same commodity export by region wp to region rp. For these two Equations to be implemented without corruption, a mapping set from $(\mathrm{rp}, \mathrm{w})$ to $(\mathrm{wp}, \mathrm{r})$ is used to swap the labels for importing and exporting regions.

$$QMR_{w,c,r} = QER_{c,wp,rp} \qquad \forall\, c \in cmr \qquad 56$$

$$PWMFOB_{w,c,r} = PWE_{c,wp,rp} \qquad \forall\, c \in cmr \qquad 57$$

5.3.6. Factor Market Closure

In order to close factor market accounts, modellers either fix factor quantity (factor total supply that sums over demand by activities) allowing factor rent to adjust or fix factor rent assuming flexible factor supply. The former is labelled in the literature as the full-employment closure rule. It is more accurate, though, to call it unchanged employment closure since it sets factor supply at its unchanged baseline level, (Pycroft 2009, p. 130).

For the purposes of this study, two closure rules are implemented for production factor markets. All the simulation scenarios, undertaken in both Chapter 6 and Chapter 7, adopt the basic closure rule whereas the sensitivity analysis, provided in Chapter 6, assumes an alternative closure rule. The following is a detailed explanation for these closure rules.

5.3.6.1 Basic Closure Rule

In the basic set of closure rules, all production factors are assumed to be fully employed. The model also assumes that production factors, except natural resources, are mobile across activities. As Inequalities H and I show, factor supply $FS_{f,r}$ is fixed at its baseline level whereas factor price $WF_{f,r}$ is allowed to adjust in order to clear the factor market. In each region, factor demand by different activities is determined endogenously and thereby fixing the sectoral proportions for factor prices in different activities, $WFDIST_{f,a,r}$.

$$FS_{f,r} = \sum_{a} FD_{f,a,r} \qquad \forall\, r \in rgn \qquad 58$$

$$\overline{FS}_{f,r} \qquad \text{H.}$$

$$-\infty \leq WF_{f,r} \leq +\infty \qquad \text{I.}$$

$$\overline{WFDIST}_{f,a,r} \qquad \text{J.}$$

It is appropriate to assume that natural resources are not flexible to be reallocated to alternative production activities. Therefore, natural resources are specified to be activity-specific. The model specifies its demand to be determined exogenously while allowing its rent to vary across activities. Accordingly, Inequalities H and J are relaxed for natural resources. Like all other factors, natural resources are assumed to be fully employed. Therefore, Inequality I is retained. A new condition is imposed as follows,

$$\overline{FD}_{f,a,r} \qquad \forall\, f = \{NatRes\} \qquad \text{K.}$$

This specification entails that sectoral proportions for natural resources rent vary across activities reflecting the prevailing utilization level in each activity. Relaxing a condition requires imposing a new one in order to ensure a unique equilibrium solution for the model.[32] An additional condition is, thus, specified such that the proportions of the natural resources returns for 'oil and minerals' activity to its total returns are fixed at their baseline ratios in all non-reference regions.[33]

$$\overline{WFDIST}_{f,a,r} \qquad \forall\, f = \{NatRes\}, a = \{aCog\} \qquad \text{L.}$$

5.3.6.2 Alternative Closure Rule

The induced changes in output and trade structures in response to the trade simulated shocks are among the key examined variables in this study. It is, thus, necessary for the model specification to reflect rigidity in factor markets for the regions at hand. From this perspective, the model employs a different closure rule that assumes unemployment for unskilled labour markets in SADC regions. According to this closure set, unskilled labour wages (relative to the region numéraire) are specified to be fixed at their baseline rates in all SADC regions whereas their

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[32] In order to ensure a unique solution for non-linear simultaneous systems of equations, where the number of variables T is greater than the number of equations N, the $T - N$ number of variables should be specified exogenously. That is to say, the number of endogenous variables should equal the number of independent equations.

[33] Under the adopted aggregation scheme, only two activities are natural resources-using; livestock $(aFfp)$ and 'oil and minerals' $(aCog)$.

employment levels are determined endogenously to reflect abundant supply of unskilled workers who are willing to offer their services at the prevailing wage rates in SADC regions.[34]

This is undertaken by specifying a sub-set of regions $rluen$ to which the regions with unemployment are assigned, i.e. SADC regions. Inequality H that fixes factor supply and Inequality I that specifies factor wage as a free variable are relaxed for $rluen$. Like the basic closure rule, unskilled labour in SADC regions is assumed to be mobile across activities. Therefore, Inequality J is retained for $rluen$. Two additional conditions are imposed as follows,

$$\overline{WF}_{f,r} \qquad \forall\ f = \{lu\}, r \in rluen \qquad \text{M.}$$

$$-\infty \leq FS_{f,r} \leq +\infty \qquad \forall\ f = \{lu\}, r \in rluen \qquad \text{N.}$$

where lu is the unskilled labour and SADC regions are assigned to the sub-set $rluen$.

Like the basic closure rule, all other production factors (skilled labour, land and capital in all regions as well as unskilled labour outside SADC regions) are specified to be fully employed and mobile across activities. Furthermore, natural resources are assumed to be immobile across activities. Therefore, the specification for these factors is the same as represented in inequalities H - L.

5.3.7. 'Globe' Region and Equilibrating the Model

As aforementioned, the GTAP7 database does not include bilateral trade data for trade and transportation margins. Therefore, trade in these commodities are undertaken by the artificial region called 'Globe'. The quantity of a trade margin commodity c demanded by region r from region w (i.e. $QT_{w,c,r}$) is determined as follows,

[34] This is undertaken in the course of the sensitivity analysis provided in Chapter 6, i.e. the sensitivity scenario Sim21-lun.

$$QT_{w,c,r} = \sum_{cp} QMR_{w,cp,r} * margcor_{w,c,cp,r} \qquad \forall\, c \in ct2, r \in rgn \qquad 59$$

where $ct2 \subset c$ is a sub-set of commodities to which trade and transportion margins are assigned. As described before, the quantity parameter $margcor_{w,cp,c,r}$ is the quantity of trade and transport commodity c required for each unit of import commodity cp by region r from region w.

In order to close the trade and transportation margins account, import demand of a trade margin commodity c by region r from all regions w is equalized with 'Globe' export supply of the trade margin commodity c to all regions wp. Import price of a trade margin commodity c by region r is equalized with world price of its export by 'Globe' to different regions wp.

$$\sum_{w} QT_{w,c,r} = \sum_{wp} QER_{c,wp,r} \qquad \forall\, c \in ct2, r \in rgn \qquad 60$$

$$PT_{c,r} = PWE_{c,wp,r} \qquad \forall\, c \in ct2, r \in rgn \qquad 61$$

where r in the right hand-sides of both Equations represent 'Globe' region.

Trade and transportation margins commodities are set to be homogenous. Accordingly, 'Globe' exports to different regions are perfect substitutes, i.e. Equation 62. In addtition, different importing regions w of a trade and transportation margin commodity $ct2$ pay the same price, i.e. Equation 63.

$$QE_{c,r} = \sum_{w} QER_{c,w,r} \qquad \forall\, c \in ct2, r \notin rgn \qquad 62$$

$$PER_{c,w,r} = PE_{c,r} \qquad \forall\, c \in ct2, r \notin rgn, w \in wgn \qquad 63$$

There is neither domestic demand nor domestic production undertaken by 'Globe' region. Therefore, its imports and exports of trade and transportation margins are necessarily identical. Bilateral trade balances for 'Globe' region and its zero-trade balance are given by,

$$KAPREG_{w,r} = \sum_{c,wp} \left(PT_{c,r} * QT_{wp,c,r}\right) - \sum_{c} \left(PWE_{c,w,r} * QER_{c,w,r}\right) \qquad \forall w \notin wgn \qquad 64$$

$$QE_{c,r} = QM_{c,r} \qquad \forall\, c \in ct2, r \notin rgn \qquad 65$$

Unlike other regions in the model, exchange rate for 'Globe' is set to be fixed.

$$\overline{ER_r} \qquad \forall\, r = \{Globe\} \qquad 0.$$

According to Walras's Law, if all markets, but one, are in equilibrium, then this last market is also cleared. Therefore, one of the model equations is redundant and can be omitted. Alternatively, the model identifies slack variables that have null values. The savings-investment equation for all regions but 'Globe' region is excluded. Total savings and investment expenditure are implicitly balanced if the rest of the equations are solved and the model reaches its equilibrium position.

$$TOTSAV_r = INVEST_r + WALRAS_r \qquad \forall\, r \in rgn \qquad 66$$

$$KAPWORSYS = \sum_{r} KAPWOR_r \qquad \forall\, r \in rgn \qquad 67$$

In order to close 'Globe' region account, a slack variable (i.e. $GLOBESLAC$) is defined as follows,

$$\sum_{w} \left(PWM_{w,c,r} * QMR_{w,c,r}\right) = \sum_{w} \left(PWE_{c,w,r} * QER_{c,w,r}\right) + GLOBESLACK$$

$$\forall\, c \in ct2, r \notin rgn \qquad 68$$

5.4 Calibration and Preparation for Simulation

CGE models assume that economies are in equilibrium at the baseline year. Accordingly, variables and parameters values are numerically calibrated in such a way that this initial equilibrium point replicates the baseline dataset. This implies no stochastic disturbance is embodied in the model equations. The model is, thus, specified as a mixed complementarity problem (MCP) and solved using a solver called 'PATH'.[35]

The following three sub-sections describe various measurements implemented by the model.

5.4.1. Welfare Measures

In this general equilibrium framework, changes in trade policy generate changes in all prices and quantities which determine the new equilibrium point. Comparative static analysis of values of the relevant variables between these two equilibria provides indications of the welfare impact. Changes in trade policy generate efficiency effects which can be traced through changes in aggregate production, income and demand. Changes in GDP, factor returns and household incomes, total absorption as well as equivalent and compensating variations are commonly used as welfare indicators in the empirical literature.[36] Using the 1-2-3 model, Robinson and Thierfelder (1999) demonstrate that changes in real factor returns do not accurately reflect the welfare impact of trade policy that embodies changes in indirect taxes. Such changes induce both efficiency and transfer effects. While the former has welfare implications, the latter does not necessarily mean changes in household income and/or total absorption. Therefore, interpreting changes in factor returns in the context of welfare analysis should be done with caution.

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[35] For more on calibrating CGE models, see Shoven and Whalley (1984 and 1992). Rutherford (1995) provides detailed mathematical explanation of MCP and the MCP solvers.

[36] Some problems related to comparing welfare across different households and measuring welfare in dynamic models are reported in the applied general equilibrium literature. For a detailed discussion, see Shoven and Whalley (1992, pp. 123-129).

In this model, welfare impact is measured by the equivalent variation on household consumption and changes in total absorption. The equivalent variation measures the amount of income (million US$ 2004) consumers would have to be given or taken at the pre-simulation utility levels in order to yield an equivalent effect on their welfare as the simulated policy change does. The equivalent variation $EV_{h,r,sim}$ for household h in region r under any scenario sim is given by

$$EV_{h,r,sim} = \prod_{c} \left(PQD0_{c,r}/PQD_{c,r,sim}\right)^{\beta_{c,h,r}} * \left(HEXP_{h,r,sim} - \left(\sum_{c} qcdconst_{c,h,r} * PQD_{c,r,sim}\right)\right) - \left(HEXP0_{h,r} - \left(\sum_{c} qcdconst_{c,h,r} * PQD0_{c,r}\right)\right) \quad \forall\, r \in rgn \qquad 69$$

where $PQD_{c,r,sim}$ is consumer price of composite commodity c in region r at the new equilibrium point, $HEXP_{h,r,sim}$ is household consumption expenditure at the new equilibrium point, $PQD0_{c,r}$ and $HEXP0_{h,r}$ are the corresponding initial equilibrium levels of these variables, $qcdconst_{c,h,r}$ is the volume of subsistence consumption for commodity c and the $\beta_{c,h,r}$ are the marginal budget shares.

In order to compare changes in welfare across regions, the welfare measure should be standardized by an indicator of the economy size. Therefore, proportional changes in total absorption provide comparable indications of changes in welfare across regions. Under the 'balanced' macro closure adopted in this study, changes in total absorption generated by GLOBE are a good proxy for changes in the Hicksian measure for consumer welfare.[37]

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[37] Robinson and Willenbockel (2009, p. 26) estimate the correlation coefficient between changes in real absorption and the equivalent variation in percent of baseline consumption by country to be 0.9946.

5.4.2. Terms of Trade Computation

In this multi-sector, multi-country model, a Laspeyres price index is used for computing terms of trade. The export price index is the current value of the baseline exports divided by the baseline value of the baseline exports. Similarly, the import price index represents the current value of the baseline imports divided by the baseline value of the baseline imports. Terms of trade $\mathrm{TOT}_{\mathrm{r,sim}}$ for region r under any scenario sim is calculated as follows,

$$\mathrm{TOT}_{\mathrm{r,sim}} = \frac{\left(\sum_{\mathrm{c,w}} \mathrm{PWE}_{\mathrm{c,w,r,sim}} * \mathrm{QER0}_{\mathrm{c,w,r}}\right) / \left(\sum_{\mathrm{c,w}} \mathrm{PWE0}_{\mathrm{c,w,r}} * \mathrm{QER0}_{\mathrm{c,w,r}}\right)}{\left(\sum_{\mathrm{c,w}} \mathrm{PWM}_{\mathrm{w,c,r,sim}} * \mathrm{QMR0}_{\mathrm{w,c,r}}\right) / \left(\sum_{\mathrm{c,w}} \mathrm{PWM0}_{\mathrm{w,c,r}} * \mathrm{QMR0}_{\mathrm{w,c,r}}\right)} \quad \forall\, r \in rgn \qquad 70$$

where $\mathrm{PWE}_{\mathrm{c,w,r,sim}}$ is world price for exports of commodity c by region r to region w at the new equilibrium point, $\mathrm{PWM}_{\mathrm{w,c,r,sim}}$ is world *cif* price for imports of commodity c by region r from region w at the new equilibrium point, $\mathrm{PWE0}_{\mathrm{c,w,r}}$ and $\mathrm{PWM0}_{\mathrm{w,c,r}}$ are the corresponding initial equilibrium levels of these world prices, $\mathrm{QER0}_{\mathrm{c,w,r}}$ is the initial equilibrium exports of commodity c by region r to region w and $\mathrm{QMR0}_{\mathrm{w,c,r}}$ is the initial equilibrium imports of commodity c by region r from region w.

5.4.3. Factor Market Adjustment Measure

The study employs a measure of the degree of structural change that takes place in each economy after the simulated trade shocks. During the adjustment process to a trade liberalization shock, resources move towards activities with comparative advantage. The employed measure $FACTADJ_{f,r,sim}$ considers the amount of production factors that have to move across activities for the economy to achieve the new equilibrium point after any simulation shock sim. It is given by

$$FACTADJ_{f,r,sim} = 100 * \left(\sum_{a} \left| FD_{f,a,r,sim} - FD0_{f,a,r} \right| / 2 \right) \Big/ FS_{f,r,sim} \quad \forall\, r \in rgn \qquad 71$$

where $FD_{f,a,r,sim}$ is demand for factor f by activity a in region r at the new equilibrium point and $FD0_{f,a,r}$ is its corresponding initial equilibrium level, $FS_{f,r,sim}$ is total supply of factor f in region r at the new equilibrium point.

It measures the degree of structural change and, hence, serves as an indication of the potential costs each economy will have to bear during its adjustment process to a policy shock. However, three limitations on measuring the degree of structural change and reflecting on the associated adjustment costs are valid here. The critical one is that, as a comparative static model, GLOBE does not consider the path through which the economy moves to reach the new equilibrium point. Therefore, any indicator of structural change gives only a measure of the distance between the old and new equilibrium points and does not reflect how easy it is for the economy to achieve the new equilibrium.

Secondly, this measure does not consider the differences among activities in terms of their ability to expand or contract. Practically speaking, how easy it is to withdraw factors from an activity and reallocate them to another activity depends on the acquired and required skills in different activities. Accounting for this, however, requires information at the industry level that is not readily available for this multi-region model.[38]

Finally, recalling that full employment and free factor mobility (except for natural resources) are assumed under the basic closure rule, the measured degree of structural change reflects factor movements along the production possibility frontier. The possible shift of the production point below the production frontier is only accounted for under the alternative closure rule that relaxes the full employment

[38] Milner (2006) provides indicative scales for the potential adjustment costs associated with the EU-ACP EPAs. The study uses crude indicators in estimating the potentially required adjustment costs in each economy; like secondary school enrolment rate for factor reallocation adjustment costs and the share of manufactures in total exports for export diversification adjustment costs.

assumption for unskilled labour markets in SADC regions as described before in Sub-section 5.3.6.2. Rigorous analysis of structural adjustment costs should account for costs the economy as a whole bears during its movement between equilibria. Nevertheless, structural adjustment imposed on labour has a special importance in the SADC context where unskilled labour-intensive sectors are predominant. Therefore, unskilled labour unemployment associated with structural change could be influential from a political economy perspective. Overall, the employed measure for factor market adjustment gives broad indications of the potential adjustment costs associated with each simulation scenario.

5.5 Capabilities and Limitations for Regional Integration Analysis

5.5.1. Rationale for Using GLOBE Model

There are a number of reasons that justify adopting the multi-region, multi-sector CGE GLOBE model as a framework for regional trade analysis. The main advantage is that the model provides a theoretically consistent economy-wide framework that takes into consideration direct and indirect effects of trade shocks not only on the economy at hand but also on its trade partners and on the world as a whole. Forming RTAs generates implications at the sectoral, national, regional and global levels. The model captures the forward and backward linkages among different sectors in a way that reflects their relative strength prevailing in the output and trade structures. CGE models derive their strength from the sound theoretical foundations of microeconomic theory and general equilibrium theory. In addition, they are flexible to accommodate alternative assumptions that reflect structural features and/or market rigidities.

5.5.2. Limitations and Areas for Developments

In analyzing trade policy using a standard CGE model, the counterfactual approach is employed in the sense that the model examines what would have happened in the baseline year if a specific trade shock was in place *ceteris paribus*. Therefore, the main concern is about a specific trade change in isolation of any other changes that might have happened in the domestic and/or foreign policies.

The employed version of the GLOBE model is a comparative static that contrasts two equilibrium positions for a particular economy: the pre- and the post- simulation equilibrium points. The generated changes in the endogenous variables compared to their baseline levels are examined. The model does not, however, consider the path through which the economy moves until reaching the new equilibrium point. Therefore, it does not provide any indications on how long it takes, nor how easy it is, for an economy to reach the new equilibrium position. It is worth bearing these two conceptual issues in mind when interpreting the generated findings.

Other welfare gains are expected by considering trade aspects like technology transfers, economies of scale, trade externalities and dynamic trade impacts on productivity, capital accumulation and, eventually, growth in the model specification.

Arguably, most of the findings from trade CGE models are known to be driven, at least partly, by the behavioural characteristics built into the model. It is thus likely for the simulation results to be, partially, driven by model specification and to be sensitive to the employed elasticity values. Therefore, conducting sensitivity analyses of the results against alternative assumptions and elasticities is particularly important.

Another limitation on the analysis is related to the restrictive assumptions of Armington specification for trade behaviour in the model.[39] The Armington specification implies that the elasticity of substitution does not depend on the quantity demanded and, thus, the import demand responsiveness to price changes is constant and, thereby, preferences are homothetic. Yang and Koo (1993) specify a generalized version of the Armington trade model by relaxing the single elasticity of

[39] For more on the critiques directed to the Armington specification, see Winters (1984) and Alston et al. (1990). Furthermore, Panagariya and Duttagupta (2001) critically review the CGE model-based results and argue that combining Armington assumption with fixed terms of trade generate misleading results.

substitution and the homotheticity assumptions. Furthermore, more flexible functional forms are used in the literature. Robinson et al. (1993) use the non-homothetic almost ideal demand system (AIDS) specification in their one-region model. Nevertheless, some empirical issues hinder the efforts to include these forms in the highly disaggregated global models.

It is worth mentioning here that, under the Armington assumption, products are exogenously differentiated in the sense that sources of differentiation are not dealt with in the model. Another trend of critical literature of the Armington assumption is based on the exclusion of endogenous product differentiation. Brown and Stern (1989, p. 243) demonstrate that "… differentiating products at the firm level sidesteps many of the problems associated with differentiation at the national level" and thus "… the development of computational models with imperfectly competitive firms offers an attractive alternative" compared to differentiating products by source. Nevertheless, inclusion of the endogenous product differentiation requires data on industry concentration that is practically hard to compile for multi-region, multi-sector CGE models.

6 Quantitative Impact of the Alternative EU-SADC EPA Scenarios

6.1 Introduction

As we saw in Chapter 2, in the course of the EPA negotiation process, SADC members have aligned themselves with four different negotiating groups: the SADC-EPA, the EAC-EPA, the ESA-EPA and the Central Africa-EPA groups. Participating in the SADC-EPA group is exclusive for SADC members. This group includes SACU members (Botswana, Lesotho, Namibia, Swaziland and South Africa) and Mozambique. In contrast, the other three negotiating groups include SADC as well as non-SADC members. It is, thus, plausible to conceive two possible scenarios for the final EU-SADC EPAs. The first assumes that the SADC-EPA group concludes final EPAs with the EU. The latter represents the ultimate goal of the EU-SADC EPAs where all SADC members conclude final EPAs with the EU.

The envisaged final EPAs have to be WTO-compatible. That is to say, trade liberalization should cover 'substantially all trade'. Given the complexities surrounding the negotiation process as well as overlapping membership for SADC members, it is not evident how different negotiating groups, and members within each negotiating group, will agree on a precise definition for 'substantially all trade' with the EU. Therefore, the study assumes that all SADC regions involved in a liberalization scenario apply a uniform 90 percent cut of the applied tariffs on imports from the EU.

This assumption is in accordance with the comparative static analysis undertaken by the CGE GLOBE model. As described in the preceding chapter, GLOBE quantifies the generated changes in the endogenous variables as a result of exogenous shocks by comparing between the pre- and post-shock equilibria. It does account for the path of movement for the model variables between the two equilibrium points. SADC members are not foreseen to liberalize 'substantially all trade' with the EU immediately; transition periods vary across negotiating groups and among members in a given group. Therefore, the model findings represent the full magnitude of the potential effects generated under the envisaged final EPAs.

This chapter provides thorough analyses of the alternative EU-SADC EPA scenarios.[1] The analyses are undertaken at both the aggregate and the sectoral levels. At the aggregate level, the impact analyses are undertaken for welfare, terms of trade and real exchange rates, fiscal revenue, factor income and factor market adjustment. Changes in SADC total trade and in SADC trade relations with the EU, with third parties and within the SADC region are then examined.

Subsequently, the underlying price changes and structural change for output and trade are contemplated. Conducting detailed sectoral analyses on a country-basis is crucial to understand the consequent welfare impacts. Furthermore, such analyses determine the most affected sectors, the sensitive sectors to be excluded from the proposed liberalization schedules and, therefore, provide policy inferences for different SADC members.

The rest of the chapter is organized as follows. Section 6.2 describes the different simulation sets and scenarios implemented by this chapter. Impact analyses of the simulation findings generated by the two liberalization scenarios (SADC-EPA Group and All SADC Regions) under the different simulation sets are provided in Sections 6.3 and 6.4, respectively. Section 6.5 conducts sensitivity analyses of the simulation findings to variations in the model settings and the liberalization degree and coverage. Section 6.6 summarizes the main conclusions. As noted in the introductory chapter, results at the aggregate level are depicted in the main text of the chapter whereas additional exposition of the sectoral results is provided by Appendix to Chapter 6 at the end of the thesis.

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[1] I have presented preliminary drafts of this chapter at two international Economics events. The first is the UNU-CRIS and UNU-WIDER International Workshop on "South-South and North-South Trade Agreements: Compatibility Issues", November 2009, Bruges. A peer-reviewed version of the presented paper is forthcoming in the South African Journal of Economics, see Osman (forthcoming). The second is the International Conference on Economic Modeling (EcoMod 2010), July 2010, Istanbul. See Osman (2010). I wish to acknowledge useful participants comments received at these events.

6.2 Simulation Description

The study carries out a series of three simulation sets; each set consists of two liberalization scenarios, as portrayed in Table 6-1.[2]

The first scenario “SADC-EPA Group” represents the case in which the negotiations are confined to the SADC-EPA group only. The SADC-EPA group is represented in the GTAP7 database by four separate regions: Botswana, South Africa, ‘Rest of SACU’ and Mozambique.[3] This scenario simulates a 90 percent cut of the applied tariff rates on imports by these regions from the EU. This is implemented simultaneously with a full elimination of the applied tariffs on the EU imports from these specific regions.

The other scenario “All SADC Regions” represents the ultimate goal of the EU-SADC EPAs; launching a FTA between the EU and all SADC members.[4] Presuming that a FTA is implemented through a once-off tariff reduction, a uniform 90 percent cut of the applied tariff rates is undertaken by all SADC regions simultaneously with full removal of the applied tariffs by the EU. The first simulation set (Set1) maintains the “Current Intra-SADC Protection” level as represented in the GTAP7 database. These two scenarios are firstly implemented without applying any other trade liberalization measures, i.e. Sim11 and Sim21.[5]

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[2] Each simulation experiment is tagged by two digits; the first represents the liberalization scenario while the other refers to the simulation set under which the experiment is conducted. As we will see later, letters are added to the simulation codes in order to represent variations in the model and liberalization settings that are adopted by the sensitivity scenarios.

[3] Due to data restrictions, Angola is not represented as a separate region in the GTAP7 database. Instead, Angola and D.R. Congo form ‘Rest of SADC’ region. Therefore, this scenario does not simulate Angola within the SADC-EPA group. As described in detail in Chapter 2, Angola has not signed an IEPA with the EU and has opted to maintain the EBA provisions. It is, thus, more likely for Angola not to sign a final EPA with the EU along with other members of the SADC-EPA group. South Africa and Namibia have not signed IEPAs with the EU. Nevertheless, it is difficult to conceive a scenario for final EPA between the EU and the SADC-EPA group, which includes all SACU-CU members, without South Africa. Namibia is represented in the GTAP7 database as part of ‘Rest of SACU’ region. Therefore, it has to be assumed that Namibia concludes a final EPA with the other members of the SADC-EPA group.

[4] Due to data restrictions, Seychelles is not included in this scenario. Seychelles is represented in the GTAP7 database as part of ‘Rest of Eastern Africa’ region. This is not expected to affect the results, though.

[5] It is worth recalling here that data on trade barriers derived from the GTAP7 database are inclusive of tariff and NTBs. Therefore, all the scenarios implicitly simulate reducing (or removing) both tariff and NTBs to the trade flows that are subject to liberalization. Data coverage and limitations are described earlier in Chapter 4.

In order to gain clear insights of the results and their determinants, each of these two main simulation scenarios is decomposed into two components according to the source of the simulated tariff cuts; the SADC and the European side. The fist scenario (Sim11) is decomposed into a 90 percent cut of the applied tariff rates on the SADC-EPA group imports from the EU (Sim11-SADC) and a full elimination of the applied tariffs on the EU imports from the SADC-EPA group (Sim11-EU). Likewise, Sim21 is decomposed into Sim21-SADC and Sim21-EU.

The second simulation set (Set 2) represents the case in which SADC liberalizes its trade with the EU according to the previous two scenarios and simultaneously completes its intra-regional trade liberalization. In other words, each of the two liberalization scenarios is run presuming "Full Intra-SADC Trade Liberalization".[6] Intra-SADC trade might be affected by liberalizing trade with the EU. Therefore, it is interesting to examine the EU-SADC EPA implications under the alternative that intra-SADC trade barriers are removed. The purpose of conducting this simulation set is to measure the extent to which the potential contractions in intra-SADC trade can be avoided by liberalizing intra-SADC trade alongside with SADC-EU trade.[7]

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[6] In order to better reflect a deeper SADC integration scenario, reductions in domestic marketing margins should have been considered here. This, however, might require large scale government investments to improve trade and transportation infrastructure within the region. Given the short-run perspective of the study, such investments do not seem to be feasible.

[7] Other hypothetical scenarios that assume tariff reductions on SADC imports from all trade partners (including trade partners inside the SADC region) are simulated to test trade diversion from third parties. These scenarios are not presented here, albeit their results are used for results interpretation when required.

Table 6-1: Simulation Scenarios

Scenario Code	Scenario Name	Scenario Description	
		SADC Side	**EU Side**
Set1 Current Intra-SADC Protection			
Sim11	SADC-EPA Group	**Sim11-SADC** Cutting the applied tariff rates on imports from the EU by the SADC-EPA Group (Botswana, South Africa, 'Rest of SACU' & Mozambique) by 90 percent	**Sim11-EU** Eliminating all the applied tariffs on imports from the SADC-EPA Group (Botswana, South Africa, 'Rest of SACU' & Mozambique)
Sim21	All SADC Regions	**Sim21-SADC** Cutting the applied tariff rates on imports from the EU by all SADC regions by 90 percent	**Sim21-EU** Eliminating all the applied tariffs on imports from all SADC members
Set2 Full Intra-SADC Trade Liberalization			
Sim12	SADC-EPA Group	Sim11 & eliminating all the applied tariffs on intra-SADC trade	Sim11
Sim22	All SADC Regions	Sim21 & eliminating all the applied tariffs on intra-SADC trade	Sim21
Set3 Domestic Tax Replacement			
Sim13	SADC-EPA Group	Sim11 & compensating tariff losses by raising domestic sales taxes in the SADC-EPA Group (Botswana, South Africa, 'Rest of SACU' & Mozambique)	Sim11
Sim23	All SADC Regions	Sim21 & compensating tariff losses by raising domestic sales taxes in all SADC regions	Sim21

The last simulation set (Set3) assumes that tariff revenue losses generated by each of the two main scenarios are offset through a rise in domestic sales tax rates. It is expected that the EU-SADC EPAs will induce considerable public revenue losses. In light of the contentions in the negotiations regarding the compensation programs, it seems reasonable for SADC to consider implementing "Domestic Tax Replacement" instruments to mitigate the associated tariff losses. By measuring tariff losses, policy makers can have an indication of the potential revenue losses under each liberalization scenario and, thus, decide on the required tax replacement measure. It is worth keeping in mind that sales tax is levied on domestic demand, including the imported component. Therefore, the increases in sales tax in this general equilibrium framework influence demand for imports symmetrically with demand for domestic products.

In addition to these simulation scenarios, the study runs a series of sensitivity analyses in order to test the robustness of the model results with respect to variations in the model settings and the liberalization degree and coverage. In the first phase of the sensitivity analysis, seven scenarios are run to represent variations in the model settings, i.e. behavioural parameters and unskilled labour market closure rule. The other phase employs two scenarios in order to examine the sensitivity to variations in the liberalization degree and coverage. A detailed description of these scenarios is provided later in Section 6.5 on Sensitivity Analysis.

For the normative interpretation of the results presented below it is important to bear in mind that, as explained at the outset, in this Chapter the benchmark for the comparative-static analysis is a status quo ante, in which trade barriers between all regions including barriers to EU-SADC trade are kept at 2004 levels. The analysis addresses the intriguing question whether SADC members would have been better off under a permanent extension of the WTO Cotonou waiver compared to a switch to the final EPA regime. In contrast, the simulation scenarios in Chapter 7 take into account that a return to the status quo ante is not a politically feasible option and compare the EPA scenarios with the WTO-compatible alternative scenarios.

6.3 SADC-EPA Group

This section presents the results for the first main simulation scenario "SADC-EPA Group". The core of the analysis deals with the results generated under the first simulation set; Sim11 as well as Sim11-SADC and Sim11-EU. Results for the second and third sets (Sim12 and Sim13) are used for comparison with the main simulation results.

6.3.1. Aggregate Results

6.3.1.1 Welfare Impact

Sim11 is confined to the SADC-EPA group that is represented in the model by four regions: Botswana, South Africa, 'Rest of SACU' and Mozambique. Table A6-1 reports the simulated changes in tariffs (measured in percentage points) under Sim11-SADC and Sim11-EU. Welfare indicators measured by real absorption and equivalent variation for households (Table 6-2) reveal that 'Rest of SACU' benefits very strongly from this liberalization scenario. Botswana and South Africa experience moderate welfare gains, whereas Mozambique loses. The other SADC regions not directly involved in this scenario lose and the biggest welfare loss is reported for Mauritius.

Table 6-2 in its first two columns outlines decomposition of the results according to the source of the simulated tariff cuts: Sim11-SADC and Sim11-EU. It shows that the previously reported welfare impacts are primarily driven by the EU tariff removal whereas tariff reductions by the SADC-EPA group generate small welfare impacts.

In this general equilibrium framework, welfare impacts are determined, *inter alia*, by comparative advantage along with the pre-liberalization trade patterns and protection structures. As described in detail in Chapter 3, trade liberalization yields gains from more efficient allocation of resources across activities. Sectors with comparative advantage accrue gains from export expansions. World export prices for these sectors rise and, consequently, terms of trade improve. Theory suggests that the higher the pre-liberalization protection levels, the greater are the experienced gains in the post-liberalization scenario. Therefore, protected sectors experience positive consumption effects induced by lower import prices in the domestic markets. These effects imply welfare gains. According to this theoretical framework, the generated changes in welfare are attributed, *inter alia*, to changes in terms of trade and these changes in terms of trade should be interpreted in light of the pre-liberalization trade patterns and protection structures.

Table 6-2: Welfare Impact, "SADC-EPA Group"

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim11-SADC	Sim11-EU	Sim11	Sim12
	Equivalent Variation ($USD billion)				**Total Absorption** (Percentage change)			
BWA	0.01	0.02	0.02	0.02	0.18	0.58	0.8	0.6
MDG	0.00	0.00	0.00	0.01	0.01	-0.02	0.0	0.2
MWI	0.00	0.00	0.00	0.00	0.05	-0.23	-0.2	-0.1
MUS	0.00	-0.02	-0.02	-0.03	0.03	-0.66	-0.6	-0.9
MOZ	0.00	-0.01	-0.01	0.02	-0.05	-0.15	-0.2	0.4
ZAF	-0.24	0.29	0.03	0.21	-0.16	0.22	0.0	0.2
TZA	0.00	-0.01	-0.01	-0.02	0.01	-0.07	-0.1	0.0
ZMB	0.00	-0.01	0.00	-0.02	0.05	-0.16	-0.1	-0.3
ZWE	0.00	0.00	0.00	0.00	0.08	-0.12	0.0	-0.2
XSC	0.00	0.37	0.38	0.38	0.00	9.36	9.5	9.4
XSD	0.00	-0.02	-0.02	0.00	0.01	-0.15	-0.1	-0.2

6.3.1.2 Terms of Trade Impact

Changes in terms of trade and real exchange rates (Table 6-3) partially explain the reported welfare effects for different SADC regions. Among the four regions involved in this liberalization scenario, 'Rest of SACU' and, to a limited extent, Botswana benefit from favourable changes in their terms of trade with appreciations of their real exchange rates. Mozambique and South Africa as well as the other SADC regions not directly involved in this liberalization scenario experience deteriorations in their terms of trade. Mauritius undergoes the biggest deterioration in terms of trade and real depreciation.

Once again, these effects are mainly driven by the EU tariff removal; Sim11-EU. The simulated tariff reductions by the SADC-EPA group (Sim11-SADC) generate very small changes in terms of trade and real exchange rates. Interestingly, Mozambique experiences deterioration in its terms of trade under Sim11-EU. The EU tariff cuts boost world prices for 'Rest of SACU', Botswana and South Africa exports not only to the EU but to other destinations as well. On the other hand, Mozambique experiences very little increases in world prices of its exports. In this general equilibrium framework, these changes in world prices entail terms of trade deteriorations for Mozambique since the previously reported increases in world prices of its imports from 'Rest of SACU', Botswana and South Africa are proportionally higher than the increases in world prices of its exports. In other words, the EU tariff cuts on imports from the SADC-EPA group generate improvements in terms of trade for 'Rest of SACU', Botswana and South Africa vis-à-vis Mozambique. These adverse terms of trade effects for Mozambique partially explain its welfare losses as seen before in Table 6-2.

Table 6-3: Terms of Trade and Real Exchange Rate, "SADC-EPA Group"

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim11-SADC	Sim11-EU	Sim11	Sim12
	Terms of Trade				**Real Exchange Rate**			
BWA	0.4	0.2	0.5	0.2	0.6	-2.4	-1.8	-1.9
MDG	0.0	-0.1	0.0	0.4	0.0	0.1	0.1	0.3
MWI	0.0	-0.4	-0.4	-0.6	0.1	0.2	0.4	2.5
MUS	0.0	-0.8	-0.8	-1.1	0.0	0.9	0.9	1.8
MOZ	-0.1	-0.4	-0.5	0.2	0.3	-0.6	-0.3	1.3
ZAF	-0.5	0.3	-0.2	0.0	1.0	-0.9	0.1	-0.4
TZA	0.0	-0.3	-0.2	-0.2	0.0	0.0	0.0	0.5
ZMB	0.1	-0.4	-0.3	-0.9	0.1	-0.1	0.0	1.4
ZWE	0.1	-0.3	-0.2	-1.0	0.2	-0.6	-0.4	5.0
XSC	0.0	5.3	5.4	5.3	0.5	-16.2	-15.9	-16.1
XSD	0.0	-0.3	-0.3	-0.2	0.0	-0.2	-0.2	0.7

A closer look at the trade patterns and protection structures in the baseline scenario is necessary to explain these macroeconomic results. Further investigations are, thus, conducted by decomposing the scenario according to the source of the simulated tariff cuts (i.e. Sim11-SADC and Sim11-EU) and contemplating the trade relations in the baseline scenario. The next are detailed explanations of the findings for the main winner ('Rest of SACU') and the main loser (Mauritius) under this scenario.[8]

Figures on trade protection reveal that the highest tariff rates on 'Rest of SACU' imports from the EU are imposed on 'meat and dairy products' (68 percent) followed by textiles (17 percent).[9] Nevertheless, the EU is not a main supplier of either commodity to the 'Rest of SACU' markets.[10] 'Rest of SACU' imports from the EU account for less than 2 percent of its total imports of each of these two commodities.[11] Therefore, reducing tariffs on imports from the EU (Sim11-SADC) has a limited terms of trade effect in 'Rest of SACU'. On the export side, extremely high tariff peaks are imposed on the EU imports of sugar (242 percent) and 'meat and dairy products' (98 percent) from 'Rest of SACU'.[12] The EU sugar and 'meat and dairy products' markets are of a great importance for 'Rest of SACU'. Sugar is an export-oriented sector in 'Rest of SACU'; around three-quarters of sugar output is exported. Virtually one-third of its sugar exports are destined for the EU markets. Besides, the EU markets absorb almost half of its 'meat and dairy products' exports.[13] It is, thus, reasonable that the EU tariff removal yields strong and favourable changes in terms of trade and real exchange rate for 'Rest of SACU'.

Mauritius is not directly involved in this trade liberalization scenario. Therefore, neither terms of trade nor real exchange rate changes under Sim11-SADC. However, removing the EU tariffs on imports from the SADC-EPA group (Sim11-EU) adversely affects the Mauritian terms of trade and real exchange rate. The EU is the primary exporting market for many of Mauritius products. This is particularly the case for sugar and textile exports. Mauritius exports half of its sugar output and the bulk of its sugar exports (96 percent) are directed to the EU markets.[14] Textiles are the main

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[8] Chapter 4 provides detailed analyses of trade structures and protection profiles for all SADC regions. The required data are presented in the Appendix to Chapter 4. See, for example, Tables A4-13, A4-14, A4-22, A4-24, A4-28 and A4-25.

[9] See Table A4-24.

[10] Instead, South Africa provides the bulk of 'Rest of SACU' imports of both products, Table A4-27.

[11] See Table A4-18.

[12] Recalling from Chapter 4, tariff data derived from the GTAP7 database cover both import tariffs and AVEs of specific and compound tariffs and TRQs. These tariff peaks reflect TRQs for the EU sugar and 'meat and dairy products' imports, Table A4-25.

[13] See Tables A4-16 and A4-22, respectively.

[14] See Tables A4-16 and A4-22, respectively.

export sector in Mauritius; it accounts for 27 percent of its total exports. The EU markets absorb almost 68 percent of Mauritius textile exports.[15] In this general equilibrium framework, Sim11-EU reduces the EU demand for sugar exported by Mauritius and, hence, world prices of Mauritius sugar exports drop.[16] As will be demonstrated later by the detailed sectoral analyses, Mauritius loses some of its share in the EU sugar markets. By and large, world prices of Mauritius exports decrease proportionally more than the experienced decreases in world prices of its imports and thereof it experiences a deterioration in its terms of trade.

6.3.1.3 Trade Impact

The model does not account for remittances and foreign transfers and maintains the trade balances fixed.[17] This specification implies that the generated changes in terms of trade reflect real changes in total trade. Unlike the total trade balances, bilateral trade balances for each pair of trade partners are allowed to vary. Therefore, changes in bilateral trade balances are not entirely explained by changes in terms of trade and require more detailed analyses of the underlying changes in price as well as industrial and trade structures at the sectoral level. The next sub-section interprets changes in SADC total trade taking into consideration the previously reported terms of trade effects for each SADC region. The other three sub-sections address changes in SADC trade with the EU, SADC trade with third parties and intra-SADC trade, respectively.

6.3.1.3.1 Total Trade

Results generated by Sim11 (Figure 6-1) show that 'Rest of SACU' only experiences significant changes in total trade and these changes are mainly driven by the EU tariff cuts, Sim11-EU. The favourable changes in its terms of trade imply more affordable imports. In other words, 'Rest of SACU' exports increase proportionally less than the increases in its imports which become relatively cheaper. Less than 10 percent

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[15] See Tables A4-14 and A4-22, respectively.

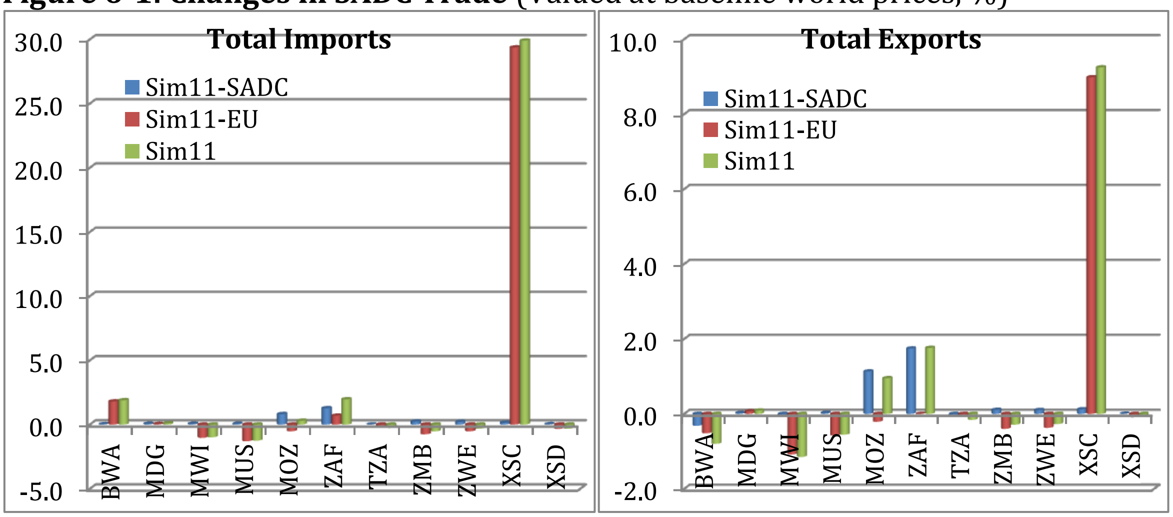
[16] The extent to which the EU sugar imports from Mauritius drop in response to the decreases in relative price of its sugar imports from the SADC-EPA group to its sugar imports from Mauritius depends, *inter alia*, on the elasticity of substitution at the third level of the CES import demand function as represented by Equation 19 in Chapter 5.

[17] External account closure is specified by Equations 54 and 55 and Inequality G in Chapter 5.

increase in real exports allows 'Rest of SACU' to afford a 30 percent increase in its real imports.

These trade figures change under the full intra-SADC trade liberalization assumption, Sim12. As depicted in Table 6-1, this scenario simulates eliminating all barriers to intra-SADC trade along with liberalizing trade between the SADC-EPA group and the EU. Under this scenario, other SADC regions (i.e. Zimbabwe, Zambia, Mozambique and Malawi) experience increases in total trade ranging from 5 to 10 percent, Table A6-2.

Figure 6-1: Changes in SADC Trade (Valued at baseline world prices, %)

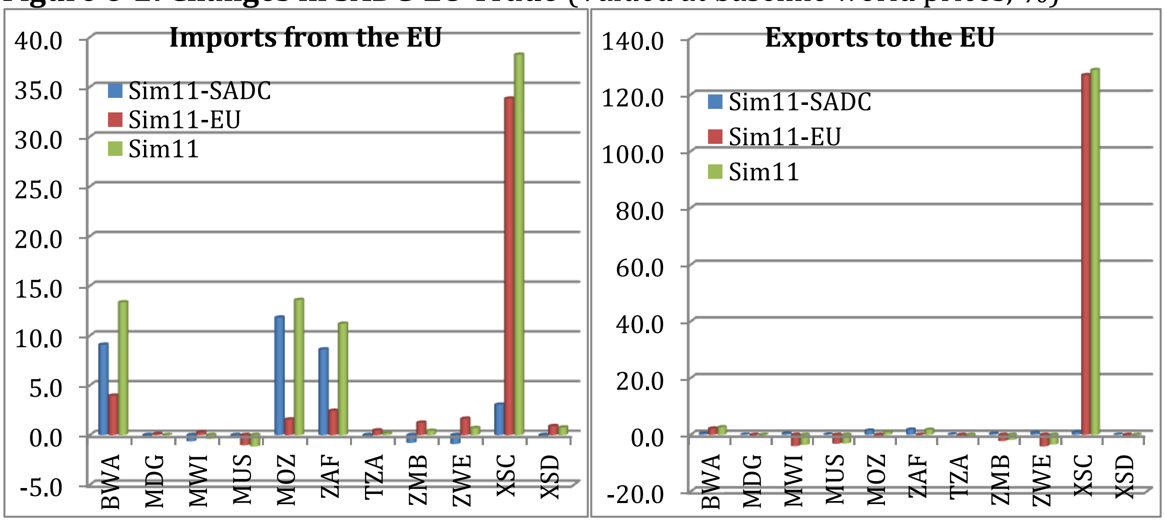


6.3.1.3.2 Trade with the EU

Results on SADC trade with the EU (Figure 6-2) show that tariff cuts by the four SADC regions boost their imports from the EU. On the other hand, the EU tariff removal significantly stimulates exports by 'Rest of SACU' to the EU. 'Rest of SACU' imports from the EU also rise, albeit at a lower rate compared to its exports to the EU. However, the other SADC regions (Botswana, South Africa and Mozambique) do not experience expansions in their exports to the EU.

By running the same scenario under the full intra-SADC trade liberalization assumption (Sim12) results do not change for three out of the four SADC regions, Table A6-3. Compared to Sim11, Mozambique imports proportionally less and exports proportionally more with the EU. Some SADC regions that are not directly involved in this simulated trade liberalization with the EU (i.e. Zimbabwe, Zambia and Malawi) experience drops in their imports from the EU with increases in their exports to the EU. These results are suggestive of some, albeit small, export opportunities for SADC regions in the EU markets by liberalizing trade between the SADC-EPA group and the EU simultaneously with liberalizing intra-SADC trade.

Figure 6-2: Changes in SADC-EU Trade (Valued at baseline world prices, %)



Two relevant questions arise here. Firstly, how do these changes in SADC trade with the EU affect its trade with third parties and within the SADC region? The next two sub-sections (6.3.1.3.3 and 6.3.1.3.4) address this question.[18] Secondly, to what extent do the experienced expansions in SADC trade with the EU reflect trade diversion from more efficient non-EU producers towards higher-cost European producers and/or trade creation associated with more efficient allocation of resources towards activities with comparative advantage? Clearly, answering this question requires more detailed country- and sector-specific analyses which will be dealt with in Sub-section 6.3.2.

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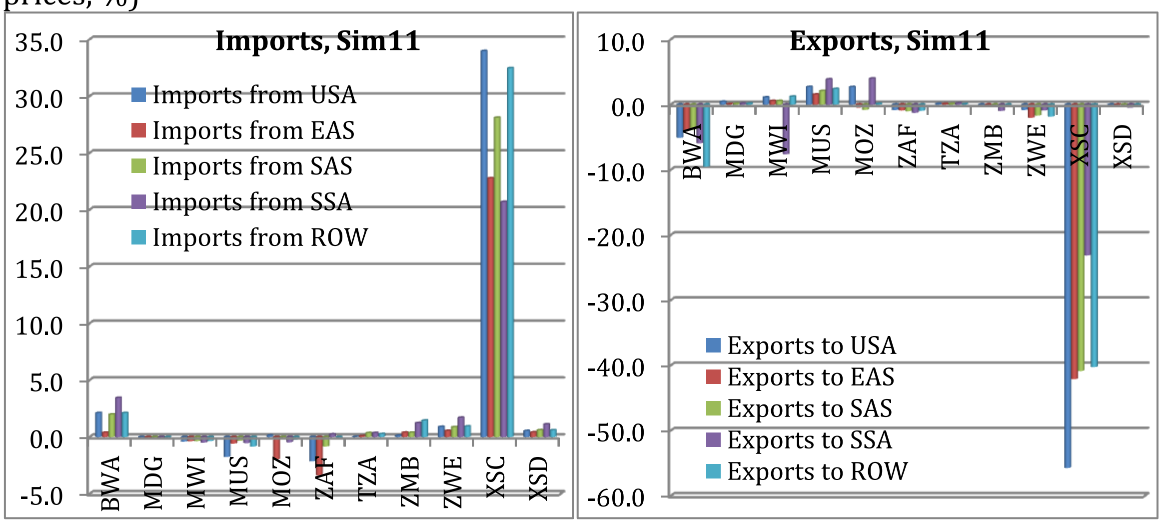
[18] Analysis of SADC trade with third parties is conducted for SADC trade with its non-EU non-SADC trade partners who are represented in this model by five regions: 'United States of America', 'East Asia', 'Southeast and South Asia', 'Rest of Sub-Saharan Africa' and 'Rest of the World'. Analysing the generated impacts on intra-SADC trade is one of the key purposes of this study. Therefore, a separate sub-section (6.3.1.3.4) is assigned for the generated impacts on intra-SADC trade.

6.3.1.3.3 Trade with Third Parties

As portrayed in Figure 6-3, changes in trade with third parties are concentrated in 'Rest of SACU' and, to a moderate extent, Botswana. 'Rest of SACU' imports more and exports less with its non-EU non-SADC trade partners. Changes in trade between the other SADC regions and their non-EU non-SADC partners generated by Sim11-SADC and Sim11-EU are in similar magnitudes but run in opposite directions. These effects virtually cancel each other out and, thus, trade with third parties hardly changes under Sim11. Interestingly, Malawi, which is not directly involved in this liberalization scenario, experiences drops in exports to 'Rest of Sub-Saharan Africa'.[19]

Figure 6-3: Changes in SADC Trade with Third Parties (Valued at baseline world prices, %)



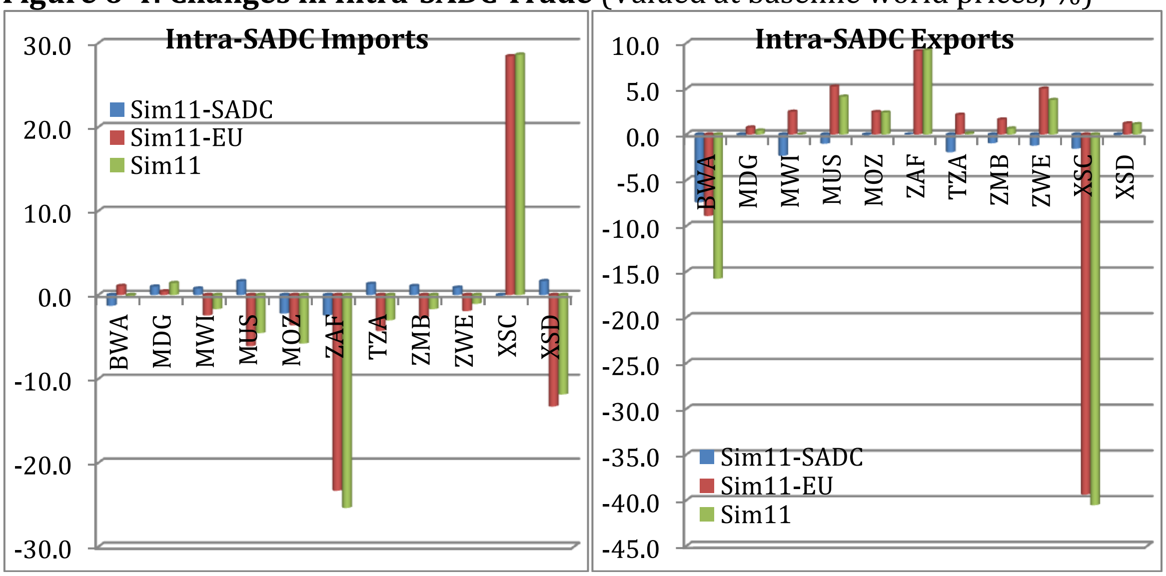
In comparison to the generated results under full intra-SADC trade liberalization (Sim12) Mozambique only, among the four SADC regions, experiences changes in the generated impact on its trade with third parties. Mozambique as well as the other SADC regions not directly involved in this liberalization scenario experiences drops in imports from third parties, Table A6-4.

[19] As we will see later, these exports rise significantly under Sim21 where Malawi liberalizes its trade with the EU.

6.3.1.3.4 Intra-SADC Trade

'Rest of SACU' experiences increases in its intra-SADC imports with considerable drops in its intra-SADC exports. To summarize, 'Rest of SACU' total exports and its exports to the EU rise while its exports to third parties as well as to its SADC partners drop. These results imply that part of 'Rest of SACU' pre-simulation exports to both third parties and its SADC partners is redirected to the EU markets under this scenario.

Figure 6-4: Changes in Intra-SADC Trade (Valued at baseline world prices, %)



Once again, these trade effects do not change under the full intra-SADC trade liberalization assumption (Sim12) for three out of the four SADC regions, Table A6-5. These findings mean that intra-SADC trade liberalization does not prevent the previously reported redirection of part of 'Rest of SACU' exports from markets in third parties and in the SADC region towards the EU markets. Among the four SADC regions, only Mozambique experiences significant increases in its intra-SADC trade. It is worth highlighting here that Mozambique, which experiences welfare losses under Sim11, gains by liberalizing intra-SADC trade simultaneously with the SADC-EPA group trade with the EU, Table 6-2. Mozambican exports to its SADC partners face very high tariff peaks, particularly in the South African and Zimbabwean markets.[20] Removing these

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[20] See Table A4-28.

trade barriers boosts world prices of its exports and, hence, protects its terms of trade from deteriorating (Table 6-3) when the EU eliminates tariffs on imports from the SADC-EPA group; the generated changes in prices will be dealt with later in detail.

6.3.1.4 Fiscal Impact

Among the four regions directly involved in this liberalization scenario, 'Rest of SACU' only does not experience fiscal losses, Table 6-4.[21] As explained earlier, the EU shares in 'Rest of SACU' merchandise markets in the baseline scenario are small. The only exception is 'oil and minerals' imports; 24 percent of which originates in the EU. However, these import flows enter 'Rest of SACU' duty-free.[22] Besides, 'Rest of SACU' imports from third parties (Table A6-4) and from its SADC partners (Table A6-5) experience increases under this scenario. This explains why the simulated tariff cuts on imports from the EU do not affect tariff revenues for 'Rest of SACU'. In contrast, Botswana, South Africa and Mozambique incur strong tariff losses.

The last column to the right of Table 6-4 presents the required sales tax replacement that compensates the experienced fiscal losses. Sales tax replacement is measured as percentage changes in sales tax revenue and percentage-points changes in the weighted average sales tax rates.

In order to domestically compensate the experienced tariff losses, Mozambique needs to raise its sales tax rate by 0.3 percentage points. It is worth noting that fiscal losses for Mozambique are far worse under the intra-SADC liberalization scenario, Sim12. Mozambique imposes high tariff peaks on imports from South Africa, which provides the bulk of merchandise imports in the baseline scenario.[23] Taking into consideration the tariff losses associated with intra-SADC liberalization, the required sales tax replacement will be more pronounced for Mozambique under full intra-SADC trade liberalization.

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[21] Due to data restrictions, the GTAP7 database does not include data on household income taxes. Data coverage and limitations are described earlier in Chapter 4.
[22] See Tables A4-18 and A4-24, respectively.
[23] See Tables A4-28 and A4-27, respectively.

Table 6-4: Fiscal Revenue by Source, "SADC-EPA Group"

(Percentage change, nominal)

	Sim11					Sim13	
						Sales Tax Replacement	
	Import Tariffs	Export Taxes*	Sales Taxes	Taxes on Output	Taxes on Factor Use	Revenue	Rate** (Change, percentage points)
BWA	-36.5			26.6	0.8		0.1
MDG	0.2			0.0	0.0		0.0
MWI	-0.5		-0.2	1.1	-0.3	1.9	0.1
MUS	-0.5	-64.9	-0.4	1.8	-0.6	1.1	0.1
MOZ	-15.6		0.0	-1.7	0.1	12.1	0.3
ZAF	-36.9	0.0	0.4	0.5	0.5	7.5	0.2
TZA	-0.3		-0.1	0.0	-0.1	1.1	0.0
ZMB	-0.5		-0.1	0.0	-0.1	2.0	0.0
ZWE	-0.2			0.0	-0.1		0.0
XSC	0.6	-57.8	8.3	-4.3	6.2	4.9	0.0
XSD	-0.5		0.0	0.1	-0.2	2.1	0.0

* These percentage changes are calculated based on very small baseline levels. Export taxes revenue is less than US$ 0.05 billion in Mauritius and 'Rest of SACU'.

** Weighted average sales tax rates where the employed weights are commodity shares in domestic demand by region.

It is worth mentioning here that the ability to raise the required fiscal resources depends, *inter alia*, on the degree of diversity in the tax base and the overall economic structures. For this reason, Milner (2006) argues that the fiscal adjustment costs associated with the EU-EPAs are not entirely attributed to the magnitude of tariff losses but rather to how easy is it for an economy to offset the fiscal losses. The study estimates a high scale of fiscal adjustment costs for Swaziland whereas Mozambique is ranked in the lowest category of the scale.

From this perspective, the reported 12 percent increment in the sales tax revenue might be easier to be collected in Mozambique than the required 5 percent in 'Rest of SACU'.

6.3.1.5 Factor Returns

As comprised of heterogeneous economies as the SADC region is, it is expected that trade liberalization will induce diversified effects on factor incomes across countries and activities. These effects depend, *inter alia*, on the prevailing economic structures and factor intensities in each country in the baseline scenario.[24] Furthermore, according to the basic closure rule that adopts a full employment assumption for all factor markets, changes in factor incomes should be explained by the changes in factor return rates.[25]

Table 6-5 shows that land incomes rise in three out of the four regions involved in this scenario, i.e. 'Rest of SACU', Botswana and South Africa. As we will shortly discuss in detail, this scenario induces strong structural change in 'Rest of SACU'.[26] Therefore, the highest increases in land rent, wage and capital rent occur in 'Rest of SACU'. The expanding activities (i.e. sugar, 'meat and dairy products', vegetables, livestock and services) withdraw the mobile factors from other activities and push their income to rise.[27] Natural resources are not allowed to be utilized by different activities other than livestock and 'oil and minerals', thereby shrinking 'oil and minerals', the activity that absorbs 86 percent of natural resources in the baseline scenario,[28] induces a 74 percent drop in natural resources rent.

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[24] Figures on factor intensity and factor allocation across activities in the baseline scenario are reported in Tables A4-7 and A4-8.

[25] It is reasonable to recall two points here. First, factor incomes and factor return rates are calculated in real terms relative to the region numéraire, i.e. CPIs. Second, production factors move across activities as a result of changes in sectoral demand for factor service according to fixed sectoral returns. Simultaneously, average return rates change endogenously to clear the markets. In the sensitivity exercise, unskilled labour in SADC regions is assumed to be underutilized. Therefore, changes in unskilled labour income are explained by changes in both real wage rates and utilization levels in the SADC unskilled labour markets.

[26] The results on changes in domestic production under Sim11-EU (presented in Table A6-16) and Sim11 are quite similar, with slight differences in the magnitudes.

[27] In this general equilibrium framework, the causal relationship between factor demand and factor rents works in two directions. Excess demand (summed over sectoral demand for different activities) for a production factor pushes its average rent to rise in order to clear the market. Simultaneously, producers substitute this factor, which became relatively more expensive, for other factors according the elasticity of substitution at the second level of the CES production function, as described by Equation 7 in Chapter 5.

[28] See Table A4-8.

In Botswana, expanding livestock, to which 66 percent of the utilized land is allocated in the baseline scenario,[29] generates outstanding increases in land rent.

Almost two-thirds of the cultivated land in South Africa is utilized by only two activities (i.e. grains and vegetables) in the baseline scenario.[30] Therefore, increasing demand for land used by these two activities, as well as by the rice and 'other crops' activities, pushes land rent to rise.

Table 6-5: Structural Change in Factor Markets, "SADC-EPA Group", Sim11

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Factor Income, Percentage Change										
Land	168.5	-0.4	1.7	-37.3	0.2	9.1	-0.2	-0.4	2.2	262.1	-0.5
NatRes	-17.8	0.2	1.7	4.8	3.1	0.6	-0.1	0.6	-0.9	-74.0	-0.3
UnSkLab	1.6	0.0	-0.3	-1.0	0.2	0.5	-0.1	-0.1	-0.2	3.7	-0.2
SkLab	0.6	0.0	-0.5	0.0	0.1	0.4	-0.1	-0.1	-0.2	3.6	-0.2
Capital	0.1	0.0	-0.5	0.3	0.0	0.5	-0.1	-0.1	-0.2	8.9	-0.2
	Factor Adjustment, Percent										
Land	10.0	0.1	0.5	7.8	0.2	0.9	0.0	0.2	1.6	23.6	0.1
UnSkLab	3.3	0.1	0.4	2.6	0.3	0.2	0.0	0.1	0.3	14.7	0.1
SkLab	0.9	0.0	0.2	0.5	0.2	0.1	0.0	0.0	0.1	6.1	0.0
Capital	2.2	0.1	0.5	1.3	0.2	0.2	0.0	0.1	0.3	17.1	0.0

Although not being directly involved in this liberalization scenario, Mauritius experiences changes in its factor incomes. The shrinkage of the sugar activity that utilizes half of the land used in the baseline scenario[31] generates excess land supply. The experienced excess land supply pushes land rent to drop in order to clear the market. Higher land utilization in all other land-use activities is not sufficient to prevent the 37 percent drop in the land rent, Table 6-5. In contrast, expanding the two natural resources-using activities (i.e. livestock and 'oil and minerals') leads to higher natural resources rent since this production factor is sector-specific.

[29] See Table A4-8.
[30] See Table A4-8.
[31] See Table A4-8.

6.3.1.6 Factor Market Adjustment

Figures in Table 6-5 indicate moderate degree of structural adjustment in most of the SADC regions. Less than 3 percent of each of the utilized production factors in the baseline scenario is reallocated among different activities in the post-liberalization scenario in eight SADC regions. The highest degree of structural adjustment occurs in 'Rest of SACU' following by Botswana and Mauritius. The welfare gains accrued by 'Rest of SACU' are associated with significant changes in its production and trade structures, changes in production and trade structures are elaborated in the next sub-section. This structural change requires reallocating one quarter of the used land across different activities. Capital and unskilled labour also experience high degrees of structural adjustment, ranging from 15 to 17 percent of their baseline utilization levels. Moreover, 8 to 10 percent of the utilized land in Mauritius and Botswana is reallocated across activities.

6.3.2. Sector-specific Impacts

For better interpretation of the determinants of the previous macroeconomic findings, detailed sector-specific analyses are needed. These detailed analyses allow for tracing the induced price and volume changes in the production and trade structures and, subsequently, permit one to identify the sectors of interests for each of SADC regions under the simulated trade liberalization scenarios. In order to gain more accurate insights of the transmission channels and the direction of effects, these analyses are undertaken for the two components which form each scenario. For the first main scenario, detailed sector-specific analyses are conducted for the main winner ('Rest of SACU') only.[32]

[32] More general sectoral analyses of all SADC regions are undertaken for the results generated by the next scenario.

6.3.2.1 Price Changes

Referring back to Table A6-1, under Sim11-SADC, tariff rates on ‘Rest of SACU’ imports of ‘meat and dairy products’ and textiles drop by 61 and 15 percentage points with some drops of 5 to 6 percentage points in other sectors (e.g. vegetables, vehicles and other manufactures). The increases in *cif* price of ‘Rest of SACU’ imports from the EU are virtually limited to two sectors: ‘meat and dairy products’ and textiles, Table A6-6.[33] These limited changes in the world prices are explained by the low import shares for ‘Rest of SACU’ (and all the participant regions) in total world imports.[34] Sectoral imports by the four participant regions together (Botswana, South Africa, ‘Rest of SACU’ and Mozambique) account for less than 3 percent of total world imports. The reason is that the lower the import share for the importing country is, the weaker is the generated impact on world prices, and, consequently, the less is the deterioration in its terms of trade. This explains the small changes in terms of trade and real exchange rates generated by Sim11-SADC, as described before at the aggregate level.

Sim11-SADC generates moderate real depreciation for ‘Rest of SACU’; real exchange rate rises by only 0.5 percent. Therefore, the simulated tariff reductions are translated into lower domestic prices of ‘Rest of SACU’ imports from the EU in these two sectors.[35] Nevertheless, domestic prices of composite sectoral imports hardly change owing to the low shares of the EU imports in these commodity markets, as explained before.

On the export side, world prices of ‘Rest of SACU’ exports to the EU, and yet world prices of exports by all the participant regions to the EU, hardly change under Sim11-SADC, Table A6-7.

[33] Beside these two sectors, world price of the EU exports to the other signatory regions rises in other sectors, e.g. food products, beverage and vegetables (Mozambique) and vehicles (Botswana and South Africa). It is worth noting here, and hereafter, that the generated changes in world prices are relative to the CPI for ‘United States of America’.
[34] See Table A4-9.
[35] The generated changes in domestic prices are relative to the region numéraire, i.e. the CPI for ‘Rest of SACU’. This is valid for all generated changes in domestic prices.

Referring back to Table A6-1, Sim11-EU simulates strong tariff cuts on the EU imports from 'Rest of SACU'; represented by 242 and 98 percentage point tariff cuts in sugar and 'meat and dairy products' sectors. These tariff cuts boost world prices of 'Rest of SACU' exports to the EU in these two sectors by more than 50 percent, Table A6-8. Furthermore, world prices of all other sectoral exports rise by more than 10 percent. The EU contributes large shares to total world imports. Therefore, the EU import demand has significant impacts on world prices of its imports. This explains the remarkable changes in world prices of 'Rest of SACU' exports induced by the EU tariff cuts.

The EU experiences trivial real depreciation under Sim11-EU; the real exchange rate rises by 0.07 percent. Therefore, the EU tariff removal is transmitted into lower domestic prices of the EU sugar and 'meat and dairy products' imports from 'Rest of SACU' whereas domestic prices for all other imports are higher, Table A6-8. These price changes mean that the 'Rest of SACU' sugar and 'meat and dairy products' exports are more competitive in the EU markets.[36]

On the import side, *cif* prices of the 'Rest of SACU' imports from the EU rise under Sim11-EU, Table A6-9. These increases in the sectoral import prices are relatively lower than the corresponding increases in the sectoral export prices. Therefore, 'Rest of SACU' experiences favourable changes in its terms of trade under Sim11-EU, as seen before. The real exchange rates adjust after a trade shock in order to maintain the trade balances fixed at their baseline levels. Therefore, the accrued terms of trade gains are associated with a drop in the 'Rest of SACU' real exchange rate by 16 percent, as seen in Table 6-3. This strong real appreciation means that the 'Rest of SACU' sectoral imports, not only from the EU but from all other regions as well, are sold in the domestic market at lower prices and consequently domestic prices of composite imports drop considerably, Table A6-9.

[36] In addition, sugar and 'meat and dairy products' exports by the other participant regions become more competitive in the EU market. However, the highest competiveness gains, indicated by the generated drops in export prices in the EU markets, are accrued by 'Rest of SACU'.

6.3.2.2 Structural Change

With the small price changes induced by Sim11-SADC, no significant changes in the 'Rest of SACU' production structure occur. The only exception is 'meat and dairy products' sector. Shift and share analysis of output and import structures indicates both trade creation and trade diversion effects in the 'meat and dairy products' sector and the net welfare effect is trivial. Trade is created for imports from the EU whereas domestic production is deflated, imports from intra-SADC partners are contracted and imports are diverted away from more efficient exporters outside the region. The following paragraphs provide a detailed elucidation of these types of effects.

'Meat and dairy products' domestic output is replaced by the cheaper imported substitutes. Domestic production shrinks (Table A6-10) whereas total imports rise, Table A6-11. These volume changes lead to a higher share of imports in total domestic demand, Table A6-12. In light of the small importance of this sector in the 'Rest of SACU' total output[37] and the small changes in output structure, the expected efficiency gains associated with reallocating production factors to other activities are negligible.

Imports of 'meat and dairy products' from the EU rise by more than five-fold, calculated from a small base, Table A6-13. This import surge leads to gains for the EU by more than 10 percentage points of share in the 'Rest of SACU' market, Table A6-14. These gains occur mainly at the expense of the South African share in the 'Rest of SACU' market, Table A6-15. This contraction in intra-SACD trade is unavoidable under the full intra-SADC liberalization assumption since 'Rest of SACU' and South Africa are members of the SACU-CUs.[38] 'Meat and dairy products' imports from 'United States of America' and 'Rest of the World' worth US$ 0.03 million and US$ 0.16 million (valued in *fob* prices) are diverted towards less efficient European producers.[39]

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[37] 'Meat and dairy products' constitutes less than 2 percent of total output (Table A4-6) and utilizes tiny fractions of production factors (Table A4-8) in 'Rest of SACU'.

[38] See Table A4-28.

[39] The European 'meat and dairy products' producers are less efficient compared to their corresponding in 'United States of America' and 'Rest of the World'. If all exporters were treated equally, the EU would be a higher-cost producer. Under a hypothetical scenario that considers the same liberalization for all trade partners (including partners inside the SADC region) prices of 'meat and dairy products' imports from EU are higher than the corresponding prices of imports from both 'United States of America' and 'Rest of the World'. If this has been the case, equivalent variation for 'Rest of SACU' would have been more than fivefold its level under Sim11-SADC.

As seen before, the EU tariff cuts (Sim11-EU) boosts world prices of the 'Rest of SACU' sugar and 'meat and dairy products' exports to the EU. Consequently, resources are shifted towards these two sectors, Table A6-16. 'Rest of SACU' accrues gains through its improved terms of trade and more efficient allocation of resources which eventually enhanced its welfare as demonstrated earlier. Under the full employment assumption, expansions in some sectors (i.e. sugar, 'meat and dairy products' and, to a lesser extent, vegetables, livestock and services) entail fewer resources available for all other sectors that, accordingly, contract. From the 'Rest of SACU' perspective, liberalizing trade with the EU enhances specialization in few agricultural and agro-processing activities at the expense of all the manufacturing and mining sectors. As explained in detail in Chapter 3, these contractions in manufactures do not necessarily mean de-industrialization. In addition to the structural change examination, dynamic comparative advantage for the manufacturing sectors should be diagnosed before conclusions on de-industrialization are drawn. Owing to the lower domestic price of composite imports, domestic production in almost all sectors is replaced by imported substitutes, which become relatively cheaper, in total demand, Table A6-17.

Sugar output, which is an export-oriented activity, expands by more than ten times compared to its baseline level, Table A6-16. Sugar exports also expand and these expansions are mainly directed to the EU markets. 'Rest of SACU' sugar exports to third countries rise in percentage terms, Table A6-18. However, their shares in 'Rest of SACU' sugar exports drop, Table A6-19. In contrast, the EU share in 'Rest of SACU' sugar exports rises by 67 percentage points.

'Rest of SACU' gains 59 percentage points in its share of the EU sugar market at the expense of exporters in the EU, 'Rest of the World' and other SADC regions, Table A6-20. This is particularly the case for Mauritius which loses 5 percentage points of its share in the EU sugar market. Among SADC members, Mauritius is the main sugar supplier to the EU markets followed by 'Rest of SACU' and both are net exporters in the baseline scenario.[40] The results are, thus, suggestive of a situation in which 'Rest of SACU' under this liberalization scenario, which is limited to the SADC-EPA group, threatens the Mauritian trade position as the main sugar supplier to the EU markets. It

[40] See Table A4-23.

is, therefore, important for SADC members to collectively negotiate on EPAs in order to ensure harmonization in their liberalization offers to the EU. This result is in line with the inferences provided by the conducted descriptive analysis of SADC-EU trade structures, Chapter 4. The similarity in SADC export bundles to the EU entails increasing competition among SADC exporters in the EU markets after launching EPAs with the EU.

6.4 All SADC Regions

This section addresses the results for the comprehensive simulation scenario "All SADC Regions". Results for the first simulation set (Sim21 as well as Sim21-SADC and Sim21-EU) are interpreted in detail. Comparisons with the results generated under the second and third sets (Sim22 and Sim23) are provided when required.

6.4.1. Aggregate Results

6.4.1.1 Welfare Impact

This comprehensive scenario covers all SADC regions. Table A6-21 presents the simulated changes in tariffs (measured in percentage points) according to the source of the tariff cuts: Sim21-SADC and Sim21-EU. Welfare indicators, measured by real absorption (Table 6-6), reveal that this comprehensive liberalization scenario is welfare-improving for many SADC regions: 'Rest of SACU', Zimbabwe, Mauritius, and, to a lesser extent, Botswana, Malawi and Madagascar. Interestingly, Mauritian households, who would have lost US$ 19 million under Sim11, accrue gains worth US$ 118 million measured by equivalent variation. Although 'Rest of SACU' is worse off under this scenario compared to Sim11, it is the main winner under both liberalization scenarios.[41]

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[41] I run an additional scenario that simulates a different degree of asymmetric trade liberalization between all SADC regions and the EU. It assumes that all SADC regions reduce 60 percent of the applied tariff rates on their imports from the EU whereas the EU fully eliminates all the applied tariffs on its imports from all SADC regions. Welfare measures generated by this scenario are similar to the corresponding results driven by Sim21. South Africa only is better off under this more asymmetric liberalization scenario.

The scenario is decomposed into two components, a 90 percent cut of the applied tariff rates on SADC imports from the EU (Sim21-SADC) and a full removal of the EU tariffs on imports from SADC (Sim21-EU). Results support the general result obtained by Sim11. Reducing tariffs on SADC imports from the EU yields small negative welfare impact on SADC regions and virtually all the accrued welfare gains are attributed to the EU tariff removal. Welfare losses induced by Sim21-SADC are cancelled by welfare gains under Sim21-EU (i.e. South Africa and Zambia). Mozambique, Tanzania and 'Rest of SADC' experience slight welfare losses.

Table 6-6: Welfare Impact, "All SADC Regions"

	Sim21-SADC	Sim21-EU	Sim21	Sim22	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Equivalent Variation ($USD billion)				**Total Absorption** (Percentage change)			
BWA	0.01	0.02	0.02	0.02	0.2	0.6	0.8	0.6
MDG	0.00	0.01	0.01	0.01	-0.1	0.4	0.3	0.5
MWI	0.00	0.01	0.00	0.00	-0.1	0.7	0.6	0.7
MUS	-0.02	0.14	0.12	0.11	-0.6	4.9	4.3	4.0
MOZ	0.00	-0.01	-0.01	0.02	0.0	0.0	-0.1	0.5
ZAF	-0.28	0.29	0.00	0.19	-0.2	0.2	0.0	0.2
TZA	-0.02	0.00	-0.01	-0.02	-0.1	0.1	-0.1	0.0
ZMB	0.00	0.00	-0.01	-0.02	-0.1	0.1	0.0	-0.2
ZWE	-0.01	0.12	0.11	0.13	-0.2	5.1	4.9	5.2
XSC	0.00	0.32	0.32	0.32	-0.1	8.0	8.1	8.0
XSD	0.02	-0.02	0.00	0.03	-0.1	-0.1	-0.3	-0.2

6.4.1.2 Terms of Trade Impact

Results on terms of trade and real exchange rates (Table 6-7) support the same finding. Most SADC members are better off under this scenario compared to Sim11, particularly the regions which would have been adversely affected by removing tariffs on the EU imports from the SADC-EPA group only (e.g. Mauritius and Zimbabwe). Once again, 'Rest of SACU' experiences very strong favourable changes in its terms of trade and real exchange rate, albeit less pronounced compared to Sim11.

Improvements in terms of trade and the experienced real appreciations are associated with Sim21-EU, whereas Sim21-SADC generates small negative effects. Reducing tariffs on SADC imports from the EU leads to deteriorations in terms of trade and real depreciations in almost all SADC regions. In contrast, eliminating tariffs on the EU imports from SADC boosts world prices of SADC exports with proportionally less increases in world prices of SADC imports. These changes in world prices imply improvements in terms of trade for almost all SADC regions. The results generated by Sim21 reflect the net effect of Sim21-SADC (towards terms of trade deterioration and real depreciation) and Sim21-EU (towards terms of trade improvement and real appreciation). For the beneficiary regions ('Rest of SACU', Zimbabwe, Mauritius, Malawi and Botswana) the favourable effects induced by Sim21-EU offset the adverse effects induced by Sim21-SADC. According to the basic closure rule, the real exchange rates have to decrease responding to the experienced favourable changes in terms of trade in order to keep the trade balances fixed at their baseline levels.[42]

Table 6-7: Terms of Trade and Real Exchange Rate, "All SADC Regions"

(Percentage change)

	Sim21-SADC	Sim21-EU	Sim21	Sim22	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Terms of Trade				**Real Exchange Rate**			
BWA	0.4	0.1	0.5	0.2	0.7	-2.3	-1.7	-1.9
MDG	-0.2	0.3	0.1	0.5	0.3	-0.8	-0.4	-0.3
MWI	-0.2	1.1	0.9	0.7	0.6	-5.1	-4.5	-2.5
MUS	-0.8	3.8	2.9	2.5	2.6	-6.3	-3.8	-3.1
MOZ	-0.1	-0.1	-0.2	0.5	0.4	-0.9	-0.5	1.0
ZAF	-0.6	0.3	-0.3	0.0	1.0	-0.9	0.2	-0.4
TZA	-0.3	0.2	-0.1	-0.1	0.9	-0.5	0.4	0.8
ZMB	-0.2	0.2	0.1	-0.7	0.5	-1.6	-1.1	0.3
ZWE	-0.2	5.5	5.3	4.7	1.1	-8.9	-7.9	-2.8
XSC	0.0	4.5	4.5	4.5	0.6	-14.5	-14.1	-14.2
XSD	-0.1	-0.2	-0.3	-0.3	2.2	-0.3	1.9	2.7

[42] Using their 1-2-3 CGE model, Devarajan et al. (1997, pp. 166-169) demonstrate that responses of exchange rate to changes in terms of trade depend on values of Armington elasticity. This highlights the importance of testing the robustness of these results with respect to variations in Armington elasticity values; this sensitivity analysis is provided later in Section 6.5.

6.4.1.3 Trade Impact

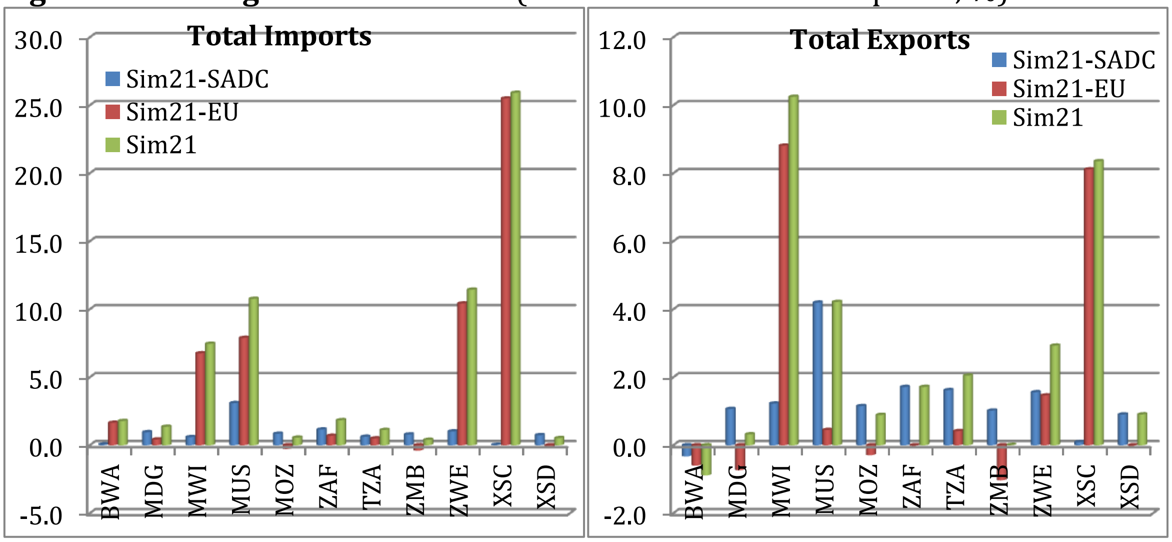
6.4.1.3.1 Total Trade

As portrayed in Figure 6-5, changes in total trade occur in the same beneficiary regions ('Rest of SACU', Zimbabwe, Mauritius and Malawi) where increases in imports are proportionally higher than the increases in exports. These changes in total trade can be interpreted by the experienced changes in terms of trade. The adverse changes in terms of trade induced by Sim21-SADC imply lower affordable imports (for the same amount of exports) and, thus, the increases in imports are proportionally less than the increases in exports for virtually all SADC regions.[43] Results for Sim21-EU reflect more affordable imports in the regions that experience favourable effects in their terms of trade, i.e. 'Rest of SACU', Zimbabwe and Mauritius. Results for Sim21 reflect net effect of Sim21-SADC and Sim21-EU. Since the latter generates trade effects in greater magnitudes, exports by these four regions increase proportionally lower than the increases in their imports which become relatively cheaper.

Three conclusions can be drawn here. Firstly, reducing tariffs on SADC imports from the EU does not stimulate SADC exports. Under Sim21-SADC, exports rise by less than 2 percent in all SADC regions. Exports by Mauritius only rise by 4 percent, Table A6-2. Secondly, the EU tariff removal generates export expansions in Malawi and 'Rest of SACU' only whereas exports by all other SADC regions hardly change. Interestingly, the EU tariff removal yields significant increases in imports by 'Rest of SACU', Zimbabwe, Mauritius and Malawi. Production structures in these regions become more concentrated in export-oriented sectors; this type of impact will be dealt with later in detail. Therefore, they tend to be more dependent on imports to meet the domestic demand for the sectors which shrink.

[43] Botswana whose terms-of-trade improves is the only exception, but the same rationale is still valid. With higher terms of trade, Botswana is able to fund more imports by less exports.

Figure 6-5: Changes in SADC Trade (Valued at baseline world prices, %)



These trade effects (Table A6-2) alter under the full intra-SADC trade liberalization assumption, Sim22. This scenario simulates eliminating all barriers to intra-SADC trade along with liberalizing trade with EU, as described in Table 6-1. The inclusion of intra-SADC trade liberalization yields trade expansions in regions which would not have experienced any changes in trade under EU-SADC trade liberalization in isolation, i.e. Mozambique and Zambia. Furthermore, trade figures for other regions (i.e. Malawi and Zimbabwe) expand more than proportionally under Sim22 compared to Sim21.

6.4.1.3.2 Trade with the EU

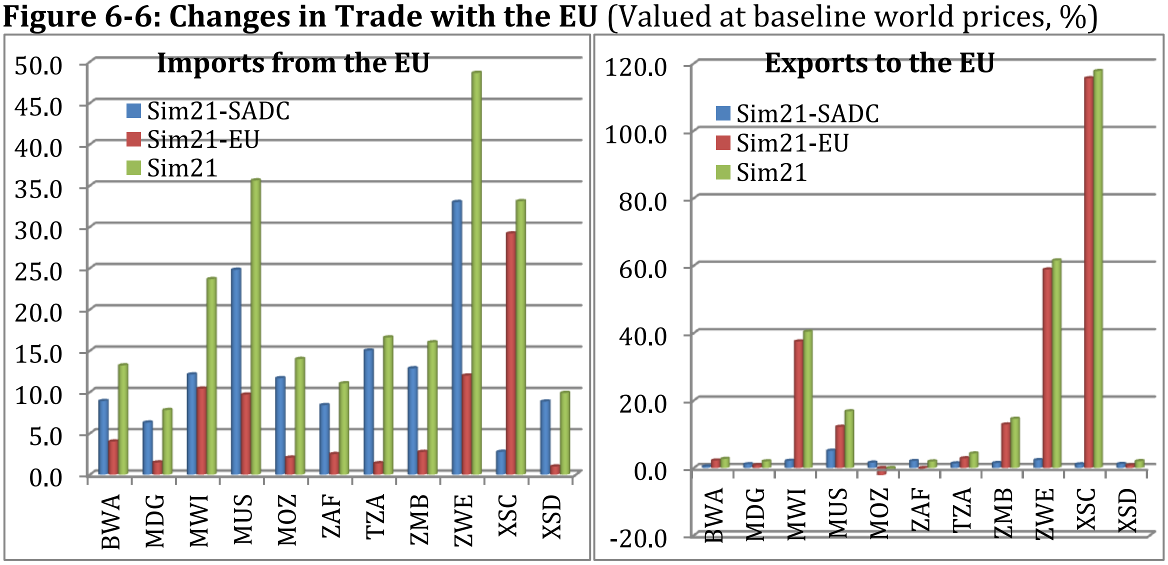
As portrayed in Figure 6-6, SADC imports from the EU rise in all regions while export expansions are concentrated in a few regions: 'Rest of SACU', Zimbabwe, Malawi, and, to a lesser extent, Mauritius and Zambia.[44] Reducing tariffs on imports from the EU (Sim21-SADC) boosts imports from the EU by all SADC members with negligible changes in their exports to the EU. Mauritius is the only exception; its exports to the

[44] These outstanding expansions in exports to the EU are calculated based on small baseline levels for SADC trade with the EU in volume terms. As a general observation, percentage changes should be read in light of the corresponding baseline levels. For example, the 1.9 percentage change in South Africa exports to the EU is calculated based on a high baseline level whereas the 40.4 percentage change in Malawi exports to the EU is based on a very low level. The absolute increment in South Africa exports to the EU is more than that in Malawi exports to the EU, both measured in real terms.

EU rise by 5 percent. In contrast, the EU tariffs removal (Sim21-EU) triggers exports to the EU by these five regions only. It also boosts their imports from the EU. The point to highlight here is that the regions whose exports to the EU expand are mainly the same beneficiary regions. In other words, benefits from launching EPAs with the EU depend mainly on SADC's capacity to export and on its export's ability to compete in the EU markets.

Under the full intra-SADC trade liberalization assumption (Sim22) the same effects on SADC trade with the EU are held albeit with different magnitudes, Table A6-3. The increases in imports by Malawi and Zimbabwe from the EU are proportionally much less compared to the generated increases under Sim21. Mozambican and Zambian imports from the EU, which increase under Sim21, experience only very slight increases. No substantive difference in the generated effects on SADC exports to the EU is reported.

Figure 6-6: Changes in Trade with the EU (Valued at baseline world prices, %)



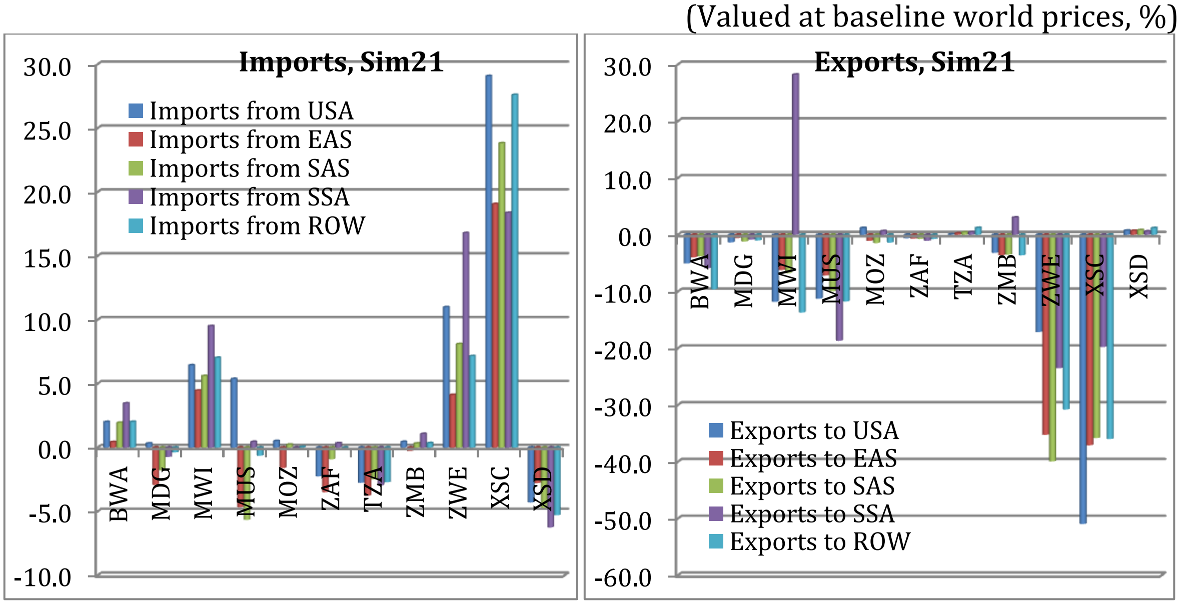
6.4.1.3.3 Trade with Third Parties

Results on SADC trade with third parties (Figure 6-7) indicate that the beneficiary regions ('Rest of SACU', Zimbabwe, Mauritius and Malawi) import more from and export less to their non-EU non-SADC partners. As shown by Tables A6-4 and A6-5, there are only two exceptions for these four beneficiary regions. Firstly, Mauritius imports from ‘East Asia’, ‘Southeast and South Asia’ and the SADC region drop. This means that not only the increments in Mauritius total imports that are now sourced in the EU markets but also part of its pre-simulation imports from ‘East Asia’, ‘Southeast and South Asia’ and the SADC region are now redirected towards their European substitutes. Secondly, Malawi exports to ‘Rest of Sub-Saharan Africa’ rise by almost 30 percent.

The generated effects on SADC trade with the non-EU non-SADC partners run in opposite directions. By reducing tariffs on SADC imports from the EU (Sim21-SADC) imports by all SADC regions from third parties drop whereas their exports to third parties rise. Removing the EU tariffs on imports from SADC (Sim21-EU), on the other hand, leads to increases in imports by these specific regions from third parties and decreases in their exports to third parties.[45]

Figure 6-7: Changes in SADC Trade with Third Parties

(Valued at baseline world prices, %)



[45] The extent to which SADC imports from the non-EU regions drop in response to the decreases in relative price of imports from the EU to imports from other regions depends, *inter alia*, on the elasticity of substitution at the third level of the CES import demand function as represented in Equation 19 in Chapter 5. Similarly, the extent to which SADC exports to non-EU regions drop in response to the increases in relative price of exports to the EU to exports to other regions depends, *inter alia*, on the elasticity of transformation at the second level of the CET export supply function as represented in Equation 28 in Chapter 5.

Effects on the import side in the beneficiary regions can be explained in Figure 6-8. Sim21-SADC implies lower relative prices of SADC imports from the EU to their imports from third parties. The generated impact is, thus, represented by moving from *a* to *b* on a higher CES import demand curve.[46] These changes in relative prices lead to increases in their imports from the EU (by higher rates compared to their total import growth rates) and drops in their imports from third parties. Sim21-EU is represented by moving from *a* to *c*. Under Sim21-EU, these regions experience improvements in their terms of trade and rises in their imports from all trade partners. Trade effects generated by Sim21-EU are of greater magnitudes compared to Sim21-SADC. Evidently, the increases in imports from third parties (induced by Sim21-EU) are greater than the drops in their imports from third parties (induced by Sim21-SADC) and, consequently, their imports from third parties increase under Sim21.[47]

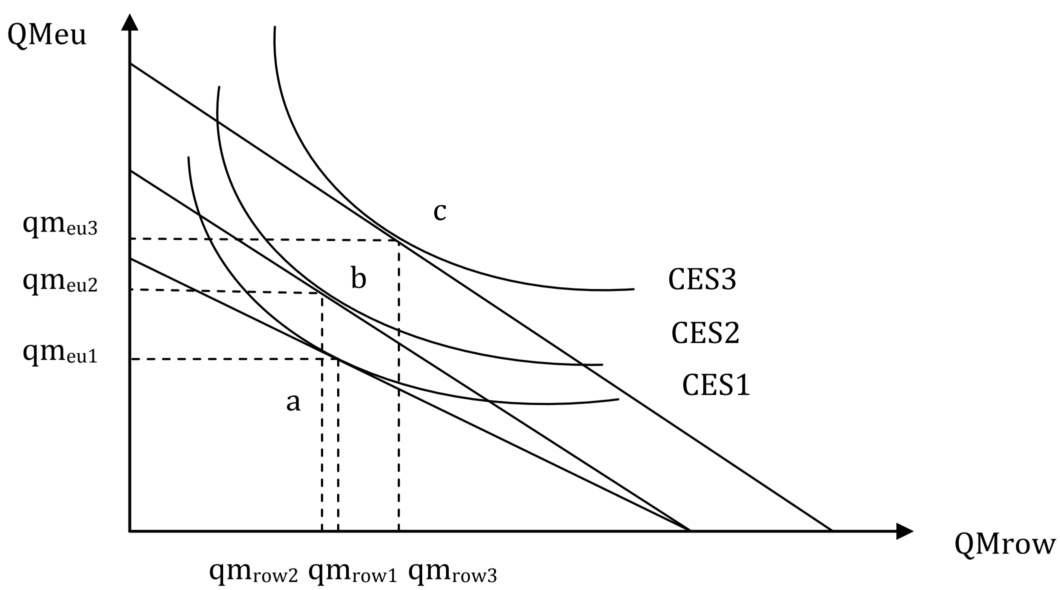


Figure 6-8: Trade Effects in the Beneficiary Regions

[46] The label 'row' in the diagram refers to all non-EU partners since these effects are valid on imports from their SADC trade partners as well. The higher CES demand curve implies greater total import level.

[47] For all other SADC regions, the increases in their imports from third parties (induced by improving terms of trade under Sim21-EU) are not strong enough to offset the decreases in their imports from third parties (induced by changes in relative prices under Sim21-SADC) and, consequently, their imports from third parties drop under Sim21.

Table 6-8: Changes in Trade Effects across Scenarios

	Proportional Changes in SADC Imports							
	Total		EU		Third Parties		Intra-SADC	
	Sim21	Sim22	Sim21	Sim22	Sim21	Sim22	Sim21	Sim22
BWA	Ø	Ø	+	+	Ø	Ø	Ø	Ø
MDG	Ø	Ø	+	+	Ø	Ø	-	+
MWI	+	++	+++	+	+	-	+	++
MUS	+	+	+	+	+	+	-	+
MOZ	Ø	+	+++	Ø	Ø	-	-	+
ZAF	Ø	Ø	+	+	Ø	Ø	-	-
TZA	Ø	Ø	+	+	Ø	Ø	-	+
ZMB	Ø	+	+++	Ø	Ø	-	-	+
ZWE	+	++	+++	+	+	-	+	++
XSC	+	+	+	+	+	+	+	+
XSD	Ø	Ø	+	+	Ø	Ø	-	+
	Proportional Changes in SADC Exports							
	Total		EU		Third Parties		Intra-SADC	
	Sim21	Sim22	Sim21	Sim22	Sim21	Sim22	Sim21	Sim22
BWA	Ø	Ø	Ø	Ø	Ø	Ø	-	-
MDG	Ø	Ø	Ø	Ø	Ø	Ø	-	-
MWI	+	++	+	+	-	-	-	+
MUS	+	+	+	+	-	-	-	-
MOZ	Ø	+	Ø	Ø	Ø	Ø	+	++
ZAF	Ø	Ø	Ø	Ø	Ø	Ø	+	++
TZA	Ø	Ø	Ø	Ø	Ø	Ø	+	++
ZMB	Ø	+	+	+	Ø	Ø	Ø	+
ZWE	+	++	+	+	-	-	--	-
XSC	+	+	+	+	-	-	-	-
XSD	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø

Note: These are broad indications of the differences in direction and magnitudes of the trade effects generated by Sim22 compared to Sim21. No implications on the differences in the effects magnitudes across regions can be drawn here. For example, +++ (in the third column, third row) is not comparable with + (in the third column, fourth row). Under Sim21, Malawi imports from the EU rise proportionally less than the increases in Mauritius imports from the EU. Comparison is valid between +++ (in the third column, third row) and + (in the fourth column, third row). Malawi imports from the EU rise under Sim22 proportionally less than the experienced increases under Sim21. Comparison is also valid between + (in the third column, fourth row) and + (in the fourth column, fourth row). Mauritius imports from the EU rise by almost the same rate under both Sim21 and Sim22.

Table 6-8 provides broad indications of the differences in direction and magnitudes of the trade effects generated by Sim22 compared to Sim21. By and large, these effects on SADC trade with third parties do not change by simulating full intra-SADC trade liberalization along with the EU-SADC trade liberalization, Sim22. However, imports from third parties by Mozambique, Zambia (which would have stagnated under Sim21) Malawi and Zimbabwe (which would have increased under Sim21) drop. The generated effects on SADC exports to third parties under Sim22 are quite similar to those generated by Sim21, Table A6-4.

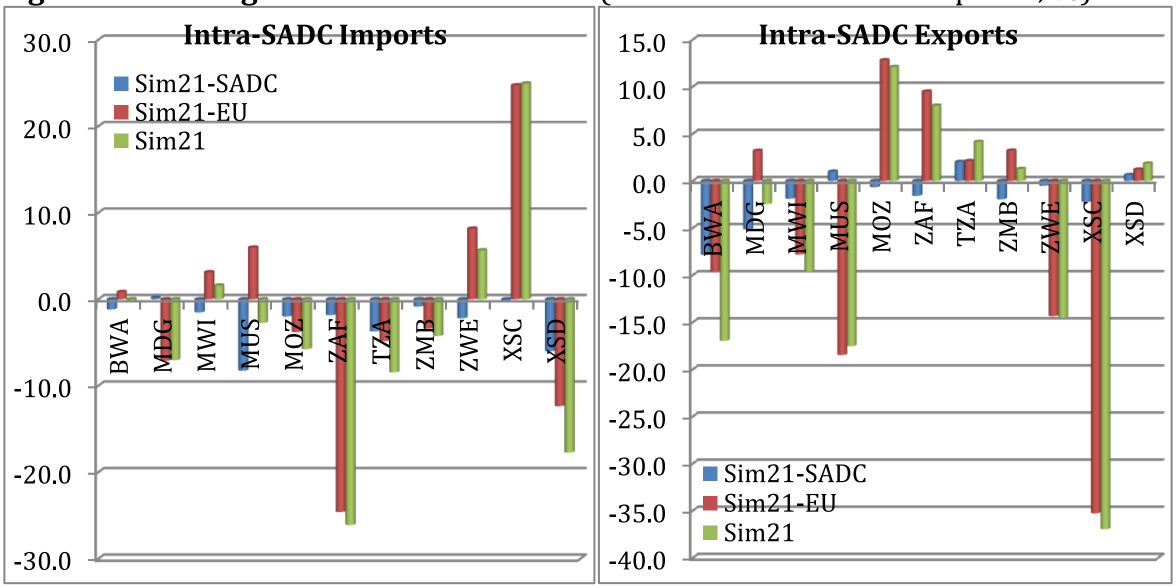
6.4.1.3.4 Intra-SADC Trade

Figure 6-9 shows that intra-SADC trade is negatively affected by liberalizing trade with the EU. Intra-SADC imports rise only in 'Rest of SACU' and Zimbabwe. South Africa, which is a main source of imports for many SADC regions,[48] experiences expansions in its intra-SADC exports by 8 percent, Table A6-5. On the other hand, exports by 'Rest of SACU', Zimbabwe, Mauritius and Malawi to their SADC partners drop outstandingly. These drops are mainly driven by removing tariffs on the EU imports from SADC (Sim21-EU). Recall that total exports and exports to the EU by these regions rise and that their exports to third parties and to their SADC partners drop; this means that not only the increments in their total exports that are now sold in the EU markets but also part of their pre-simulation exports to third parties and their SADC partners are redirected to the EU markets.[49]

[48] See Table A4-27.

[49] As reported before, Malawi exports to 'Rest of Sub-Saharan Africa' increase outstandingly. Therefore, it experiences export redirection away from the third parties (excluding 'Rest of Sub-Saharan Africa') and SADC markets towards markets in 'Rest of Sub-Saharan Africa' and the EU.

Figure 6-9: Changes in Intra-SADC Trade (Valued at baseline world prices, %)



Effects on intra-SADC trade change dramatically by simulating intra-SADC trade liberalization simultaneously with the EU-SADC liberalization scenario, Sim22. The inclusion of intra-SADC trade liberalization strongly boosts imports in regions where intra-SADC imports would have either dropped (i.e. Madagascar, Mauritius Mozambique, Tanzania, Zambia and 'Rest of SADC') or experienced slight increases (i.e. Malawi and Zimbabwe) under Sim21, Table A6-5. On the export side, the directions of effects are similar to those generated by Sim21, albeit the magnitude of the effects is different in most of the SADC regions. This means that intra-SADC trade liberalization does not prevent the previously reported redirection of part of 'Rest of SACU', Zimbabwe and Mauritius exports away from the third parties and SADC markets to the EU markets. Only Malawian exports to its SADC partners (which would have dropped and redirected to the EU and 'Rest of Sub-Saharan Africa' markets under Sim21) experience slight increases, Table A6-5.

6.4.1.4 Fiscal Impact

Under this comprehensive scenario, tariff revenue drops substantially for most SADC regions, Table 6-9. Some regions (i.e. Botswana, Madagascar, Mauritius, South Africa and 'Rest of SADC') incur remarkable tariff losses which exceed 35 percent of the baseline levels.

The required increases in sales tax to offset these tariff losses depend, however, on the structure of public budget in the baseline scenario.[50] For example, tariffs and sales tax are the main sources of public revenue in Mauritius, each accounting for 38 percent. South Africa depends mainly on indirect taxes on production factor use followed by sales tax while tariff revenue contributes 5 percent only to its public revenue. Mauritius needs to raise sales tax rate by 1.3 percentage points whereas an increment of only 0.2 percentage points of sales tax rate is required by South Africa to offset the experienced 35 percent tariff loss in both countries. In 'Rest of SADC', where tariffs account for only 12 percent of public revenue in the baseline scenario, an increase of 0.7 percentage points in sales tax rate is required to offset a tariff loss of 42 percent.

Table 6-9: Fiscal Revenue by Source, "All SADC Regions"

(Percentage change, nominal)

	Sim21					Sim23	
						Sales Tax Replacement	
	Import Tariffs	Export Taxes*	Sales Taxes	Taxes on Output	Taxes on Factor Use	Revenue	Rate** (Change, percentage points)
BWA	-35.7			26.9	0.8		0.1
MDG	-39.9			0.4	0.7		0.2
MWI	-10.7		1.3	-12.0	2.5	0.5	0.0
MUS	-34.9	139.6	2.4	-5.3	6.1	34.1	1.3
MOZ	-15.2		0.1	-0.8	0.2	11.5	0.3
ZAF	-36.9	0.2	0.4	0.5	0.4	7.6	0.2
TZA	-19.6		-0.2	0.6	0.4	28.2	0.3
ZMB	-10.6		-0.1	-1.4	0.2	37.5	0.2
ZWE	-9.4			6.2	4.8		-0.1
XSC	0.2	-53.7	7.1	-4.3	5.2	5.5	0.0
XSD	-42.3		-0.5	-0.5	1.4	64.3	0.7

* As explained in Table 6-4, these percentage changes are calculated based on very small baseline levels.

** As noted in Table 6-4, sales tax rates are weighted by commodity shares in domestic demand by region.

[50] See Table 4-1.

6.4.1.5 Factor Returns

Changes in factor returns are positive in most of the cases with the exception of natural resources, Table 6-10. These changes reflect the experienced changes in output structures, this type of impact will be dealt with later.[51] Output expansions occur mainly in agricultural and agro-processing sectors in five regions, i.e. 'Rest of SACU', Zimbabwe, Mauritius, Botswana and Malawi. Therefore, it is not surprising that the increases in factor incomes are the greatest for land in these specific regions. Recalling that natural resources is sector-specific, decreasing demand for output of 'oil and minerals', which is the main natural resources-using activity, pushes its rent to drop in the same regions.

Table 6-10: Structural Change in Factor Markets, "All SADC Regions", Sim21

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Factor Income, Percentage Change										
Land	169.9	3.0	-12.2	324.7	1.0	9.6	0.9	12.4	103.6	238.4	0.0
NatRes	-17.5	0.5	-14.3	-19.9	2.3	1.0	0.4	-1.3	-29.9	-63.9	4.5
UnSkLab	1.5	0.7	2.4	8.1	0.3	0.5	0.4	0.5	1.2	2.9	0.4
SkLab	0.6	0.3	3.7	1.7	0.2	0.4	0.3	-0.4	1.7	2.8	0.7
Capital	0.2	0.5	3.9	-0.2	0.1	0.5	0.3	-0.6	1.4	7.5	1.1
	Factor Adjustment, Percent										
Land	9.9	0.7	4.6	21.3	0.2	0.9	0.3	2.1	39.8	21.1	0.3
UnSkLab	3.3	0.7	3.6	13.5	0.3	0.2	0.2	1.0	9.7	13.2	0.4
SkLab	0.9	0.3	2.0	2.6	0.2	0.1	0.2	0.2	2.4	5.5	0.1
Capital	2.2	0.5	4.5	6.9	0.3	0.2	0.2	0.6	7.5	15.2	0.4

Expanding sugar activities in 'Rest of SACU', Zimbabwe and Mauritius imply outstanding increases in demand for land. Accordingly, land rents rise by very high rates, albeit based on low benchmark rent levels. In Botswana, expanding livestock, the activity that occupies 66 percent of the utilized land in the baseline scenario,[52] pushes land rent to rise by almost two fold. Despite the increased demand for land used in sugar and rice in Malawi, land rent drops. This is attributed to the shrinkage of 'other crops', the large activity that contributes 14 percent to total output and uses

[51] The point to mention here is that changes in output structure generated under Sim21-EU are quite similar to those induced by Sim21 with slight differences in magnitudes.
[52] See Table A4-8.

more than one third of the cultivated land in the baseline scenario.[53] Excess supply of land released from ‘other crops’ activity pushes average land rent to fall until the sum of sectoral demand for land equilibrates its total supply. Sugar activity expansion in Mauritius explains the relatively high increase in unskilled labour wage. This activity is unskilled labour-intensive and solely absorbs 9 percent of unskilled labour in the baseline scenario.[54]

6.4.1.6 Factor Market Adjustment

Sim21 generates significant changes in output structures and shifts of production factors across activities in many SADC regions. The highest degrees of structural adjustment occur in the same beneficiary regions: ‘Rest of SACU’, Zimbabwe, Mauritius and Botswana, Table 6-10. Land and unskilled labour experience substantial structural adjustment for these economies to reach their new equilibrium points after the simulated trade shock. For example, 40 percent of the utilized land in Zimbabwe in the baseline scenario is reallocated among different activities in the post-liberalization scenario.

As expected, structural adjustment imposed by Sim21-SADC; the scenario that does not generate significant structural change, is trivial. Apart from Mauritius that experiences changes in its output structure, the structural adjustment degree is less than 0.5 percent for each production factor in the other SADC regions. To conclude, structural adjustment is mainly driven by the generated changes in output structure after simulating the EU tariff removal.

[53] See Tables A4-6 and A4-8, respectively.

[54] See Tables A4-7 and A4-8, respectively. It is expected that unemployment level for unskilled labour drops under the alternative closure rule.

6.4.2. Sectoral Results

6.4.2.1 Price Changes

By removing 90 of the applied tariff rates on SADC imports from the EU (Sim21-SADC) *cif* prices of SADC imports from the EU increase, Table A6-22.[55] The extent to which the simulated tariff cuts are transmitted into lower domestic prices of SADC imports from the EU depends on several factors, among which are the associated changes in real exchange rate. For the same tariff reduction, domestic prices *ceteris paribus* drop proportionally less in countries which experience higher increases in their real exchange rates. This explains the relatively low decreases in domestic prices of imports from the EU for Mauritius, 'Rest of SADC', Zimbabwe and South Africa, Table A6-23.[56]

Owing *inter alia* to the low shares for the EU in some SADC markets,[57] Sim21-SADC does not generate significant changes in domestic prices of SADC composite imports except for few cases, e.g. beverage and vehicles, Table A6-24. The experienced large decreases in domestic prices of composite beverage imports by Mauritius, 'Rest of SADC' and Tanzania are attributable to the big EU shares in their beverage markets.

On the export side, no significant changes in SADC production and export structures are reported under Sim21-SADC. This type of effect will be dealt with later in detail. Therefore, world prices of SADC exports to the EU hardly change.

Given the increases in world prices of SADC imports with the slight drops in world prices of SADC exports, terms of trade deteriorates in some regions, e.g. Mauritius, South Africa and Zimbabwe. Real exchange rates increase accordingly to maintain the trade balances fixed at their baseline levels as demonstrated by the aggregate results.

Eliminating the EU tariffs on imports from SADC (Sim21-EU) triggers world prices of SADC exports to the EU in some sectors, Table A6-25. This is particularly the case for

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[55] Since Sim21-SADC includes all SADC members, these price changes are more evident compared to the corresponding increases induced by Sim11-SADC. On the other hand, world prices of SADC imports from the EU rise under Sim21-SADC by lower rates compared to the corresponding rises in world prices of SADC exports to the EU under Sim21-EU. These differences are attributed to the size difference between SADC's and the EU's shares in total world imports, Table A4-9.

[56] For example, the same tariff cut is simulated for Mauritius vegetables imports and Madagascar sugar imports from the EU. The Mauritian real exchange rate rises by a higher rate than the Madagascan real exchange rate. Therefore, domestic price for Mauritius vegetables imports drops proportionally less than the drops in domestic price for Madagascar sugar imports.

[57] See Table A4-18.

rice, sugar and 'meat and dairy products'.[58] In addition, world prices of other sectoral exports rise for 'Rest of SACU', Zimbabwe, Mauritius and Botswana. Not only do world prices of SADC exports to the EU rise but also SADC exports to other regions experience price increases.[59] These world price increases of SADC exports with relatively less increases in world prices of SADC imports from the EU entail terms of trade improvements and real appreciations for almost all SADC regions, as demonstrated by the aggregate results.

It is worth noting here that the strong real appreciations for 'Rest of SACU', Zimbabwe, Mauritius and Malawi mean that their imports, not only from the EU but also from all other sources, are sold in their domestic markets at lower prices and, consequently, domestic prices of their composite imports drop considerably relative to the numéraire.

6.4.2.2 Structural Change

Generally speaking, Sim21-SADC does not generate significant changes in the SADC economic structure with very few exceptions, e.g. Mauritius and Zimbabwe, Table A6-26.

This scenario generates structural change in Mauritius with indications of both trade creation and diversion in the beverage sector. The EU is the main beverage exporter to Mauritius with a market share of 64 percent at the baseline scenario.[60] By removing tariffs on Mauritius beverage imports from the EU, domestic beverage production shrinks and resources are reallocated into textiles activity, Figure 6-10. Domestic beverage production is replaced by the relatively cheaper imports; beverage imports increase in both volume terms and as ratio of total demand, Tables A6-27 and A6-28. The associated gains in consumer surplus are affirmed by the lower consumer price of composite commodity and the higher level of private consumption in this sector.

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[58] Unlike Sim11-EU in which prices for exports from the other SADC countries that are not involved in the liberalization drop, export prices for all SADC members rise under this scenario.

[59] There are very few exceptions of price decreases that occur mainly in the sugar exports to the non-EU importers.

[60] See Table A4-18.

In volume terms, imports from the EU rise with declines in imports from all other partners except Mozambique. This result implies that the increment in beverage imports is mainly sourced in the EU. Share analysis supports the diagnosis of trade diversion effects; the EU gains 16 percentage points of share in the Mauritian beverage market at the expense of more efficient producers in 'Rest of the World', Table A6-29.[61] Beverage imports worth US$ 1.06 million (valued at *fob* prices) are diverted from 'Rest of the World' leading to a 7 percentage-points loss of its share in the Mauritian beverage market.

Evidence on export expansions in the textiles sector is suggested by the results. Within this general equilibrium framework, export expansions can be attributed to changes in two effects: output and relative price. The former reflects upward/downward shifts of the CET export supply frontier due to increases/decrease in domestic output whereas the latter reflects movements along the CET export supply frontier due to changes in relative prices of domestic commodities and exports.[62] At this stage of analysis evolution, output effect is valid only at the sectoral level. The full employment assumption with no technical progress implies fixed output at the aggregate level.

Textiles activity gains one percentage point of share in output structure which in turn contributes to the 10 percent increase in export volumes that is worth US$ 104.7 million. In addition, producers shift toward exporting market since textile exports become relatively more profitable compared to domestic sales. This relative price effect leads to a higher ratio of textile export in total supply. These increments in exports are mainly directed to the EU that gains share in Mauritius textile exports. It is noteworthy that the textiles sector forms 15 percent of total output in Mauritius in the baseline scenario. Almost three-quarters of output is exported, 68 percent of which is

[61] The European beverage producers are less efficient compared to their corresponding in 'Rest of the World'. If all exporters were treated equally, the EU would be a higher-cost producer. Under a hypothetical scenario that considers the same tariff cuts on SADC imports from all trade partners (including partners inside the SADC region) *fob world prices* and domestic prices of beverage imports from the EU are higher than the corresponding prices of beverage imports from 'Rest of the World'.

[62] For a detailed explanation, see Blonigen, Flynn and Reinert (1997, p. 217).

destined for the EU markets, forming the bulk of Mauritius total exports and of its exports to the EU.[63]

Figure 6-10: Changes in Activity Shares in Output Structure (Percentage points)

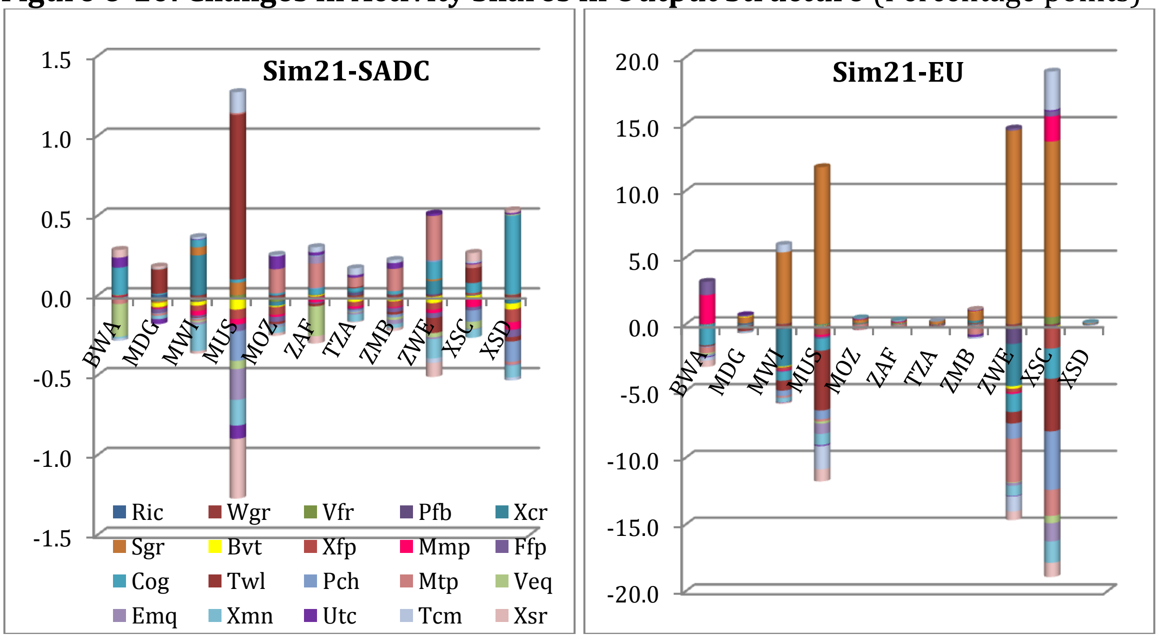

Table A6-30 reveals considerable changes in output structures for many SADC countries under Sim21-EU. It is not hard to explain these volume changes in light of the substantial price changes for SADC exports, as seen before. The reported shrinkage of manufacturing production for Mauritius concurs with the conclusion reached by Milner, Morrissey and Zgovu (2007). Using a partial equilibrium model, the study estimates 24 percent average decline in domestic production of manufactures and primary products under a full Mauritius-EU EPA.

Figure 6-10 shows that the highest changes are in 'Rest of SACU', Zimbabwe, Mauritius and Malawi where resources are reallocated into sugar activity. 'Meat and dairy products' also attracts some resources in Botswana and 'Rest of SACU'.

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[63] See Tables A4-6, A4-16, A4-22, A4-14 and A4-21, respectively. In light of the importance of textiles activity in Mauritius, the associated factor allocation, as well as factor adjustment, effects should have been influential. Nevertheless, the expanded sugar activity, under Sim21-EU, draws resources out of all other activities including textiles. The decline in textiles output (under Sim21-EU) outweighs the expansion (under Sim21-SAD) leading to shrinkage in this activity under Sim21.

Efficiency gains and the export expansions, as we will see next, associated with this structural change are consistent with the welfare gains accrued by these beneficiary regions as revealed at the aggregate level. These expanded sectors draw resources from higher value-added activities; among which are textiles and all the other the manufactures.

Under Sim21-EU, sugar exports by all SADC members expand, Table A6-31. Other exports also expand, i.e. ‘meat and dairy products’ (by ‘Rest of SACU’, Botswana and South Africa) and rice (by Madagascar, Malawi and South Africa). Almost all other SADC commodity exports experience drops. Following the same rationale, the observed expansions in sugar exports in the beneficiary regions are attributed to two effects. The first is output effect; sugar output raises in volume terms and as ratio of total output the effect that boosts sugar exports. The latter is relative price effect that leads to higher export shares in total supply. These export expansions are directed mainly to the EU sugar markets. SADC sugar exports to the EU surge at higher rates compared to SADC total sugar exports, Table A6-32.

Many SADC members gain extra share in the EU sugar markets. The main winners are ‘Rest of SACU’, Zimbabwe and Mauritius, Table A6-33.[64] Compared to Sim11, under which some SADC members (Mauritius and Zimbabwe) lose share in the EU sugar market, this scenario allows many SADC sugar exporters to gain shares in the EU markets. It is, thus, evident why ‘Rest of SACU’ is worse off, whereas many SADC regions are better off, under this scenario, the conclusion that is derived from the aggregate welfare measure. The additional shares in the EU markets, which would have been accrued by ‘Rest of SACU’ only under Sim11, are spread among the other beneficiary regions under this comprehensive scenario.

These findings are in line with the conclusions obtained by the CGE MIRAGE model in Bouët, Laborde and Mevel (2007) and Berisha-Krasniqi, Bouët and Mevel (2008). Both studies find positive real income and welfare impact for SADC and ESA regions under a full EU-EPA scenario.[65] These macroeconomic gains are primarily attributed to

[64] In addition, Botswana and ‘Rest of SACU’ gain extra shares in the EU ‘meat and dairy products’ markets.

[65] The two regions together include all SADC countries, except South Africa, Angola, Seychelles and D.R. Congo.

substantial export expansions for meat and sugar sectors as a result of removing the EU trade barriers. In addition, Fontagné, Laborde and Mitaritonna (2010) estimate substantial expansions in sugar exports to the EU driven by a complete EPA scenario for the same beneficiary regions. These sugar export increases, valued in million euro 2004, are sourced in Mauritius (511) Swaziland (398) and Zimbabwe (145).

6.5 Sensitivity Analysis

CGE models are criticized, *inter alia,* by their sensitivity to the chosen behavioural parameters and assumptions. The purpose of this section is, thus, to examine the robustness of the results with respect to variations in the main settings of the model and in the liberalization degree and coverage. If the model generates similar results under these variations, then this will provide evidence that the adopted elasticities, assumptions, and liberalization degree and coverage are not the important determinants of the observed changes in welfare, trade and structural change. Results from sensitivity scenarios are compared to those generated by the comprehensive liberalization scenario that covers all SADC regions under the current intra-SADC protection status, Sim21.

6.5.1. Sensitivity to the Model Settings

6.5.1.1 Behavioural Parameters

This sub-section conducts six scenarios in order to examine the sensitivity of the results to variations in the model behavioural parameters, i.e. the trade elasticities and factor substitution elasticities. As presented in Table 6-11, the first two sensitivity scenarios (Sim21-mph, Sim21-mpl) adopt higher and lower values of import elasticities. In the main scenarios, the elasticities of substitution between domestic products and imports (Armington elasticities) as well as the elasticities of substitution between imports from different origins are derived from the GTAP7 database.[66] As described earlier in Chapter 4, the GTAP7 database sets the elasticities of substitution between imports from different origins, for a given product, to be double the

[66] Trade elasticity values are presented in Tables A4-3 and A4-4.

corresponding values of Armington elasticities; the 'rule of two'. Therefore, both Armington elasticities and the elasticities of substitution between imports from different origins are simultaneously doubled under Sim21-mph and then they are simultaneously halved under Sim21-mpl.

Table 6-11: Sensitivity Scenarios

Simulation Code	Simulation Description	
Phase1: Model Settings		
Trade Elasticities		
Sim21-mph	Sim21, doubling import substitution elasticities for all regions	
Sim21-mpl	Sim21, halving import substitution elasticities for all regions	
Sim21-xph	Sim21, doubling export transformation elasticities for all regions	
Sim21-xpl	Sim21, halving export transformation elasticities for all regions	
Production Factors Elasticities		
Sim21-prh	Sim21, doubling factors substitution elasticities for all regions	
Sim21-prl	Sim21, halving factors substitution elasticities for all regions	
	SADC Side	**EU Side**
Labour Market Closure Rule		
Sim21-lun	Sim21, flexible unskilled labour supply in all SADC regions	Sim21
Phase2: Liberalization Degree and Coverage		
Sim21-asy	Removing 60 percent of the applied tariff rates on imports from the EU by all SADC regions	Sim21
Sim21-eus	Sim21	Sim21, except tariffs on sugar imports from all SADC regions

The following two scenarios (Sim21-xph, Sim21-xpl) assume higher and lower values of export elasticities. Likewise the first two scenarios, each change is done simultaneously for both the elasticities of transformation between domestic supply and exports and the elasticities of transformation between exports to different destinations keeping the 'rule of two' valid on the export supply side.

It is reasonable to expect greater (smaller) welfare impacts with the higher (lower) values of trade elasticities. Higher trade elasticities mean greater responsiveness of quantity traded to changes in prices for tradable sectors. In this general equilibrium framework, changes in quantity supplied and demanded and, hence, price changes for all sectors become also more pronounced. Therefore, the generated trade creation as well as diversion effects and allocation efficiency are stronger under the higher trade elasticities.

Two scenarios adopt higher and lower values of elasticities of substitution between production factors, Sim21-prh, Sim21-prl. The elasticity values at the second level of the production function[67] are set to be double their initial values (Sim21-prh) and then half their initial values (Sim21-prl). It is worth noting here that Sim21-prl implies factor markets rigidity by assuming low substitutability between production factors.

Tables 6-12 and 6-13 show that the generated impacts in the four beneficiary regions ('Rest of SACU', Zimbabwe, Mauritius and Malawi) are more pronounced under the alternative trade elasticities. This is particularly the case for the import substitution elasticities. The higher import elasticities considerably raise welfare gains in 'Rest of SACU' and Zimbabwe. The generated changes in imports and exports for the four regions are almost doubled under the higher import elasticities, whereas they are halved under the lower import elasticities. Interestingly, the accrued terms of trade gains by 'Rest of SACU' become slightly smaller under the higher import elasticities and significantly stronger under the higher export elasticities. Results on factor market adjustment (Table 6-14) support the same finding. The required degree of adjustment for the four beneficiary regions ('Rest of SACU', Zimbabwe, Mauritius and Malawi) is larger under the higher trade elasticities and vice versa. Once again, results are particularly sensitive to variations in import elasticities. Results for all other SADC regions do not show substantial changes under the alternative trade elasticities.

A comparison of welfare and trade results generated under alternative factor substitution elasticities with the main simulation results does not reveal any substantial differences. However, results on factors adjustment show that the required adjustment for the four beneficiary regions is slightly greater, the higher the

[67] Table A4-5 presents elasticity of substitution between production factors.

production factor substitutability and vice versa. Overall, the simulation results are robust to variations in the factor substitution elasticities.

Table 6-12: Sensitivity Analysis Phase1: Welfare and Terms of Trade Impact

(Percentage change)

	Sim21	Sim21-mph	Sim21-mpl	Sim21-xph	Sim21-xpl	Sim21-prh	Sim21-prl	Sim21-lun
	Total Absorption							
BWA	0.8	0.8	0.6	1.1	0.6	0.8	0.7	1.5
MDG	0.3	0.2	0.2	0.4	0.2	0.2	0.3	0.7
MWI	0.6	0.5	0.5	0.9	0.1	0.5	0.6	1.6
MUS	4.3	3.6	4.2	4.6	3.7	4.3	4.2	7.6
MOZ	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	0.1
ZAF	0.0	0.2	-0.1	0.0	0.0	0.0	0.0	0.3
TZA	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.1
ZMB	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.3
ZWE	4.9	7.9	2.6	5.8	3.7	4.7	5.2	5.5
XSC	8.1	14.4	3.9	12.3	4.1	7.9	8.3	9.6
XSD	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.1
	Terms of Trade							
BWA	0.5	0.0	0.8	0.9	0.4	0.6	0.5	0.4
MDG	0.1	0.0	0.2	0.3	0.0	0.1	0.2	0.0
MWI	0.9	0.0	1.1	1.6	-0.1	0.9	0.9	0.5
MUS	2.9	1.8	3.5	3.4	1.9	3.0	3.0	1.9
MOZ	-0.2	-0.3	-0.1	-0.3	0.0	-0.1	-0.2	-0.2
ZAF	-0.3	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3
TZA	-0.1	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.2
ZMB	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0
ZWE	5.3	5.4	3.3	6.8	3.2	4.9	5.6	5.2
XSC	4.5	2.5	3.3	9.1	0.8	4.5	4.5	4.1
XSD	-0.3	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3	-0.3

Table 6-13: Sensitivity Analysis Phase1: Total Trade Impact

(Percentage change)

	Sim21	Sim21-mph	Sim21-mpl	Sim21-xph	Sim21-xpl	Sim21-prh	Sim21-prl	Sim21-lun
	Total Imports							
BWA	1.8	1.9	1.4	3.4	0.8	1.7	1.8	2.3
MDG	1.4	1.4	1.1	1.8	1.0	1.3	1.4	1.7
MWI	7.5	12.3	4.0	8.1	6.4	6.9	7.9	8.2
MUS	10.8	11.7	8.7	11.6	9.5	12.1	9.7	13.4
MOZ	0.6	0.2	0.6	0.6	0.6	0.6	0.5	0.7
ZAF	1.8	2.7	1.2	2.4	1.3	1.8	1.8	2.1
TZA	1.1	1.3	0.8	1.6	0.8	1.1	1.2	1.2
ZMB	0.4	-0.2	0.6	0.7	0.1	0.2	0.6	0.6
ZWE	11.4	21.2	5.2	12.5	9.4	12.1	11.0	11.8
XSC	25.9	62.8	8.0	36.1	16.0	25.8	25.8	27.0
XSD	0.5	0.6	0.4	0.7	0.4	0.7	0.5	0.6
	Total Exports							
BWA	-0.9	-1.4	-0.4	-0.5	-1.0	-1.2	-0.7	-0.3
MDG	0.3	0.5	0.3	0.4	0.3	0.3	0.3	0.7
MWI	10.2	18.0	4.9	10.4	9.8	9.5	10.9	11.8
MUS	4.2	5.8	2.9	4.8	3.6	5.6	3.4	7.6
MOZ	0.9	0.6	0.9	1.1	0.7	0.9	0.9	1.1
ZAF	1.7	2.0	1.4	2.3	1.2	1.7	1.7	2.0
TZA	2.0	2.5	1.5	2.8	1.4	2.0	2.1	2.3
ZMB	0.0	-1.0	0.4	0.3	-0.3	-0.1	0.1	0.2
ZWE	2.9	6.5	1.3	2.9	2.7	4.2	2.0	3.4
XSC	8.4	25.5	1.5	11.2	5.6	8.5	7.9	9.6
XSD	0.9	1.0	0.7	1.1	0.8	1.1	0.8	0.9

Note: Percentage changes are calculated based on figures valued at baseline world prices.

Table 6-14: Sensitivity Analysis Phase1: Factor Adjustment

(Percent)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Sim21										
Land	9.9	0.7	4.6	21.3	0.2	0.9	0.3	2.1	39.8	21.1	0.3
UnSkLab	3.3	0.7	3.6	13.5	0.3	0.2	0.2	1.0	9.7	13.2	0.4
SkLab	0.9	0.3	2.0	2.6	0.2	0.1	0.2	0.2	2.4	5.5	0.1
Capital	2.2	0.5	4.5	6.9	0.3	0.2	0.2	0.6	7.5	15.2	0.4
	Sim21-mph										
Land	14.6	0.7	9.1	26.9	0.4	2.4	0.3	3.0	66.6	41.6	0.4
UnSkLab	4.9	0.7	6.6	15.9	0.5	0.4	0.2	1.9	18.1	28.3	0.5
SkLab	1.3	0.3	3.9	3.3	0.3	0.1	0.2	0.4	4.4	12.4	0.2
Capital	3.0	0.5	8.3	8.9	0.5	0.4	0.2	1.1	14.1	32.4	0.5
	Sim21-mpl										
Land	5.4	0.5	1.8	14.7	0.1	0.3	0.2	1.0	15.6	7.5	0.2
UnSkLab	1.7	0.5	1.6	9.2	0.1	0.1	0.1	0.4	3.5	4.2	0.2
SkLab	0.4	0.2	0.8	1.7	0.1	0.1	0.1	0.1	1.0	1.7	0.1
Capital	1.3	0.4	2.0	4.6	0.1	0.1	0.1	0.2	2.7	4.5	0.4
	Sim21-xph										
Land	13.0	1.3	4.6	20.9	0.2	0.9	0.4	2.5	41.7	21.4	0.4
UnSkLab	4.8	1.2	3.6	13.0	0.3	0.2	0.3	1.1	10.1	15.5	0.4
SkLab	1.3	0.5	2.1	2.5	0.2	0.1	0.2	0.3	2.5	6.5	0.2
Capital	3.2	0.9	4.7	6.5	0.3	0.2	0.2	0.6	7.8	17.8	0.4
	Sim21-xpl										
Land	6.8	0.4	4.6	21.7	0.2	0.9	0.2	1.5	36.4	19.5	0.2
UnSkLab	2.0	0.4	3.5	14.1	0.2	0.2	0.1	0.9	8.9	10.3	0.3
SkLab	0.5	0.1	2.0	2.8	0.1	0.1	0.1	0.2	2.3	4.2	0.1
Capital	1.4	0.3	4.3	7.5	0.3	0.2	0.2	0.5	7.0	11.9	0.4

Table 6-14 (cont.)

(Percent)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Sim21-prh										
Land	11.0	0.7	4.6	21.9	0.1	0.9	0.3	2.0	38.9	18.8	0.3
UnSkLab	4.0	0.7	3.7	18.9	0.3	0.2	0.2	1.2	10.1	13.8	0.4
SkLab	1.0	0.3	2.0	3.3	0.2	0.1	0.2	0.2	2.6	5.7	0.1
Capital	3.1	0.5	4.5	9.3	0.3	0.2	0.2	0.6	7.9	16.0	0.6
	Sim21-prl										
Land	9.0	0.8	4.5	21.3	0.2	0.9	0.3	2.1	40.8	25.0	0.4
UnSkLab	2.9	0.7	3.6	8.8	0.2	0.2	0.2	0.9	9.4	12.8	0.3
SkLab	0.8	0.3	2.1	2.0	0.2	0.1	0.2	0.3	2.3	5.2	0.1
Capital	1.9	0.5	4.7	5.0	0.3	0.2	0.2	0.5	7.2	14.4	0.3
	Sim21-lun										
Land	10.0	0.6	4.3	21.0	0.2	0.9	0.3	2.0	39.6	20.8	0.3
UnSkLab	2.9	0.7	4.0	10.4	0.4	0.5	0.3	0.8	9.5	13.8	0.5
SkLab	0.8	0.3	1.9	2.6	0.2	0.1	0.1	0.3	2.4	5.3	0.1
Capital	2.3	0.6	4.5	6.9	0.3	0.2	0.2	0.6	7.5	15.0	0.4

6.5.1.2 Labour Market Closure Rule

This sub-section examines the results sensitivity to the unskilled labour market closure rule. Under this sensitivity scenario (Sim21-lun) the full employment assumption is *ceteris paribus* relaxed for the unskilled labour markets in all SADC regions. Unskilled labour real wages are specified to be fixed at their baseline rates whereas employment levels are determined endogenously to reflect abundant supply of unskilled workers who are willing to offer their services at the prevailing wage rates in all SADC regions.

As reported in Table 6-12, welfare gains are slightly stronger whereas terms of trade improvements are weaker for almost all SADC regions. Changes in trade (Table 6-13) become more pronounced. Allowing for unemployment of unskilled labour in SADC regions implies more pronounced changes in the output structure and, hence, trade flows after the simulated tariff cuts. Therefore, efficiency gains and the associated changes in real trade figures are stronger while terms of trade changes are proportionally less. Interestingly, results on factor market adjustment (Table 6-14) do not show substantial differences. The flexibility of unskilled labour supply is effectively restricted by factor substitution elasticities and, maybe more importantly, by the limited supply of other production factors that are fully employed.

6.5.2. Sensitivity to the Liberalization Degree and Coverage

6.5.2.1 Asymmetric Liberalization

This sensitivity scenario (Sim21-asy) assumes asymmetric trade liberalization between SADC regions and the EU. All SADC regions employ 60 percent cut of the applied tariff rates on their imports from the EU whereas the EU eliminates all the applied tariffs on imports from SADC.

Results from this sensitivity scenario (as shown in Tables 6-15 and 6-16) are quite similar to the main simulation results. Welfare and terms of trade losses for some regions (i.e. Mozambique, South Africa, Tanzania, Zambia and 'Rest of SADC') are slightly less. This means that the regions that lose from liberalizing trade with the EU might have reasons to prefer asymmetric over symmetric liberalization module. Figures on the required factor adjustment (Table 6-17) under symmetric and asymmetric liberalization scenarios are almost identical for all SADC regions.

Table 6-15: Sensitivity Analysis Phase2: Welfare and Terms of Trade Impact

(Percentage change)

	Sim21	Sim21-asy	Sim21-eus	Sim21	Sim21-asy	Sim21-eus
	Total Absorption			**Terms of Trade**		
BWA	0.8	0.7	0.9	0.5	0.4	0.9
MDG	0.3	0.3	-0.1	0.1	0.2	-0.2
MWI	0.6	0.6	-0.1	0.9	0.9	-0.2
MUS	4.3	4.7	-0.6	2.9	3.2	-0.8
MOZ	-0.1	0.0	-0.1	-0.2	-0.1	-0.3
ZAF	0.0	0.1	-0.1	-0.3	-0.1	-0.3
TZA	-0.1	0.0	-0.1	-0.1	0.0	-0.4
ZMB	0.0	0.1	-0.1	0.1	0.1	-0.3
ZWE	4.9	5.1	-0.3	5.3	5.3	-0.2
XSC	8.1	8.1	2.2	4.5	4.5	0.9
XSD	-0.3	-0.2	-0.2	-0.3	-0.3	-0.2

Table 6-16: Sensitivity Analysis Phase1: Total Trade Impact

(Percentage change)

	Sim21	Sim21-asy	Sim21-eus	Sim21	Sim21-asy	Sim21-eus
	Total Imports			**Total Exports**		
BWA	1.8	1.7	2.2	-0.9	-0.8	-0.8
MDG	1.4	1.0	0.9	0.3	-0.1	1.0
MWI	7.5	7.2	0.6	10.2	9.7	1.2
MUS	10.8	9.7	3.1	4.2	2.7	4.2
MOZ	0.6	0.3	0.5	0.9	0.4	1.0
ZAF	1.8	1.4	1.6	1.7	1.1	1.8
TZA	1.1	0.9	0.6	2.0	1.4	1.6
ZMB	0.4	0.1	0.5	0.0	-0.4	0.9
ZWE	11.4	11.1	0.7	2.9	2.3	1.3
XSC	25.9	25.7	5.9	8.4	8.2	0.7
XSD	0.5	0.3	0.6	0.9	0.6	0.9

Note: Percentage changes are calculated based on figures valued at baseline world prices.

Table 6-17: Sensitivity Analysis Phase2: Factor Adjustment

(Percent)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Sim21										
Land	9.9	0.7	4.6	21.3	0.2	0.9	0.3	2.1	39.8	21.1	0.3
UnSkLab	3.3	0.7	3.6	13.5	0.3	0.2	0.2	1.0	9.7	13.2	0.4
SkLab	0.9	0.3	2.0	2.6	0.2	0.1	0.2	0.2	2.4	5.5	0.1
Capital	2.2	0.5	4.5	6.9	0.3	0.2	0.2	0.6	7.5	15.2	0.4
	Sim21-asy										
Land	9.9	0.7	4.8	21.1	0.2	0.8	0.3	2.0	39.6	21.1	0.3
UnSkLab	3.3	0.7	3.6	13.4	0.3	0.2	0.2	1.1	9.7	13.2	0.2
SkLab	0.8	0.3	2.0	2.7	0.1	0.1	0.1	0.2	2.4	5.5	0.1
Capital	2.2	0.5	4.5	7.0	0.3	0.2	0.2	0.6	7.5	15.2	0.3
	Sim21-eus										
Land	10.1	0.1	0.6	0.4	0.0	0.3	0.1	0.1	0.5	10.3	0.1
UnSkLab	3.3	0.1	0.3	1.2	0.1	0.2	0.1	0.1	0.4	3.2	0.3
SkLab	0.9	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	1.2	0.2
Capital	2.2	0.1	0.3	1.2	0.2	0.2	0.1	0.1	0.4	2.7	0.4

6.5.2.2 Partial Liberalization Coverage

Regarding sensitivity with respect to liberalization coverage, this scenario (Sim21-eus) excludes sugar from the EU liberalization schedule. A comparison of this scenario results with Sim21 results (Tables 6-15 and 6-16) indicates high sensitivity to this alternative liberalization coverage. Under this sensitivity scenario, almost all SADC regions experience welfare losses and deteriorations in their terms of trade. The previously reported welfare and terms of trade gains for 'Rest of SACU' become significantly less. Only Botswana experiences slightly higher welfare and terms of trade gains. Changes in trade figures for the beneficiary regions ('Rest of SACU', Zimbabwe, Mauritius and Malawi) are significantly smaller. Table 6-17 shows minor degrees of factor adjustment; less than 1 percent of production factors have to move across activities in almost all SADC regions. Factor adjustment that would have taken place in 'Rest of SACU' under the full coverage liberalization scenario is significantly less after the sugar exclusion. Factor adjustment for Botswana is almost the same under this scenario. These results support the main finding derived from the simulation scenarios that the experienced welfare gains are primarily driven by removing trade barriers to SADC sugar exports to the EU markets.

6.6 Conclusions

Under the "SADC-EPA Group" scenario, 'Rest of SACU' is the main winner. This scenario generates moderate welfare gains for Botswana and South Africa and welfare losses for Mozambique. "SADC-EPA Group" is disadvantageous to Mozambique unless barriers to its intra-SADC trade are removed simultaneously. The other SADC regions not directly involved in this scenario lose and the biggest welfare loss is reported for Mauritius.

"All SADC Regions" is welfare-improving for many SADC regions: 'Rest of SACU', Zimbabwe, Mauritius, and, to a lesser extent, Botswana, Malawi, Mozambique, South Africa and Madagascar. Besides, Malawi, Mauritius and Zimbabwe are outstandingly better off under this comprehensive scenario compared to the "SADC-EPA Group" scenario. For ‘Rest of SACU’, the “All SADC Regions” scenario is less advantageous compared to the “SADC-EPA Group” scenario.

SADC preferential access to the EU markets is the key source for the reported welfare and terms of trade gains under both EPA scenarios. Reducing tariffs on SADC imports from the EU yields small negative welfare impact on SADC regions. Whenever the former favourable effects offset the latter adverse effects, regions experience welfare gains, i.e. ‘Rest of SACU’, Zimbabwe, Mauritius, Malawi and Botswana.

Reciprocal trade liberalization with the EU neither stimulates exports nor provides export opportunities in the EU markets for most SADC members. Opening SADC markets to the EU products boosts SADC imports from the EU whereas the EU tariff removal stimulates exports to the EU by only ‘Rest of SACU’, under the “SADC-EPA Group” scenario, and by a few regions (i.e. ‘Rest of SACU’, Zimbabwe, Malawi, and, to a lesser extent, Mauritius and Zambia) under the comprehensive scenario.

7 Comparative Assessment of the Alternative Scenarios to the EU-SADC EPAs

7.1 Introduction

According to the WTO waiver for the Cotonou preferences, the EU was allowed to provide non-reciprocal preferences until December 2007, and thereafter EU-ACP trade should be based on reciprocal preferences in compliance with the WTO rules, particularly Article XXIV of the GATT. Therefore, the *status quo* for SADC-EU trade (i.e. the EU-ACP Cotonou Agreement) is no longer legally sustainable.

From this perspective, the impact of the EU-SADC EPAs cannot be properly grasped without conducting comparative analyses with the impact generated under their WTO-compatible trade alternatives. The consequences of the EU-SADC EPAs should be assessed in comparison with the corresponding consequences that might take place in the case of not signing final EPAs.

This chapter aims to examine the possible ways for different SADC members to liberalize their trade with the EU in the case of not agreeing on final EPAs. The underlying research question is whether these alternatives are preferable for SADC members to the EU-SADC EPAs.

Different alternatives to the EU-SADC EPAs are simulated and their implications for individual SADC members are examined.[1] As described in detail in Chapter 2, in the case of not signing final EPAs, SADC-EU trade should be governed by the alternative constitutional framework, i.e. the 'Enabling Clause'. This in practice means that the SADC LDCs maintain their current EU-EBA initiative whereas the SADC non-LDCs switch to the EU-GSP. South Africa is the only exception since it has already a WTO-compatible FTA with the EU, i.e. the EU-South Africa TDCA. In addition to these alternative trade arrangements, the EU sugar reforms and trade liberalization as well

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[1] I have presented the bulk of the results generated under this phase of simulation scenarios at the 14th Annual Conference on Global Economic Analysis - "Governing Global Challenges: Climate Change, Trade, Finance and Development", June 2011, Venice. See Osman (2011).

as the Doha Round are simulated to examine their implications for the assessment of the EU-SADC EPAs.

The rest of the chapter is structured as follows. Section 7.2 explains the importance, scope and limitations of the analysis. Section 7.3 describes the design of the simulation experiments. Section 7.4 provides comparative analyses of the simulation findings. The next two sections conclude the findings by ranking the different trade arrangements for individual SADC members (Section 7.5) and by presenting the patterns of gains and losses under each of the examined trade arrangements (Section 7.6). Finally, Section 7.7 provides the chapter's main conclusions. Like the preceding chapter, results at the aggregate level are displayed in the main text of the chapter whereas detailed display of the sectoral results is provided by Appendix to Chapter 7 at the end of the thesis.

7.2 Relevance, Scope and Limitations of the Analysis

An impact analysis of the alternatives to the EU-SADC EPAs is particularly relevant for SADC regions. SADC includes two groups of economies (i.e. SADC LDCs and SADC non-LDCs); each is eligible for a different preferential trade arrangement.

Table 7-1 portrays the trade preferential arrangement for which each SADC member is eligible, and the simulated trade regime for each SADC region. The eight SADC LDCs are represented in the GTAP7 database by six separate regions: Madagascar, Malawi, Mozambique, Tanzania, Zambia and 'Rest of SADC' (i.e. Angola and D.R. Congo) whereas Lesotho is part of 'Rest of SACU' region.[2] The seven SADC non-LDCs members are represented in GTAP7 by four separate regions (i.e. Botswana, Mauritius, South Africa and Zimbabwe) and Namibia and Swaziland are part of 'Rest of SACU' region.[3]

In the case of not signing final EPAs with the EU, the SADC LDCs could continue benefiting from the EU-EBA initiative granted to all LDCs. The alternative

[2] Due to data restrictions, Lesotho is represented in GTAP7 as part of the 'Rest of SACU' region, along with Namibia and Swaziland. Thus, this region is modelled as a non-LDC developing region. This, however, is not expected to affect the results.

[3] As for the preceding chapter, Seychelles is not included in these scenarios. Seychelles is the only SADC member that is not a WTO member and, thereby, is not accorded MFN treatment.

arrangement for the SADC non-LDCs is the EU-GSP which entails a deterioration in their preferential access to the EU markets granted under the Cotonou Agreement.[4] This per se might mean wider preferential access for the SADC LDCs vis-à-vis the SADC non-LDCs. Furthermore, completing the EU-EBA means improving market access for SADC LDCs trade without being committed to open their markets to EU exports in return.

Switching to the GSP tariffs also means less preferential margins for SADC non-LDCs vis-à-vis other non-ACP developing countries. This is of particular concern for SADC non-LDCs exports that are expected to face very high competition in the EU markets by Chinese and Indian products.

This comparative case is interesting, bearing in mind that the results derived from the first simulation phase indicate that the main winners from liberalizing trade within the EPA framework are mainly the SADC non-LDCs. By removing barriers to trade for all SADC members, the SADC LDCs preferential access to the EU markets, granted under the EU-EBA initiative, is eroded. SADC LDCs exports face high competition with corresponding exports from the SADC non-LDCs in the EU markets. Thus, the questions are to what extent this preference erosion for SADC LDCs differs under the alternatives to the EU-SADC EPA and how this influences the accrued gains for SADC non-LDCs.

The purpose of this simulation phase is to compare the EU-SADC EPAs with other alternative arrangements for SADC-EU trade. In other words, it examines the EU-SADC EPAs impacts vis-à-vis impacts generated under other trade arrangements for SADC members. Assessing the impacts of these alternatives themselves is, however, beyond the focus of this study.

Not signing final EPAs with SADC members does not necessarily mean that the EU negotiations with the other ACP states fail. Therefore, the simulation design is limited to the alternatives to the EU-SADC EPAs and does not consider the alternatives to the EU EPAs with the other ACP states.[5]

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[4] Seychelles' application to become a GSP+ beneficiary was rejected by the EC since Seychelles does not meet some of the required conditions (e.g. labour, human rights and environmental conditions).

[5] Some non-SADC ACP states (e.g. Mongolia, Venezuela and Sri Lanka) are eligible for the EU-GSP+.

Table 7-1: Trade Preferential Regime by Region

Model Region	Country	Region Classification	Trade Preferences	
			Preferential Regime	Simulated Regime
BWA	Botswana	Non-LDC Developing Region	GSP	GSP
MDG	Madagascar	LDC Region	EBA	EBA
MWI	Malawi	LDC Region	EBA	EBA
MUS	Mauritius	Non-LDC Developing Region	GSP	GSP
MOZ	Mozambique	LDC Region	EBA	EBA
TZA	Tanzania	LDC Region	EBA	EBA
ZAF	South Africa	Non-LDC Developing Region	TDCA	TDCA
ZMB	Zambia	LDC Region	EBA	EBA
ZWE	Zimbabwe	Non-LDC Developing Region	GSP	GSP
Lesotho	XSC	Non-LDC Developing	EBA	GSP
Namibia			GSP	
Swaziland			GSP	
Angola	XSD	LDC Region	EBA	EBA
Congo, D.R.			EBA	
Seychelles	Included in SSA	Included in SSA	GSP	Not simulated
Model Region	**Country**	**Region Classification**	**Weights for Composite Regions**	
EU	EU – 27 members	Developed Region		
USA	'United States of America'	Developed Region		
EAS	'East Asia'	Developing/Developed Region	23:77	
SAS	'Southeast and South Asia'	Developing/Developed Region	90:10	
SSA	'Rest of Sub-Saharan Africa'	LDC/Developing Region	70:30	
ROW	'Rest of the World'	Developing/Developed Region	51:49	

The reason for this is twofold. Firstly, this approach ensures comparability of the results with those derived from the first phase of simulation that only considers the EU-SADC EPAs without reflecting on the EU EPAs with other ACP states. Secondly, this simulation design aims to isolate the impact of the EU-SADC trade arrangements from the feedback effects generated by the EU trade arrangements with third parties on SADC trade.

Two limitations are valid here. Firstly, the analysis omits the potential effects on SADC non-LDC exports to the EU markets driven by completing the EU-EBA arrangements for non-SADC LDC exporters. Secondly, it does not consider the potential effects on SADC non-LDCs induced by raising the applied tariffs faced by the other ACP non-LDCs in the EU markets to the GSP tariffs. While the former means that the analysis overestimates the SADC non-LDCs preferential access to the EU markets (vis-à-vis non-SADC LDCs), the latter implies underestimating their preferential access (vis-à-vis other ACP non-LDCs) to the EU markets.

7.3 Simulation Description

In line with the objective of this simulation phase, three scenarios are designed, as portrayed in Table 7-2. In the case of not signing final EPAs, three alternative preferential arrangements will organize SADC-EU trade. These alternatives are the EU-EBA (for SADC LDCs), the EU-GSP (for SADC non-LDCs) and the EU-South Africa TDCA (for South Africa).

As the outcome of comparisons between EPAs and its alternatives might be affected by other potentially crucial policy changes with respect to SADC-EU trade beyond 2004, the EU sugar reforms and trade liberalization in addition to a complete Doha Round are taken into account in two additional scenarios. Detailed description for each of these scenarios is provided in the following sub-sections.

All scenarios, including the baseline scenarios, assume full SADC-FTA. The SADC-FTA is the most likely scenario for intra-SADC integration taking into consideration that the complex pattern of trade arrangements lessens the possibility of SADC-CUs.

7.3.1. Alter: "EBA, GSP and TDCA"

The first scenario "EBA, GSP and TDCA" represents the alternatives to the two SADC groups of economies (LDCs and non-LDCs excluding South Africa) as well as South Africa. This scenario is composed of three components (i.e. Alter-SADC_EBA, Alter-SADC_GSP and Alter-SA_TDCA) each represents a different trade arrangement depending on the SADC members involved. The first two components of the scenario represent non-reciprocal preferential trade arrangements whereas the last one simulates reciprocal asymmetric trade liberalization. Therefore, neither groups of economies (SADC LDCs and SADC non-LDCs excluding South Africa) has to open its markets to the EU exports. In other words, no tariff change is simulated on the SADC side under Alter-SADC_EBA and Alter-SADC_GSP.

7.3.1.1 Alter-SADC_EBA

In the case of completing the SADC-EBA arrangements (Alter-SADC_EBA), the EU eliminates tariffs on all imports from the SADC LDCs. The only exception is sugar imports that was planned to be multilaterally liberalized in conjunction with other reform measures under the EU sugar reforms.

7.3.1.2 Alter-SADC_GSP

Regarding GSP (Alter-SADC_GSP), the applied tariffs on imports from SADC non-LDCs are adapted to the GSP tariff rates. In order to keep quota-tariff equivalents for sensitive sectors valid, the EU tariff rates on imports of sugar (from all SADC regions), 'meat and dairy products' (from Botswana and 'Rest of SACU') and rice and grains (from Mauritius) are kept at their baseline rates.

7.3.1.3 Alter-SA_TDCA

As discussed in Chapter 2, the TDCA-FTA between the EU and South Africa imposes reciprocal asymmetric trade liberalization. South Africa eliminates tariffs on only 86 percent of imports from the EU whereas the EU eliminates tariffs on 95 percent of imports from South Africa. Sensitive sectors include textiles and clothing products and motor vehicles for South Africa, and mainly agricultural products for the EU.

Table 7-2: Simulation Scenarios

Scenario Title	Scenario Code		Scenario Description: SADC Side	Scenario Description: EU Side
Baseline scenario: EU-SADC EPAs	**Full EPA**		Cutting the applied tariff rates on imports from the EU by all SADC regions by 90 percent Eliminating all the applied tariffs on intra-SADC trade	Eliminating all the applied tariffs on imports from all SADC members
Simulation scenario: EBA, GSP and TDCA	**Alter**	Alter-SADC_ EBA	Eliminating all the applied tariffs on intra-SADC trade	Eliminating all the applied tariffs on imports from Madagascar, Malawi, Mozambique, Tanzania, Zambia and 'Rest of SADC' Keeping tariffs on sugar imports at their baseline rates
		Alter-SADC_ GSP	Eliminating all the applied tariffs on intra-SADC trade	Applying the GSP tariff rates on imports from Botswana, Mauritius, Zimbabwe and 'Rest of SACU' Keeping tariffs on sugar imports at their baseline rates Keeping tariffs on 'meat and dairy products' (from Botswana & 'Rest of SACU') and rice and grains (from Mauritius) at their baseline rates
		Alter-SA_TDCA	Eliminating tariffs on 85% of South Africa imports from the EU, i.e. removing tariffs on all imports except textiles & applying a 40% tariff cut on vehicle imports Eliminating all the applied tariffs on intra-SADC trade	Eliminating tariffs on 94.7% of the EU imports from South Africa, i.e. removing tariffs on all imports except rice, grains, sugar, beverages, 'food products' and 'meat and dairy products'

Table 7-2 (cont.)

Scenario Title	Scenario Code	Scenario Description	
		SADC Side	EU Side
Baseline scenario: EU-SADC EPAs with the EU Sugar Reforms	**Full EPA_Sug**	Full EPA	Full EPA Eliminating tariffs on the EU sugar imports from all regions Eliminating subsidies for the EU sugar exports to all regions Eliminating the EU sugar domestic subsidies
Simulation scenario: EBA, GSP and TDCA with the EU Sugar Reforms	**Alter_Sug**	Alter	Alter Eliminating tariffs on the EU sugar imports from all regions Eliminating subsidies for the EU sugar exports to all regions Eliminating the EU sugar domestic subsidies
Baseline scenario: EU-SADC EPAs with the EU Sugar Reforms and Doha Round	**Full EPA_Sug & Doha***	Full EPA_Sug	Full EPA_Sug Doha round tariff cuts and reductions in agricultural production subsidies
Simulation scenario: EBA, GSP and TDCA with the EU Sugar Reforms and Doha Round	**Alter_Sug & Doha***	Alter	Alter_Sug Doha round tariff cuts and reductions in agricultural production subsidies

* Specification of Doha Round is described in detail in Table 7-3 below.

According to this background, this component of the scenario (Alter-SA_TDCA) represents asymmetric liberalization between the EU and South Africa and excludes sensitive sectors from the simulated tariff removal. For South Africa, textile imports from the EU are exempted from trade liberalization whereas vehicle imports are partially liberalized, i.e. tariff cut by 40 percent. On the EU side, the sensitive sectors are mainly agricultural, i.e. rice, grains, sugar, beverages, ‘food products’ and ‘meat and dairy products’. The EU tariffs on these imports from South Africa, which account for 5 percent of EU total imports from South Africa, are kept at their baseline rates.

The *status quo ante* (i.e. the initial EU-ACP Cotonou preferences) is no longer legally tenable. Therefore, a counterfactual scenario is designed to simulate the stylized "EU-SADC EPAs" with full SADC-FTA. The inclusion of SADC-FTA ensures consistent comparative analysis between the three alternative scenarios and the counterfactual scenario.[6]

7.3.2. Alter_Sug: "EBA, GSP and TDCA with the EU Sugar Reforms"

The second scenario "EBA, GSP and TDCA with the EU Sugar Reforms" represents the case in which the previous trade arrangements (EBA, GSP and TDCA) are implemented simultaneously with the EU sugar reforms. The results derived by the first phase of simulation highlight the importance of the EU sugar market for some SADC countries. It is, thus, essential to undertake a thorough examination of the incremental impact of applying the EU reforms for sugar industry and trade. Sugar trade liberalization is one of the most contentious topics during the EU negotiations with ACP countries. Therefore, it is more likely for sugar trade to be liberalized on a multilateral, rather than regional, basis.

As we saw in Chapter 2, the EC initiative for sugar reforms deals with both interventions in domestic markets and preferential trade arrangements. Cuts in the EU intervention sugar price were scheduled for 2006/07 (20 percent), 2007/08 (27.5 percent), 2008/09 (35 percent) and 2009/10 (36 percent). These price cuts effectively lessen the price wedge between world and domestic prices and, thereby, were envisaged to be reflected in reduced export subsidies. In addition, the reforms include simplifying the EU system of production quotas as well as improving market access for preferential sugar trade. The latter includes reducing import tariffs and phasing out TRQs.

This scenario represents completing the EU sugar trade liberalization and reforms, Table 7-2. It simulates full elimination of the EU tariffs on sugar imports from all regions. The scenario, therefore, serves to measure the full magnitude of the potential preference erosions for SADC in the EU sugar market. Furthermore, subsidies on the

[6] The "EU-SADC EPAs" scenario (i.e. Full EPA) is the scenario labelled "All SADC Regions" under "Full Intra-SADC Trade Liberalization" simulation set (i.e. Sim22) in Chapter 6.

EU sugar exports and domestic production (both factor usage subsidies and output subsidies) are fully eliminated. Removing barriers to EU sugar trade and eliminating production subsidies implies lessening the wedges between sugar world price and the EU domestic price. Due to data restrictions and model limitations, the cuts in the EU price intervention are not directly simulated by this scenario and, accordingly, are not fully transmitted into changes in domestic price.[7] A comprehensive analysis of the EU sugar reforms is not the focus of this study.[8]

The benchmark scenario for a meaningful comparison is in this case a scenario that includes the stylized "EU-SADC EPAs" with full SADC-FTA plus the EU sugar reforms as specified above.

7.3.3. Alter_Sug & Doha: "EBA, GSP and TDCA with the EU Sugar Reforms and Doha Round"

The final scenario "EBA, GSP and TDCA with the EU Sugar Reforms and Doha Round" aims to explore whether a successful completion of the Doha Round would affect the comparison between EPA and its alternative.

Based on the Doha draft modality revisions,[9] this scenario accounts for market access commitments (regarding agricultural and non-agricultural products), phasing out agricultural export subsidies by developed countries and reductions in domestic support for agricultural production. The scenario distinguishes between different groups of WTO members (e.g. net food-importing developing countries (NFIDCs) versus non-LDC developing countries) and different groups of products (e.g. products not included in the Agreement on Agriculture (NAMA) versus agricultural products) as well as other details described in the Doha draft modality revisions.[10]

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[7] In their study on the CAP reforms, van Meijl and van Tongeren (2002) employ an endogenous price transmission mechanism from the intervention price to the market price within the GTAP model.

[8] A recent Ph.D. thesis on the implications of the EU sugar reforms for poverty reduction in ACP countries is undertaken by Facello (2008).

[9] The Doha draft modality revisions are documented in World Trade Organization (2008a) and World Trade Organization (2008b).

[10] The scenario does not, however, consider some elements of the Doha Round. These include barriers to trade in services, trade facilitation, intellectual property rights and movements of natural resources. This entails that the simulation results omit (or underestimate) some of the potential gains from a complete Doha Round implementation.

It is worth highlighting here that this scenario takes into account the potential erosion for SADC non-LDC preferences in the EU markets as simulated by the first scenario; Alter. Furthermore, it considers completing the EU sugar liberalization and reforms as represented by the second scenario; Alter_Sugar. It also examines the effect of potential preference erosion driven by the conclusion of the Doha Round of trade negotiations. Reducing the MFN bound tariffs means preference erosion for both SADC LDC and non-LDC members.

7.3.3.1 Tariff Cuts

The planned tariff cuts according to the Doha Round are conducted on the basis of the MFN bound rates. This scenario, however, implements the tariff reductions on the applied tariff rates. The underlying assumption is that the planned cuts in bound tariffs entail proportional cuts in the applied tariff rates. In other words, the ratios of bound to applied tariffs (i.e. the 'binding overhang' ratios) are kept fixed.[11]

Regarding agriculture, a tiered formula is used to cut the applied tariffs on agricultural imports by non-LDC developing countries as well as developed countries. This formula ensures larger cuts in higher tariffs and vice versa, Table 7-3.

For NAMA products, which correspond to the manufacturing sectors including fish and forestry products as well as fuels and mining products, the following Swiss Formula[12] for tariff cuts is implemented.

$$NTR^{r}_{c,w} = \frac{\left(A * OTR^{r}_{c,w}\right)}{\left(A + OTR^{r}_{c,w}\right)}$$

where $NTR^{r}_{c,w}$ and $OTR^{r}_{c,w}$ are the new and old bound tariff rates imposed by region r on imports c from partner w, and A is the agreed ceiling for the tariff rate.

[11] The term 'binding overhang' is assigned by Francois and Martin (2003). For a CGE-based study on the Doha Round and the binding overhangs in the pre-Doha tariff schedules, see Willenbockel (2009).

[12] This non-linear formula for tariff cuts was introduced by Switzerland in the 1973-79 Tokyo Round negotiations. It implies an inverse relation between the employed tariff cuts and the initial tariff rates. In other words, high tariffs are reduced proportionally more than the reductions in low tariffs. As the old tariff rate tends to infinity, the new tariff rate tends to A. As the old tariff rate tends to zero, the new tariff rate tends to the old tariff rate, i.e. no tariff cut, since the old tariff rate is barely distorting.

In accordance with the Doha draft modality, the coefficient used to measure the cut in bound tariffs for non-agricultural imports by developed countries is 8 percent, whereas it ranges between three rates (i.e. x = 20, y = 22, z = 25) for developing countries. Developing countries are also granted other flexibilities. For example, they might choose to keep tariff lines unbound or not to use the Swiss formula for a ceiling of non-agricultural tariff lines conditioned that these imports do not exceed a certain limit of the total value of the country's non-agricultural imports. These flexibilities cannot, however, be combined with the z coefficient.[13] Therefore, the study adopts the coefficient z (i.e. 25 percent) for all developing countries assuming that they do not benefit from other flexibilities.

As explained earlier, some aggregated regions used in the model are composites of developing and developed countries (i.e. 'East Asia', 'South East and South Asia' and 'Rest of the World'), whereas 'Rest of Sub-Saharan Africa' is a composite of non-LDCs and LDCs. Therefore, weights based on the country share in the total GDP (by expenditure) for the aggregated region are used to calculate the Doha tariff cuts as well as the post-Doha tariff ceiling rate for composite regions. Tables 7-1 and 7-3 present the measured weights and the simulated tariff cuts and tariff ceiling rates for both the agricultural and NAMA imports for non-LDC regions. Tariffs on imports by the eight SADC LDCs remain unchanged.

[13] SACU-CU members should altogether choose a common list of these granted flexibilities. During the negotiations, special concerns are raised regarding the potential tariff revenue losses for BLNS countries, Lesotho in particular. Therefore, they are targeted for aid-for-trade financial compensation. For a detailed description, see World Trade Organization (2008a, pp. 1-5).

Table 7-3: Trade Measures Simulated in Doha Round Scenario

Model Region	Simulation Description					
1. Tariffs on Agricultural Imports						
Pre-Doha Applied Rate	Tariff Cut, %					
	SADC non-LDCs	EU & USA	EAS	SAS	SSA	ROW
> 130	46.7	70.0	64.6	49.0	14.0	58.1
> 80 – 130	42.7	70.0	63.7	45.4	12.8	56.1
> 75 – 80	38.0	70.0	62.6	41.2	11.4	53.7
> 50 – 75	38.0	64.0	58.0	40.6	11.4	50.7
> 30 – 50	38.0	57.0	52.6	39.9	11.4	47.3
> 20 – 30	33.3	57.0	51.5	35.7	10.0	44.9
≤ 20	33.3	54.0	49.2	35.4	10.0	43.4
2. Tariffs on Non-Agricultural Imports						
Post-Doha Ceiling Bound Rate, %	SADC non-LDCs	EU & USA	EAS	SAS	SSA	ROW
	25.0	8.0	12.0	23.0	78.0	17.0
3. Agricultural Export Subsidy						
Export Subsidy Cut, %	SADC non-LDCs	EU & USA	EAS	SAS	SSA	ROW
	0.0	100.0	0.0	0.0	0.0	80.0
4. Agricultural Production Subsidy						
Factors & Output Subsidy Cut, %	SADC non-LDCs*	EU & USA	EAS	SAS	SSA	ROW
	45.0	70.0	64.0	48.0	10.0	50.0

* Except Botswana and Mauritius which are included in NFIDCs.

7.3.3.2 Reducing Agriculture Domestic Support

Subsidies on agricultural exports by developed countries are assumed to be fully eliminated. In the baseline scenario, subsidies on agricultural exports are granted only by EU, 'United States of America' and 'Rest of the World' regions.[14] As seen before, the 'Rest of the World' region encompasses developed and developing countries. In the baseline scenario, only three developing countries (i.e. Morocco, Panama and Tunisia)

[14] Contradicting the reforms to the Common Agricultural Policy (CAP), the EU re-introduced export subsidies for some dairy products (i.e. butter, cheese and milk powder) in February 2009 aiming to enhancing its products competitiveness in the world markets.

subsidize agricultural exports. Therefore, agricultural export subsidies are fully eliminated for the EU and 'United States of America', whereas an 80 percent cut is implemented for agricultural export subsidies by 'Rest of the World', Table 7-3.

According to the Doha Round modality for agriculture, domestic production support should be reduced using tiered formulas. These tiered formulas of subsidy cuts are implemented on both Overall Trade-Distorting Domestic Support (OTDS) and the final bound Aggregate Measure of Support (AMS).[15] Along the lines of the Special and Differential Treatment (SDT), the cuts in agricultural production subsidies are simulated to be less constraining for developing countries. Furthermore, NFIDCs are exempted from the reductions in both OTDS and AMS.[16]

Subsidies for domestic agricultural production (both factor usage subsidies and output subsidies) are cut by 70 percent for developed countries and 45 percent for non-LDC developing countries, Table 7-3. As for tariff cuts, weights based on the country share in the total GDP (by expenditure) for the aggregated region are used to calculate the reductions in agricultural production subsidies for composite non-LDC developing/developed regions. Agricultural production subsidies for SADC LDCs as well as Botswana and Mauritius are exempted from the planned reductions.

The benchmark scenario, for a meaningful comparison, is in this case a scenario that includes the stylized "EU-SADC EPAs" with full SADC-FTA plus the EU sugar reforms and a complete Doha Round as specified above.

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[15] The base level for reductions in OTDS includes three components. The first is the final bound AMS. Besides, a ratio of the average agricultural production values during the base period (1995-2000) that is defined to be 10 percent for developed countries and 20 percent for developing countries. The last component is either the average Blue Box payments or 5 percent of the average agricultural production values during the base period (1995-2000), whichever is higher. Blue Box payments are specific domestic support payments that are excluded from the AMS but are counted for in measuring the OTDS. For detailed a description on reducing domestic support in agriculture, see World Trade Organization (2008b, pp. 4-13). Bouët et al. (2005, p. 1332) argue that the AMS figures notified to WTO do not reflect the actual agricultural subsidy, particularly for the EU. Therefore, the reductions in agricultural subsidy imply only reductions in a small fraction of actual agricultural subsidy.

[16] NFIDCs include LDCs as well as some non-LDC developing countries including Botswana, Mauritius and Namibia. For a full list of NFIDCs, see World Trade Organization (2005).

7.4 Simulation Analyses

The simulation scenarios represent the alternative preferential arrangements between the EU and SADC members in the case of not signing final EPAs. These alternatives are the EU-EBA (for SADC LDCs), the EU-GSP (for SADC non-LDCs) and the EU-South Africa TDCA (for South Africa). In addition, the EU sugar reforms as well as a complete Doha Round are simulated. This section deals with the results derived under the three scenarios (i.e. Alter, Alter_Sug and Alter_Sug & Doha) compared to the corresponding relevant baseline scenario (i.e. Full EPA, Full EPA_Sug and Full EPA_Sug & Doha). All scenarios, including the baseline scenarios, assume full SADC-FTA.[17]

The implications of these alternative scenarios for each SADC member depend on several factors, among which are the share of exports to the EU market, composition of trade and the initial tariff level. Moreover, the magnitude of the tariff cuts and the resulting change in SADC preference margins vis-à-vis its preference margins under the counterfactual scenarios are among the main determinants of the impacts.

7.4.1. Welfare Impact

Table 7-4 reports the resulting welfare impact measured by equivalent variation for households and changes in real absorption. Welfare results derived under Alter are worse for SADC non-LDCs ('Rest of SACU', Mauritius, Zimbabwe and Botswana) compared to the welfare results associated with the Full EPA scenario. These welfare losses generally become less pronounced when the EU sugar reforms are included (Alter_Sug) and are the lowest under Alter_Sug & Doha.

To conclude, SADC non-LDCs experience welfare losses under the alternatives to EPAs, compared to the Full EPA scenario, particularly without considering the EU sugar reforms and the Doha Round. In other words, the Full EPA scenario is the best option for Botswana, Mauritius, Zimbabwe and 'Rest of SACU'. Mauritius is, however, indifferent between Full EPA and its WTO-compatible alternative scenario should both the EU sugar reforms and a complete Doha round come into force.

[17] In this section, SADC non-LDCs refer only to four SADC regions (i.e. Botswana, Mauritius, Zimbabwe and 'Rest of SACU') and do not include South Africa.

Compared to the Full EPA baseline scenario, no significant changes in welfare are reported for either SADC LDCs or South Africa under the Alter scenario. The generated changes in total absorption are negative for Madagascar, Malawi and South Africa. Slight positive changes are reported for 'Rest of SADC'. Mozambique, Tanzania and Zambia do not experience any welfare change under the Alter scenario compared to Full EPA. Changes in welfare become positive for all SADC LDCs and South Africa when the EU sugar reforms are taken into account (Alter_Sug). By including a complete Doha Round (Alter_Sug & Doha), the results remain quite similar to those generated under Alter_Sug.

These findings suggest that the Full EPA scenario is a more favourable option compared to its WTO-compatible alternative scenarios for Madagascar, Malawi and South Africa. Mozambique, Tanzania and Zambia are indifferent between the Full EPA scenario and the WTO-compatible alternative scenario. 'Rest of SADC' is better off under the WTO-compatible alternative scenario compared to the Full EPA scenario. In the case of completing the EU sugar reforms and the Doha round, SADC LDCs and South Africa would have reasons to prefer the WTO-compatible alternative scenarios to the Full EPA scenario.

Three points are worth mentioning here. First, the non-reciprocal arrangements for SADC (except South Africa) trade with the EU do not necessarily mean more favourable trade alternatives compared to the reciprocal EPAs. The "EBA, GSP and TDCA" scenario entails, *inter alia*, maintaining the applied tariffs on SADC (except South Africa) imports from the EU. This per se does not lead to a more welfare-improving equilibrium compared to the "EU-SADC EPAs" scenario except for 'Rest of SADC'. This conclusion is in line with the general finding derived from the first simulation phase that reciprocal trade liberalization by SADC, i.e. the SADC tariff reductions, generates very small negative welfare impacts.

Table 7-4: Welfare Impact

	Alter	Alter_Sug	Alter_Sug & Doha	Alter	Alter_Sug	Alter_Sug & Doha
	Equivalent Variation ($USD billion)			**Total Absorption** (Percentage change)		
BWA	-0.03	-0.03	-0.02	-0.9	-1.1	-0.7
MDG	-0.01	0.00	0.00	-0.2	0.1	0.1
MWI	0.00	0.00	0.00	-0.5	0.1	0.1
MUS	-0.14	0.00	0.00	-4.5	-0.1	0.0
MOZ	0.01	0.01	0.00	0.0	0.1	0.1
ZAF	-0.08	0.01	0.03	-0.1	0.0	0.0
TZA	0.01	0.01	0.01	0.0	0.1	0.1
ZMB	0.01	0.00	0.00	0.0	0.1	0.1
ZWE	-0.14	-0.01	-0.01	-5.5	-0.5	-0.2
XSC	-0.32	-0.08	-0.05	-7.3	-1.7	-1.1
XSD	-0.01	-0.02	-0.02	0.2	0.1	0.1

Second, taking the EU sugar reforms into consideration has significant implications for the assessment of the EU-SADC EPAs. The generated welfare impacts for all SADC members show significant changes in magnitude and, more importantly, in direction under "EBA, GSP and TDCA with the EU Sugar Reforms" in comparison to those generated under "EBA, GSP and TDCA".

Third, a complete Doha Round multilateral trade liberalization does not alter the EPAs welfare implications for individual SADC members. The observed deviations of welfare effects generated under "EBA, GSP and TDCA with the EU Sugar Reforms and Doha Round", from the corresponding baseline scenario, are virtually the same as for welfare deviations between "EBA, GSP and TDCA with the EU Sugar Reforms" and the underlying baseline scenario.

7.4.2. Terms of Trade Impact

Changes in terms of trade under the Alter scenario, for example, represent proportional changes in relative price of exports to imports under each scenario compared to relative price of exports to imports under the Full EPA scenario where the latter is initialized to one.[18] For example, 0.5 percent for 'Rest of SADC' under Alter (Table 7-5) means that relative price of exports to imports under Alter is higher than the level of terms of trade that would prevail if the Full EPA scenario took place.

SADC non-LDCs ('Rest of SACU', Zimbabwe, Mauritius and Botswana) experience deteriorations in their terms of trade with depreciation of their real exchange rates under Alter compared to the Full EPA scenario, Table 7-5. These adverse effects are outstandingly smaller under the Alter_Sug and the Alter_Sug & Doha scenarios. This is particularly the case for 'Rest of SACU' and Zimbabwe. Interestingly, these losses turn into terms of trade gains for Mauritius under both the Alter_Sug and the Alter_Sug & Doha scenarios.

These figures support the same finding that Botswana, Mauritius, Zimbabwe and 'Rest of SACU' are better off under the Full EPA scenario compared to the WTO-compatible alternative scenario particularly without completing the EU sugar reforms and the Doha Round.

Among SADC LDCs, 'Rest of SADC' only experiences slightly more favourable changes in its terms of trade and real exchange rates under Alter, as well as Alter_Sug and Alter_Sug & Doha, compared to the corresponding changes under the baseline scenarios. Therefore, 'Rest of SADC' has reasons, albeit not strong, to opt out of the EU-SADC EPAs in favour of its WTO-compatible alternative scenario. Malawi experiences terms of trade losses with strong depreciation of its real exchange rate under the Alter scenario. From this perspective, the EU-SADC EPAs might be its best option particularly without completing the EU sugar reforms and the Doha round. For all other SADC non-LDCs (Madagascar, Mozambique, Tanzania and Zambia) as well as South Africa, results show adverse, albeit moderate, changes in terms of trade and real exchange rate, under Alter compared to the baseline scenario. Changes in the direction of these experienced effects are reported for the five regions under the Alter_Sug and the Alter_Sug & Doha scenarios.

[18] Laspeyres price index is used in computing terms of trade, as described earlier in Chapter 5.

Table 7-5: Terms of Trade Impact

(Percentage change)

	Alter	Alter_Sug	Alter_Sug & Doha	Alter	Alter_Sug	Alter_Sug & Doha
	Terms of Trade			**Real Exchange Rate**		
BWA	-2.5	-2.9	-1.5	2.2	1.9	1.3
MDG	-0.7	0.3	0.3	0.4	-0.3	-0.3
MWI	-2.7	0.3	0.3	4.8	-0.3	-0.3
MUS	-5.7	0.8	0.3	5.0	-1.7	-0.9
MOZ	0.0	0.3	0.3	0.8	-0.1	-0.2
ZAF	-0.3	0.0	0.1	0.3	-0.2	-0.2
TZA	-0.1	0.5	0.5	-0.2	-0.8	-0.8
ZMB	-0.4	0.3	0.3	1.2	-0.2	-0.3
ZWE	-9.8	-0.5	-0.3	9.5	0.0	0.0
XSC	-16.0	-3.6	-1.5	16.5	2.0	1.5
XSD	**0.5**	0.3	0.3	-1.6	-1.9	-2.0

7.4.3. Trade Impacts

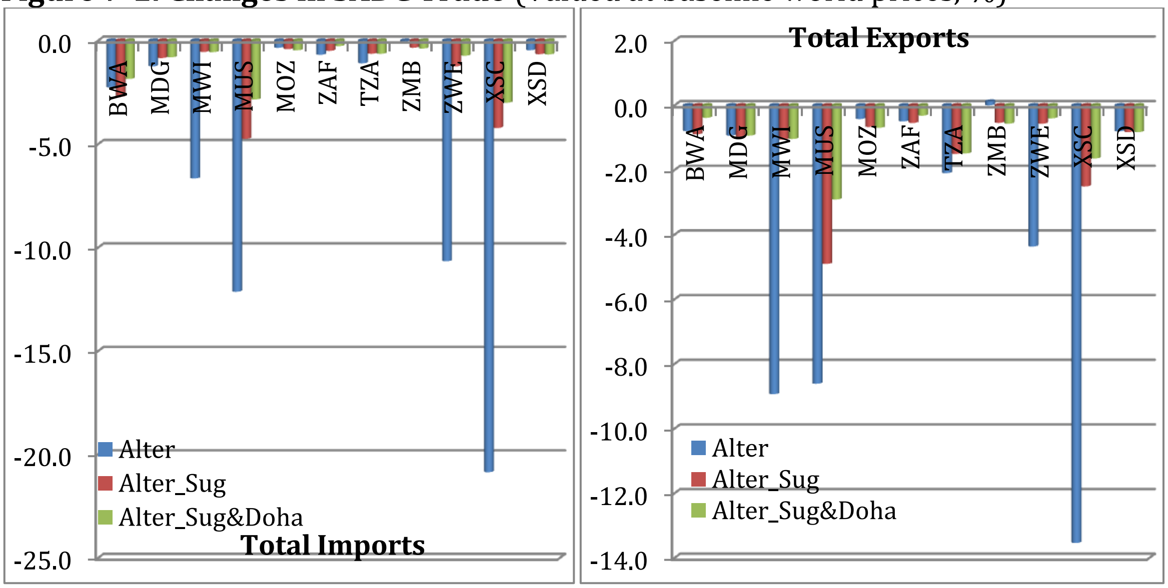
7.4.3.1 Total Trade

Figure 7-1 presents changes in SADC total trade under Alter, Alter_Sug and Alter_Sug & Doha measured as deviations from the corresponding baseline levels. These real changes are calculated based on trade figures valued at the world prices prevailed under the baseline scenarios.

Results suggest proportionally less trade for SADC non-LDCs as well as Malawi under Alter compared to the corresponding levels under the "EU-SADC EPAs" scenario, Table A7-1. These difference gaps become less pronounced after considering the EU sugar reforms (Alter_Sug) and are the lowest under Alter_Sug & Doha.

Results for SADC LDCs, except Malawi, as well as South Africa show very small differences compared to the trade levels generated under the Full EPA scenario. Percentage changes in trade volumes compared to their Full EPA levels are less than 5 percent for Madagascar, Mozambique, Tanzania, Zambia, 'Rest of SADC' and South Africa. The EU sugar reforms as well as the Doha Round do not alter these trade results. Furthermore, Malawian trade under the baseline scenarios remains unchanged under the WTO-compatible alternative scenario should the EU sugar reforms and the Doha round are completed.

Figure 7-1: Changes in SADC Trade (Valued at baseline world prices, %)



7.4.3.2 Trade with the EU

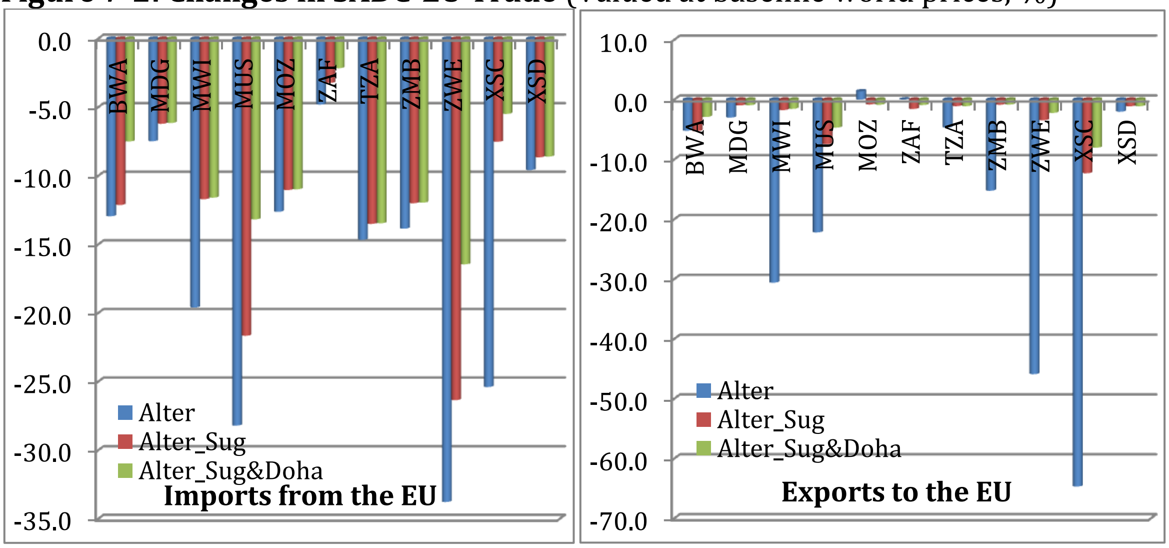
SADC imports from the EU are considerably less under the Alter scenario compared to the Full EPA scenario, Table A7-1. This is particularly the case for SADC non-LDCs as well as Malawi.

These differences in imports from the EU compared to Full EPA are explained by two factors. Firstly, under Alter, SADC regions do not reciprocate in the sense that no tariff cuts are applied on their imports from the EU, except for imports by South Africa. Accordingly, SADC imports from the EU are lower than the corresponding levels generated under the reciprocal trade arrangement that is simulated by the Full EPA scenario. Secondly, part of the increments in SADC imports from the EU under Full EPA is driven by the generated patterns of structural change. As we saw in Chapter 6, production structures in 'Rest of SACU', Zimbabwe, Mauritius and Malawi become more concentrated in export-oriented sectors after the EU tariff removal and, consequently, their imports from the EU rise.[19] Under the WTO-compatible alternative

[19] This is explained in detail in Chapter 6 by decomposing the Sim21 scenario, which is almost the same as the Full EPA scenario, into two components; Sim21-SADC and Sim21-EU. The latter yields noticeable

scenarios, the generated patterns of structural change are different than the Full EPA scenario, particularly for SADC non-LDCs.[20] With the generated changes in the production structures, imports by these regions from the EU are lower under Alter compared to Full EPA. Results for 'Rest of SACU', Mauritius, Zimbabwe and Malawi alter considerably under Alter_Sug and Alter_Sug & Doha.

Figure 7-2: Changes in SADC-EU Trade (Valued at baseline world prices, %)



On the export side, sharp differences are recorded for SADC non-LDCs as well as Malawi.[21] Under Alter, 'Rest of SACU', Zimbabwe and Mauritius export only 35, 54 and 78 percent, respectively, of the volumes that they would export to the EU if Full EPA took place. In the case of not signing final EPAs with the EU, SADC non-LDCs exports face the GSP tariffs in the EU markets. This entails less preference margins (GSP tariffs vis-à-vis MFN tariffs) compared to their preference margins under Full EPA. Not surprisingly, after considering the EU sugar reforms, Alter_Sug, the reported differences in exports to the EU, compared to the baseline levels, are considerably less for 'Rest of SACU' and Mauritius and virtually vanish for Zimbabwe and Malawi.

increases in these regions imports from the EU. For a detailed discussion, see Sub-sections 6.4.1.3.2 and 6.4.2.2.

[20] This type of changes in the SADC output and trade structures will be dealt with later in detail.

[21] Although SADC exports to the EU generally expand under the alternative scenarios (measured as percentage changes compared to the original GTAP benchmark) these increments are considerably less than the corresponding export expansions generated by the Full EPA scenario.

Nevertheless, these negative differences indicate that this scenario provides less preferential access for SADC non-LDCs in the EU markets compared to the Full EPA_Sug scenario. Results are quite similar after considering a complete Doha Round, Alter_Sug & Doha.

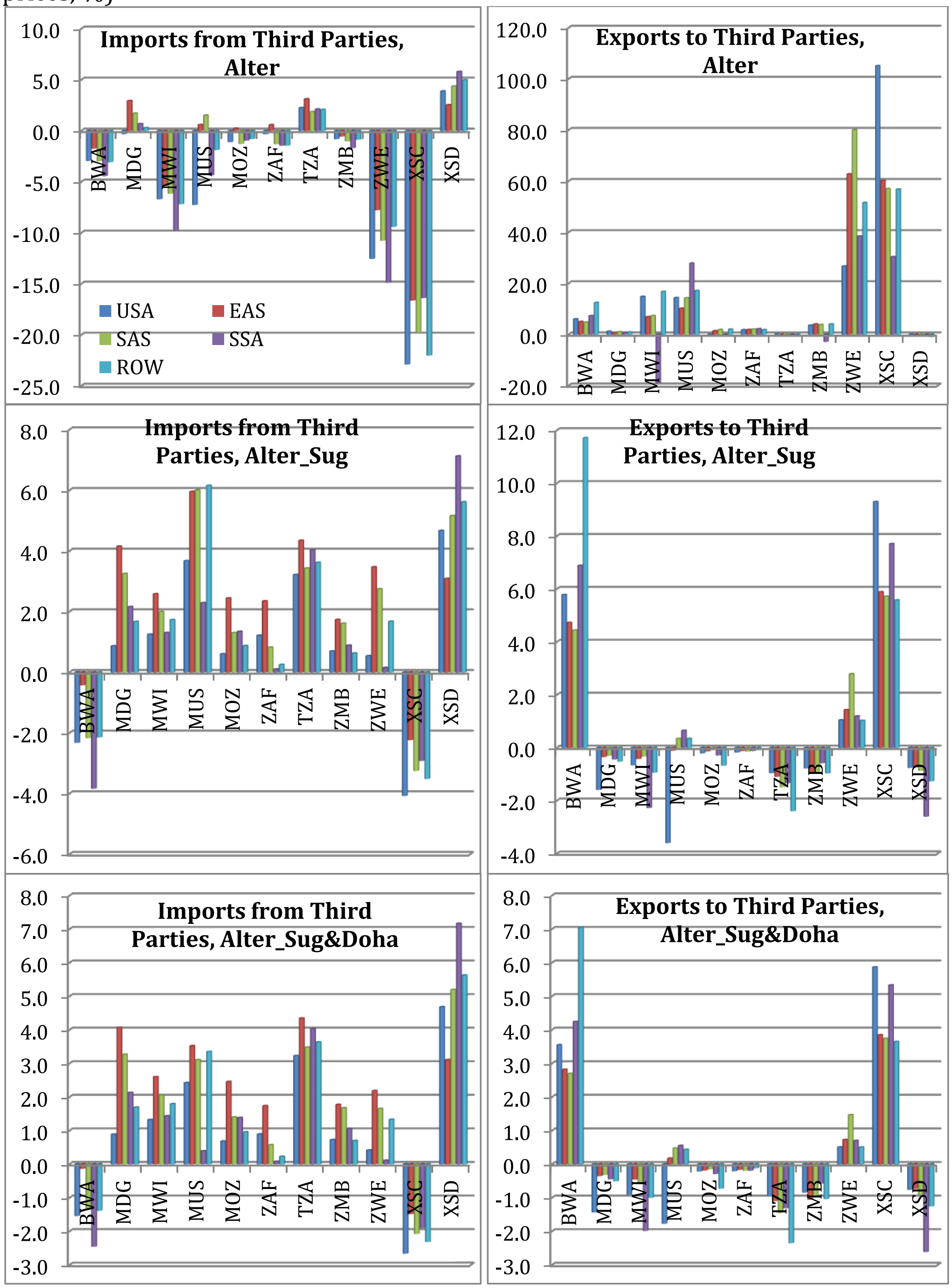
7.4.3.3 Trade with Third Parties

Results on SADC trade with third parties (Figure 7-3 and Table A7-2) show strong differences for SADC non-LDCs and Malawi under Alter versus the trade levels prevailing under Full EPA. Generally, 'Rest of SACU', Zimbabwe, Mauritius and Malawi import less and export more with third parties under Alter compared to Full EPA. As we saw in Chapter 6, the increments in these regions imports from third parties under Full EPA are mainly driven by improvements in their terms of trade associated with the EU tariff removal. The Alter scenario implies less favourable terms of trade effects for these regions and, consequently, less imports from third parties compared to Full EPA. Furthermore, the EU tariff removal also leads to drops in their exports to third parties since they export more to the EU under Full EPA.[22] This explains the experienced increments in their exports to third parties under Alter compared to the export levels prevailed under the Full EPA scenario.

Both the direction and the magnitude of these experienced trade effects change under Alter_Sug. Generally, SADC imports and exports more with third parties under Alter_Sug compared to the underlying baseline scenario, Full EPA_Sug. These trade gaps are moderate. The Alter_Sug & Doha scenario does not alter the experienced trade effects.

[22] This type of effect is explained in detail in Chapter 6.

Figure 7-3: Changes in SADC Trade with Third Parties (Valued at baseline world prices, %)

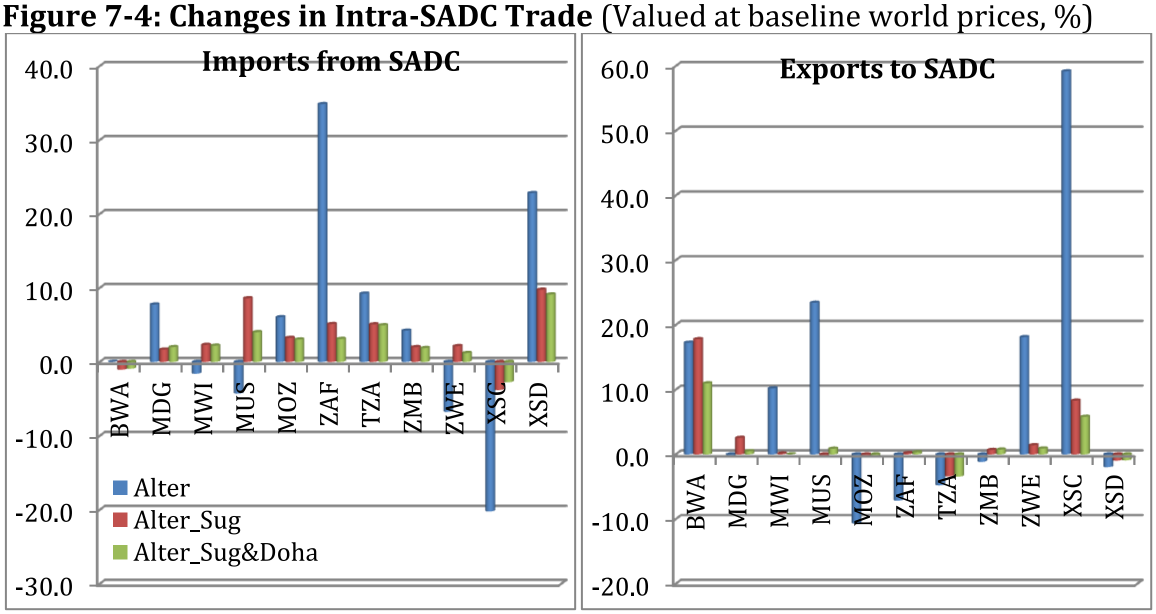


7.4.3.4 Intra-SADC Trade

An important difference between the EU-SADC EPAs and the WTO-compatible alternative scenarios is related to the intra-SADC integration process. Results suggest that Alter has more favourable impacts on intra-SADC trade compared to the Full EPA scenario. As shown in Figure 7-4, for most of the cases, trade levels among SADC regions are higher than the corresponding levels under Full EPA. Some trade differences become considerably less under Alter_Sug and Alter_Sug & Doha, but remain positive.

In summary, the WTO-compatible alternative scenarios generally boost trade among SADC members compared to trade levels under the "EU-SADC EPAs" scenario. These positive trade effects are less pronounced should the EU sugar reforms come into force. Nevertheless, intra-SADC trade levels under "EBA, GSP and TDCA with the EU Sugar Reforms" are higher than those might prevail under "EU-SADC EPAs with the EU Sugar Reforms".

Figure 7-4: Changes in Intra-SADC Trade (Valued at baseline world prices, %)



7.4.4. Structural Change

In order to gain more detailed insights of the impacts generated under the alternatives to the EU-SADC EPAs, this sub-section examines how the sectoral impacts derived by the Full EPA scenario differ under the WTO-compatible alternative scenarios. These sectoral analyses are undertaken for two crucial variables for the purposes of this study; volume changes in sectoral output and volume changes in sectoral exports to the EU.

For both variables, the sectoral levels prevailing under Full EPA, as well as the generated deviations from these levels as a result of adopting the Alter scenario, are depicted in Figures 7-5 and 7-6. In each figure, the left vertical axis measures the variable level under the Full EPA scenario; real sectoral output and sectoral export volume to the EU. According to the simulation design, variable volumes and values under this baseline scenario are identical. Therefore, column bars present variable levels (measured in billion US$ - 2004) under Full EPA. The right vertical axis measures the generated differences (percentage changes) in the variable level under the Alter scenario as deviations from the Full EPA level. The × marker displays the difference gaps in percentage changes.

7.4.4.1 Sectoral Output

Figure 7-5 shows percentage changes in real sectoral output under Alter versus the generated sectoral output level under Full EPA. Percentage changes in sectoral output under the three scenarios (Alter, Alter_Sug and Alter_Sug & Doha) compared to the baseline scenarios are reported in Tables A7-3, A7-4 and A7-5, respectively.

For SADC non-LDCs, significant differences in the output structure generated under Alter compared to Full EPA are recorded for the sugar sector, Table A7-3. Sugar output levels in 'Rest of SACU', Zimbabwe and Mauritius under Alter are less than the prevailing levels under Full EPA by 90, 86 and 58 percent, respectively. 'Meat and dairy products' also shrinks by 55 and 36 percent in the case of 'Rest of SACU' and Zimbabwe, respectively. Other sectors expand considerably under Alter compared to the prevailing levels under Full EPA. Output levels for 'other crops' and rice (for Mauritius) and textiles and 'plant fibres' (for 'Rest of SACU') are more than doubled under Alter compared to Full EPA. Changes in the output structure for South Africa are generally moderate under the Alter scenario compared to Full EPA.

Under Alter_Sug and Alter_Sug & Doha, changes in output structures are generally moderate with exceptions of the experienced shrinkages of 'meat and dairy products' for 'Rest of SACU' and Botswana, Tables A7-4 and A7-5.

Generally speaking, the pattern of structural change that occurs under Alter in SADC LDCs does not deviate from that prevails under Full EPA. Sugar output levels in Malawi, Mozambique and Zambia under Alter are virtually half the prevailing levels under Full EPA. No significant changes in output structures under Alter_Sug and Alter_Sug & Doha compared to the baseline scenarios are reported for SADC LDCs.

Figure 7-5: Real Output by Sector (Level in billion US$ 2004 and percentage change)

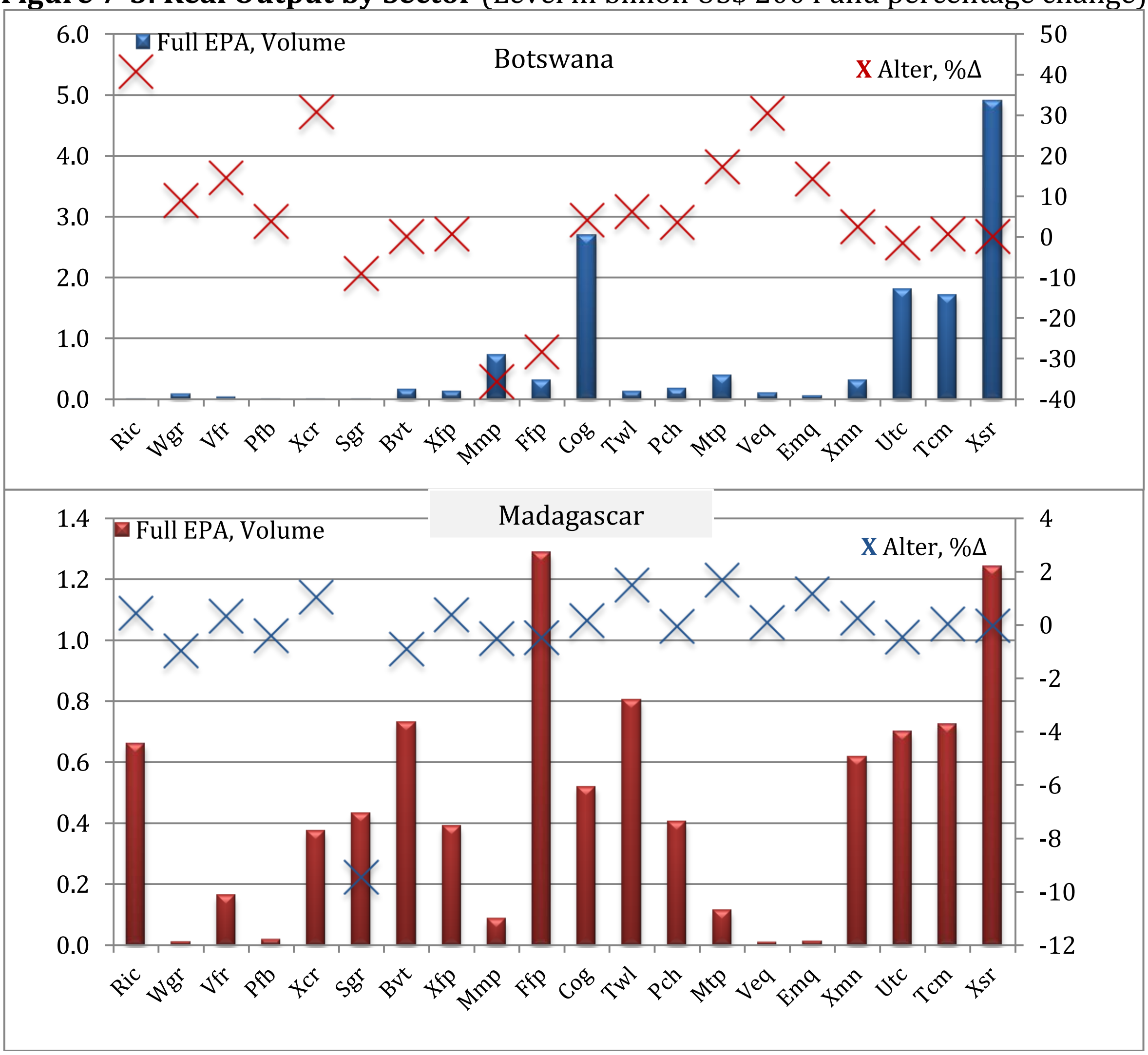


Figure 7-5 (cont.) (Level in billion US$ 2004 and percentage change)

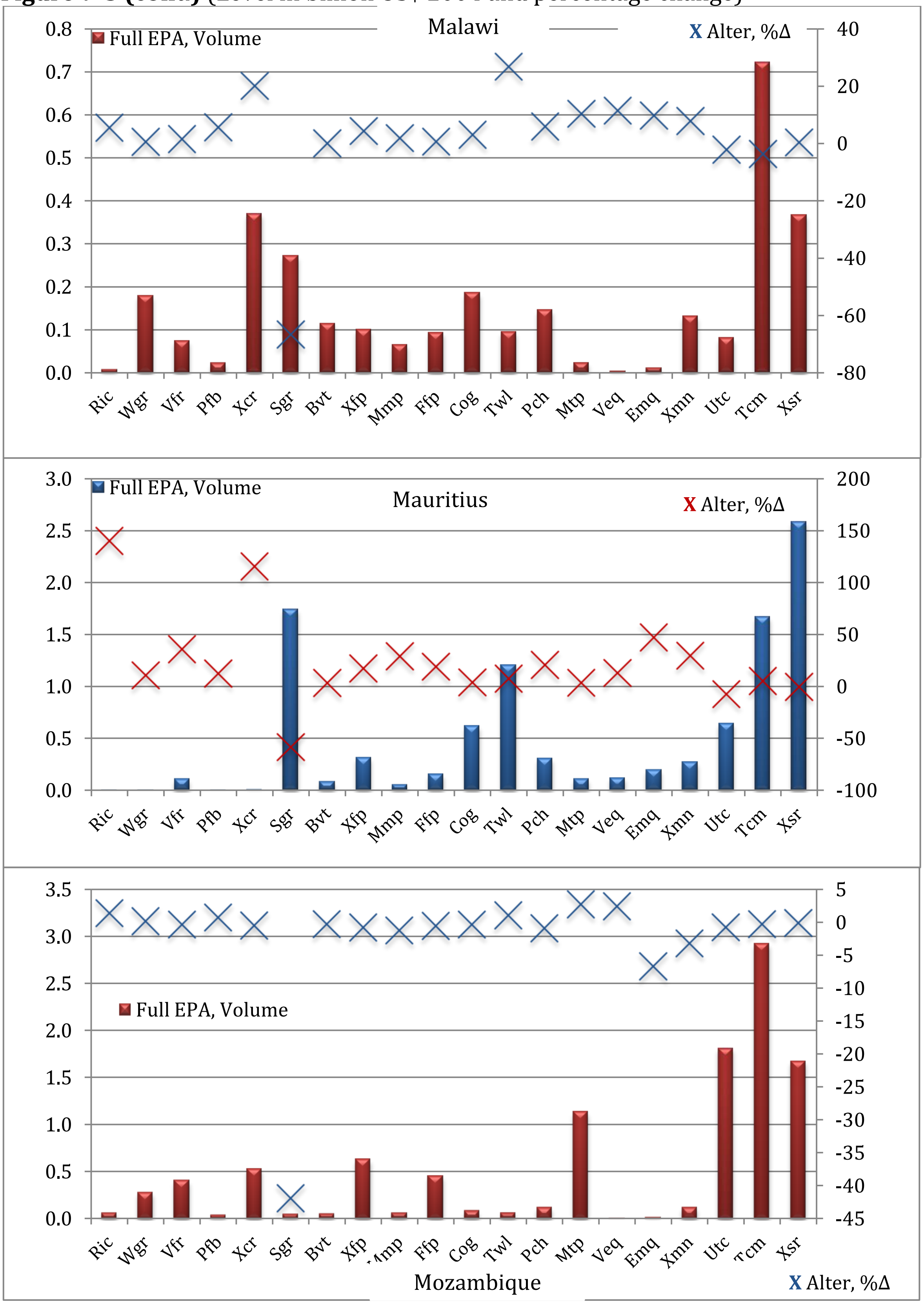


Figure 7-5 (cont.) (Level in billion US$ 2004 and percentage change)

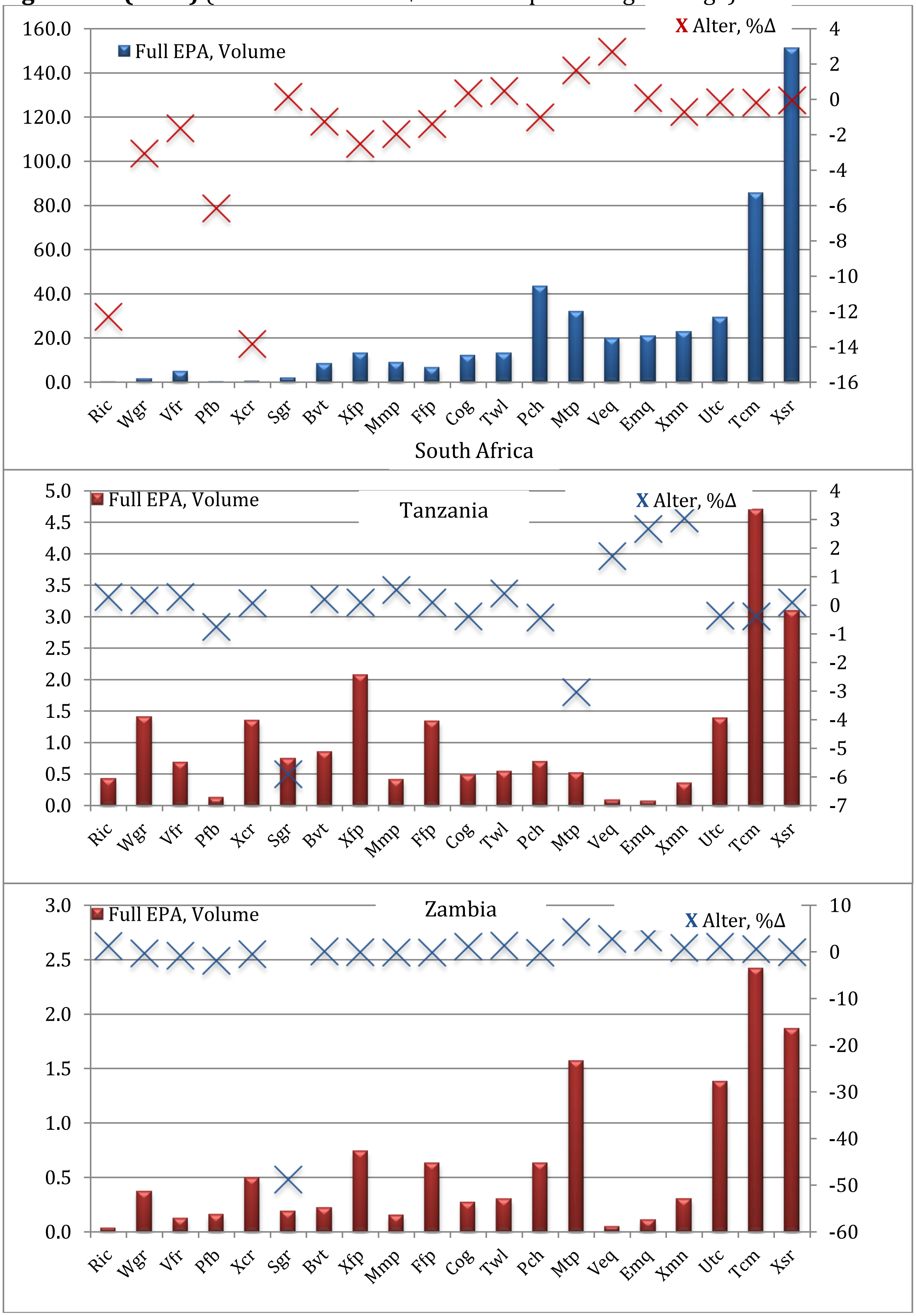
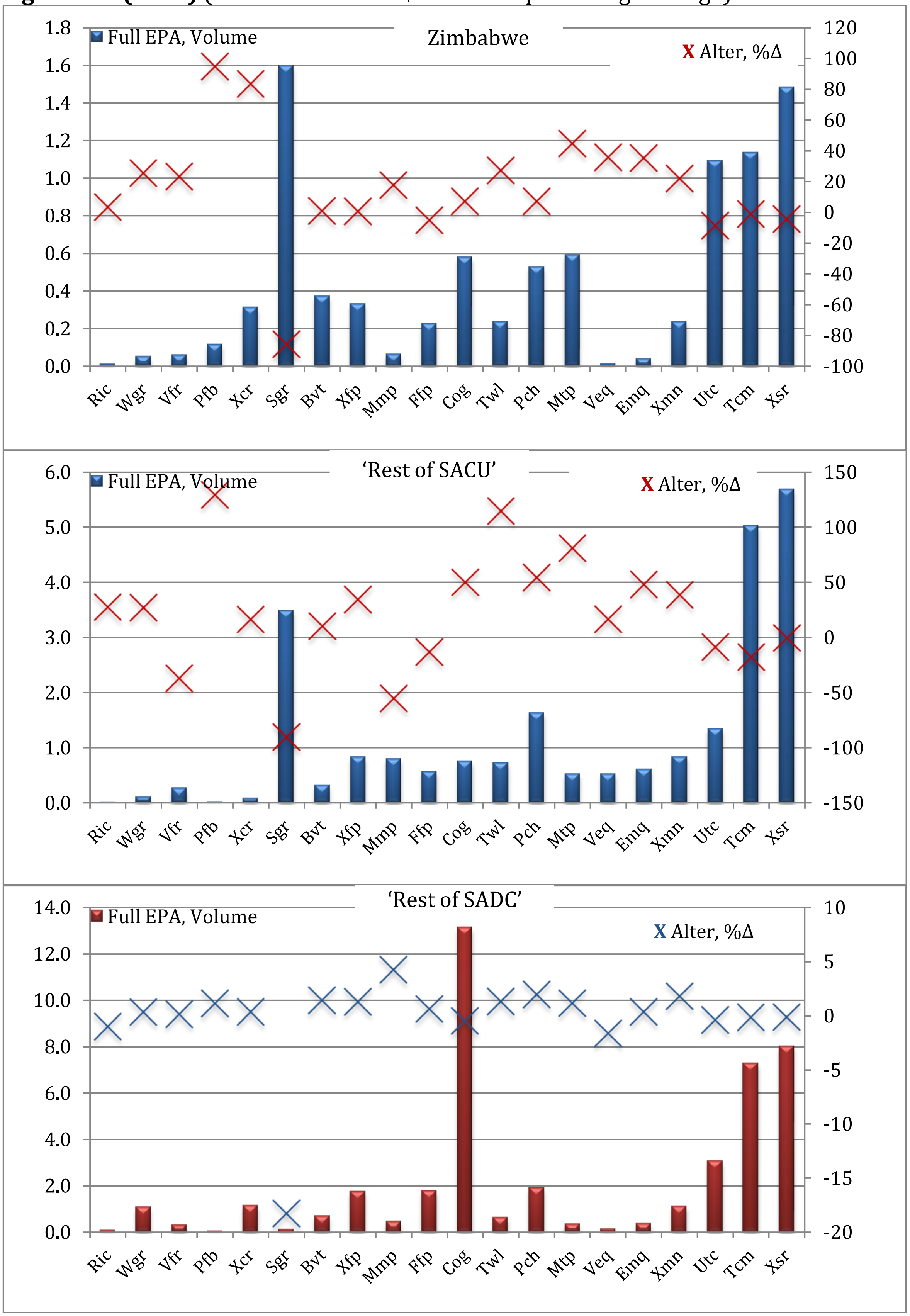


Figure 7-5 (cont.) (Level in billion US$ 2004 and percentage change)



7.4.4.2 Sectoral Exports to the EU

Figure 7-6 shows percentage changes in real sectoral exports to the EU under Alter versus the generated levels under Full EPA. Tables A7-6, A7-7 and A7-8 present percentage changes in exports to the EU by sector under the three scenarios as deviations from the corresponding export levels under the corresponding baseline scenarios.

The previous changes in the output structure for SADC regions under Alter versus Full EPA are reflected in corresponding changes in their sectoral exports to the EU. As shown in Figure 7-6, sugar exports to the EU are far less for SADC non-LDCs under Alter versus their sugar export levels under Full EPA. Sugar exports are less than the prevailing levels under Full EPA by more than 90 percent, for 'Rest of SACU' and Zimbabwe, and by more than 50 percent for Mauritius and South Africa. 'Meat and dairy products' exports by SADC non-LDCs are less than the corresponding export levels under Full EPA by 50 to 87 percent.

Table A7-9 shows the generated changes in SADC shares in the EU markets under Alter compared to their market shares under Full EPA. In the case of not signing final EPAs and applying the GSP tariffs on the EU imports from SADC non-LDCs, 'Rest of SACU', Zimbabwe and Mauritius lose 41, 10 and 7 percentage points of shares in the EU sugar market compared to their market shares under Full EPA.

Results change significantly by considering the EU sugar reforms. Under Alter_Sug, sugar exports by SADC non-LDCs to the EU are slightly higher than their sugar exports to the EU under Full EPA_Sug.

Figure 7-6: Export Volume to the EU by Commodity (Level in billion US$ 2004 and percentage change)

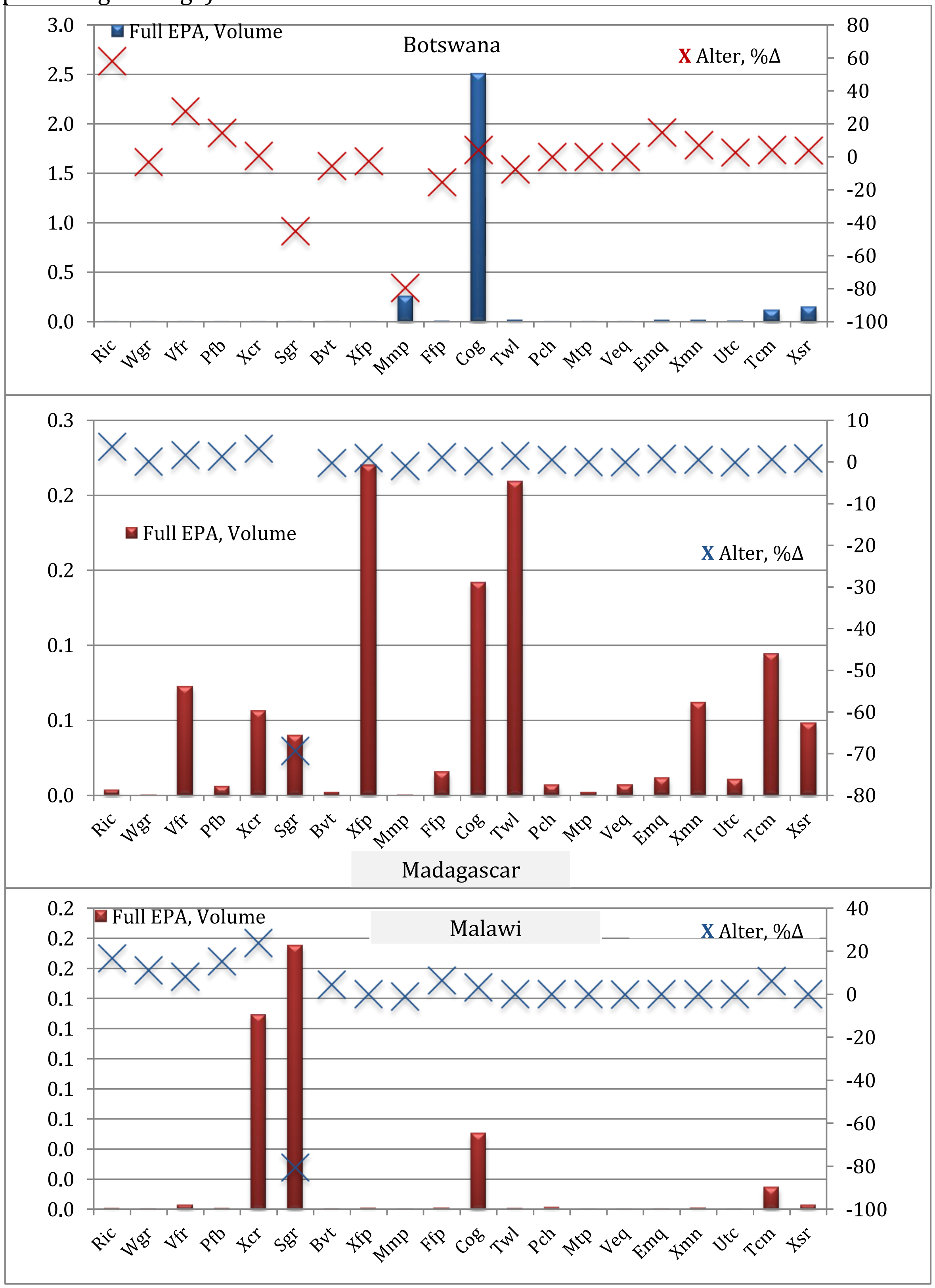


Figure 7-6 (cont.) (Level in billion US$ 2004 and percentage change)

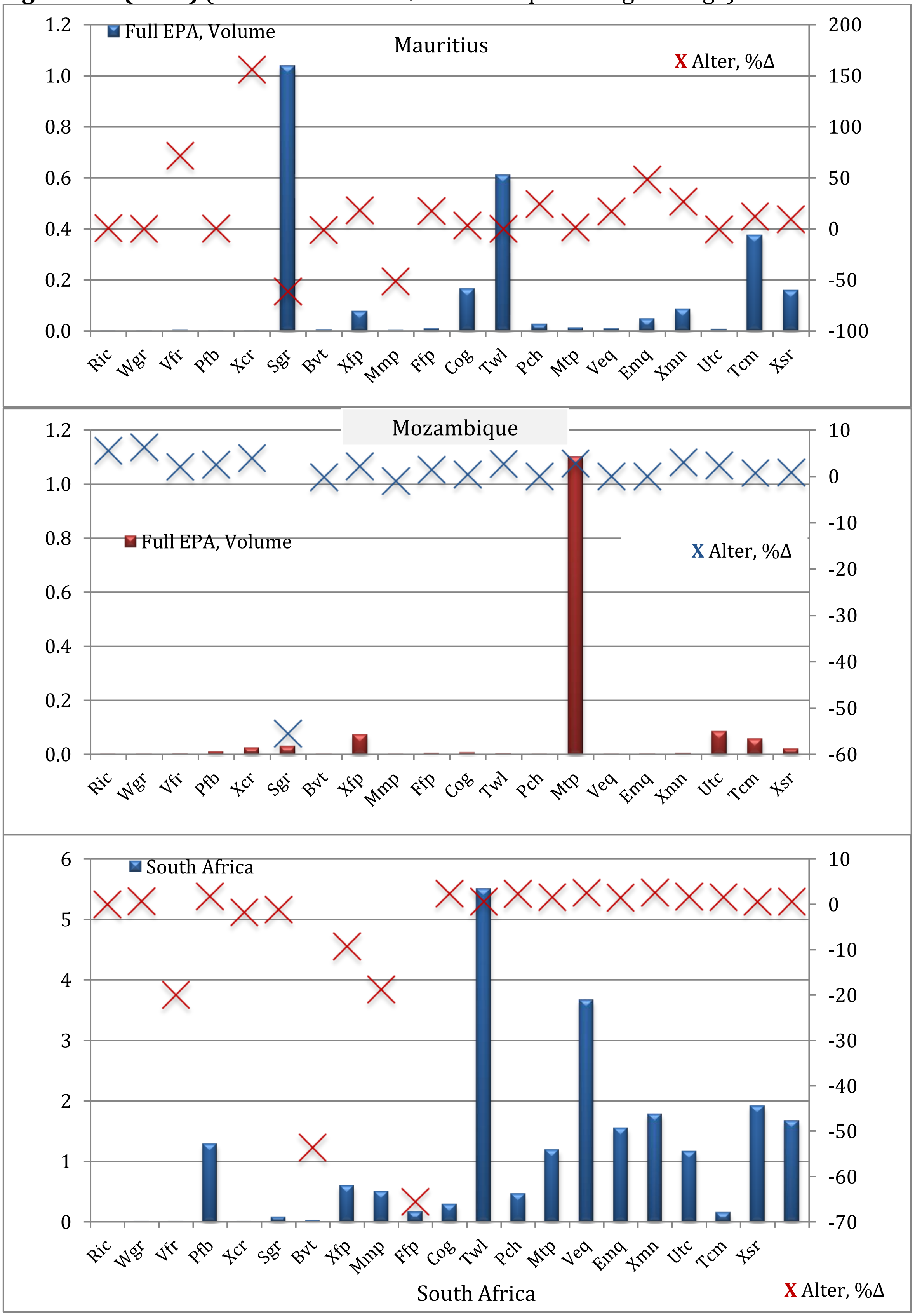


Figure 7-6 (cont.) (Level in billion US$ 2004 and percentage change)

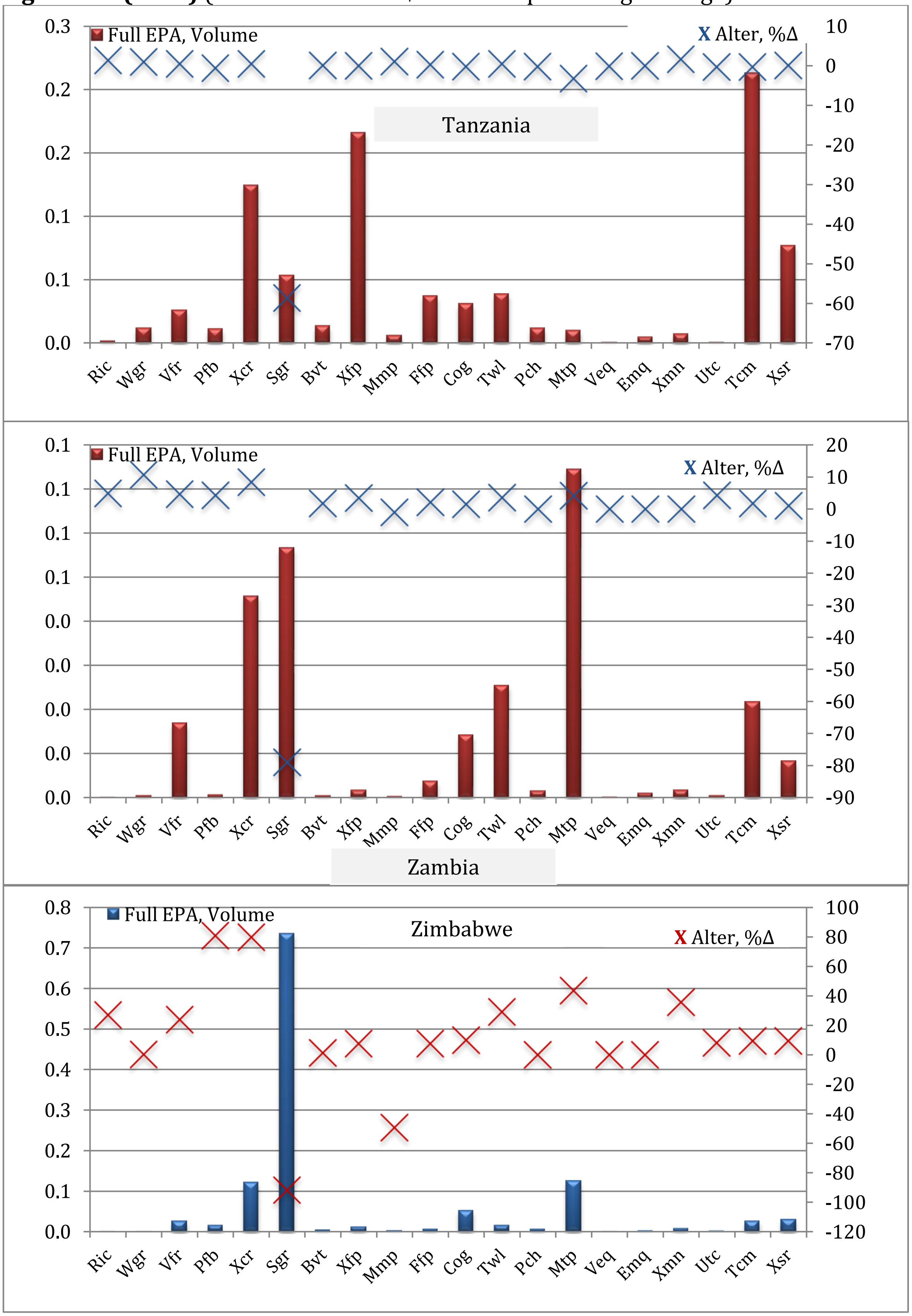
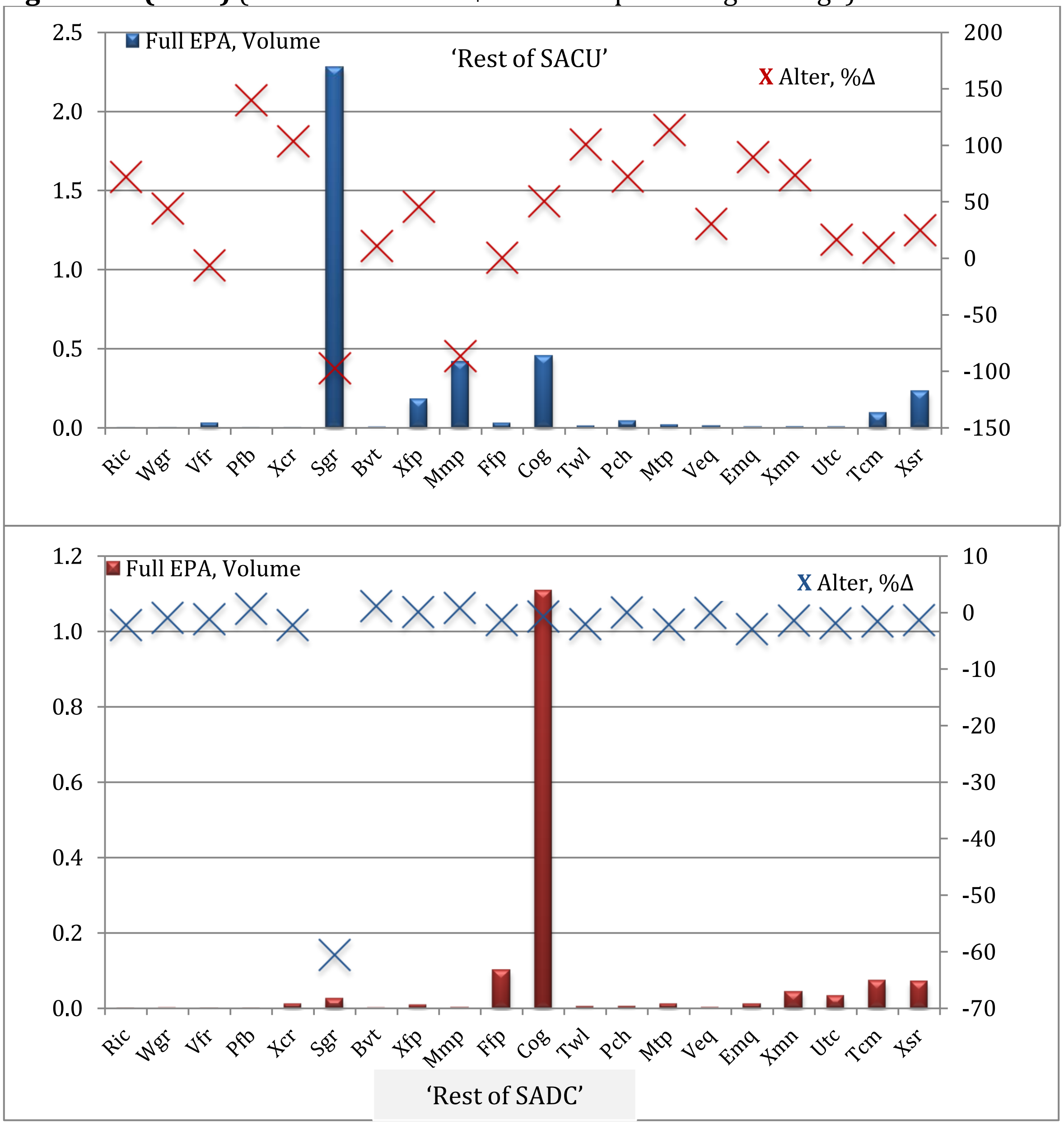


Figure 7-6 (cont.) (Level in billion US$ 2004 and percentage change)



7.4.5. Fiscal Impact

The WTO-compatible alternative scenarios are more favourable, for most of the cases, in terms of their fiscal impact. Results reveal significant positive differences in fiscal revenue accrued by SADC regions under Alter versus the Full EPA scenario, Table 7-6. The WTO-compatible alternative scenarios do not require reciprocal treatment by SADC regions, except South Africa, towards their imports from the EU. Therefore, this scenario yields higher tariff revenues for most of the SADC regions compared to Full

EPA. It is worth recalling here that these higher tariff revenues, compared to Full EPA, are levied on less import levels generated by Alter, as we saw in Sub-section 7.4.4.1.

Table 7-6: Fiscal Revenue by Source (Percentage change, nominal)

	Import Tariffs	Export Taxes	Sales Taxes	Taxes on Output	Taxes on Factor Use
	Alter				
BWA	59.0			-21.7	-0.9
MDG	72.9			-0.4	-0.6
MWI	23.3		-1.2	14.9	-2.3
MUS	67.9	99.7	-2.9	0.7	-6.3
MOZ	30.9		-0.1	1.0	-0.1
ZAF	24.1	2.0	-0.3	-0.2	-0.2
TZA	26.9		0.1	-0.5	-0.4
ZMB	27.3		0.1	1.4	-0.1
ZWE	26.8			-6.2	-5.1
XSC	5.2	117.3	-6.6	4.5	-5.0
XSD	88.1		0.4	0.4	-1.2
	Alter_Sug				
BWA	62.0			-20.5	-1.2
MDG	74.3			-0.3	-0.3
MWI	28.7		0.1	-0.8	-0.3
MUS	69.4	23.1	-0.5	-9.2	-2.8
MOZ	34.7		0.0	-0.3	-0.2
ZAF	26.3	-0.6	-0.2	-0.2	-0.2
TZA	28.5		0.2	-0.5	-0.2
ZMB	29.5		0.0	0.1	-0.1
ZWE	34.7			-0.9	-1.0
XSC	8.2	9.4	-2.2	0.8	-1.4
XSD	90.5		0.4	0.6	-1.4
	Alter_Sug & Doha				
BWA	52.9			-13.4	-0.7
MDG	74.8			-0.3	-0.3
MWI	28.6		0.1	-0.9	-0.3
MUS	57.9	19.5	-0.3	-5.7	-1.6
MOZ	34.9		0.0	-0.4	-0.2
ZAF	22.7	-0.5	-0.1	-0.1	-0.1
TZA	28.6		0.2	-0.5	-0.2
ZMB	29.6		0.0	0.0	-0.1
ZWE	30.1			-0.5	-0.5
XSC	10.2	6.0	-1.4	0.7	-0.8
XSD	90.5		0.4	0.6	-1.4

7.5 Preferable Trade Arrangement

This section helps to rank SADC members' preferences toward the EPA and the non-EPA scenarios, under different trade regimes, according to the simulated welfare impacts.

Table 7-7 shows that the Full EPA scenario is preferable compared with the WTO-compatible alternative scenarios for SADC non-LDCs (excluding South Africa). Under Full EPA, Botswana, Mauritius, Zimbabwe and 'Rest of SACU' are better off in terms of the generated changes in total absorption. Only Mauritius is indifferent between EPA and non-EPA if the EU sugar reforms and the Doha Round are completed.

South Africa prefers Full EPA to non-EPA, but is indifferent between EPA and non-EPA should the EU sugar reforms and the Doha Round come into force.

Table 7-7: Preferable Scenario for SADC Regions

	WTO-Compatible Alternatives	With the EU Sugar Reforms	With the EU Sugar Reforms & Doha Round
BWA	EPA	EPA	EPA
MDG	EPA	Non-EPA	Non-EPA
MWI	EPA	Non-EPA	Non-EPA
MUS	EPA	EPA	Indifferent
MOZ	Indifferent	Non-EPA	Non-EPA
ZAF	EPA	Indifferent	Indifferent
TZA	Indifferent	Non-EPA	Non-EPA
ZMB	Indifferent	Non-EPA	Non-EPA
ZWE	EPA	EPA	EPA
XSC	EPA	EPA	EPA
XSD	Non- EPA	Non- EPA	Non- EPA

Three conclusions can be drawn for SADC LDCs. For two regions (Madagascar and Malawi), Full EPA is preferable compared with the non-EPA scenario, however, they opt for non-EPA if the EU sugar reforms are completed. Other regions (Mozambique, Tanzania and Zambia) are indifferent between EPA and non-EPA, however, they prefer non-EPA if the EU sugar reforms come into force. For 'Rest of SADC', non-EPA is preferable to Full EPA under all scenarios. In summary, SADC LDCs have reasons to opt out the EU-SADC EPAs and prefer other alternatives.

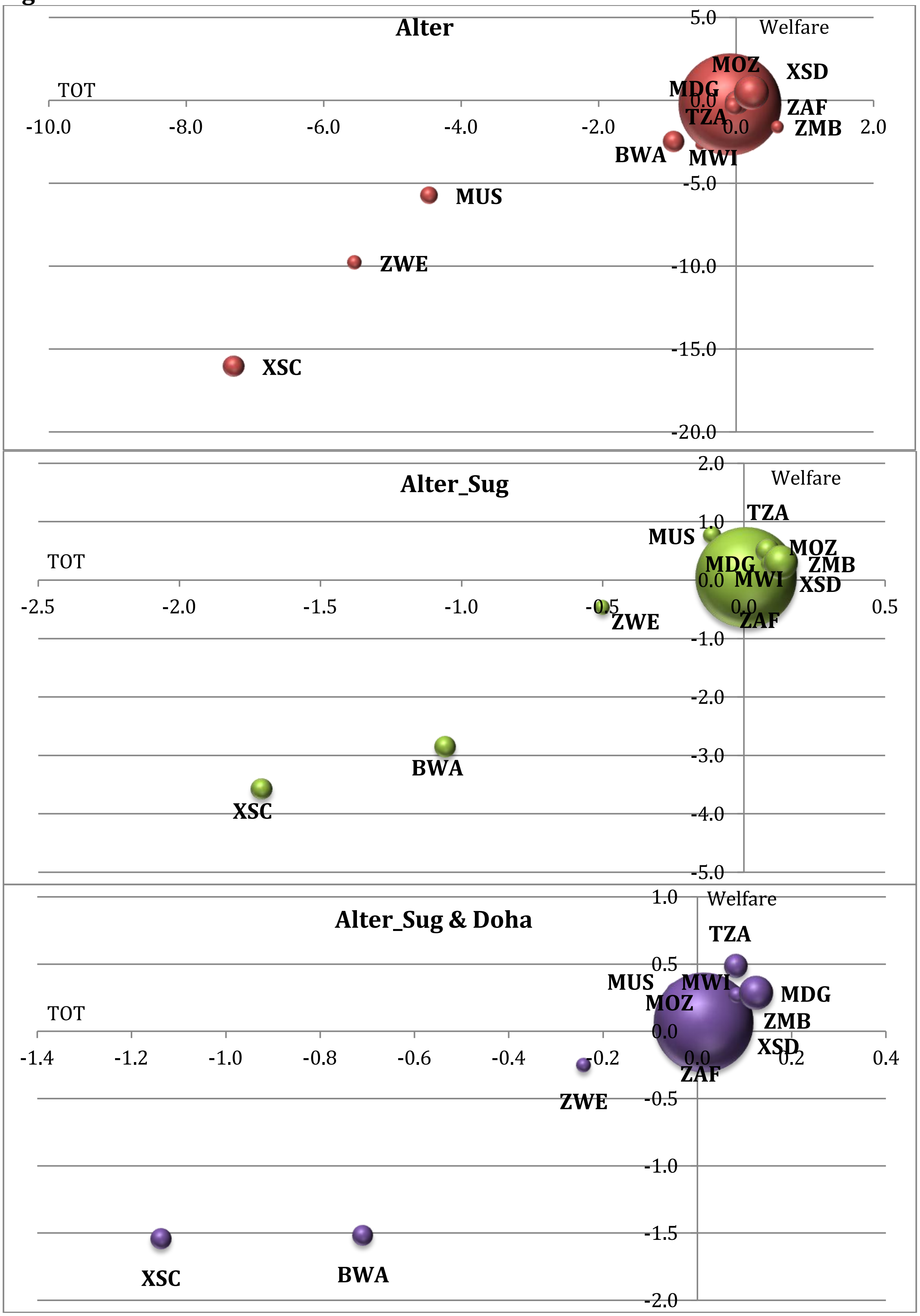
These results are in line with Perez (2006). As aforementioned, the study calibrates the CGE GTAP model to a global SAM derived from the GTAP6 database. The author finds that the EU-EPA is the best option for the SADC region. According to the aggregation scheme employed by the study, the SADC region is mainly composed of the SADC non-LDCs. The study findings suggest that the other SADC LDCs are better off under the EBA/GSP scenario.

7.6 Patterns of Gains and Losses

This section aims at drawing an overall picture of which regions gain and which regions lose under the three scenarios, i.e. Alter, Alter_Sug and Alter_Sug & Doha. Percentage changes in total absorption are used to indicate the welfare gains/losses under each scenario. To highlight the strong association between welfare and terms-of-trade effects, Figure 7-7 plots both against each other. The regions that accrue welfare and terms of trade gains appear in the first quadrant while the regions that experience welfare and terms of trade losses are located in the third quadrant. To give an idea about the relative size of the regions that gain and those which lose, different weights are given to each SADC region based on the region's contribution to the SADC total GDP. These weights are reflected in the size of the bubbles.

As can be seen in the first panel of Figure 7-7, Zimbabwe, 'Rest of SAC', Mauritius and Botswana only are the main losers under the non-EPA scenarios in terms of welfare and terms of trade impacts. All other SADC members experience very slight benefits under the non-EPA scenarios, particularly if the EU sugar reforms and the Doha Round are completed.

Figure 7-7: Gains and Losses Patterns



7.7 Conclusions

Welfare figures associated with the WTO-compatible alternative scenarios are worse for SADC non-LDCs than welfare results derived under the EU-SADC EPAs scenario. The WTO-compatible alternative scenarios are less advantageous, for SADC non-LDCs, than the EU-SADC EPAs scenario in terms of the preferential access to the EU markets. For SADC LDCs, however, welfare findings are roughly the same under the EU-EPAs scenario and its WTO-compatible alternative options.

The EU sugar reforms are an important determinant for an impact analysis of the EU-SADC EPAs. A complete Doha Round, however, does not have strong implications for the EU-SADC EPA assessment.

The WTO-compatible alternative scenarios are generally more favourable from the SADC integration perspective. For most of the cases, Intra-SADC trade levels are higher under each of the three scenarios compared to the corresponding levels generated under the underlying baseline scenarios.

8 Conclusions

8.1 Introduction

This thesis has employed the comparative static multi-region, multi-sector CGE GLOBE model as a tool for conducting various simulation scenarios in order to examine the effects of the envisaged EU-SADC EPAs on individual SADC economies. The modelling work utilizes the most recent GTAP database (version 7) from which a global SAM for 2004 is extracted. The modelling framework for this thesis covers not only SADC members and their EU trade partners but also SADC's main non-EU trade partners.

This chapter summarizes the main findings (Section 8.2), concludes with some policy implications (Section 8.3) and outlines the limitations of the thesis and areas of future research work, Section 8.4.

8.2 Insights from the Simulation Scenarios

The core quantitative assessment consists of two simulation phases: the first phase quantifies the potential impacts of the envisaged EPA liberalisation scenarios in comparison to the 2004 benchmark equilibrium. This first phase simulates two main EU-SADC EPA scenarios: the "SADC-EPA Group" scenario (which is confined to Botswana, South Africa, 'Rest of SACU' and Mozambique) and "All SADC Regions" that covers all SADC members. These scenarios intend to throw light on the question how the EPAs compare to the status quo ante prior to the expiry of the WTO waiver for the Cotonou preferences. The second simulation phase takes into account that a return to the status quo ante is actually not a politically feasible option at this point in time and compares the EU-SADC EPAs with the WTO-compatible alternative options that reflect other possible ways for individual SADC members to liberalise their trade with the EU in the case of not reaching agreement on final EU-SADC EPAs. The simulation results are meant to address the research questions posed in the introductory chapter.

8.2.1. Who Gains and Who Loses from the EU-SADC EPAs?

Under the “SADC-EPA Group” scenario, ‘Rest of SACU’ is the main winner. This scenario generates moderate welfare gains for Botswana and South Africa and welfare losses for Mozambique. The other SADC regions not directly involved in this liberalization scenario lose and the biggest welfare loss is reported for Mauritius.

“All SADC Regions” is welfare-improving for many SADC regions: ‘Rest of SACU’, Zimbabwe, Mauritius, and, to a lesser extent, Botswana, Malawi and Madagascar. For ‘Rest of SACU’, this scenario is less advantageous compared to the “SADC-EPA Group” scenario. Malawi, Mauritius and Zimbabwe are noticeably better off under this comprehensive scenario compared to the “SADC-EPA Group” scenario.

8.2.2. What are the Main Determinants for the Outcomes of the EU-SADC EPAs?

The analysis suggests outstanding welfare gains for the ‘Rest of SACU’ region under both scenarios. Liberalizing trade with the EU yields strong favourable changes in its terms of trade and real exchange rate and, accordingly, big welfare gains. These gains are primarily driven by the preferential access to the EU sugar, as well ‘meat and dairy products’, markets where ‘Rest of SACU’ accrues extra shares.

Under both scenarios, Botswana and South Africa experience moderate welfare gains. Botswana gains are explained by the favourable, albeit small, changes in its terms of trade and appreciations of its real exchange rate. In contrast, the South African welfare gains are associated with terms of trade losses.

Under the “SADC-EPA Group” scenario, the biggest welfare loss is reported for Mauritius. These losses are attributable to a strong deterioration in its terms of trade and real depreciation. The “SADC-EPA Group” scenario entails less preferential access for Mauritius vis-à-vis the SADC-EPA group in the EU sugar markets. The results demonstrate that ‘Rest of SACU’ under this liberalization scenario threatens the Mauritian trade position as the main sugar supplier to the EU markets. It is, therefore, important for Mauritius to collectively negotiate on EPAs with its SADC partners. Mauritius has strong reasons to prefer the comprehensive “All SADC Regions” scenario to the “SADC-EPA Group” scenario.

The overarching result is that SADC preferential access to the EU markets is the key source for the reported welfare and terms of trade gains under both EPA scenarios. Reducing tariffs on SADC imports from the EU yields small negative welfare impact on SADC regions. Whenever the former favourable effects offset the latter adverse effects, regions experience welfare gains. That is in particular the case for 'Rest of SACU', Zimbabwe, Mauritius, Malawi and Botswana.

8.2.3. Will Liberalizing Intra-SADC Trade Affect the Potential Impacts?

The "SADC-EPA Group" scenario is disadvantageous to Mozambique unless barriers to its intra-SADC trade are removed simultaneously. Mozambique experiences welfare losses by liberalizing its trade within the SADC-EPA group. The EU tariff cuts on imports from the SADC-EPA grouping members generate improvements in terms of trade for 'Rest of SACU', Botswana and South Africa vis-à-vis Mozambique. Removing the high trade barriers to Mozambique trade within the SADC region boosts world prices of Mozambique exports and, thereby, protects its terms of trade from deteriorating when the EU eliminates tariffs on imports from the SADC-EPA group. In addition, intra-SADC trade liberalization generates significant increases for Mozambique trade within the SADC region. Consequently, Mozambique accrues welfare gains by liberalizing intra-SADC trade simultaneously with the SADC-EPA group trade with the EU.[1]

8.2.4. Do the EU-SADC EPAs Help SADC to Effectively Integrate into the World Economy?

The EU-SADC regional integration does not serve as a stumbling block towards more integration for SADC members into the world markets. By liberalizing trade with the SADC-EPA group, 'Rest of SACU' experiences significant changes in total trade. Furthermore, under the comprehensive scenario, total trade changes for 'Rest of SACU', Zimbabwe, Mauritius and Malawi.

[1] Further insights are also provided in the course of the following three research questions.

Under "All SADC Regions", the inclusion of intra-SADC trade liberalization yields trade expansions in regions which would not have experienced any changes in trade under EU-SADC trade liberalization in isolation, i.e. Mozambique and Zambia. Furthermore, trade figures expand proportionally higher for Malawi and Zimbabwe. The same expansions in these regions' trade are reported when intra-SADC trade liberalization is simultaneously simulated with the "SADC-EPA Group" scenario as well.

8.2.5. Do the EU-SADC EPAs Offer Export Opportunities for SADC Products in the EU Markets?

Reciprocal trade liberalization with the EU neither stimulates exports nor provides export opportunities in the EU markets for most SADC members. The "SADC-EPA Group" scenario yields export expansions only for 'Rest of SACU'. Under the comprehensive scenario, export expansions occur only in Malawi and 'Rest of SACU' and these expansions are driven by the EU tariff removal. Opening SADC markets to the EU products boosts SADC imports from the EU whereas the EU tariff removal stimulates exports to the EU by only 'Rest of SACU', under the "SADC-EPA Group" scenario, and by a few regions (i.e. 'Rest of SACU', Zimbabwe, Malawi, and, to a lesser extent, Mauritius and Zambia) under the comprehensive scenario.

Results are suggestive of some, albeit small, export opportunities for SADC regions in the EU markets by liberalizing intra-SADC trade simultaneously with the "SADC-EPA Group" scenario. This is the case for Malawi, Mozambique, Zambia and Zimbabwe. In contrast, the inclusion of intra-SADC liberalization with the comprehensive scenario does not show any substantive difference in the experienced effects on SADC exports to the EU.

8.2.6. How Do the EU-SADC EPAs Affect SADC Trade with Third Parties and with Other SADC Partners?

SADC regional integration is negatively affected by the envisaged EU-SADC EPAs. Reciprocal trade liberalization with the EU undermines the existing weak intra-SADC trade relations. Results demonstrate that part of 'Rest of SACU' pre-simulation exports to both third parties and its SADC partners is redirected to the EU markets under the

"SADC-EPA Group" scenario. Furthermore, part of the pre-simulation exports by 'Rest of SACU', Zimbabwe, Mauritius and Malawi to their third parties and to their SADC partners is redirected to the EU markets under the comprehensive scenario.

Intra-SADC trade liberalization does not prevent this trade redirection from SADC markets towards the EU markets. This is the case under both scenarios for 'Rest of SACU', Zimbabwe and Mauritius. As aforementioned, Mozambique only experiences significant increases in its intra-SADC trade when intra-SADC liberalization is simultaneously simulated with the "SADC-EPA Group" scenario. Malawi exports to its SADC partners experience slight increases when intra-SADC liberalization is simultaneously simulated with the "All SADC Regions" scenario.

8.2.7. What Type of Structural Change Might SADC Experience under the EU-SADC EPA Scenarios?

Liberalizing 'Rest of SACU' trade with the EU under the "SADC-EPA Group" scenario enhances its specialization in a few agricultural and agro-processing activities at the expense of all the manufacturing and mining sectors. The expanded activities are sugar, 'meat and dairy products' and, to a lesser extent, vegetables and livestock. The reported contractions in manufactures do not necessarily mean de-industrialization. In addition to the structural change examination, dynamic comparative advantage for the manufacturing sectors should be diagnosed before conclusions on de-industrialization are drawn.

Opening the EU markets to SADC products under a comprehensive EPA scenario ("All SADC Regions") generates considerable changes in output structures for many SADC countries. The highest changes are in 'Rest of SACU', Zimbabwe, Mauritius and Malawi where resources are reallocated into sugar activity. 'Meat and dairy products' also attracts some resources in Botswana and 'Rest of SACU'.

These expanded sectors draw resources from higher value added-activities; among which are textiles and all the other manufactures. This finding is of a great interest for Mauritius, where textiles is an export-oriented sector comprising the bulk of Mauritius total exports and of its exports to the EU.

It is noteworthy that these potential expansions in sugar output would virtually vanish ('Rest of SACU' and Zimbabwe) or halved (Mauritius and Malawi) if a final EPA is not reached and the WTO-compatible alternatives take place without completing the EU sugar reforms and trade liberalization.

8.2.8. How Significant are Potential Adjustment and Fiscal Costs for the SADC Members Likely to Be?

The welfare gains accrued by 'Rest of SACU' under the "SADC-EPA Group" scenario are associated with significant changes in its production and trade structures. This structural change requires reallocating one quarter of the used land across different activities. Capital and unskilled labour also experience high degrees of structural adjustment. 'Rest of SACU', however, does not experience fiscal losses. This is because its markets are already relatively less protective towards imports from the EU.

Important portions of the utilized land in Botswana and Mauritius are required to be reallocated across activities for these two economies to achieve the new equilibrium point after launching the "SADC-EPA Group" scenario. Besides, Botswana, Mozambique and South Africa incur strong tariff losses. Fiscal losses for Mozambique are far worse under the intra-SADC liberalization scenario.

The comprehensive "All SADC Regions" scenario entails high degree of structural adjustment in many SADC regions. This is particularly the case for the regions which accrue welfare gains, 'Rest of SACU', Zimbabwe, Mauritius and Botswana. Structural adjustment is mainly driven by the generated changes in output structure after simulating the EU tariff removal. Furthermore, most of the SADC regions experience substantial fiscal losses.

8.2.9. Do the EU-SADC EPAs Help SADC members to Diversify their Export Structures?

The "SADC-EPA Group" scenario generates expansions in 'Rest of SACU' sugar exports. These expansions are mainly directed to the EU markets. 'Rest of SACU' sugar exports to third countries rise in percentage terms. However, their shares in 'Rest of SACU' sugar exports drop. In contrast, the EU share in 'Rest of SACU' sugar exports rises.

As anticipated by the conducted descriptive analyses of SADC economies, the similarity in SADC export bundles to the EU entails increasing competition among SADC exporters in the EU markets as a result of the EU-SADC EPAs. Indeed, simulation results demonstrate that these accrued shares for 'Rest of SACU' in the EU sugar markets are at the expense of other SADC members' shares, Mauritius in particular.

The comprehensive "All SADC Regions" scenario induces expansions in sugar exports by all SADC members. Other exports also expand, i.e. 'meat and dairy products' (by 'Rest of SACU', Botswana and South Africa) and rice (by Madagascar, Malawi and South Africa). These export expansions are directed mainly to the EU sugar markets. Many SADC members gain extra share in the EU sugar markets.

The point to highlight here is that almost all other SADC commodity exports experience drops. This finding is suggestive of more concentration of the already undiversified SADC export structures as a result of the EU-SADC EPAs.

8.2.10. Is a Complete Breakdown of the EPA Negotiations a Preferable Option for any of the SADC Members?

Simulation results show that SADC non-LDCs experience welfare losses under the WTO-compatible alternatives to EPAs, compared to the Full EPA scenario, particularly without considering the EU sugar reforms and the Doha Round. Based on this finding, the study concludes that the Full EPA scenario is the best option for Botswana, Mauritius, Zimbabwe and 'Rest of SACU'. Mauritius is, however, indifferent between Full EPA and its WTO-compatible alternative should both the EU sugar reforms and a complete Doha round come into force. The Full EPA scenario is more preferable for South Africa compared with the non-EPA scenario. However, it has no preferences for the two scenarios if the EU sugar reforms are completed.

Results for SADC LDCs are mixed. For two regions (Madagascar and Malawi), Full EPA is preferable compared with the non-EPA scenario. Other regions (Mozambique, Tanzania and Zambia) are indifferent between the EPA and the non-EPA scenarios. 'Rest of SADC' is better off under the non-EPA scenario. All SADC LDCs would, actually, have reasons to break the EPA negotiations and opt for the WTO-compatible alternatives if the EU sugar reforms and trade liberalization are completed.

8.3 Policy Implications

Based on the previously reported results, three main policy implications can be drawn.

Firstly, SADC negotiators should aim for a more comprehensive scenario that covers all member states, the scenario that is welfare-improving for many SADC regions. Concluding final EPAs with the EU is particularly in SADC non-LDCs' interests since they are anticipated to lose should the EPA negotiations break.

Secondly, constraints to intra-SADC trade need to be mitigated prior to full reciprocal liberalization with the EU. The envisaged EU-SADC EPAs impose threats to SADC regional integration. These adverse effects, however, change dramatically if SADC liberalizes internal trade simultaneously EU trade. Furthermore, more liberalized intra-SADC trade would yield trade expansions and additional export opportunities for SADC members in the EU markets compared with EU-SADC trade liberalization in isolation. The WTO-compatible alternatives, on the other hand, are particularly advantageous to SADC regional integration.

Thirdly, SADC negotiators should push for adequate compensating measures given the reported fiscal losses and potential adjustment costs. By the same token, it is important for SADC members to pursue strategies that are directed to diversifying their industrial and export structures before launching final EPAs with the EU. Such strategies, in conjunction with fiscal reforms aimed at reducing dependency on tariff revenues and broadening the tax bases, would alleviate the prospective costs associated with implementing final EPAs.

8.4 Limitations and Extensions for Future Research

The employed modelling framework allows for quantifying a wide range of prospective effects of the EPAs at the aggregate and sectoral levels for individual SADC members. This internally consistent CGE framework is more advantageous compared to partial equilibrium analysis in terms of capturing direct and indirect effects among trade partners as well as forward and backward sectoral linkages.

Nevertheless, three main limitations apply to the provided findings. Firstly, the study examines the trade components of the EU-SADC EPAs without attempting to address the non-trade aspects. There are several reasons behind this omission. As explained in detail, defining the contents of the EPA development agenda is problematic in light of the observed procrastination in negotiating the EPA development provisions. Besides, some non-trade aspects that affect development prospects of ACP states are more likely to be implemented at an all-ACP, rather than a regional, level. Furthermore, realizing the potential benefits of the EPA development dimensions requires a long time span that goes beyond the scope of the present study. Lastly, and more importantly, the non-trade aspects of the envisaged EPAs are, particularly, difficult to quantify.

The second limitation is due to issues with data availability and quality. Employing the multi-region, multi-sector GLOBE CGE model requires an enormous amount of data which is adequately derived from the GTAP7 database. Such large database would not be constructed without omissions. Lack of data on barriers to trade in services is the most relevant shortfall to the current research topic. Proceeding with examining potential impacts of removing barriers to SADC-EU trade in services, maybe within a single-region CGE framework, would be an interesting topic for future research. Besides, the quality of the data for many African regions in the GTAP7 database is of low quality. As aforementioned, input-output tables are, for many cases, for early/mid nineties.

There is always a trade-off between extending the study scope and considering fine details. Conducting quantitative examination of the EPA implications for all SADC members under different scenarios comes at the expense of considering a more disaggregated sectoral level. Modelling SADC-EU trade liberalization at the HS6 level would have allowed for reflecting variations in the planned liberalization schedules and various sensitive sectors.

The last limitation pertains to dynamic aspects of the EU-SADC EPAs. The present study implements a comparative static analysis of the agreements for individual SADC members. The study, therefore, does not provide inferences on potential for productivity growth. Inclusion of dynamic growth effects of the EU-EPAs is of utmost importance for SADC. SADC members might acquire strong welfare gains from specialization according to dynamic, rather than existing, comparative advantage. This is another ambitious area for future research.

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10 Appendix to Chapter 4

Table A4-1
Region Aggregation

<table>
<tr><th>Model No.</th><th>Model Code</th><th>Model Region</th><th>GTAP No.</th><th>GTAP Code</th><th>GTAP Region</th><th>Member Countries</th></tr>
<tr><td>1</td><td>BWA</td><td>Botswana</td><td>111</td><td>BWA</td><td>Botswana</td><td>Botswana</td></tr>
<tr><td>2</td><td>MDG</td><td>Madagascar</td><td>102</td><td>MDG</td><td>Madagascar</td><td>Madagascar</td></tr>
<tr><td>3</td><td>MWI</td><td>Malawi</td><td>103</td><td>MWI</td><td>Malawi</td><td>Malawi</td></tr>
<tr><td>4</td><td>MUS</td><td>Mauritius</td><td>104</td><td>MUS</td><td>Mauritius</td><td>Mauritius</td></tr>
<tr><td>5</td><td>MOZ</td><td>Mozambique</td><td>105</td><td>MOZ</td><td>Mozambique</td><td>Mozambique</td></tr>
<tr><td>6</td><td>ZAF</td><td>South Africa</td><td>112</td><td>ZAF</td><td>South Africa</td><td>South Africa</td></tr>
<tr><td>7</td><td>TZA</td><td>Tanzania</td><td>106</td><td>TZA</td><td>Tanzania</td><td>Tanzania, United Republic of</td></tr>
<tr><td>8</td><td>ZMB</td><td>Zambia</td><td>108</td><td>ZMB</td><td>Zambia</td><td>Zambia</td></tr>
<tr><td>9</td><td>ZWE</td><td>Zimbabwe</td><td>109</td><td>ZWE</td><td>Zimbabwe</td><td>Zimbabwe</td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">XSC</td><td rowspan="3">‘Rest of SACU’</td><td rowspan="3">113</td><td rowspan="3">XSC</td><td rowspan="3">Rest of South African Customs Union</td><td>Lesotho</td></tr>
<tr><td>Namibia</td></tr>
<tr><td>Swaziland</td></tr>
<tr><td rowspan="2">11</td><td rowspan="2">XSD</td><td rowspan="2">‘Rest of SADC’</td><td rowspan="2">100</td><td rowspan="2">XAC</td><td rowspan="2">Rest of South Central Africa</td><td>Angola</td></tr>
<tr><td>Congo, Democratic Republic of the</td></tr>
<tr><td>12</td><td>EU</td><td>‘EU-27’</td><td colspan="4">(46- AUT- Austria) (47- BEL- Belgium) (48- CYP- Cyprus) (49- CZE-Czech Republic) (50- DNK- Denmark) (51- EST- Estonia) (52- FIN-Finland) (53- FRA- France) (54- DEU- Germany) (55- GRC- Greece) (56- HUN- Hungary) (57- IRL- Ireland) (58- ITA- Italy) (59- LVA-Latvia) (60- LTU- Lithuania) (61- LUX- Luxembourg) (62- MLT-Malta) (63- NLD- Netherlands) (64- POL- Poland) (65- PRT-Portugal) (66- SVN- Slovenia) (67- SVK- Slovakia) (68- ESP- Spain) (69- SWE- Sweden) (70- GBR- United Kingdom) (75- BGR- Bulgaria) (78- ROU- Romania)</td></tr>
</table>

Table A4-1 (cont.)

Model No.	Model Code	Model Region	GTAP No.	GTAP Code	GTAP Region	Member Countries
13	USA	‘United States of America’	26	USA	United States of America	United States of America
14	EAS	‘East Asia’	(4- CHN- China) (5- HKG- Hong Kong) (6- JPN- Japan) (7- KOR- Republic of Korea) (8- TWN- Taiwan) (9- XEA- Rest of East Asia: Macau, Mongolia, Democratic People’s Republic of Korea)			
15	SAS	‘Southeast and South Asia’	(10- KHM- Cambodia) (11- IDN- Indonesia) (12- LAO- Lao People’s Democratic Republic) (13- MMR- Myanmar) (14- MYS- Malaysia) (15- PHL- Philippines) (16- SGP- Singapore) (17- THA- Thailand) (18- VNM- Viet Nam) (19- XSE- Rest of Southeast Asia: Brunei Darussalam-Timor, Leste) (20- BGD- Bangladesh) (21- IND- India) (22- PAK- Pakistan) (23- LKA- Sri Lanka) (24- XSA- Rest of South Asia: Afghanistan- Bhutan- Maldives- Nepal)			
16	SSA	‘Rest of Sub-Saharan Africa’	(96- NGA- Nigeria) (97- SEN- Senegal) (98- XWF- Rest of West Africa: Benin- Burkina Faso- Cote d'Ivoire- Cape Verde- Ghana- Guinea- Guinea-Bissau- Gambia- Liberia- Mali- Mauritania- Niger- Saint Helena- Sierra Leone- Togo) (99- XCF- Rest of Central Africa: Central African Republic- Cameroon- Congo- Gabon- Equatorial Guinea- Sao Tome and Principe- Chad) (101- ETH- Ethiopia) (107- UGA- Uganda) (110- XEC- Rest of Eastern Africa: Burundi- Comoros- Djibouti- Eritrea- Kenya- Mayotte- Reunion- Rwanda- Somalia- Sudan- Seychelles)			

Table A4-1 (cont.)

Model No.	Model Code	Model Region	GTAP No.	GTAP Code	GTAP Region	Member Countries
17	ROW	'Rest of the World'	(1- AUS- Australia) (2- NZL- New Zealand) (3- XOC- Rest of Oceania: American Samoa- Cook Islands- Fiji- French Polynesia- Guam- Kiribati- Marshall Islands- Federated States of Micronesia- Nauru- New Caledonia- Norfolk Island- Northern Mariana Islands- Niue- Palau- Papua New Guinea- Samoa- Solomon Islands- Tokelau- Tonga- Tuvalu- Vanuatu- Wallis and Futuna) (25- CAN- Canada) (27- MEX- Mexico) (28- XNA- Rest of North America: Bermuda- Greenland-Saint Pierre and Miquelon) (29- ARG- Argentina) (30- BOL- Bolivia) (31- BRA- Brazil) (32- CHL- Chile) (33- COL- Colombia) (34- ECU- Ecuador) (35- PRY- Paraguay) (36- PER- Peru) (37- URY- Uruguay) (38- VEN- Venezuela) (39- XSM- Rest of South America: Falkland Islands (Malvinas)- French Guiana-Guyana-Suriname- Belize) (40- CRI- Costa Rica) (41- GTM- Guatemala) (42- NIC- Nicaragua) (43- PAN- Panama) (44- XCA- Central America: El Salvador- Honduras) (45- XCB - Caribbean: Antigua & Barbuda- Bahamas- Barbados- Dominica- Dominican Republic- Grenada- Haiti- Jamaica- Puerto Rico- Saint Kitts and Nevis- Saint Lucia- Saint Vincent and the Grenadines- Trinidad and Tobago- Virgin Islands, U.S.- Anguilla- Aruba- Cayman Islands- Cuba- Guadeloupe- Martinique- Montserrat- Netherlands Antilles- Turks and Caicos- Virgin Islands, British) (71- CHE- Switzerland) (72- NOR- Norway) (73- XEF- Rest of EFTA: Iceland - Liechtenstein) (74- ALB- Albania) (76- BLR- Belarus) (77- HRV- Croatia) (79- RUS- Russian Federation) (80- UKR- Ukraine) (81- XEE- Rest of Eastern Europe: Ukraine- Republic of Moldova) (82- XER- Rest of Europe: Andorra- Bosnia and Herzegovina- Faroe Islands- Gibraltar- the former Yugoslav Republic of Macedonia- Monaco- San Marino- Serbia and Montenegro) (83- KAZ- Kazakhstan) (84- KGZ- Kyrgyzstan) (85- XSU- Rest of Former Soviet Union: Tajikistan- Turkmenistan- Uzbekistan) (86- ARM- Armenia) (87- AZE- Azerbaijan) (88- GEO- Georgia) (89- IRN- Islamic Republic of Iran) (90- TUR- Turkey) (91- XWS- Rest of West Asia: Bahrain- Iraq- Israel- Jordan- Kuwait- Lebanon- Palestinian Territory, Occupied- Oman- Qatar- Saudi Arabia- Syrian Arab Republic- United Arab Emirates- Yemen) (92- EGY- Egypt) (93- MAR- Morocco) (94- TUN- Tunisia) (95- XNF- Rest of North Africa: Algeria- Arab Jamahiriya Libyan)			

n.e.c. not elsewhere classified.
Source: aggregated by the author from the GTAP7 Database.

Table A4-2
Sector Aggregation

Model No.	Model Code	Model Sector	Sector Description	GTAP No.	GTAP Code	GTAP Sector
1	Ric	Rice	Paddy and processed rice	1	Pdr	Paddy rice
				23	Pcr	Processed rice
2	Wgr	Grains	Wheat and other cereal grains	2	Wht	Wheat
				3	Gro	Cereal grains nec
3	Vfr	Vegetables	Vegetables, fruit and nuts	4	v_f	Vegetables, fruit, nuts
4	Pfb	‘Plant fibres’	Plant-based fibres	7	Pfb	Plant-based fibres
5	Xcr	‘Other crops’	Other Crops	8	Ocr	Crops nec
6	Sgr	Sugar	Sugar and sugar cane	24	Sgr	Sugar
				6	c_b	Sugar cane, sugar beet
7	Bvt	Beverages	Beverages and tobacco products	26	b_t	Beverages and tobacco products
8	Xfp	‘Food products’	Oil seeds, vegetables oils, fats and Other food products	5	Osd	Oil seeds
				21	Vol	Vegetable oils and fats
				25	Ofd	Food products nec
9	Mmp	‘Meat and dairy products’	Milk, Meat & dairy and meat products	11	Rmk	Raw milk
				19	Cmt	Meat: cattle, sheep, goats, horse
				20	Omt	Meat products nec
				22	Mil	Dairy products
10	Ffp	Livestock	Fishing, forestry and other livestock products	9	Ctl	Cattle, sheep, goats, horses
				10	Oap	Animal products nec
				12	Wol	Wool, silk-worm cocoons
				13	Frs	Forestry
				14	Fsh	Fishing

Table A4-2 (cont.)

Model No.	Model Code	Model Sector	Sector Description	GTAP No.	GTAP Code	GTAP Sector
11	Cog	'Oil and minerals'	Coal, oil, gas and other minerals	15	Coa	Coal
				16	Oil	Oil
				17	Gas	Gas
				18	Omn	Minerals nec
12	Twl	Textiles	Textiles, wearing apparel and leather products	27	Tex	Textiles
				28	Wap	Wearing apparel
				29	Lea	Leather products
13	Pch	'Chemical and mineral products'	Petroleum, chemical and other mineral products	32	p_c	Petroleum, coal products
				33	Crp	Chemical, rubber, plastic prods
				34	Nmm	Mineral products nec
14	cMtp	'Metals and metal products'	Metals and metal products	35	i_s	Ferrous metals
				36	Nfm	Metals nec
				37	Fmp	Metal products
15	Veq	Vehicles	Vehicle and transport equipment	38	Mvh	Motor vehicles and parts
				39	Otn	Transport equipment nec
16	Emq	'Electronic equipments'	Electronic, machinery and other equipments	40	Ele	Electronic equipment
				41	Ome	Machinery and equipment nec
17	Xmn	'Other manufactures'	Other manufactures	30	Lum	Wood products
				31	Ppp	Paper products, publishing
				42	Omf	Manufactures nec

Table A4-2 (cont.)

Model No.	Model Code	Model Sector	Sector Description	GTAP No.	GTAP Code	GTAP Sector
18	Utc	'Public utilities'	Public Utilities & Construction	43	Ely	Electricity
				44	Gdt	Gas manufacture, distribution
				45	Wtr	Water
				46	Cns	Construction
19	Tcm	'Trade and communication'	Trade, Transport and Communication	47	Trd	Trade
				48	Otp	Transport nec
				49	Wtp	Sea transport
				50	Atp	Air transport
				51	Cmn	Communication
20	Xsr	'Other services'	Other Services	52	Ofi	Financial services nec
				53	Isr	Insurance
				54	Obs	Business services nec
				55	Ros	Recreation and other services
				56	Osg	Public Administration /Defence/Health/Education
				57	Dwe	Dwellings

n.e.c. not elsewhere classified.
Source: aggregated by the author from the GTAP7 Database.

Table A4-3
Armington Elasticities

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	3.2	3.8	3.6	2.6	3.4	2.7	4.3	2.9	2.7	2.8	2.8
Wgr	1.7	2.4	1.5	2.7	2.1	2.2	1.7	1.7	2.1	2.2	1.6
Vfr	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Pfb	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Xcr	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Sgr	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
cBvt	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Xfp	2.1	2.3	2.4	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.2
Mmp	4.0	3.8	4.0	4.0	4.1	3.9	4.2	4.2	4.2	4.0	4.1
Ffp	1.9	2.1	1.6	1.6	1.8	2.0	1.8	2.5	2.7	2.1	2.4
Cog	1.5	1.7	2.2	1.8	0.9	4.5	1.0	2.7	1.5	1.6	4.1
Twl	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Pch	2.9	3.0	3.1	2.9	2.8	3.0	3.0	2.8	2.8	3.1	2.7
Mtp	3.6	3.6	3.5	3.3	3.4	3.4	3.6	3.5	3.9	3.4	3.5
Veq	2.9	3.2	3.2	3.1	3.1	2.9	3.4	3.3	3.1	3.0	4.0
Emq	4.1	4.1	4.1	4.2	4.2	4.1	4.1	4.1	4.1	4.1	4.1
Xmn	3.4	3.4	3.2	3.3	3.3	3.3	3.3	3.3	3.4	3.3	3.3
Utc	2.0	2.1	2.4	2.1	2.2	2.2	2.1	2.3	2.5	2.1	2.1
Tcm	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Xsr	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9

Table A4-3 (cont.)

	EU	USA	EAS	SAS	SSA	ROW
Ric	3.1	3.5	3.7	3.6	3.4	3.6
Wgr	2.8	1.7	2.8	3.5	1.9	2.7
Vfr	1.9	1.9	1.9	1.9	1.9	1.9
Pfb	2.5	2.5	2.5	2.5	2.5	2.5
Xcr	3.3	3.3	3.3	3.3	3.3	3.3
Sgr	2.7	2.7	2.7	2.7	2.7	2.7
cBvt	1.2	1.2	1.2	1.2	1.2	1.2
Xfp	2.1	2.1	2.1	2.4	2.2	2.2
Mmp	3.8	3.9	4.0	3.8	4.0	3.8
Ffp	1.7	1.8	1.7	1.9	2.1	1.9
Cog	5.8	5.9	4.1	5.4	5.7	7.0
Twl	3.8	3.8	3.8	3.8	3.8	3.8
Pch	2.9	2.9	2.9	2.8	2.8	2.8
Mtp	3.6	3.6	3.4	3.6	3.5	3.6
Veq	3.1	3.1	3.1	3.4	3.6	3.2
Emq	4.2	4.2	4.2	4.2	4.1	4.2
Xmn	3.3	3.2	3.3	3.4	3.3	3.3
Utc	2.1	2.1	2.1	2.2	2.1	2.2
Tcm	1.9	1.9	1.9	1.9	1.9	1.9
Xsr	1.9	1.9	1.9	1.9	1.9	1.9

Note: Here and hereafter, shading indicates SADC non-LDCs and vice versa.

Table A4-4
Elasticity of Substitution between Imports by Origin

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	5.7	5.3	5.2	5.2	5.4	5.3	5.4	5.3	5.2	5.5	5.2
Wgr	4.8	8.3	5.4	5.3	8.1	7.0	7.8	6.1	4.6	5.4	6.6
Vfr	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Pfb	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Xcr	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Sgr	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
cBvt	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Xfp	4.4	5.1	5.1	4.4	5.2	5.1	5.6	5.4	5.2	4.3	4.5
Mmp	7.5	7.7	7.4	7.7	8.0	8.1	7.7	7.6	7.8	8.0	8.1
Ffp	3.3	3.0	2.9	4.1	3.2	3.8	3.6	3.3	3.3	3.6	2.8
Cog	1.9	4.5	2.3	2.1	1.9	9.0	1.9	8.8	2.3	2.0	3.0
Twl	7.6	7.5	7.5	7.5	7.6	7.6	7.6	7.6	7.5	7.5	7.6
Pch	5.7	5.5	6.1	5.7	5.6	6.4	5.8	6.3	5.8	5.8	5.6
Mtp	7.1	6.7	6.8	6.4	6.8	7.6	7.4	6.9	7.9	7.1	6.8
Veq	5.8	6.3	6.4	6.3	6.2	6.2	6.6	6.0	6.0	6.0	8.0
Emq	8.3	8.3	8.3	8.4	8.3	8.3	8.2	8.2	8.3	8.3	8.2
Xmn	6.5	6.6	6.2	6.7	6.6	6.5	6.6	6.3	6.3	6.6	6.7
Utc	5.0	4.3	5.0	4.5	5.1	5.5	3.9	3.8	5.5	5.4	3.8
Tcm	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Xsr	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8

Table A4-4 (cont.)

	EU	USA	EAS	SAS	SSA	ROW
Ric	6.6	5.6	6.1	5.4	5.7	5.9
Wgr	5.7	4.5	5.2	7.8	8.2	6.0
Vfr	3.7	3.7	3.7	3.7	3.7	3.7
Pfb	5.0	5.0	5.0	5.0	5.0	5.0
Xcr	6.5	6.5	6.5	6.5	6.5	6.5
Sgr	5.4	5.4	5.4	5.4	5.4	5.4
cBvt	2.3	2.3	2.3	2.3	2.3	2.3
Xfp	4.4	4.2	4.5	5.2	4.6	4.6
Mmp	7.9	7.8	8.2	7.6	7.8	7.9
Ffp	3.7	3.2	4.1	4.3	3.7	3.5
Cog	12.8	12.4	10.5	9.1	8.5	13.2
Twl	7.6	7.6	7.6	7.6	7.6	7.6
Pch	6.3	6.1	6.2	6.0	5.7	6.2
Mtp	7.2	7.3	7.3	7.3	6.8	7.2
Veq	6.2	6.1	6.6	6.9	7.3	6.3
Emq	8.4	8.4	8.5	8.5	8.3	8.3
Xmn	6.6	6.9	6.7	6.7	6.6	6.7
Utc	4.6	4.8	4.1	4.3	4.6	4.8
Tcm	3.8	3.8	3.8	3.8	3.8	3.8
Xsr	3.8	3.8	3.8	3.8	3.8	3.8

Table A4-5
Elasticity of Substitution between Production Factors

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.3	0.2	0.4	0.7	0.2	0.6	0.2	0.8	1.1	0.7	0.7
Wgr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Vfr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Pfb	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Xcr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sgr	0.4	0.7	0.9	0.4	1.0	0.8	0.2	0.4	0.3	0.9	0.5
cBvt	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Xfp	1.1	1.1	0.7	1.1	1.1	1.1	0.8	0.9	1.1	1.1	1.0
Mmp	1.1	0.9	1.1	1.1	1.0	0.9	1.1	1.1	1.0	1.0	1.1
Ffp	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cog	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Twl	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Pch	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Mtp	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Veq	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Emq	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Xmn	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Utc	1.4	1.4	1.4	1.4	1.3	1.3	1.4	1.3	1.3	1.4	1.3
Tcm	1.6	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.6	1.6	1.6
Xsr	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3

Table A4-5 (cont.)

	EU	USA	EAS	SAS	SSA
Ric	0.8	0.5	0.4	0.5	0.4
Wgr	0.2	0.2	0.2	0.2	0.2
Vfr	0.2	0.2	0.2	0.2	0.2
Pfb	0.2	0.2	0.2	0.2	0.2
Xcr	0.2	0.2	0.2	0.2	0.2
Sgr	0.8	0.9	0.7	0.5	0.5
cBvt	1.1	1.1	1.1	1.1	1.1
Xfp	1.1	1.0	1.1	0.8	0.9
Mmp	0.9	1.0	0.9	0.8	0.7
Ffp	0.2	0.2	0.2	0.2	0.2
Cog	0.2	0.2	0.2	0.2	0.2
Twl	1.3	1.3	1.3	1.3	1.3
Pch	1.3	1.3	1.3	1.3	1.3
Mtp	1.3	1.3	1.3	1.3	1.3
Veq	1.3	1.3	1.3	1.3	1.3
Emq	1.3	1.3	1.3	1.3	1.3
Xmn	1.3	1.3	1.3	1.3	1.3
Utc	1.4	1.4	1.4	1.3	1.4
Tcm	1.6	1.6	1.6	1.6	1.7
Xsr	1.3	1.3	1.3	1.3	1.3

Table A4-6
Domestic Production by Activity (Percent, value, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**8.3**	**44.3**	**39.9**	**16.1**	**24.7**	**9.5**	**44.3**	**25.8**	**26.3**	**13.5**	**17.3**
Ric	0.0	7.1	0.2	0.0	0.6	0.0	2.0	0.3	0.1	0.0	0.2
Wgr	0.6	0.1	6.2	0.0	2.7	0.3	6.7	3.2	0.8	0.6	2.5
Vfr	0.3	1.8	2.6	1.5	4.0	1.0	3.2	1.1	0.9	0.7	0.7
Pfb	0.0	0.2	0.8	0.0	0.3	0.0	0.6	1.3	2.5	0.1	0.1
Xcr	0.0	4.1	***14.4***	0.1	5.0	0.1	6.3	4.3	7.2	0.4	2.6
Sgr	0.0	4.2	2.7	7.0	0.3	0.4	3.4	0.8	2.2	1.5	0.2
Bvt	1.2	7.8	3.9	0.9	0.5	1.7	4.0	1.9	4.5	1.4	1.6
Xfp	1.0	4.2	3.6	3.9	6.2	2.7	***9.8***	6.4	4.2	5.0	4.1
Mmp	3.4	0.9	2.3	0.7	0.6	1.8	1.9	1.3	1.0	1.6	1.1
Ffp	1.7	***13.8***	3.2	1.9	4.5	1.3	6.3	5.4	2.7	2.2	4.1
Mani.	**30.0**	**27.0**	**21.8**	**33.9**	**14.5**	**34.5**	**12.6**	**27.0**	**31.1**	**38.2**	**40.7**
Cog	***20.6***	5.6	6.4	6.5	0.8	2.5	2.2	2.2	7.1	4.9	***30.0***
Twl	1.0	***8.7***	3.5	***14.8***	0.6	2.7	2.5	2.6	3.7	6.9	1.5
Pch	1.3	4.5	5.5	3.9	1.3	***9.0***	3.3	5.5	7.3	***10.9***	4.5
Mtp	3.4	1.2	1.0	1.1	10.8	6.8	2.2	***12.4***	8.3	4.1	0.8
Veq	1.0	0.1	0.1	1.4	0.0	4.3	0.4	0.5	0.2	2.5	0.3
Emq	0.4	0.1	0.4	2.8	0.1	4.3	0.4	1.1	0.6	3.7	0.9
Xmn	2.3	6.7	4.9	3.5	0.9	4.8	1.7	2.7	3.8	5.1	2.6
Ser.	**61.8**	**28.7**	**38.2**	**50.1**	**60.8**	**56.0**	**43.1**	**47.2**	**42.6**	**48.2**	**42.0**
Utc	***13.1***	7.5	2.6	6.2	***16.9***	6.1	6.4	11.3	***11.8***	5.4	7.0
Tcm	12.7	7.8	***23.2***	***17.5***	***27.8***	***18.0***	***22.1***	***20.2***	***13.3***	***18.0***	***16.7***
Xsr	***36.0***	***13.4***	***12.5***	***26.3***	***16.1***	***31.9***	***14.6***	***15.7***	***17.5***	***24.8***	***18.4***
Main*	**69.7**	**35.9**	**50.1**	**58.6**	**60.8**	**58.9**	**46.5**	**48.3**	**42.6**	**53.7**	**65.1**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Rice output constitutes 0.0 percent of total output in Botswana. * Shares of the three main sectors (presented above in italic bold). Here and hereafter, Agri. refers to agricultural and agro-processing activities/commodities, Mani. includes manufacturing and mining activities/commodities; and Ser. refers to the three services activities/commodities. Figures for Agri., Mani., Ser. and Total are calculated as simple averages. Source: Calculated by the author from the GTAP7 Database.

Table A4-7
Factor Shares in Value Added and Factor Intensity by Activity

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Land										
% of VA	**0.4**	**3.2**	**3.9**	**1.2**	**3.5**	**0.4**	**5.1**	**3.1**	**3.9**	**0.6**	**1.4**
Ric	12.6	11.8	13.1	7.5	14.9	8.9	15.0	5.8	1.7	6.6	7.3
Wgr	14.0	12.0	16.7	15.2	15.0	14.1	15.0	15.0	31.0	14.0	14.2
Vfr	14.0	12.0	16.7	15.2	15.0	14.1	15.0	15.0	31.0	14.0	14.2
Pfb	14.0	12.0	16.7	15.2	15.0	13.8	15.0	15.0	31.0	14.0	14.2
Xcr	14.0	12.0	16.7	15.2	15.0	14.0	15.0	15.0	31.0	14.0	14.2
Sgr	11.9	6.2	3.2	11.7	1.6	5.2	15.0	12.8	27.3	4.1	10.6
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xfp	0.8	0.4	7.6	0.0	0.8	0.4	5.9	3.6	2.2	0.5	2.4
Mmp	0.2	3.1	0.1	0.0	2.6	3.0	0.2	0.1	3.7	2.2	0.2
Ffp	13.3	3.7	4.8	9.2	5.0	9.1	4.9	4.4	26.0	7.0	4.2
	Natural Resources										
% of VA	**2.4**	**4.7**	**3.6**	**2.8**	**0.8**	**1**	**1.4**	**1.3**	**1.5**	**1.9**	**15.3**
Ffp	0.7	10.5	19.2	11.7	10.2	8.3	11.2	14.3	2.1	12.5	11.6
Cog	8.4	38.8	41.7	44.9	10.3	31.6	8.7	16.1	20.6	23.1	34.9

Table A4-7 (cont.)

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Unskilled Labour										
% of VA	**27.6**	**44.9**	**43.7**	**33.6**	**40.3**	**31.5**	**44.2**	**40.4**	**34.5**	**34.4**	**26.6**
Ric	35.5	70.8	47.5	44.6	59.5	30.3	59.5	47.3	8.5	36.2	51.4
Wgr	33.6	71.4	55.1	58.9	59.5	33.1	59.5	59.5	40.7	33.6	62.8
Vfr	33.6	71.4	55.1	58.9	59.5	33.1	59.5	59.5	40.7	33.6	62.8
Pfb	33.6	71.4	55.1	58.9	59.5	32.3	59.5	59.5	40.7	33.6	62.8
Xcr	33.6	71.4	55.1	58.9	59.5	32.9	59.5	59.5	40.7	33.6	62.8
Sgr	38.1	58.9	32.8	55.6	59.3	24.6	59.5	58.6	37.3	25.9	56.0
Bvt	37.3	48.8	15.9	24.9	61.2	29.8	45.0	48.5	38.2	35.3	38.3
Xfp	78.1	46.5	41.6	39.3	58.4	42.9	49.0	54.0	15.4	47.1	53.5
Mmp	45.6	52.9	27.4	37.3	63.1	47.5	42.9	59.2	18.3	51.6	50.7
Ffp	33.8	36.9	56.6	43.8	66.7	25.0	66.9	51.2	41.1	33.4	56.4
Cog	7.4	17.2	19.1	12.7	26.2	27.4	58.5	11.5	23.6	22.5	2.5
Twl	71.5	46.6	31.6	42.0	36.8	64.7	33.8	36.5	44.7	63.8	37.7
Pch	51.1	42.9	21.1	44.5	43.7	34.0	17.4	23.4	31.1	35.2	25.4
Mtp	79.0	44.2	33.4	57.6	23.0	29.7	18.2	11.8	36.0	28.4	33.5
Veq	49.1	66.6	39.4	21.5	82.4	38.6	17.5	53.4	45.3	42.9	52.5
Emq	61.7	62.0	33.7	19.2	79.9	45.4	16.3	45.6	38.6	47.5	46.0
Xmn	52.2	45.3	26.1	53.9	54.1	37.6	33.3	32.9	58.2	41.8	34.7
Utc	44.1	45.2	33.5	44.6	38.4	38.0	23.2	13.0	29.4	40.6	25.2
Tcm	33.3	32.8	42.8	30.1	28.9	34.8	34.4	49.0	45.7	39.4	49.6
Xsr	28.2	37.5	35.8	28.0	31.6	26.4	23.0	30.9	29.0	28.4	33.8

Table A4-7 (cont.)

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Skilled Labour										
% of VA	**16.9**	**9.6**	**9.6**	**16**	**10.6**	**17.8**	**6.1**	**10.7**	**14.8**	**16.1**	**9.7**
Ric	1.5	0.6	1.1	3.3	0.5	2.2	0.5	4.9	1.2	4.5	4.0
Wgr	0.4	0.6	0.4	0.5	0.5	0.4	0.5	0.5	0.3	0.4	0.5
Vfr	0.4	0.6	0.4	0.5	0.5	0.4	0.5	0.5	0.3	0.4	0.5
Pfb	0.4	0.6	0.4	0.5	0.5	0.4	0.5	0.5	0.3	0.4	0.5
Xcr	0.4	0.6	0.4	0.5	0.5	0.4	0.5	0.5	0.3	0.4	0.5
Sgr	2.6	5.1	4.9	2.6	11.5	3.0	0.5	2.1	0.6	3.8	2.4
Bvt	6.1	6.8	2.2	3.5	8.6	4.9	6.3	6.8	5.4	5.8	5.4
Xfp	17.8	9.6	3.8	8.5	12.0	9.8	5.7	8.8	2.7	10.7	9.4
Mmp	9.2	6.9	5.2	7.4	10.4	8.2	8.4	11.5	2.7	9.4	9.8
Ffp	0.4	0.3	0.5	0.4	0.5	0.3	0.5	0.4	0.3	0.4	0.5
Cog	1.2	3.2	3.5	2.2	3.8	4.4	8.4	1.7	3.3	4.1	0.4
Twl	11.7	7.1	4.6	6.5	5.5	10.4	5.0	5.6	7.3	10.3	5.7
Pch	11.3	8.7	4.1	9.0	8.5	7.6	3.3	4.6	5.5	8.1	4.8
Mtp	16.3	7.9	6.0	10.4	4.4	5.9	3.3	2.2	6.6	5.7	6.0
Veq	10.3	12.0	7.1	3.9	14.9	8.1	3.2	9.6	8.2	9.0	9.5
Emq	15.1	12.8	7.0	4.0	16.5	11.1	3.4	9.4	8.0	11.7	9.5
Xmn	8.4	6.8	3.6	9.3	7.5	6.8	4.7	5.0	8.8	8.0	5.0
Utc	10.9	10.9	9.9	10.3	13.6	11.4	5.9	4.1	12.2	10.7	6.5
Tcm	9.7	9.3	10.2	10.0	7.3	9.8	8.9	12.8	11.9	10.8	12.6
Xsr	34.9	32.2	27.8	30.9	30.4	28.5	16.2	29.2	36.4	29.8	37.8

Table A4-7 (cont.)

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Capital										
% of VA	**52.8**	**37.7**	**39.3**	**46.5**	**44.9**	**49.4**	**43.1**	**44.4**	**45.4**	**46.9**	**47.1**
Ric	50.4	16.7	38.2	44.7	25.1	58.6	25.0	41.9	88.5	52.7	37.3
Wgr	52.0	16.0	27.8	25.4	25.0	52.4	25.0	25.0	28.0	52.0	22.5
Vfr	52.0	16.0	27.8	25.4	25.0	52.4	25.0	25.0	28.0	52.0	22.5
Pfb	52.0	16.0	27.8	25.4	25.0	53.4	25.0	25.0	28.0	52.0	22.5
Xcr	52.0	16.0	27.8	25.4	25.0	52.7	25.0	25.0	28.0	52.0	22.5
Sgr	47.4	29.8	59.1	30.1	27.6	67.1	25.0	26.5	34.7	66.1	31.1
Bvt	56.6	44.5	81.9	71.6	30.2	65.3	48.7	44.7	56.4	58.9	56.4
Xfp	3.3	43.5	47.0	52.1	28.8	46.9	39.3	33.7	79.6	41.7	34.7
Mmp	45.0	37.1	67.3	55.3	23.8	41.3	48.6	29.1	75.4	36.9	39.3
Ffp	51.8	48.6	19.0	35.0	17.5	57.3	16.4	29.7	30.4	46.6	27.4
Cog	83.0	40.8	35.7	40.1	59.7	36.6	24.3	70.6	52.4	50.2	62.2
Twl	16.8	46.3	63.8	51.5	57.7	24.9	61.2	57.9	48.1	26.0	56.6
Pch	37.6	48.4	74.8	46.5	47.8	58.3	79.2	72.0	63.4	56.7	69.9
Mtp	4.6	47.9	60.6	32.1	72.6	64.3	78.5	85.9	57.4	65.9	60.5
Veq	40.7	21.3	53.5	74.7	2.7	53.3	79.3	36.9	46.5	48.2	38.1
Emq	23.1	25.2	59.4	76.9	3.6	43.5	80.3	44.9	53.5	40.8	44.5
Xmn	39.4	47.9	70.3	36.8	38.4	55.6	62.0	62.1	33.0	50.2	60.3
Utc	45.0	44.0	56.6	45.1	47.9	50.6	70.9	82.9	58.3	48.7	68.3
Tcm	57.0	57.9	47.0	59.9	63.8	55.4	56.8	38.2	42.4	49.8	37.8
Xsr	36.9	30.4	36.4	41.1	38.0	45.1	60.8	39.9	34.7	41.8	28.4

At the aggregate level, land constitutes 0.4 of total value added (measures at agents prices) in Botswana. At the sectoral level, land composes 12.6 percent of total factor usage in rice activity in Botswana.
Source: Calculated by the author from the GTAP7 Database.

Table A4-8
Factor Allocation across Activities

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Land										
Ric	1.0	23.4	0.7	0.0	3.5	0.0	6.1	0.4	0.1	0.2	0.6
Wgr	19.0	0.8	35.2	0.0	20.3	11.9	27.5	22.1	6.9	18.8	35.5
Vfr	11.1	12.2	15.4	32.2	26.9	45.0	16.0	10.4	5.2	24.0	12.4
Pfb	0.2	1.4	4.8	0.0	1.8	0.9	1.5	9.6	16.9	3.7	1.8
Xcr	1.1	30.6	33.5	2.7	37.0	4.2	29.9	40.0	47.7	19.7	31.6
Sgr	0.1	8.5	1.2	49.8	0.0	3.4	4.3	2.4	7.3	6.0	1.5
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xfp	0.9	0.4	4.4	0.0	0.5	1.6	4.8	5.3	2.0	2.4	3.6
Mmp	1.1	0.7	0.0	0.0	0.1	4.1	0.1	0.0	0.3	1.5	0.1
Ffp	65.5	22.1	4.9	15.4	9.9	28.9	9.8	9.7	13.6	23.8	12.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Natural Resources										
Ffp	0.5	43.2	21.4	8.4	86.9	9.9	80.7	72.2	2.8	13.6	3.3
Cog	99.5	56.8	78.6	91.6	13.1	90.1	19.3	27.8	97.2	86.4	96.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table A4-8 (cont.)

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Unskilled Labour										
Agri.	**8.6**	**60.5**	**43.9**	**20.6**	**45.5**	**6.9**	**64**	**43.4**	**21.6**	**11.2**	**36.1**
Ric	0.0	10.0	0.3	0.0	1.2	0.0	2.8	0.2	0.0	0.0	0.2
Wgr	0.6	0.3	12.4	0.0	6.9	0.3	12.6	6.7	1.0	0.8	8.4
Vfr	0.4	5.2	5.4	4.5	9.1	1.3	7.3	3.1	0.8	1.0	2.9
Pfb	0.0	0.6	1.7	0.0	0.6	0.0	0.7	2.9	2.5	0.2	0.4
Xcr	0.0	13.0	11.8	0.4	12.6	0.1	13.7	12.1	7.0	0.8	7.5
Sgr	0.0	5.7	1.3	8.5	0.1	0.2	2.0	0.9	1.1	0.7	0.4
Bvt	0.6	6.0	1.4	0.8	0.3	1.0	2.6	1.8	5.2	1.0	1.7
Xfp	1.2	3.1	2.5	2.9	3.3	2.2	4.6	6.2	1.5	4.1	4.4
Mmp	3.6	0.8	0.9	0.8	0.1	0.8	2.1	0.9	0.1	0.6	0.9
Ffp	2.2	15.8	6.2	2.7	11.3	1.0	15.6	8.6	2.4	2.0	9.3
Mani.	**23.7**	**14.9**	**10.7**	**30.4**	**6.6**	**23.9**	**6.4**	**8.2**	**25.3**	**28.6**	**10.4**
Cog	7.6	2.6	3.5	2.2	0.7	2.6	4.2	0.7	4.9	4.7	3.9
Twl	1.3	5.6	1.5	14.4	0.4	2.9	0.6	1.3	3.7	6.4	1.0
Pch	1.6	2.3	2.2	7.3	0.9	4.3	0.4	1.1	4.1	5.9	1.1
Mtp	10.1	0.6	0.8	0.2	3.8	5.8	0.2	1.0	4.9	3.7	0.5
Veq	0.1	0.0	0.0	1.4	0.0	1.8	0.0	0.7	0.2	1.2	0.2
Emq	0.5	0.0	0.1	2.7	0.1	2.6	0.1	1.0	0.6	2.4	0.8
Xmn	2.5	3.8	2.6	2.2	0.7	3.9	0.9	2.4	6.9	4.3	2.9
Ser.	**67.5**	**24.6**	**45.2**	**49.1**	**48**	**69.2**	**29.6**	**48.4**	**53**	**60.3**	**53.3**
Utc	13.0	2.8	1.0	4.4	13.0	6.2	2.9	3.4	12.6	4.7	3.1
Tcm	16.0	5.3	29.0	12.2	20.0	23.8	18.8	29.5	18.3	25.3	27.3
Xsr	38.5	16.5	15.2	32.5	15.0	39.2	7.9	15.5	22.1	30.3	22.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table A4-8 (cont.)

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Skilled Labour										
Agri.	**1.8**	**11.4**	**5**	**2.7**	**4.2**	**1.4**	**12.5**	**6.8**	**2.4**	**2.8**	**4.1**
Ric	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1
Wgr	0.0	0.0	0.5	0.0	0.2	0.0	0.7	0.2	0.0	0.0	0.2
Vfr	0.0	0.2	0.2	0.1	0.3	0.0	0.4	0.1	0.0	0.0	0.1
Pfb	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Xcr	0.0	0.5	0.4	0.0	0.4	0.0	0.8	0.4	0.1	0.0	0.2
Sgr	0.0	2.3	0.9	0.8	0.1	0.0	0.1	0.1	0.0	0.2	0.0
Bvt	0.2	3.9	0.9	0.2	0.2	0.3	2.6	1.0	1.7	0.3	0.7
Xfp	0.4	3.0	1.0	1.3	2.6	0.9	3.9	3.8	0.6	2.0	2.1
Mmp	1.2	0.5	0.8	0.3	0.1	0.2	2.9	0.7	0.0	0.2	0.5
Ffp	0.0	0.6	0.2	0.0	0.3	0.0	0.9	0.3	0.0	0.1	0.2
Mani.	**7.3**	**11.6**	**8.4**	**11.1**	**4.4**	**8.2**	**6.9**	**5.3**	**9.6**	**12**	**4.9**
Cog	2.1	2.3	2.9	0.8	0.4	0.7	4.3	0.4	1.6	1.8	2.0
Twl	0.3	4.0	1.0	4.6	0.3	0.8	0.7	0.8	1.4	2.2	0.4
Pch	0.6	2.2	2.0	3.1	0.6	1.7	0.6	0.8	1.7	2.9	0.6
Mtp	3.4	0.5	0.7	0.1	2.7	2.0	0.3	0.7	2.1	1.6	0.2
Veq	0.0	0.0	0.0	0.5	0.0	0.7	0.0	0.4	0.1	0.5	0.1
Emq	0.2	0.0	0.1	1.2	0.1	1.1	0.1	0.8	0.3	1.3	0.5
Xmn	0.7	2.6	1.7	0.8	0.3	1.2	0.9	1.4	2.4	1.7	1.1
Ser.	**90.8**	**76.9**	**86.7**	**86**	**91.4**	**90.1**	**80.5**	**88.1**	**87.7**	**85.1**	**91.1**
Utc	5.2	3.2	1.3	2.1	17.5	3.3	5.3	4.1	12.2	2.6	2.2
Tcm	7.6	7.1	31.4	8.6	19.1	11.8	35.0	29.0	11.1	14.8	19.0
Xsr	78.0	66.6	54.0	75.3	54.8	75.0	40.2	55.0	64.4	67.7	69.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table A4-8 (cont.)

(Percent, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
	Capital										
Agri.	**5**	**47**	**30.3**	**11.3**	**15.8**	**6.7**	**29.9**	**20**	**20.8**	**10.8**	**10**
Ric	0.0	2.8	0.2	0.0	0.5	0.0	1.2	0.2	0.3	0.0	0.1
Wgr	0.5	0.1	5.8	0.0	2.6	0.3	5.4	2.6	0.5	0.9	1.7
Vfr	0.3	1.4	2.5	1.4	3.4	1.3	3.2	1.2	0.4	1.2	0.6
Pfb	0.0	0.2	0.8	0.0	0.2	0.0	0.3	1.1	1.3	0.2	0.1
Xcr	0.0	3.5	5.5	0.1	4.7	0.1	5.9	4.6	3.7	1.0	1.5
Sgr	0.0	3.5	2.2	3.2	0.1	0.3	0.9	0.4	0.8	1.3	0.1
Bvt	0.5	6.5	6.6	1.6	0.2	1.4	2.9	1.5	5.9	1.2	1.4
Xfp	0.0	3.5	2.7	2.7	1.5	1.5	3.8	3.5	6.1	2.6	1.6
Mmp	1.9	0.7	2.1	0.8	0.0	0.4	2.4	0.4	0.4	0.3	0.4
Ffp	1.8	24.8	1.9	1.5	2.6	1.4	3.9	4.5	1.4	2.1	2.5
Mani.	**47.4**	**22.6**	**24.2**	**34.9**	**13.9**	**22.1**	**8.1**	**20.9**	**27.5**	**29.1**	**62.5**
Cog	45.1	7.4	6.1	4.9	1.4	2.2	1.8	3.7	8.3	7.7	56.1
Twl	0.2	6.6	2.7	12.4	0.6	0.7	1.2	1.9	3.0	1.9	0.8
Pch	0.6	3.2	7.3	5.4	0.9	4.6	1.9	3.1	6.4	6.9	1.7
Mtp	0.3	0.7	1.4	0.1	10.6	7.8	1.0	6.8	6.0	6.3	0.5
Veq	0.1	0.0	0.0	3.5	0.0	1.6	0.2	0.4	0.2	1.0	0.1
Emq	0.1	0.0	0.1	7.6	0.0	1.6	0.3	0.9	0.6	1.5	0.5
Xmn	1.0	4.7	6.6	1.0	0.4	3.6	1.7	4.1	3.0	3.8	2.8
Ser.	**47.6**	**30.4**	**45.5**	**53.7**	**70.2**	**71.1**	**62.3**	**59**	**51.9**	**60.1**	**27.3**
Utc	6.9	3.2	1.6	3.1	14.5	5.2	9.0	19.9	18.9	4.1	4.8
Tcm	14.4	11.2	29.5	17.1	39.5	23.8	31.8	20.9	12.9	23.4	11.7
Xsr	26.3	16.0	14.4	33.5	16.2	42.1	21.5	18.2	20.1	32.6	10.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Rice activity occupies 1.0 percent of employed land in Botswana. Source: Calculated by the author from the GTAP7 Database.

Table A4-9
Import Shares in World Imports by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Agri.	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.5**	**0.1**	**0.0**	**0.1**	**0.1**	**0.2**	**1.2**
Ric	0.1	0.2	0.0	0.2	0.6	***1.7***	0.6	0.1	0.0	0.1	0.8	**4.4**
Wgr	0.1	0.0	0.0	0.0	0.2	0.7	0.3	0.0	0.3	0.1	0.1	**2.0**
Vfr	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	**0.5**
Pfb	0.0	0.0	0.0	0.2	0.0	0.8	0.0	0.0	0.1	0.1	0.0	**1.3**
Xcr	0.0	0.0	0.1	0.0	0.0	0.6	0.0	0.0	0.1	0.1	0.0	**1.1**
Sgr	0.2	0.0	0.0	0.1	0.3	***1.0***	0.2	0.0	0.0	0.1	0.4	**2.3**
Bvt	0.1	0.0	0.0	0.1	0.1	0.4	0.0	0.0	0.0	0.2	0.5	**1.4**
Xfp	0.1	0.0	0.0	0.1	0.1	0.5	0.1	0.0	0.0	0.1	0.2	**1.2**
Mmp	0.1	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.1	0.3	**0.9**
Ffp	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1	**0.6**
Mani.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.9**
Cog	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	**1.0**
Twl	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.1	0.1	**0.9**
Pch	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.1	0.1	**1.0**
Mtp	0.0	0.0	0.0	0.1	0.0	0.5	0.1	0.0	0.0	0.0	0.1	**0.9**
Veq	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.1	0.2	**1.4**
Emq	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	**0.8**
Xmn	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1	**0.8**
Ser.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.7**
Utc	0.1	0.0	0.0	0.0	0.2	0.7	0.1	0.1	0.1	0.1	***1.2***	**2.6**
Tcm	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	**0.6**
Xsr	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.3	**0.7**
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.5**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.9**

Botswana rice imports make up 0.1 percent of world rice imports.
Source: Calculated by the author from the GTAP7 Database.

Table A4-10
Export Shares in World Exports by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Agri.	**0.0**	**0.1**	**0.1**	**0.1**	**0.0**	**0.9**	**0.1**	**0.1**	**0.1**	**0.2**	**0.0**	**1.8**
Ric	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	**0.5**
Wgr	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.1	0.0	0.0	0.0	**0.8**
Vfr	0.0	0.1	0.0	0.0	0.0	***2.9***	0.2	0.0	0.1	0.1	0.0	**3.4**
Pfb	0.0	0.1	0.2	0.0	0.2	0.7	0.7	***1.0***	***1.5***	0.0	0.0	**4.5**
Xcr	0.0	0.4	0.7	0.0	0.2	0.5	0.6	0.2	***1.1***	0.0	0.0	**3.9**
Sgr	0.0	0.1	0.5	***2.8***	0.2	***1.9***	0.2	0.3	0.6	***1.9***	0.2	**8.7**
Bvt	0.0	0.0	0.0	0.0	0.0	***1.5***	0.0	0.0	0.1	0.2	0.0	**1.8**
Xfp	0.0	0.1	0.0	0.1	0.1	0.6	0.1	0.0	0.0	0.2	0.0	**1.2**
Mmp	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	**0.5**
Ffp	0.0	0.1	0.0	0.0	0.1	0.9	0.2	0.0	0.0	0.3	0.4	**2.0**
Mani.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**	**1.0**
Cog	0.4	0.1	0.0	0.1	0.0	***1.2***	0.0	0.0	0.0	0.2	***1.8***	**3.8**
Twl	0.0	0.1	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.2	0.0	**0.8**
Pch	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.0	**0.6**
Mtp	0.0	0.0	0.0	0.0	0.2	***2.4***	0.0	0.2	0.1	0.1	0.0	**3.0**
Veq	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	**0.5**
Emq	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	**0.2**
Xmn	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.1	0.0	**0.9**
Ser.	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**
Utc	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.1	**1.2**
Tcm	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	**0.5**
Xsr	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.0	**0.6**
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.9**

Botswana rice exports make up 0.0 percent of world rice exports.
Source: Calculated by the author from the GTAP7 Database.

Table A4-11
Import Shares in SADC Total Imports by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	Total
Agri.	**5.0**	**2.0**	**2.1**	**5.6**	**6.0**	**39.5**	**5.9**	**1.9**	**4.4**	**9.1**	**18.5**	**100.0**
Ric	2.7	4.8	0.3	4.7	***13.6***	38.0	***13.7***	1.4	1.0	2.6	***17.2***	**100.0**
Wgr	5.4	0.6	2.3	1.9	***10.9***	32.6	***15.5***	1.7	***16.8***	7.3	4.9	**100.0**
Vfr	***10.0***	0.5	1.7	8.8	9.6	24.6	2.6	3.7	9.8	***13.6***	***15.0***	**100.0**
Pfb	0.7	0.7	0.5	***15.9***	0.1	60.9	1.7	2.2	6.1	***10.9***	0.3	**100.0**
Xcr	3.2	1.1	***12.1***	1.2	2.9	60.9	2.4	1.3	8.4	5.0	1.7	**100.0**
Sgr	6.9	2.1	0.5	4.3	***12.7***	41.9	9.2	0.1	0.2	5.0	***17.1***	**100.0**
Bvt	5.5	1.2	0.7	4.1	3.9	32.7	2.7	1.7	0.7	***13.0***	***33.9***	**100.0**
Xfp	4.9	2.9	2.4	6.6	4.7	39.5	5.5	2.6	3.8	9.6	***17.5***	**100.0**
Mmp	5.6	0.8	0.8	7.2	3.4	36.2	1.8	0.7	1.0	***10.0***	***32.5***	**100.0**
Ffp	3.0	0.4	1.0	6.3	1.6	66.2	1.4	0.7	1.2	9.7	8.3	**100.0**
Mani.	**3.4**	**1.6**	**1.2**	**3.8**	**1.9**	**64.3**	**3.9**	**2.3**	**2.4**	**5.2**	**9.9**	**100.0**
Cog	0.4	0.0	0.1	0.6	0.1	95.1	0.1	2.5	0.3	0.5	0.4	**100.0**
Twl	3.6	5.2	1.8	7.6	1.8	57.0	4.5	1.3	2.0	9.6	5.4	**100.0**
Pch	4.7	2.1	2.1	4.5	3.4	53.2	6.4	3.2	3.9	7.8	8.7	**100.0**
Mtp	4.4	1.4	0.9	6.9	2.1	54.1	6.9	2.7	4.6	4.8	***11.3***	**100.0**
Veq	2.8	1.0	0.6	1.4	1.0	67.8	2.0	0.9	1.2	3.7	***17.5***	**100.0**
Emq	3.4	1.3	0.8	3.8	1.8	66.5	3.4	2.8	2.5	4.1	9.5	**100.0**
Xmn	4.7	2.1	2.4	5.4	3.0	55.3	5.5	1.9	2.1	8.8	8.8	**100.0**
Ser.	**3.1**	**2.5**	**0.7**	**5.1**	**3.1**	**42.7**	**4.4**	**1.9**	**2.0**	**6.4**	**28.0**	**100.0**
Utc	2.0	0.4	0.1	0.4	9.0	26.0	5.3	2.5	5.7	3.4	***45.3***	**100.0**
Tcm	2.6	1.6	0.7	7.1	1.9	62.0	4.1	2.9	1.2	2.1	***13.8***	**100.0**
Xsr	3.9	3.9	0.9	4.8	2.4	31.3	4.5	0.9	1.6	***10.9***	***35.1***	**100.0**
Total	**3.5**	**1.8**	**1.2**	**4.2**	**2.5**	**58.6**	**4.2**	**2.2**	**2.5**	**5.8**	**13.5**	**100.0**

Botswana rice imports make up 2.7 percent of SADC total rice imports.
Source: Calculated by the author from the GTAP7 Database.

Table A4-12
Export Shares in SADC Total Exports by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Agri.	**1.1**	**4.7**	**3.4**	**4.6**	**2.7**	**51.7**	**7.9**	**3.1**	**7.4**	**11.3**	**2.3**	**100.0**
Ric	3.6	6.2	0.3	0.4	1.6	74.7	7.8	3.1	0.4	1.2	0.5	**100.0**
Wgr	1.1	0.0	0.8	0.0	1.7	72.2	***11.3***	***11.1***	0.3	0.7	0.9	**100.0**
Vfr	0.1	3.3	0.8	0.2	1.4	83.2	4.9	1.4	2.0	2.6	0.1	**100.0**
Pfb	0.1	1.8	4.2	0.3	5.0	14.8	***16.7***	***22.0***	***34.0***	1.0	0.1	**100.0**
Xcr	0.0	***11.4***	***18.1***	0.3	4.9	13.6	***15.1***	5.8	***29.2***	0.5	1.1	**100.0**
Sgr	0.0	1.2	6.0	***32.3***	1.8	21.6	2.5	3.0	7.3	***22.1***	2.1	**100.0**
Bvt	0.7	0.3	0.1	0.7	0.0	83.0	2.2	0.1	3.9	8.7	0.2	**100.0**
Xfp	0.9	7.7	0.3	4.3	4.3	48.9	9.4	1.6	1.3	***20.4***	0.9	**100.0**
Mmp	13.1	0.2	0.1	0.9	0.1	59.8	2.2	0.3	2.9	***19.8***	0.6	**100.0**
Ffp	0.9	2.9	0.2	2.5	2.8	45.0	9.6	1.0	2.0	***14.1***	***18.9***	**100.0**
Mani.	**4.5**	**1.5**	**0.4**	**2.8**	**1.5**	**62.1**	**0.8**	**2.1**	**1.6**	**6.0**	**16.6**	**100.0**
Cog	***10.5***	1.8	0.7	2.3	0.1	31.8	0.5	0.3	1.1	4.2	***46.8***	**100.0**
Twl	2.5	***11.7***	1.2	***22.7***	0.2	32.6	2.8	1.0	1.5	***23.6***	0.2	**100.0**
Pch	0.5	0.1	0.1	1.1	0.1	80.5	0.6	0.7	1.0	***14.3***	0.7	**100.0**
Mtp	1.4	0.0	0.0	0.1	5.3	80.2	1.1	6.7	2.7	2.0	0.4	**100.0**
Veq	2.4	0.1	0.0	0.5	0.0	94.2	0.1	0.1	0.2	2.0	0.3	**100.0**
Emq	0.9	0.2	0.1	2.9	0.1	89.8	0.3	0.4	0.6	4.2	0.5	**100.0**
Xmn	0.8	1.5	0.4	3.3	0.2	79.4	0.9	0.4	2.8	8.5	1.7	**100.0**
Ser.	**4.9**	**2.9**	**0.3**	**9.2**	**4.6**	**59.3**	**6.3**	**1.1**	**1.6**	**5.7**	**4.2**	**100.0**
Utc	1.9	2.2	0.1	1.0	***42.6***	37.2	0.2	1.6	0.6	1.4	***11.2***	**100.0**
Tcm	4.4	3.1	0.5	***12.6***	2.6	57.6	9.0	1.6	1.6	3.3	3.6	**100.0**
Xsr	5.9	2.6	0.1	6.0	0.8	65.2	3.8	0.4	1.8	9.5	3.8	**100.0**
Total	**4.2**	**2.1**	**0.7**	**3.9**	**2.1**	**60.5**	**2.4**	**2.1**	**2.3**	**6.6**	**13.2**	**100.0**

Botswana rice exports constitute 3.6 percent of SADC total rice exports.
Source: Calculated by the author from the GTAP7 Database.

Table A4-13

Commodity Composition of SADC Imports (Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**13.7**	**10.6**	**17.4**	**13.0**	**23.3**	**6.5**	**13.7**	**8.3**	**16.7**	**15.1**	**13.2**
Ric	0.5	1.9	0.2	0.8	3.9	0.5	2.3	0.4	0.3	0.3	0.9
Wgr	1.5	0.3	1.9	0.4	4.2	0.5	3.5	0.7	6.3	1.2	0.3
Vfr	1.2	0.1	0.6	0.9	1.6	0.2	0.3	0.7	1.6	1.0	0.5
Pfb	0.0	0.1	0.1	0.6	0.0	0.2	0.1	0.2	0.4	0.3	0.0
Xcr	0.4	0.3	5.1	0.1	0.6	0.5	0.3	0.3	1.6	0.4	0.1
Sgr	0.9	0.5	0.2	0.5	2.3	0.3	1.0	0.0	0.0	0.4	0.6
Bvt	1.9	0.8	0.7	1.2	1.9	0.7	0.8	0.9	0.3	2.7	3.0
Xfp	5.1	5.9	7.6	5.9	7.0	2.5	4.8	4.5	5.5	6.2	4.8
Mmp	1.9	0.5	0.8	2.0	1.6	0.7	0.5	0.4	0.4	2.0	2.8
Ffp	0.3	0.1	0.3	0.6	0.2	0.4	0.1	0.1	0.2	0.6	0.2
Mani.	**72.8**	**67.8**	**73.3**	**68.1**	**57.6**	**82.3**	**69.9**	**78.1**	**71.3**	**67.7**	**54.9**
Cog	0.8	0.2	0.6	1.0	0.2	11.9	0.2	***8.3***	0.8	0.6	0.2
Twl	6.2	***17.3***	***9.2***	11.1	4.4	5.9	6.5	3.6	4.8	10.0	2.4
Pch	***20.6***	***17.8***	***27.5***	***16.8***	***21.5***	***14.1***	***23.6***	***23.0***	***24.0***	***20.9***	9.9
Mtp	7.8	4.8	4.8	***10.5***	5.3	5.8	***10.4***	7.8	***11.3***	5.2	5.3
Veq	***12.7***	8.3	8.4	5.2	6.4	***18.2***	7.6	6.7	7.5	10.2	***20.4***
Emq	***18.7***	14.0	***13.9***	***17.7***	***14.4***	***22.1***	***15.7***	***24.6***	***19.2***	***13.9***	***13.7***
Xmn	6.1	5.3	9.0	5.9	5.5	4.3	5.9	4.0	3.8	6.9	2.9
Ser.	**13.6**	**21.6**	**9.3**	**18.9**	**19.1**	**11.2**	**16.4**	**13.6**	**11.9**	**17.1**	**32.0**
Utc	1.2	0.4	0.1	0.2	***7.4***	0.9	2.6	2.3	4.6	1.2	6.8
Tcm	4.4	5.4	3.6	10.4	4.6	6.4	6.0	8.2	2.9	2.2	6.2
Xsr	8.0	***15.8***	5.6	8.3	7.1	3.9	7.8	3.1	4.5	***13.7***	***18.9***
Main*	**52.0**	**50.9**	**50.6**	**45.0**	**43.3**	**54.4**	**49.7**	**55.9**	**54.5**	**48.5**	**53.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Rice imports constitute 0.5 percent of total imports for Botswana. * Shares of the three main imports (presented above in italic bold).

Table A4-14
Commodity Composition of SADC Exports (Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**3.1**	**27.4**	**56.2**	**14.1**	**15.8**	**10.3**	**39.3**	**17.8**	**39.3**	**20.6**	**2.2**
Ric	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0
Wgr	0.1	0.0	0.4	0.0	0.3	0.4	1.5	1.7	0.0	0.0	0.0
Vfr	0.0	3.7	2.6	0.1	1.6	3.2	4.7	1.5	2.1	0.9	0.0
Pfb	0.0	0.5	3.0	0.0	1.2	0.1	3.5	***5.3***	7.6	0.1	0.0
Xcr	0.0	8.7	***39.0***	0.1	3.6	0.4	***9.7***	4.3	***20.1***	0.1	0.1
Sgr	0.0	0.6	***9.3***	9.2	1.0	0.4	1.1	1.6	3.6	3.7	0.2
Bvt	0.2	0.2	0.2	0.2	0.0	1.9	1.2	0.1	2.3	1.8	0.0
Xfp	0.7	***12.0***	1.5	3.5	6.6	2.6	***12.5***	2.4	1.9	10.0	0.2
Mmp	1.8	0.0	0.1	0.1	0.0	0.6	0.5	0.1	0.7	1.7	0.0
Ffp	0.2	1.5	0.3	0.7	1.4	0.8	4.3	0.5	1.0	2.3	1.5
Mani.	**80.9**	**53.5**	**37.8**	**53.7**	**54.0**	**76.2**	**25.0**	**75.0**	**51.0**	**67.6**	**93.5**
Cog	***65.1***	***22.0***	***24.5***	***15.0***	0.9	***13.5***	5.7	3.5	***12.6***	***16.5***	***91.5***
Twl	2.7	***26.2***	7.8	***26.8***	0.4	2.5	5.3	2.2	3.1	***16.5***	0.1
Pch	1.1	0.6	1.5	2.4	0.6	***10.8***	2.1	2.6	3.7	***17.5***	0.4
Mtp	6.8	0.4	0.4	0.7	***51.3***	***26.8***	9.3	***64.7***	***23.9***	6.1	0.6
Veq	3.0	0.3	0.3	0.7	0.1	8.1	0.2	0.1	0.4	1.6	0.1
Emq	1.2	0.6	0.7	4.3	0.4	8.5	0.6	1.0	1.6	3.6	0.2
Xmn	0.9	3.4	2.6	3.9	0.4	6.0	1.8	0.9	5.6	5.9	0.6
Ser.	**16.0**	**19.1**	**6.0**	**32.2**	**30.2**	**13.4**	**35.7**	**7.3**	**9.8**	**11.8**	**4.4**
Utc	0.4	1.0	0.1	0.2	***19.0***	0.6	0.1	0.7	0.2	0.2	0.8
Tcm	***7.6***	11.0	5.0	***23.4***	***8.9***	6.9	***27.0***	***5.5***	5.2	3.6	***2.0***
Xsr	***7.9***	7.1	0.9	8.6	2.2	6.0	8.6	1.0	4.4	8.0	***1.6***
Main*	**80.6**	**60.2**	**72.8**	**65.2**	**79.2**	**51.1**	**49.2**	**75.5**	**56.6**	**50.5**	**95.1**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Rice exports constitute 0.0 percent of total exports for Botswana. * Shares of the three main exports (presented above in italic bold).

Table A4-15
Import to Total Demand Ratios by Commodity

(Percent, value, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	85.2	5.0	24.8	99.6	61.3	97.4	18.8	23.5	39.2	76.0	60.4
Wgr	39.3	38.4	11.0	99.8	27.7	19.8	9.8	4.6	70.6	35.4	4.3
Vfr	54.5	2.6	10.7	20.4	9.6	3.5	1.9	14.3	58.6	34.3	16.8
Pfb	62.1	12.4	29.4	99.8	1.9	45.2	7.4	9.4	27.6	43.9	0.9
Xcr	78.4	2.7	30.9	36.4	3.2	67.0	1.1	1.6	25.9	23.1	0.7
Sgr	98.6	2.4	17.9	6.0	91.4	10.0	5.8	0.5	0.8	19.2	50.3
Bvt	29.9	1.9	6.5	39.7	49.3	5.3	3.8	8.4	2.4	42.9	36.8
Xfp	63.8	43.9	49.0	51.2	26.4	11.8	10.5	12.4	32.0	44.0	27.5
Mmp	14.6	10.1	12.5	56.6	38.4	4.9	5.3	5.4	15.1	32.9	45.3
Ffp	4.8	0.1	4.0	12.8	1.4	4.0	0.4	0.4	2.2	9.3	1.9
Cog	41.4	5.9	44.7	55.5	8.9	66.8	2.5	***49.7***	6.5	60.8	3.6
Twl	92.5	***55.5***	***71.2***	55.8	66.4	23.5	41.6	23.4	35.3	55.7	34.1
Pch	***84.3***	***44.5***	***68.6***	***71.6***	***82.0***	***18.9***	***61.0***	***46.1***	***54.6***	***48.1***	41.7
Mtp	62.1	45.5	68.7	***84.6***	87.6	17.9	***65.8***	67.9	***70.0***	36.7	72.2
Veq	***99.3***	99.8	98.4	66.9	99.2	***41.5***	80.3	73.7	96.0	55.6	***95.9***
Emq	***99.0***	99.8	***95.9***	***88.5***	***98.7***	***46.2***	***91.9***	***83.7***	***97.1***	***57.1***	***84.5***
Xmn	43.9	15.0	46.0	57.5	63.2	11.7	44.0	23.1	35.0	34.5	27.8
Utc	2.3	1.1	1.7	1.4	***12.3***	1.8	7.4	3.8	10.9	5.5	24.2
Tcm	10.2	16.8	6.3	36.2	4.2	4.5	6.0	7.4	7.1	3.2	10.9
Xsr	5.9	***20.9***	15.6	13.7	10.0	1.5	10.3	3.6	8.0	***13.5***	***25.1***

Botswana imports 85.2 percent of its rice total demand.

Note: the three main imports, which are previously identified in Table A4-13, are presented in italic bold.

Source: Calculated by the author from the GTAP7 Database.

Table A4-16
Export to Domestic Output Ratios by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**11.7**	**14.0**	**35.3**	**36.0**	**13.3**	**14.2**	**10.3**	**12.5**	**42.4**	**44.8**	**3.9**
Ric	33.8	0.5	2.3	61.0	1.3	83.3	0.9	4.4	1.6	8.8	0.3
Wgr	4.2	0.6	1.4	79.0	2.0	15.8	2.7	9.8	1.6	1.7	0.3
Vfr	3.6	47.7	24.7	3.8	8.2	41.3	17.0	26.3	62.4	35.9	0.4
Pfb	28.6	52.6	91.7	95.1	79.5	37.7	70.1	***75.5***	86.5	18.2	0.6
Xcr	9.9	48.1	***67.8***	28.3	15.0	58.8	***17.9***	18.4	***79.4***	8.5	1.5
Sgr	15.9	3.3	***87.6***	54.3	79.2	12.6	4.0	38.4	46.3	72.6	24.1
Bvt	5.9	0.5	1.1	11.6	0.9	13.9	3.6	0.7	14.5	36.6	0.4
Xfp	22.1	***64.6***	10.6	37.3	22.3	12.6	***14.9***	6.9	12.6	59.2	1.7
Mmp	16.2	1.2	0.6	7.5	0.9	4.0	3.1	1.2	20.5	31.9	0.7
Ffp	4.3	2.5	2.0	14.5	6.7	7.7	7.9	1.8	10.1	30.6	11.5
Mani.	**84.0**	**45.0**	**43.3**	**65.0**	**77.4**	**28.8**	**23.2**	**50.2**	**46.5**	**52.0**	**71.2**
Cog	***98.5***	***88.8***	***95.5***	***94.6***	25.6	***70.3***	29.4	28.5	***50.0***	***97.8***	***94.3***
Twl	86.6	***68.4***	56.4	***74.3***	12.7	11.9	25.2	14.9	24.2	***70.4***	1.4
Pch	24.8	2.9	6.8	25.2	9.1	***15.6***	7.6	8.5	14.4	***47.2***	3.0
Mtp	63.0	7.4	9.8	25.5	***98.3***	***51.0***	50.2	***94.4***	***81.6***	43.5	21.8
Veq	97.4	96.9	55.5	19.6	52.6	24.6	5.3	5.1	53.6	18.1	13.2
Emq	87.9	97.0	42.7	63.9	63.5	25.6	21.2	16.8	71.3	28.5	7.3
Xmn	12.5	11.5	13.1	45.6	8.9	16.3	12.1	6.1	41.9	34.1	7.1
Ser.	**8.0**	**15.1**	**3.9**	**26.4**	**10.3**	**3.1**	**9.7**	**2.8**	**6.5**	**7.2**	**3.2**
Utc	1.0	3.1	0.6	1.6	***23.5***	1.2	0.1	1.2	0.5	1.1	3.5
Tcm	***18.8***	32.0	5.4	***54.7***	***6.6***	5.0	***14.3***	***4.9***	11.0	6.0	***3.6***
Xsr	***6.8***	12.0	1.8	13.3	2.9	2.4	6.9	1.2	7.1	9.5	***2.7***
Total	**31.1**	**22.7**	**25.0**	**41.0**	**20.8**	**13.0**	**11.7**	**18.1**	**28.4**	**29.4**	**31.0**

Botswana exports 33.8 percent of its rice output.

Note: the three main exports, which are previously identified in Table A4-14, are presented in italic bold.

Table A4-17

Commodity Composition of SADC Imports from the EU, (Percent, volume, 2004)

	BWA	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Agri.	**0.9**	**8.5**	**3.4**	**9.4**	**4.0**	**2.6**	**4.3**	**1.7**	**2.9**	**3.0**	**12.3**
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.6	0.0	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Vfr	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.3	0.1	0.1
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.1	0.0
Sgr	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Bvt	0.1	1.2	0.7	1.4	2.0	0.8	1.5	0.2	0.4	1.5	3.1
Xfp	0.4	5.7	1.4	5.8	1.3	1.0	2.0	1.0	1.1	0.9	5.8
Mmp	0.2	0.4	1.1	1.2	0.4	0.3	0.4	0.2	0.1	0.3	3.0
Ffp	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.2
Mani.	**47.5**	**67.3**	**72.3**	**60.1**	**53.3**	**83.7**	**62.3**	**61.2**	**74.5**	**28.7**	**43.2**
Cog	0.1	0.0	0.0	1.5	0.0	2.4	0.0	0.1	0.0	0.9	0.1
Twl	1.3	8.3	0.9	5.7	1.2	1.6	1.2	1.1	3.4	1.0	1.2
Pch	6.0	***14.8***	***25.0***	9.4	14.5	***15.0***	***16.9***	***16.2***	***12.9***	***7.4***	***11.0***
Mtp	0.6	5.3	0.8	3.6	2.6	4.2	5.2	4.1	3.7	1.8	6.3
Veq	***18.3***	9.1	6.8	5.0	4.0	***24.7***	7.6	5.6	10.7	4.2	5.6
Emq	***18.6***	***23.0***	***20.5***	***29.5***	***26.9***	***31.6***	***24.4***	***31.5***	***37.2***	***11.8***	***15.7***
Xmn	2.8	6.8	***18.3***	5.4	4.1	4.3	7.0	2.6	6.6	1.5	3.3
Ser.	**51.6**	**24.2**	**24.3**	**30.5**	**42.8**	**13.7**	**33.3**	**37.1**	**22.7**	**68.3**	**44.4**
Utc	1.9	0.7	0.3	0.4	***16.1***	1.3	6.4	9.4	0.8	3.1	10.5
Tcm	15.9	5.5	8.6	***15.7***	9.0	7.6	10.9	***17.9***	8.4	7.2	7.9
Xsr	***33.8***	***18.1***	15.4	***14.5***	***17.7***	4.9	***16.0***	9.8	***13.5***	***58.1***	***26.0***
Main*	**70.7**	**55.8**	**63.8**	**59.6**	**60.7**	**71.3**	**57.3**	**65.6**	**63.6**	**77.4**	**52.7**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Botswana rice imports from the EU constitute 0.0 percent of its total imports from the EU. * Shares of the three main imports from the EU (presented above in italic bold).

Table A4-18
EU Shares in SADC Markets by Commodity

(Percent, *fob* price, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.1	0.0	0.1	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.5
Wgr	0.1	67.1	0.3	42.4	0.0	4.8	0.3	0.1	0.0	0.1	5.8
Vfr	0.5	27.2	1.2	5.2	1.3	10.0	7.0	2.9	2.4	1.1	11.3
Pfb	4.0	2.0	1.5	0.2	17.6	0.6	2.7	0.3	0.1	0.1	13.4
Xcr	0.7	35.8	0.3	24.7	2.1	12.5	14.3	3.3	2.5	1.9	25.6
Sgr	0.2	12.2	0.5	0.8	0.1	0.4	1.3	3.5	1.1	0.3	4.5
Bvt	0.8	65.6	23.8	63.5	28.1	53.2	57.5	3.5	21.7	8.4	52.5
Xfp	0.9	38.6	4.0	35.2	4.5	16.8	12.1	3.7	2.8	2.1	54.0
Mmp	1.5	30.2	26.2	17.7	6.7	19.9	21.9	7.7	3.7	1.8	42.8
Ffp	2.4	40.3	2.0	7.8	6.1	13.9	26.4	18.5	41.0	2.1	32.3
Cog	1.3	5.9	0.7	46.7	2.3	7.7	4.6	0.1	0.8	23.9	20.8
Twl	2.8	19.1	2.1	17.7	6.8	13.0	5.4	5.2	9.7	1.6	21.8
Pch	3.7	32.2	18.7	21.6	15.4	43.3	18.1	11.4	6.7	5.0	47.4
Mtp	0.9	43.4	3.6	11.7	11.5	28.3	13.4	8.3	3.9	4.9	49.8
Veq	18.3	43.7	17.3	33.1	14.2	57.8	24.2	13.7	19.6	5.6	10.5
Emq	12.2	62.9	29.1	57.2	41.4	54.8	38.2	19.2	23.1	11.7	44.5
Xmn	5.9	51.7	43.2	37.3	18.3	41.6	33.6	11.0	25.0	3.2	51.7
Utc	19.9	55.3	55.7	56.1	42.9	51.9	54.8	54.8	1.8	33.9	54.8
Tcm	42.6	35.6	41.6	44.2	38.2	42.7	40.2	29.7	29.7	43.3	45.4
Xsr	50.3	40.3	48.9	50.9	48.9	45.7	45.2	43.1	31.0	56.4	49.1

0.1 percent of Botswana rice imports are sourced in the EU.
Source: Calculated by the author from the GTAP7 Database.

Table A4-19
Imports from the EU as Ratios to the EU Exports by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Wgr	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Bvt	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3
Xfp	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.3
Mmp	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2
Ffp	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Mani.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**
Cog	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Twl	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Pch	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1
Mtp	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1
Veq	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.1
Xmn	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1
Ser.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**
Utc	0.0	0.0	0.0	0.0	0.2	0.7	0.1	0.1	0.0	0.1	1.2
Tcm	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1
Xsr	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.2
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**

0.0 percent of the EU rice exports are destined for Botswana.
Source: Calculated by the author from the GTAP7 Database.

Table A4-20
Imports from the EU as Ratios to the EU Exports to its non-EU Partners by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**0.0**	**0.1**	**0.0**	**0.2**	**0.0**	**0.8**	**0.1**	**0.0**	**0.0**	**0.0**	**0.8**
Ric	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.4
Wgr	0.0	0.2	0.0	0.4	0.0	0.7	0.0	0.0	0.0	0.0	0.1
Vfr	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2
Pfb	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.1	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.1
Sgr	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3
Bvt	0.0	0.0	0.0	0.1	0.1	0.9	0.1	0.0	0.0	0.1	0.8
Xfp	0.0	0.1	0.0	0.3	0.0	0.8	0.1	0.0	0.0	0.0	1.1
Mmp	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	1.1
Ffp	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.2
Mani.	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**1.8**	**0.1**	**0.0**	**0.0**	**0.0**	**0.2**
Cog	0.0	0.0	0.0	0.1	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Twl	0.0	0.1	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.1
Pch	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0	0.0	0.0	0.2
Mtp	0.0	0.0	0.0	0.1	0.0	1.2	0.1	0.0	0.0	0.0	0.4
Veq	0.0	0.0	0.0	0.0	0.0	***3.0***	0.0	0.0	0.0	0.0	0.2
Emq	0.0	0.0	0.0	0.1	0.0	1.9	0.1	0.0	0.0	0.0	0.2
Xmn	0.0	0.1	0.0	0.1	0.0	1.2	0.1	0.0	0.0	0.0	0.2
Ser.	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.6**	**0.1**	**0.0**	**0.0**	**0.1**	**0.4**
Utc	0.1	0.0	0.0	0.0	0.5	1.7	0.4	0.2	0.0	0.1	***3.1***
Tcm	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.1
Xsr	0.1	0.1	0.0	0.1	0.0	0.5	0.1	0.0	0.0	0.2	0.6
Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**1.3**	**0.1**	**0.0**	**0.0**	**0.0**	**0.3**

0.0 percent of the EU rice exports to the non-EU partners are destined for Botswana.
Source: Calculated by the author from the GTAP7 Database.

Table A4-21
Commodity Composition of Exports to the EU (Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Agri.	**2.1**	**39.8**	**71.9**	**22.0**	**9.6**	**12.2**	**51.7**	**36.4**	**56.6**	**27.9**	**9.0**
Ric	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.2	0.0	0.0	0.0	1.5	0.2	0.0	0.0	0.1
Vfr	0.0	7.5	1.3	0.2	0.2	5.9	3.2	7.6	5.0	1.8	0.0
Pfb	0.0	0.6	0.3	0.0	0.8	0.0	1.3	0.3	4.2	0.0	0.0
Xcr	0.0	5.9	***57.2***	0.1	1.9	0.3	***15.3***	***20.7***	***36.2***	0.1	0.8
Sgr	0.0	1.3	***12.0***	***16.3***	0.9	0.0	2.7	5.0	7.2	3.9	0.7
Bvt	0.1	0.2	0.2	0.2	0.0	2.5	1.6	0.2	0.7	0.3	0.1
Xfp	0.0	***22.6***	0.3	4.4	***5.5***	1.9	***20.5***	0.7	1.7	***16.6***	0.6
Mmp	1.7	0.0	0.1	0.1	0.0	0.3	0.7	0.1	0.5	3.1	0.1
Ffp	0.2	1.6	0.4	0.6	0.3	1.3	4.6	1.6	1.1	2.1	***6.7***
Mani.	**88.7**	**44.6**	**21.2**	**51.4**	**78.9**	**70.6**	**12.6**	**50.4**	**34.6**	**49.9**	**79.3**
Cog	***86.8***	***14.5***	***19.9***	7.8	0.5	***25.4***	3.8	6.2	***8.0***	***39.2***	***74.4***
Twl	0.6	***21.2***	0.2	***33.3***	0.2	2.2	4.8	***11.3***	2.9	1.6	0.2
Pch	0.1	0.7	0.5	1.5	0.1	5.6	1.4	0.6	0.9	4.4	0.3
Mtp	0.1	0.2	0.0	0.5	***77.7***	***17.1***	1.0	***31.0***	***20.8***	2.3	0.7
Veq	0.0	0.7	0.1	0.5	0.0	6.5	0.1	0.1	0.0	0.9	0.1
Emq	0.5	1.1	0.1	3.1	0.1	8.5	0.6	0.4	0.4	0.7	0.7
Xmn	0.6	6.2	0.3	4.7	0.3	5.4	0.9	0.7	1.5	0.8	2.9
Ser.	**9.2**	**15.6**	**6.9**	**26.6**	**11.5**	**17.2**	**35.8**	**13.2**	**8.8**	**22.1**	**11.7**
Utc	0.3	1.1	0.0	0.2	***6.0***	0.7	0.1	0.2	0.2	0.4	2.2
Tcm	***3.9***	9.6	5.8	***18.6***	4.1	***8.8***	***26.2***	9.4	3.9	5.6	***4.8***
Xsr	***5.0***	4.9	1.1	7.8	1.4	7.7	9.5	3.6	4.7	***16.1***	4.7
Main*	**95.7**	**58.3**	**89.1**	**68.3**	**89.2**	**51.3**	**61.9**	**63.0**	**65.0**	**72.0**	**85.9**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Rice exports constitute 0.0 percent of Botswana total exports to the EU. * Shares of the three main exports to the EU (presented above in italic bold).

Table A4-22
Exports to the EU to Total Exports Ratios by Commodity

(Percent, volume, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	1.3	***50.8***	47.2	3.1	13.4	0.0	45.8	3.6	8.5	7.9	36.3
Wgr	17.7	***97.6***	16.2	14.6	9.9	1.3	31.4	1.3	9.0	21.4	36.3
Vfr	36.0	***94.5***	17.4	***66.5***	6.2	***65.7***	22.5	***52.3***	***71.1***	***52.1***	46.0
Pfb	18.5	***64.5***	3.1	0.8	41.1	3.8	12.2	0.5	16.0	2.1	0.9
Xcr	20.6	31.9	***50.9***	***57.3***	34.6	33.6	***51.5***	***51.1***	***52.7***	24.4	***64.0***
Sgr	8.6	***94.1***	44.7	***96.3***	***59.2***	3.7	***78.0***	32.7	***58.7***	27.2	39.6
Bvt	35.5	49.6	38.1	46.0	34.1	48.0	43.0	27.2	8.8	4.3	33.5
Xfp	4.4	***87.7***	7.6	***68.8***	***54.3***	25.8	***53.6***	3.1	26.5	43.9	26.6
Mmp	***67.6***	21.5	42.4	27.3	***57.0***	16.7	47.1	14.9	19.7	48.7	***52.6***
Ffp	***58.2***	49.8	***54.9***	49.3	11.9	***56.9***	35.1	32.5	34.7	24.3	48.2
Cog	***94.8***	30.8	28.3	28.3	31.9	***66.6***	21.9	18.9	18.6	***62.8***	8.9
Twl	16.4	37.9	1.0	***67.7***	37.0	30.9	29.5	***55.4***	27.2	2.6	40.0
Pch	5.5	***56.0***	10.5	33.6	8.7	18.4	21.6	2.6	7.2	6.6	7.2
Mtp	0.7	23.6	4.0	42.3	***98.5***	22.7	3.5	5.1	25.5	10.0	13.6
Veq	0.6	***92.6***	10.1	41.1	11.1	28.5	17.2	6.9	1.9	15.7	10.6
Emq	32.2	***84.8***	5.6	38.5	16.3	35.3	28.2	4.7	7.2	5.1	37.7
Xmn	42.3	***85.9***	4.6	***66.7***	***54.8***	32.2	16.3	8.7	7.7	3.4	***52.7***
Utc	48.8	48.8	11.7	49.1	20.5	43.6	40.1	3.1	31.5	49.5	29.8
Tcm	36.4	40.8	39.8	43.3	30.1	45.3	31.7	18.2	22.0	40.6	26.7
Xsr	44.7	32.3	42.5	49.4	41.7	45.7	36.1	38.2	31.5	***53.3***	32.3
Total	**71.1**	**46.8**	**34.7**	**54.4**	**65.1**	**35.6**	**32.7**	**10.7**	**29.3**	**26.3**	**11.0**

1.3 percent of Botswana rice exports are destined for the EU.
Source: Calculated by the author from the GTAP7 Database.

Table A4-23
SADC Shares in the EU Commodity Markets

(Percent, *fob* price, 2004)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Vfr	0.0	0.2	0.0	0.0	0.0	3.5	0.1	0.0	0.1	0.1	0.0
Pfb	0.0	0.4	0.0	0.0	0.7	0.2	0.7	0.0	1.8	0.0	0.0
Xcr	0.0	0.3	0.7	0.0	0.1	0.4	0.6	0.2	1.2	0.0	0.1
Sgr	0.0	0.3	0.7	8.4	0.3	0.2	0.5	0.3	1.2	1.6	0.2
Bvt	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.2	0.0	0.1	0.1	0.4	0.1	0.0	0.0	0.3	0.0
Mmp	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Ffp	0.0	0.1	0.0	0.1	0.0	1.1	0.1	0.0	0.0	0.2	0.4
Cog	1.1	0.1	0.0	0.1	0.0	2.4	0.0	0.0	0.0	0.3	0.5
Twl	0.0	0.1	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Pch	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Mtp	0.0	0.0	0.0	0.0	0.4	1.4	0.0	0.0	0.1	0.0	0.0
Veq	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Xmn	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.1
Tcm	0.0	0.0	0.0	0.1	0.0	0.6	0.1	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0

0.0 percent of the EU rice imports are sourced in Botswana.
Source: Calculated by the author from the GTAP7 Database.

Table A4-24
Applied Tariffs on Imports from the EU

(Percent, imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.0	0.0	0.0	3.9	4.0	0.0	8.8	3.3	9.2	0.0	2.0
Wgr	0.0	0.0	0.0	0.0	0.0	1.3	6.9	2.7	0.0	0.6	4.5
Vfr	0.0	8.7	5.3	12.2	15.8	1.0	12.8	13.5	17.2	7.2	7.8
Pfb	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	1.5
Xcr	0.0	4.0	5.8	13.7	3.0	6.6	1.3	6.9	4.0	2.1	14.8
Sgr	2.6	12.4	0.0	***50.2***	5.5	4.7	22.9	0.0	0.0	3.7	5.5
Bvt	3.3	3.4	13.3	***70.6***	17.2	5.9	18.0	21.1	23.5	2.8	27.4
Xfp	1.6	2.7	16.7	10.3	19.0	7.4	20.5	21.5	24.2	4.9	10.6
Mmp	0.0	5.0	11.7	12.6	19.4	***37.1***	18.7	12.0	25.7	***67.5***	11.5
Ffp	0.0	0.7	0.9	3.9	10.0	0.9	10.3	6.0	10.5	0.2	10.9
Cog	0.0	0.0	8.1	0.0	5.6	0.0	2.3	4.8	8.6	0.0	9.5
Twl	11.5	6.8	17.1	16.5	19.1	12.3	19.9	18.4	28.3	16.6	14.5
Pch	1.5	2.0	1.9	23.3	4.8	2.8	7.2	6.4	8.2	2.9	10.5
Mtp	2.6	3.6	13.9	16.6	8.5	3.1	15.2	9.7	14.5	1.3	7.0
Veq	20.4	6.3	11.8	9.0	7.9	13.6	6.6	11.8	***30.6***	5.3	6.8
Emq	0.8	4.6	7.7	12.1	7.7	1.1	6.5	5.0	10.2	0.7	4.7
Xmn	3.1	3.7	7.9	**35.7**	14.8	4.4	11.8	13.0	19.6	6.9	11.1
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Data covers all import distortions; ad valorem tariff rates (including quotas) and the ad valorem equivalents (AVEs) of specific tariffs GTAP7 data for trade protection covers all import distortions; ad valorem tariff rates (including quotas) and the ad valorem equivalents (AVEs) of specific tariffs.
Source: Calculated by the author from the GTAP7 Database.

Table A4-25
Applied Tariffs on Exports to the EU

(Percent, imports-weighted preferential rates, 2004)

Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	36.9	***125.8***	***115.7***	0.0	***57.7***	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	28.1	0.0	10.2	0.0	0.0	1.3	0.0	0.0
Vfr	0.0	0.3	0.0	7.7	0.0	1.0	0.0	0.0	1.1	0.6	0.3
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.2	0.0	0.0	2.1	0.4	0.0	1.0	0.1	0.0
Sgr	0.0	***112.0***	***87.3***	***79.2***	***48.1***	***60.6***	***82.0***	***90.2***	***146.3***	***242.2***	***67.4***
Bvt	0.0	0.0	0.0	3.6	0.0	10.4	0.2	0.0	0.4	0.4	0.0
Xfp	4.4	0.0	0.0	1.0	0.0	10.9	0.0	0.0	0.3	0.3	0.0
Mmp	***70.0***	0.0	0.0	17.1	0.0	***34.8***	0.0	0.0	10.7	***97.9***	0.0
Ffp	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Twl	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.3	0.0
Pch	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Mtp	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Veq	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.1	0.0	0.0	0.0	0.0	2.8	0.0	0.4	0.0
Xmn	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Data covers all import distortions; ad valorem tariff rates (including quotas) and the ad valorem equivalents (AVEs) of specific tariffs GTAP7 data for trade protection covers all import distortions; ad valorem tariff rates (including quotas) and the ad valorem equivalents (AVEs) of specific tariffs.
Source: Calculated by the author from the GTAP7 Database.

Table A4-26
Applied Tariffs on the EU Trade with non-SADC Partners

(Percent, Imports-weighted preferential rates, 2004)

Importer	**USA**	**EAS**	**SAS**	**SSA**	**ROW**	**EU**				
Exporter	**EU**					**USA**	**EAS**	**SAS**	**SSA**	**ROW**
Ric	6.8	47.9	19.2	13.5	16.7	***68.4***	***107.5***	***89.8***	1.3	***50.3***
Wgr	0.1	9.3	4.1	8.4	23.8	19.3	***28.1***	12.4	1.8	***22.4***
Vfr	2.6	8.4	19.8	21.1	16.3	2.9	***41.6***	3.4	10.9	***20.3***
Pfb	5.4	0.4	3.5	2.2	1.6	0.0	0.0	0.0	0.0	0.0
Xcr	10.1	4.6	26.6	9.6	18.7	***35.5***	4.7	2.1	0.0	11.0
Sgr	27.5	27.9	18.1	17.3	15.1	18.9	***56.8***	28.3	***111.4***	***160.6***
Bvt	1.9	18.7	36.6	34.7	23.7	10.1	9.1	14.6	1.2	8.8
Xfp	6.3	21.1	15.3	23.8	13.9	9.5	13.3	9.6	0.1	5.5
Mmp	16.2	43.5	8.6	16.5	28.2	***32.2***	10.5	***33.8***	3.6	***47.3***
Ffp	0.2	6.5	6.4	14.7	7.8	3.1	0.8	2.1	0.0	2.3
Cog	0.3	2.2	13.5	7.4	0.7	0.0	0.0	0.0	0.0	0.0
Twl	8.2	10.0	11.7	26.0	9.3	6.6	10.0	5.8	0.0	1.1
Pch	1.9	4.6	7.9	16.5	4.6	1.9	3.2	1.2	0.0	0.8
Mtp	1.6	4.1	9.6	17.7	5.2	2.3	2.4	0.4	0.0	0.6
Veq	1.7	9.1	13.8	13.7	6.5	2.8	6.6	4.1	0.0	0.6
Emq	1.0	4.2	5.3	11.5	4.5	1.0	1.9	0.8	0.0	0.2
Xmn	0.8	3.2	9.8	20.3	5.5	0.8	1.6	0.6	0.0	0.3
Utc	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0

Data covers all import distortions; ad valorem tariff rates (including quotas) and the ad valorem equivalents (AVEs) of specific tariffs GTAP7 data for trade protection covers all import distortions; ad valorem tariff rates (including quotas) and the ad valorem equivalents (AVEs) of specific tariffs.
Source: Calculated by the author from the GTAP7 Database.

Table A4-27
Shares for SADC Exporters in SADC Importing Markets

(Percent, *fob* price, 2004)

Importer	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**BWA**									
Ric	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.2	0.0
Pfb	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.1	0.0
Bvt	0.0	0.0	0.0	0.0	0.7	0.0	0.6	2.5	0.0	0.0
Xfp	0.0	0.0	0.0	0.0	2.0	0.0	0.2	0.8	0.1	0.0
Mmp	0.0	0.2	0.1	0.0	2.9	0.1	0.5	2.6	0.1	0.0
Ffp	0.0	0.0	0.0	0.0	1.1	0.0	1.5	0.0	0.0	0.0
Cog	0.0	14.0	0.0	0.0	0.1	0.0	1.3	17.6	0.0	0.0
Twl	0.0	0.0	0.1	0.0	2.0	0.0	0.1	1.1	0.0	0.0
Pch	0.0	0.1	0.0	0.2	0.4	0.0	0.2	1.0	0.1	0.0
Mtp	0.0	0.1	0.0	0.0	0.7	0.0	0.3	29.3	0.1	0.0
Veq	0.0	1.7	0.0	0.0	1.2	0.0	2.5	0.4	0.3	0.0
Emq	0.0	0.3	0.0	0.0	0.2	0.0	0.2	0.2	0.2	0.0
Xmn	0.0	0.1	0.0	0.0	0.5	0.0	1.7	1.9	0.2	0.0
Utc	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**MDG**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	3.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ffp	0.0	0.0	3.4	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Cog	0.0	0.6	1.1	0.0	0.1	0.0	0.1	0.0	0.3	0.0
Twl	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Pch	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mtp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Veq	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xmn	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utc	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**MWI**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Wgr	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.8	0.0	0.3
Vfr	0.4	0.0	1.5	0.0	1.4	0.3	0.1	1.0	0.6	0.0
Pfb	21.0	0.0	0.6	0.0	9.3	49.2	47.0	0.0	23.7	0.0
Xcr	5.7	0.0	3.2	9.5	5.9	2.2	3.7	3.0	0.0	11.2
Sgr	1.3	3.0	0.0	0.0	2.7	10.4	16.7	4.3	0.0	1.4
Bvt	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0
Xfp	0.0	0.0	0.0	0.0	0.4	0.1	1.1	3.0	0.0	0.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
Ffp	0.0	0.0	0.0	0.4	0.0	0.3	0.8	0.1	0.0	0.0
Cog	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.6	0.0	0.0
Twl	0.0	0.0	0.0	0.4	0.7	0.0	0.4	0.9	0.1	0.0
Pch	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.3	0.0	0.0
Mtp	0.0	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0
Veq	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.2	0.0	0.0
Emq	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.0	0.0
Xmn	0.1	0.0	0.0	11.8	0.1	0.0	0.7	0.4	0.0	0.0
Utc	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**MUS**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Bvt	0.0	18.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
Xfp	0.0	9.7	0.8	0.5	0.0	0.0	0.8	1.3	0.0	0.0
Mmp	0.0	2.2	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0
Ffp	0.0	18.4	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0
Cog	0.0	9.5	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Twl	0.4	9.6	0.1	2.6	0.5	0.0	0.5	1.3	0.0	0.0
Pch	0.2	3.5	0.4	0.0	0.0	0.2	0.3	0.2	0.0	0.1
Mtp	0.0	2.8	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Veq	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Emq	0.0	2.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Xmn	0.1	5.3	0.0	0.0	0.1	1.3	0.0	0.6	0.1	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.1	0.1
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**MOZ**									
Ric	0.0	0.0	2.7	0.0	0.1	0.4	0.0	2.5	0.0	0.0
Wgr	0.0	0.0	11.2	0.0	0.1	0.2	0.0	0.5	0.0	0.0
Vfr	0.0	0.0	47.9	0.0	1.3	0.0	0.5	1.0	0.6	0.0
Pfb	0.0	0.0	0.0	0.4	1.4	0.0	0.2	0.4	5.5	0.0
Xcr	0.0	0.0	74.2	0.0	0.0	0.0	1.3	7.7	0.0	0.0
Sgr	0.0	5.6	1.4	0.0	0.1	2.8	0.0	2.3	0.0	0.0
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	19.2	0.0	1.0	0.0	2.0	2.6	1.8	0.0
Mmp	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ffp	0.0	0.1	0.0	0.2	0.4	0.1	0.0	0.0	0.6	0.0
Cog	0.0	0.0	1.7	0.3	0.0	0.0	0.0	3.6	0.0	0.0
Twl	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Pch	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mtp	0.5	0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.2	0.0
Veq	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Emq	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.3	0.0
Xmn	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.6	0.0	0.0
Utc	4.9	0.2	0.4	0.2	2.6	0.1	0.0	86.4	3.5	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	TZA	ZMB	ZWE	XSC	XSD
Exporter	**ZAF**									
Ric	98.3	0.0	0.6	0.0	0.3	0.0	64.3	14.0	86.1	0.3
Wgr	98.3	1.9	1.3	0.1	7.6	3.3	89.4	51.1	68.0	22.6
Vfr	94.6	4.8	12.7	35.8	87.0	7.5	23.7	27.7	93.4	34.8
Pfb	9.8	0.1	0.1	0.0	1.8	0.1	6.1	92.4	6.4	0.1
Xcr	90.2	0.7	1.9	10.8	48.0	1.5	35.1	15.1	88.8	29.9
Sgr	64.8	13.6	1.1	98.0	78.4	31.1	35.0	8.8	29.8	9.8
Bvt	94.0	4.5	23.2	13.6	33.3	19.0	58.1	54.9	88.1	28.0
Xfp	94.8	1.1	18.1	9.0	32.4	2.8	56.3	47.9	89.3	3.2
Mmp	91.2	0.5	22.0	4.0	52.4	7.8	52.5	74.4	94.9	2.2
Ffp	69.1	1.4	14.5	56.0	48.8	11.1	40.1	41.5	93.1	9.5
Cog	61.0	27.5	12.6	18.5	59.6	11.9	3.7	28.5	34.7	9.3
Twl	70.1	1.5	13.8	5.6	15.6	2.1	22.1	27.7	46.4	3.8
Pch	89.2	25.5	43.9	12.0	53.5	10.8	57.7	68.3	86.5	12.4
Mtp	91.6	10.2	43.9	14.7	68.0	22.4	61.5	60.2	90.4	14.7
Veq	74.7	5.7	43.2	9.1	49.5	9.6	53.4	42.6	82.7	0.9
Emq	71.2	2.5	34.0	4.7	37.5	12.6	50.7	40.8	74.6	7.1
Xmn	86.8	14.1	27.7	15.8	44.2	14.0	53.6	55.3	77.3	8.6
Utc	58.5	0.7	1.8	1.0	0.9	0.2	0.1	7.9	15.7	0.1
Tcm	0.7	0.5	0.6	0.4	0.6	0.7	0.9	0.5	0.5	0.6
Xsr	0.5	0.3	0.5	0.4	0.4	0.7	0.4	0.5	0.2	0.1

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	ZMB	ZWE	XSC	XSD
Exporter	TZA									
Ric	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Wgr	0.0	0.1	16.3	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Vfr	0.0	0.1	1.2	0.0	0.0	2.1	4.8	0.0	0.0	0.0
Pfb	3.8	32.9	0.4	0.0	0.0	0.2	0.0	0.8	1.0	0.0
Xcr	0.1	0.1	0.9	2.0	0.0	1.6	1.2	0.0	0.3	0.0
Sgr	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Bvt	0.0	0.0	1.9	0.0	0.3	0.0	0.4	0.0	0.0	0.0
Xfp	0.0	0.0	1.8	0.2	0.3	0.2	0.4	0.1	0.0	0.0
Mmp	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Ffp	0.4	0.6	0.8	0.8	0.2	0.3	4.3	0.2	0.0	0.0
Cog	0.0	0.0	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0
Twl	0.0	0.5	9.3	0.0	1.4	0.2	4.8	0.5	0.5	0.0
Pch	0.0	0.4	2.2	0.0	0.2	0.0	0.7	0.1	0.0	0.0
Mtp	0.0	0.0	2.1	0.0	0.1	2.9	0.2	0.0	0.0	0.0
Veq	0.0	0.0	0.2	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Emq	0.0	0.0	2.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0
Xmn	0.0	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZWE	XSC	XSD
Exporter					**ZMB**					
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.7	0.0	33.9	0.0	0.0	0.1	2.2	17.6	0.8	0.4
Vfr	0.2	0.0	0.0	0.0	0.0	0.2	0.0	45.8	0.1	0.2
Pfb	0.0	0.0	87.7	14.0	0.0	39.8	0.0	5.1	14.4	0.0
Xcr	0.0	0.0	21.3	0.0	0.3	1.2	0.0	59.5	0.0	0.2
Sgr	0.5	0.0	0.0	0.0	0.0	2.2	4.3	3.7	1.2	0.1
Bvt	0.0	0.0	4.3	0.0	0.0	0.0	0.0	2.1	0.0	0.0
Xfp	0.2	0.0	2.9	0.0	0.1	2.6	0.0	3.7	0.1	0.0
Mmp	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ffp	0.1	0.1	9.2	0.0	1.8	0.1	0.6	3.3	0.0	0.0
Cog	0.1	0.0	0.4	0.0	0.0	0.4	0.0	23.0	0.1	0.0
Twl	0.3	0.0	1.0	1.3	0.0	0.2	0.1	2.0	0.0	0.0
Pch	0.0	0.0	1.2	0.0	0.0	0.0	0.1	0.3	0.0	0.0
Mtp	0.2	0.0	3.0	0.1	0.4	2.0	31.1	2.5	0.0	0.0
Veq	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.8	0.0	0.0
Emq	0.0	0.0	0.5	0.0	0.0	0.1	0.1	0.6	0.0	0.0
Xmn	0.1	0.0	0.7	0.0	0.0	0.4	0.1	2.4	0.0	0.0
Utc	0.1	0.0	0.0	0.0	0.0	1.4	0.5	0.0	7.5	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	XSC	XSD
Exporter	**ZWE**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
Wgr	0.7	0.0	0.7	0.0	0.0	0.0	0.0	1.2	0.0	0.0
Vfr	2.2	0.0	0.6	0.0	0.1	1.8	0.0	55.2	0.6	0.0
Pfb	45.7	0.0	0.0	0.2	12.5	38.6	0.0	42.5	15.9	0.0
Xcr	0.9	1.3	0.9	1.2	31.5	10.6	25.2	49.1	0.3	2.7
Sgr	32.8	0.0	40.7	0.0	0.0	3.3	0.0	19.2	66.8	0.0
Bvt	2.5	0.0	40.6	1.2	12.8	0.4	0.0	22.0	0.7	1.2
Xfp	2.3	0.0	2.7	0.0	0.5	0.7	0.2	9.4	0.1	0.0
Mmp	3.3	0.0	23.1	2.9	0.9	1.3	2.2	6.4	0.6	0.0
Ffp	18.1	0.0	66.8	0.0	4.8	0.5	1.3	5.8	0.1	0.2
Cog	0.1	0.0	62.9	0.0	7.2	3.0	0.0	4.9	0.0	0.1
Twl	1.8	0.0	3.5	0.0	1.0	1.1	0.1	4.9	0.2	0.0
Pch	1.4	0.0	4.9	0.1	0.3	0.2	0.0	6.3	0.0	0.0
Mtp	3.8	0.0	10.9	0.0	0.8	1.9	0.0	8.2	0.2	0.0
Veq	0.2	0.0	0.8	0.0	0.3	0.1	0.1	0.7	0.0	0.0
Emq	0.3	0.0	3.2	0.0	0.2	0.1	0.1	1.9	0.1	0.0
Xmn	2.8	0.0	6.3	0.0	1.0	3.6	0.2	14.5	0.2	0.1
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	XSC										
Ric	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1
Wgr	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.0	0.8
Vfr	0.0	0.0	0.0	0.5	2.0	20.6	0.0	0.0	0.0	0.0	7.1
Pfb	0.0	0.0	0.0	0.0	2.3	1.1	0.0	0.0	0.0	0.0	3.5
Xcr	0.0	0.0	0.0	0.0	7.4	1.4	0.0	0.0	0.0	0.0	8.9
Sgr	0.0	46.6	0.2	0.0	21.3	82.0	1.5	13.8	67.6	0.0	8.7
Bvt	1.7	0.0	1.2	0.1	23.2	19.1	0.9	11.9	9.4	0.1	12.3
Xfp	0.9	0.0	0.6	3.4	14.1	12.1	5.6	2.6	8.3	0.3	4.4
Mmp	2.6	0.0	1.3	0.0	6.5	10.9	1.0	4.4	1.8	0.0	0.8
Ffp	2.2	0.1	0.0	0.0	28.8	44.8	0.1	9.0	4.5	0.0	7.2
Cog	0.3	0.3	0.0	0.1	1.0	1.3	0.0	8.2	1.1	0.1	21.6
Twl	0.1	0.0	0.0	0.1	4.3	9.4	0.0	0.0	0.0	0.0	2.7
Pch	0.1	0.1	1.4	1.1	4.2	10.3	1.9	1.4	0.2	0.3	5.0
Mtp	0.0	0.0	0.0	0.0	1.6	1.5	0.0	0.4	0.0	0.0	2.9
Veq	0.3	0.0	0.0	0.0	1.0	0.4	0.1	0.5	0.1	0.0	1.5
Emq	0.1	0.0	0.2	0.0	0.9	0.8	0.0	0.3	0.1	0.0	1.9
Xmn	0.1	1.3	0.2	0.8	2.5	12.7	0.0	0.5	0.3	0.0	8.4
Utc	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Table A4-27 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**XSD**										
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Xfp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0
Ffp	0.0	0.1	0.0	0.0	0.0	0.6	0.1	0.1	0.1	0.1	0.0
Cog	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	2.5	0.1	0.0
Twl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mtp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Veq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xmn	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utc	0.0	0.1	0.2	0.1	1.0	0.8	0.0	0.0	0.0	0.8	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

0.0 percent of Madagascar rice imports are sourced in Botswana.
Source: Calculated by the author from the GTAP7 Database.

Table A4-28
Applied Tariffs on SADC Exports in SADC Importing Markets

(Percent, Imports-weighted preferential rates, 2004)

Importer	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Exporter	**BWA**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	5.0	21.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.5	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.5	0.0	25.0	5.5	0.5	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	25.0	33.4	0.0	0.0
Xfp	0.0	0.0	0.0	12.8	0.0	0.0	14.9	33.7	0.0	15.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.0	4.9	16.9	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	0.0	0.0
Twl	4.9	9.7	4.4	7.2	0.0	0.0	24.5	37.3	0.0	0.0
Pch	0.0	14.2	44.1	4.2	0.0	3.5	10.0	12.6	0.0	2.0
Mtp	5.0	22.0	0.0	9.3	0.1	15.0	6.4	5.1	0.0	4.9
Veq	0.0	2.1	0.2	10.8	0.0	7.9	14.3	38.6	0.0	10.0
Emq	5.0	15.2	0.1	5.9	0.0	8.6	10.3	11.8	0.0	4.9
Xmn	4.6	17.3	0.0	21.7	0.0	0.0	22.4	31.3	0.0	5.1
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	5.0	21.0	0.0	0.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter					**MDG**					
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bvt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	10.7	0.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Twl	0.0	0.0	0.0	0.0	27.6	6.0	0.0	0.0	23.3	0.0
Pch	0.0	0.0	0.0	5.9	6.1	0.0	0.0	0.0	20.0	0.0
Mtp	7.5	0.0	0.0	11.6	7.1	0.0	0.0	0.0	0.0	7.5
Veq	0.8	0.0	0.0	25.0	9.0	0.0	0.0	0.0	0.0	0.8
Emq	0.0	0.0	0.0	5.5	0.8	0.0	0.0	0.0	0.0	0.0
Xmn	0.0	0.0	0.0	20.1	14.1	10.3	0.0	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	MWI									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.9	0.0	20.2	0.0	0.0	0.0	2.0
Vfr	0.0	0.0	0.0	20.2	0.0	25.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	3.7	0.0	0.1	0.0	0.0	0.0	5.1
Sgr	8.7	0.0	0.0	0.0	8.0	25.0	0.0	0.0	0.0	14.3
Bvt	0.0	0.0	0.0	12.9	0.0	22.2	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	0.0	18.1	0.0	25.0	0.0	0.0	0.0	10.7
Mmp	0.0	0.0	0.0	22.5	0.0	24.6	0.0	0.0	0.0	0.0
Ffp	0.0	0.0	0.0	5.1	0.0	4.6	0.0	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Twl	4.0	0.0	0.0	7.2	8.9	18.0	0.0	0.0	0.1	17.0
Pch	0.0	0.0	0.0	6.9	0.0	13.9	0.0	0.0	0.0	12.8
Mtp	0.0	0.0	0.0	3.6	0.0	15.6	0.0	0.0	0.0	0.0
Veq	7.7	0.0	0.0	11.2	4.8	10.9	0.0	0.0	3.2	0.0
Emq	0.0	0.0	0.0	5.7	0.0	9.2	0.0	0.0	0.0	11.4
Xmn	1.3	0.0	0.0	0.3	0.3	19.3	0.0	0.0	1.4	15.6
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.9	0.0	20.2	0.0	0.0	0.0	2.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**MUS**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Bvt	0.0	0.0	0.0	25.0	0.0	10.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	0.0	8.6	0.0	17.9	0.0	0.0	0.0	0.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0
Twl	0.2	0.0	0.0	24.9	4.0	11.5	0.0	0.0	0.5	17.8
Pch	0.0	0.0	0.0	4.5	0.0	9.4	0.0	0.0	0.0	2.0
Mtp	0.0	0.0	0.0	17.6	0.0	17.5	0.0	0.0	0.0	10.6
Veq	9.9	0.0	0.0	6.8	3.0	3.4	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.0	4.6	0.0	7.2	0.0	0.0	0.0	2.4
Xmn	0.0	0.0	0.0	9.2	0.0	1.1	0.0	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter					**MOZ**					
Ric	0.0	0.0	10.0	0.0	0.0	25.0	0.0	15.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	1.7	19.8	0.0	23.2	2.6	0.0
Vfr	0.0	0.0	16.9	0.0	4.6	0.0	14.0	24.4	7.8	0.0
Pfb	0.0	0.0	0.0	0.0	14.0	0.0	5.0	2.5	14.0	0.0
Xcr	0.0	0.0	22.3	0.0	12.6	0.0	15.0	23.0	3.4	0.0
Sgr	0.0	12.5	25.0	0.0	0.1	25.0	0.0	25.0	0.0	0.0
Bvt	0.0	0.0	0.0	0.0	***346.4***	0.0	0.0	28.0	0.0	0.0
Xfp	0.0	0.0	4.5	0.0	1.5	24.1	14.9	16.0	0.3	0.0
Mmp	0.0	0.0	10.0	0.0	0.0	0.0	0.0	39.7	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.3	0.0
Cog	0.0	0.0	1.0	15.0	0.9	15.0	2.8	5.4	0.0	0.0
Twl	30.5	0.0	8.5	0.0	35.8	25.0	15.5	25.5	15.6	0.0
Pch	0.0	0.0	1.9	0.0	16.9	0.0	0.6	13.1	4.0	0.0
Mtp	4.0	0.0	22.8	0.0	1.6	19.1	11.5	11.0	2.5	0.0
Veq	15.0	0.0	10.9	0.0	13.3	7.8	11.1	28.0	22.8	0.0
Emq	1.1	0.0	4.9	0.0	4.0	1.4	6.4	9.6	0.4	0.0
Xmn	9.5	0.0	14.8	0.3	1.8	24.6	0.1	***252.5***	2.1	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	10.0	0.0	0.0	25.0	0.0	15.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	1.7	19.8	0.0	23.2	2.6	0.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	TZA	ZMB	ZWE	XSC	XSD
Exporter	**ZAF**									
Ric	0.0	0.0	10.0	2.8	6.4	25.0	5.0	15.0	0.0	2.9
Wgr	0.0	2.6	0.1	0.0	2.1	16.8	5.0	22.1	0.0	2.1
Vfr	0.0	10.0	19.2	0.9	24.4	24.9	15.9	29.3	0.0	5.3
Pfb	0.0	0.0	6.6	0.0	0.0	0.0	11.1	2.5	0.0	0.0
Xcr	0.2	5.3	13.5	13.5	20.4	6.5	14.2	***74.4***	0.7	8.8
Sgr	0.0	12.5	24.6	**80.0**	7.5	25.0	24.9	24.9	0.0	5.3
Bvt	0.0	6.9	20.1	70.6	24.1	18.5	23.0	***51.8***	0.0	29.8
Xfp	0.0	6.8	11.4	17.5	18.8	22.2	15.4	24.2	0.0	9.7
Mmp	0.0	4.6	13.0	5.8	19.7	24.3	13.7	28.5	0.0	7.1
Ffp	0.0	1.3	8.0	0.6	6.1	12.8	13.9	9.6	0.0	11.5
Cog	0.0	0.0	2.7	3.1	4.7	4.9	1.8	5.3	0.0	10.3
Twl	0.0	5.0	16.2	3.5	20.3	21.2	19.3	23.6	0.0	13.1
Pch	0.0	0.4	6.0	12.3	7.9	6.0	9.0	11.3	0.0	11.8
Mtp	0.0	2.9	14.0	13.5	8.2	9.6	8.0	11.7	0.1	5.7
Veq	0.0	5.3	12.2	7.8	7.6	4.7	12.5	29.3	0.0	5.7
Emq	0.0	4.8	7.4	12.8	8.0	9.6	5.9	12.6	0.0	4.3
Xmn	0.0	3.5	13.0	10.1	13.1	12.7	12.8	22.7	0.0	11.3
Utc	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0
Tcm	0.0	0.0	10.0	2.8	6.4	25.0	5.0	15.0	0.0	2.9
Xsr	0.0	2.6	0.1	0.0	2.1	16.8	5.0	22.1	0.0	2.1

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	ZMB	ZWE	XSC	XSD
Exporter	TZA									
Ric	0.0	0.0	9.6	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Vfr	0.0	0.0	20.4	0.9	0.0	3.3	14.5	0.0	0.0	0.0
Pfb	1.8	0.0	0.0	0.0	0.0	11.1	8.5	2.5	14.0	0.0
Xcr	0.0	0.0	11.5	49.4	0.0	14.7	16.0	0.0	9.6	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bvt	0.0	0.0	23.3	0.0	25.0	17.8	24.4	0.0	0.0	0.0
Xfp	0.0	9.1	21.2	25.5	16.5	7.8	15.5	20.3	0.0	9.9
Mmp	0.0	0.0	15.1	0.0	0.0	3.7	21.3	0.0	0.0	0.0
Ffp	0.0	0.0	2.1	3.6	0.0	0.3	16.1	12.8	0.0	0.0
Cog	0.0	0.0	0.0	0.0	7.5	0.0	8.7	0.0	0.0	0.0
Twl	24.1	0.2	7.0	0.0	17.1	21.7	24.4	35.0	15.2	0.0
Pch	0.0	5.0	6.5	10.0	12.2	9.1	7.5	20.0	14.8	10.4
Mtp	0.0	0.0	11.4	20.0	13.8	0.0	3.9	0.0	15.0	6.4
Veq	26.4	0.0	18.2	0.0	0.0	9.0	15.8	26.9	16.8	0.0
Emq	1.5	4.9	3.0	0.0	1.3	1.1	5.7	8.3	1.3	0.0
Xmn	4.7	0.0	14.5	25.8	16.1	1.7	22.9	16.4	14.2	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	9.6	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZWE	XSC	XSD
Exporter	**ZMB**									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	19.9	0.0	0.0	2.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.1	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	9.8
Sgr	7.1	0.0	0.0	0.0	0.0	7.1	25.0	0.0	6.1	5.0
Bvt	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	0.0	0.0	11.8	0.0	24.9	0.0	0.0	8.4
Mmp	0.0	0.0	0.0	0.0	0.0	0.0	16.5	0.0	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	24.7	0.0	18.6	0.0	0.0	3.7
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6
Twl	0.3	0.0	0.0	0.0	20.0	0.3	17.6	0.0	2.0	0.0
Pch	0.0	0.0	0.0	0.0	6.4	0.0	19.0	0.0	0.0	26.8
Mtp	0.0	0.0	0.0	0.0	3.9	0.0	14.9	0.0	0.0	7.5
Veq	4.8	0.0	0.0	0.0	7.2	3.5	5.4	0.0	8.3	0.0
Emq	0.0	0.0	0.0	0.0	4.3	0.0	2.1	0.0	0.0	2.0
Xmn	0.1	0.0	0.0	0.0	20.3	0.1	21.6	0.0	3.3	14.8
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	19.9	0.0	0.0	2.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	XSC	XSD
Exporter	ZWE									
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	9.5
Sgr	13.3	0.0	0.0	0.0	0.0	14.2	0.0	0.0	14.3	0.0
Bvt	0.0	0.0	0.0	0.0	22.1	0.0	25.0	0.0	0.0	29.3
Xfp	0.0	0.0	0.0	0.0	8.7	0.0	24.8	0.0	0.0	13.9
Mmp	0.0	0.0	0.0	0.0	17.6	0.0	24.1	0.0	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	5.3	0.0	22.1	0.0	0.0	9.9
Cog	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	14.9
Twl	1.6	0.0	0.0	0.0	17.7	1.1	20.6	0.0	4.3	18.4
Pch	0.0	0.0	0.0	0.0	6.8	0.0	15.3	0.0	0.0	13.6
Mtp	0.0	0.0	0.0	0.0	8.0	0.0	1.8	0.0	0.0	10.3
Veq	5.6	0.0	0.0	0.0	8.1	1.9	7.5	0.0	7.8	7.6
Emq	0.0	0.0	0.0	0.0	5.2	0.0	5.7	0.0	0.0	11.4
Xmn	0.2	0.0	0.0	0.0	8.2	0.4	22.5	0.0	1.1	19.4
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**XSC**										
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Wgr	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	5.2	0.0	2.0
Vfr	0.0	0.0	0.0	17.8	8.9	0.0	0.0	23.5	0.0	0.0	5.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Xcr	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	8.8
Sgr	0.0	12.5	22.7	0.0	7.5	0.0	25.0	25.0	25.0	0.0	5.4
Bvt	0.0	0.0	10.0	72.7	24.9	0.0	25.0	24.8	64.2	0.0	30.5
Xfp	0.0	0.0	19.2	11.6	14.9	0.0	17.5	8.5	10.3	0.0	10.8
Mmp	0.0	0.0	10.0	0.0	21.9	0.0	24.1	15.8	32.8	0.0	7.0
Ffp	0.0	0.0	0.0	0.0	1.0	0.0	2.2	12.8	16.1	0.0	11.1
Cog	0.0	0.0	0.0	9.4	4.8	0.0	25.0	10.0	10.0	0.0	15.4
Twl	0.0	0.0	20.5	3.8	16.4	0.0	12.9	24.0	29.9	0.0	9.1
Pch	0.0	5.0	5.1	5.8	9.5	0.0	9.9	0.7	6.2	0.0	12.6
Mtp	0.0	0.0	9.2	9.9	11.2	0.0	15.5	6.5	17.0	20.0	4.3
Veq	0.0	5.0	16.1	0.0	17.8	0.0	5.1	12.2	31.3	0.0	7.4
Emq	0.0	0.0	10.8	33.1	8.3	0.0	14.5	11.9	47.2	0.0	6.4
Xmn	0.0	5.0	19.5	0.1	4.1	0.0	22.0	21.4	17.1	0.0	10.9
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Xsr	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	5.2	0.0	2.0

Table A4-28 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	XSD										
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.6	0.0
Bvt	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	59.1	0.0
Xfp	0.0	0.0	0.0	0.0	0.0	9.5	0.0	0.0	0.0	6.7	0.0
Mmp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Ffp	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0
Twl	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	0.0	34.1	0.0
Pch	3.3	0.0	0.0	0.0	0.0	3.5	3.0	0.0	0.0	10.3	0.0
Mtp	0.0	0.0	0.0	0.0	0.0	6.3	0.0	10.0	10.9	6.6	0.0
Veq	0.0	0.0	0.0	0.0	0.0	1.0	0.0	14.9	27.8	20.9	0.0
Emq	0.0	0.0	12.2	0.0	0.0	1.5	13.3	0.6	4.6	8.2	0.0
Xmn	0.0	0.0	20.3	0.0	0.0	1.7	0.0	0.0	0.0	19.3	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Madagascar grants duty-free access to rice imports from Botswana.
Source: Calculated by the author from the GTAP7 Database.

Table A4-29
Exports to SADC to Total Exports Ratios by Commodity

(Percent, volume, 2004)

Importer	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter						**BWA**					
Ric	0.0	0.0	0.0	0.0	**97.3**	0.0	0.0	0.0	0.0	0.0	97.3
Wgr	0.0	0.4	0.1	0.0	**56.4**	0.0	0.1	5.9	0.0	0.0	62.9
Vfr	0.0	0.0	0.0	0.0	7.7	0.1	0.0	7.6	8.9	0.0	24.2
Pfb	0.0	0.0	0.0	0.0	**61.3**	0.0	0.0	0.0	0.0	0.0	61.4
Xcr	0.0	0.3	0.0	0.0	39.1	0.0	0.2	12.8	10.2	0.0	62.6
Sgr	0.0	0.0	0.0	0.0	8.9	0.0	0.0	**61.1**	12.0	0.0	82.1
Bvt	0.0	0.0	0.0	0.0	23.5	0.1	0.9	1.3	0.1	0.0	25.9
Xfp	0.0	0.0	0.0	0.0	**85.4**	0.0	0.6	2.9	1.0	0.0	90.0
Mmp	0.0	0.0	0.1	0.0	13.6	0.0	0.0	0.3	0.1	0.0	14.1
Ffp	0.0	0.0	0.0	0.0	26.1	0.0	0.3	0.0	0.1	0.0	26.6
Cog	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.0	0.0	0.4
Twl	0.0	0.0	0.4	0.0	**47.0**	0.0	0.0	0.8	0.2	0.0	48.5
Pch	0.0	0.9	0.0	2.0	**69.3**	0.9	2.1	11.3	1.4	0.2	88.1
Mtp	0.0	0.0	0.0	0.0	7.2	0.0	0.1	25.5	0.1	0.0	33.1
Veq	0.0	1.1	0.1	0.0	**88.8**	0.0	2.4	0.5	1.3	0.0	94.1
Emq	0.0	0.8	0.0	0.3	**51.4**	0.2	2.3	1.8	2.5	0.2	59.5
Xmn	0.0	0.1	0.0	0.0	29.5	0.0	3.1	3.4	2.1	0.0	38.4
Utc	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.0	0.0	0.9	1.5
Tcm	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.6
Xsr	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.1	0.7

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter	**MDG**										
Ric	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.7
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	1.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.2
Pfb	0.0	0.0	0.7	0.0	0.9	0.0	0.0	0.0	0.0	0.0	1.6
Xcr	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Sgr	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Bvt	0.0	0.0	0.1	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.8
Xfp	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Mmp	0.0	0.0	0.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.9
Ffp	0.0	0.0	2.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	2.8
Cog	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.2
Twl	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Pch	0.0	0.0	9.3	0.0	0.4	1.3	0.0	0.0	0.4	0.0	11.4
Mtp	0.1	0.0	0.9	0.0	0.2	0.0	0.0	0.0	0.0	0.0	1.3
Veq	0.1	0.0	0.0	1.9	0.2	0.0	0.0	0.0	0.0	0.0	2.3
Emq	0.0	0.0	4.1	0.4	4.2	0.0	0.0	0.0	0.0	0.0	8.6
Xmn	0.0	0.0	3.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	3.5
Utc	0.0	0.0	0.0	0.1	0.5	0.1	0.1	0.0	0.0	0.9	1.8
Tcm	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.1	0.8
Xsr	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.7

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter					**MWI**						
Ric	0.0	0.0	0.0	0.0	2.8	0.0	0.0	21.2	0.0	0.0	24.1
Wgr	0.0	0.0	0.0	2.7	6.9	4.7	1.2	**43.3**	0.0	5.1	63.9
Vfr	0.8	0.0	2.1	0.1	6.3	0.1	0.1	1.7	1.5	0.0	12.6
Pfb	1.1	0.0	0.7	0.0	**40.7**	6.1	7.2	0.0	17.8	0.0	73.6
Xcr	0.3	0.0	0.1	0.4	5.5	0.1	0.1	0.4	0.0	0.3	7.0
Sgr	0.5	0.3	0.0	0.0	6.5	4.1	0.1	0.0	0.0	1.2	12.7
Bvt	0.0	0.0	0.0	4.0	0.5	4.2	0.3	0.2	0.0	0.0	9.2
Xfp	0.2	0.0	0.0	0.1	**43.9**	1.0	7.6	28.6	0.0	0.4	81.9
Mmp	0.0	0.0	0.0	0.2	0.5	5.4	3.7	0.0	0.0	0.0	9.9
Ffp	0.0	0.0	0.0	1.2	3.0	0.8	0.9	0.1	0.1	0.0	6.1
Cog	0.0	0.0	0.0	0.0	1.1	0.0	0.1	0.1	0.0	0.0	1.2
Twl	0.0	0.0	0.0	0.5	31.8	0.0	0.4	1.4	0.5	0.0	34.7
Pch	0.3	0.0	0.1	5.2	22.3	1.6	31.8	14.0	0.2	0.0	75.4
Mtp	0.2	0.0	0.0	11.9	**71.4**	0.4	4.1	2.6	0.2	0.0	90.8
Veq	6.4	0.0	0.0	14.5	**42.3**	2.0	6.0	12.5	1.0	0.0	84.6
Emq	0.8	0.0	0.0	11.2	24.1	7.7	9.1	15.4	0.0	0.1	68.3
Xmn	0.8	0.0	0.1	**68.7**	14.3	0.5	2.7	1.4	0.3	0.1	88.9
Utc	0.0	0.0	0.0	67.6	0.2	0.0	0.0	0.0	0.0	0.1	68.0
Tcm	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.7
Xsr	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.1	0.0	0.1	0.9

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter	**MUS**										
Ric	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	1.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	2.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	2.5
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bvt	0.0	20.7	0.0	0.3	1.2	0.0	0.2	0.0	0.9	0.0	23.5
Xfp	0.0	6.5	0.4	0.5	0.4	0.0	0.4	1.0	0.0	0.0	9.3
Mmp	0.0	3.6	0.0	0.0	0.3	0.0	2.1	0.0	0.6	0.0	6.6
Ffp	0.0	1.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	1.2
Cog	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	1.2
Twl	0.1	2.5	0.0	0.2	1.2	0.0	0.0	0.1	0.0	0.0	4.2
Pch	1.2	10.8	1.1	0.1	2.9	2.0	1.3	0.9	0.1	1.0	21.3
Mtp	0.0	8.0	0.0	0.1	2.9	0.7	0.5	0.1	0.0	0.6	12.8
Veq	0.8	1.7	0.0	0.2	1.5	0.1	0.5	0.1	0.0	0.0	5.0
Emq	0.1	3.1	0.0	0.0	3.0	1.1	0.1	0.0	0.0	0.1	7.5
Xmn	0.1	2.9	0.0	0.0	1.1	1.7	0.0	0.3	0.2	0.0	6.2
Utc	0.0	0.0	0.0	0.1	0.8	0.1	0.1	0.0	0.0	0.9	2.1
Tcm	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.1	0.9
Xsr	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.7

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter	**MOZ**										
Ric	0.0	0.0	5.2	0.0	22.4	27.6	0.0	16.3	0.0	0.0	71.5
Wgr	0.0	0.0	**41.4**	0.0	3.0	4.6	0.0	12.1	0.1	0.0	61.2
Vfr	0.0	0.0	7.3	0.0	3.4	0.0	0.2	0.9	0.9	0.0	12.7
Pfb	0.0	0.0	0.0	0.4	5.2	0.0	0.0	0.1	3.5	0.0	9.3
Xcr	0.0	0.0	**47.6**	0.0	0.1	0.0	0.1	3.3	0.0	0.0	51.1
Sgr	0.0	2.1	0.1	0.0	0.4	3.7	0.0	0.1	0.0	0.0	6.3
Bvt	0.0	0.0	0.0	0.0	14.6	0.1	0.0	0.4	0.0	0.0	15.1
Xfp	0.0	0.0	10.0	0.0	9.0	0.0	1.1	1.9	4.4	0.0	26.4
Mmp	0.0	0.0	6.8	0.0	0.3	0.0	0.0	0.6	0.0	0.0	7.8
Ffp	0.0	0.0	0.0	0.1	3.3	0.0	0.0	0.0	0.7	0.0	4.1
Cog	0.0	0.0	0.5	0.6	2.7	0.0	0.0	2.9	0.0	0.0	6.8
Twl	0.0	0.0	0.7	0.0	22.5	0.3	0.1	0.5	0.1	0.0	24.2
Pch	0.0	0.0	**56.7**	0.0	24.3	0.0	1.2	0.7	3.8	0.0	86.7
Mtp	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.6
Veq	12.2	0.0	8.4	0.0	36.7	4.3	4.4	1.6	8.3	0.0	76.0
Emq	1.4	0.0	4.4	0.0	17.2	0.1	2.8	3.8	24.3	0.0	53.9
Xmn	0.5	0.0	2.0	0.9	21.0	0.6	1.4	5.8	0.3	0.0	32.5
Utc	0.5	0.0	0.0	0.0	3.4	0.0	0.0	25.0	0.6	0.1	29.6
Tcm	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.5
Xsr	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4	0.7

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter	**ZAF**										
Ric	**43.2**	0.0	0.0	0.0	0.6	0.0	12.8	2.0	36.1	0.7	95.5
Wgr	20.0	0.0	0.1	0.0	3.0	1.8	5.4	28.2	18.6	4.0	81.1
Vfr	1.7	0.0	0.0	0.5	1.1	0.0	0.1	0.5	2.3	0.9	7.1
Pfb	0.1	0.0	0.0	0.0	0.0	0.0	0.3	11.4	1.4	0.0	13.2
Xcr	6.0	0.0	0.4	0.2	2.6	0.1	0.9	2.3	9.2	1.0	22.8
Sgr	7.2	0.4	0.0	3.5	15.7	3.4	0.0	0.0	2.3	2.3	35.0
Bvt	5.1	0.0	0.1	0.3	1.0	0.4	0.7	0.2	11.1	7.0	26.1
Xfp	10.1	0.1	0.8	1.1	2.8	0.3	2.8	3.2	18.7	1.0	40.9
Mmp	16.9	0.0	0.5	0.9	4.8	0.4	1.1	1.8	30.9	2.1	59.6
Ffp	1.5	0.0	0.1	2.4	0.5	0.1	0.2	0.3	6.4	0.5	12.0
Cog	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.6
Twl	8.9	0.3	0.8	1.4	0.8	0.3	0.9	1.6	15.1	0.7	30.7
Pch	9.2	1.0	1.8	0.9	3.3	1.3	3.6	4.9	15.0	2.0	43.0
Mtp	1.4	0.0	0.1	0.3	0.5	0.5	0.5	0.9	1.6	0.5	6.5
Veq	6.4	0.2	0.7	0.3	1.3	0.5	1.3	1.2	9.6	0.4	22.0
Emq	8.8	0.1	0.9	0.5	2.1	1.3	4.5	3.1	11.1	2.2	34.7
Xmn	4.7	0.3	0.7	0.8	1.3	0.7	1.0	1.0	7.7	0.7	18.9
Utc	6.8	0.0	0.0	0.0	0.5	0.1	0.0	2.6	3.1	0.2	13.4
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
Xsr	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	ZMB	ZWE	XSC	XSD	SADC
Exporter						**TZA**					
Ric	0.0	0.0	0.1	0.0	0.0	0.5	0.4	0.0	0.0	0.0	1.1
Wgr	0.0	0.0	8.9	0.0	0.0	0.3	0.1	0.0	0.0	0.0	9.4
Vfr	0.0	0.0	0.1	0.0	0.0	1.6	0.5	0.0	0.0	0.0	2.1
Pfb	0.0	0.4	0.0	0.0	0.0	0.3	0.0	0.1	0.2	0.0	1.0
Xcr	0.0	0.0	0.2	0.0	0.0	1.8	0.0	0.0	0.0	0.0	2.1
Sgr	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3
Bvt	0.0	0.0	0.4	0.0	0.3	0.5	0.2	0.0	0.0	0.0	1.5
Xfp	0.0	0.0	0.4	0.1	0.1	0.8	0.1	0.0	0.0	0.0	1.7
Mmp	0.0	0.0	0.1	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.8
Ffp	0.0	0.0	0.0	0.2	0.0	0.8	0.1	0.0	0.0	0.0	1.1
Cog	0.0	0.0	0.0	0.1	0.0	6.9	0.0	0.0	0.0	0.0	7.0
Twl	0.0	1.0	6.2	0.0	0.9	3.2	2.3	0.4	2.0	0.0	16.0
Pch	0.0	2.5	11.8	0.3	2.1	1.1	5.8	1.0	0.2	0.4	25.1
Mtp	0.0	0.0	0.4	0.0	0.1	**41.3**	0.1	0.0	0.0	0.1	42.0
Veq	0.3	0.0	3.6	0.0	0.0	5.5	26.5	1.2	0.5	0.0	37.6
Emq	0.4	0.0	18.4	0.0	0.4	7.2	6.9	2.3	0.2	0.0	35.8
Xmn	0.0	0.0	0.7	0.0	0.1	1.3	0.4	0.0	0.0	0.0	2.6
Utc	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.2	0.8
Tcm	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.5
Xsr	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.7

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZWE	XSC	XSD	SADC
Exporter						**ZMB**					
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
Wgr	1.0	0.0	18.9	0.0	0.0	0.7	7.8	**63.3**	1.5	0.4	93.7
Vfr	0.2	0.0	0.0	0.0	0.0	0.5	0.0	**45.2**	0.2	0.3	46.4
Pfb	0.0	0.0	0.6	3.1	0.0	33.4	0.0	0.4	2.1	0.0	39.6
Xcr	0.0	0.0	11.5	0.0	0.0	3.4	0.0	21.7	0.0	0.0	36.7
Sgr	0.4	0.0	0.0	0.0	0.0	10.5	3.4	0.1	0.7	0.2	15.1
Bvt	0.0	0.0	17.6	0.0	1.0	1.3	0.0	6.4	0.0	0.0	26.5
Xfp	0.6	0.0	4.1	0.0	0.3	**65.0**	0.1	7.6	0.7	0.1	78.4
Mmp	0.4	0.0	19.0	0.0	0.0	4.6	0.1	0.0	0.2	0.0	24.4
Ffp	0.1	0.0	2.8	0.0	0.8	2.4	0.2	1.1	0.0	0.0	7.5
Cog	0.0	0.0	0.0	0.0	0.0	34.0	0.0	5.0	0.0	0.0	39.1
Twl	1.1	0.0	1.9	10.8	0.0	10.5	0.3	4.0	0.3	0.0	28.9
Pch	0.1	0.0	6.3	0.0	0.1	1.3	2.4	3.0	0.4	0.0	13.7
Mtp	0.0	0.0	0.1	0.0	0.0	4.7	8.2	0.5	0.0	0.0	13.6
Veq	2.2	0.0	2.7	0.0	1.8	12.0	9.0	**39.2**	3.6	0.0	70.5
Emq	0.3	0.0	3.4	0.0	0.7	**53.5**	3.0	12.2	0.5	0.0	73.4
Xmn	0.7	0.0	3.3	0.0	0.3	**48.3**	1.5	8.6	0.3	0.0	63.0
Utc	0.4	0.0	0.0	0.0	0.0	**50.3**	3.8	0.1	34.2	0.0	88.8
Tcm	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3
Xsr	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.0	0.1	0.8

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	XSC	XSD	SADC
Exporter	**ZWE**										
Ric	0.0	0.0	0.0	0.0	0.0	0.1	0.0	**70.4**	0.0	0.0	70.6
Wgr	29.8	0.0	12.5	0.2	0.0	6.2	0.0	16.4	0.4	0.0	65.6
Vfr	1.6	0.0	0.1	0.0	0.0	3.2	0.0	13.8	0.6	0.0	19.4
Pfb	0.3	0.0	0.0	0.0	0.0	20.9	0.0	0.8	1.5	0.0	23.5
Xcr	0.0	0.0	0.1	0.0	0.8	6.0	0.6	0.6	0.0	0.0	8.2
Sgr	10.7	0.0	0.8	0.0	0.0	6.6	0.0	0.0	15.1	0.0	33.4
Bvt	2.8	0.0	4.8	0.6	8.5	2.2	0.0	6.0	1.9	6.5	33.3
Xfp	9.1	0.0	4.6	0.0	1.7	22.2	0.7	17.6	0.5	0.1	56.5
Mmp	12.7	0.0	11.4	13.7	1.6	27.5	2.2	2.9	4.4	0.0	76.4
Ffp	8.5	0.0	10.5	0.0	1.1	5.7	0.3	0.6	0.1	0.3	27.1
Cog	0.0	0.0	1.2	0.0	0.1	**68.2**	0.0	2.7	0.0	0.0	72.3
Twl	4.9	0.0	4.2	0.3	1.2	**39.3**	0.2	4.3	1.4	0.1	55.9
Pch	11.3	0.0	16.3	0.3	1.6	17.7	0.1	31.6	0.5	0.1	79.5
Mtp	1.8	0.0	0.9	0.0	0.2	11.0	0.0	2.2	0.1	0.0	16.2
Veq	7.7	0.1	7.1	0.0	4.0	**56.1**	4.2	9.1	0.8	0.0	89.1
Emq	5.7	0.0	13.0	0.0	2.0	21.1	0.9	25.3	2.2	0.0	70.2
Xmn	4.3	0.0	4.4	0.0	0.9	**61.6**	0.3	8.1	0.6	0.2	80.3
Utc	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.7
Tcm	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.5
Xsr	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.7

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter	**XSC**											
Ric	0.0	0.0	0.0	0.0	0.0	**65.4**	0.0	0.0	0.0	0.0	17.5	82.9
Wgr	0.7	0.0	0.0	0.0	8.9	16.6	0.0	0.0	13.4	0.0	15.6	55.2
Vfr	0.0	0.0	0.0	0.2	0.9	29.4	0.0	0.0	0.0	0.0	5.7	36.3
Pfb	0.0	0.0	0.0	0.0	0.1	19.9	0.0	0.0	0.0	0.0	0.3	20.3
Xcr	0.1	0.0	0.0	0.0	11.2	**48.4**	0.0	0.0	0.0	0.0	8.0	67.6
Sgr	0.0	1.4	0.0	0.0	4.2	**54.7**	0.2	0.0	0.2	0.0	2.0	62.6
Bvt	0.9	0.0	0.1	0.0	6.9	**52.4**	0.2	1.5	0.4	0.1	29.3	91.7
Xfp	0.2	0.0	0.1	1.0	2.9	23.0	1.3	0.3	1.3	0.2	3.5	33.9
Mmp	1.5	0.0	0.1	0.0	1.8	33.2	0.1	0.3	0.1	0.0	2.4	39.6
Ffp	0.1	0.0	0.0	0.0	1.0	**66.7**	0.0	0.1	0.1	0.0	1.2	69.2
Cog	0.0	0.0	0.0	0.0	0.0	7.8	0.0	1.2	0.0	0.0	0.4	9.5
Twl	0.0	0.0	0.0	0.0	0.3	23.1	0.0	0.0	0.0	0.0	0.6	24.1
Pch	0.1	0.0	0.3	0.5	1.6	**65.6**	1.4	0.5	0.1	0.3	4.8	75.2
Mtp	0.0	0.0	0.0	0.0	0.4	11.5	0.0	0.1	0.0	0.0	4.4	16.5
Veq	1.1	0.0	0.0	0.0	1.2	**39.2**	0.2	0.6	0.2	0.0	35.9	78.4
Emq	0.3	0.0	0.1	0.0	1.1	**39.3**	0.1	0.6	0.1	0.1	12.2	53.9
Xmn	0.0	0.3	0.0	0.4	0.7	**71.6**	0.0	0.1	0.1	0.0	6.7	79.9
Utc	0.0	0.0	0.0	0.0	0.2	1.3	0.1	0.1	0.0	0.0	0.9	2.8
Tcm	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.7
Xsr	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.6

Table A4-29 (cont.)

(Percent, volume, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD	SADC
Exporter	**XSD**											
Ric	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	0.7
Wgr	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.1	0.9
Vfr	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.7
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xcr	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5
Bvt	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	7.7	0.0	8.5
Xfp	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	6.2	0.0	7.5
Mmp	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	7.8	0.0	15.2
Ffp	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.7
Cog	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.1
Twl	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.8
Pch	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.0	0.8
Mtp	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.5
Veq	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.1	0.0	0.6	0.0	3.4
Emq	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.2	0.1	0.2	0.0	4.4
Xmn	0.0	0.0	0.0	0.9	0.0	0.2	0.0	0.0	0.0	0.1	0.0	1.2
Utc	0.0	0.0	0.0	0.0	1.8	4.2	0.0	0.0	0.0	0.5	0.0	6.6
Tcm	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.6
Xsr	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	0.7

0.0 percent of Botswana rice exports are destined for Madagascar.

Source: Calculated by the author from the GTAP7 Database.

Table A4-30
Shares for non-SADC non-EU Exporters in SADC Importing Markets

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**USA**										
Ric	0.0	8.2	45.2	0.0	4.0	0.1	0.8	0.0	0.2	0.3	1.0
Wgr	0.0	22.8	16.3	0.0	38.1	26.9	3.8	8.3	5.9	28.8	31.1
Vfr	0.1	8.7	29.5	2.7	4.8	7.1	40.3	6.1	17.0	2.0	9.3
Pfb	1.4	0.5	0.5	2.4	6.2	0.2	1.0	0.1	0.1	0.1	3.4
Xcr	0.1	49.1	0.0	0.5	0.0	5.7	0.9	0.2	0.6	0.4	0.1
Sgr	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.5	0.4	0.1	0.0
Bvt	0.1	0.3	0.4	1.0	0.1	8.5	0.7	0.1	0.8	0.5	0.0
Xfp	0.1	8.6	20.8	0.4	5.9	3.3	1.7	2.5	11.3	1.9	2.3
Mmp	0.2	0.6	0.5	0.2	4.2	3.4	1.2	2.5	0.6	0.3	9.8
Ffp	0.5	4.2	0.3	0.5	0.6	10.3	1.3	7.8	1.7	0.3	7.4
Cog	0.1	27.4	0.0	14.1	0.0	0.4	0.5	0.2	0.1	9.1	19.1
Twl	0.4	0.4	0.7	1.2	2.0	1.9	2.4	1.1	1.4	0.4	1.9
Pch	0.5	1.9	1.8	1.2	4.4	10.0	2.2	1.3	2.5	1.2	4.8
Mtp	0.3	0.4	0.5	0.4	0.5	3.5	0.9	0.5	0.6	0.9	10.1
Veq	1.5	3.4	1.1	1.2	2.9	7.9	19.2	1.9	6.9	0.9	1.2
Emq	3.6	2.8	4.4	4.1	1.7	9.9	7.0	3.4	2.8	2.1	24.9
Xmn	0.6	1.0	2.2	3.8	4.4	8.3	7.3	1.9	2.7	7.5	5.3
Utc	2.8	7.7	8.6	7.8	4.0	5.1	7.5	7.6	1.3	3.2	7.8
Tcm	9.4	8.7	11.9	14.3	18.5	10.0	13.2	31.2	23.7	8.0	5.5
Xsr	20.6	33.9	22.3	20.9	23.0	24.6	26.5	27.1	32.1	19.3	22.1

Table A4-30 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter						**EAS**					
Ric	0.7	5.0	1.6	0.4	3.7	0.6	10.0	0.3	0.8	0.4	2.2
Wgr	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	2.0	0.0
Vfr	0.6	39.6	1.2	3.7	1.5	18.1	13.8	2.4	0.3	0.2	13.0
Pfb	0.2	0.1	0.1	0.0	1.1	0.0	0.2	0.0	0.0	0.0	1.5
Xcr	0.0	3.2	0.0	6.6	0.0	2.0	2.0	0.4	0.5	0.0	0.5
Sgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Bvt	0.2	8.6	0.5	2.1	0.4	1.8	1.0	0.2	1.2	0.8	0.1
Xfp	0.1	4.7	0.2	4.3	1.3	3.5	0.8	0.3	0.3	1.1	0.8
Mmp	0.1	0.3	0.2	1.1	0.8	0.7	0.6	0.5	0.3	0.1	0.7
Ffp	2.7	10.3	2.0	4.0	3.2	8.2	15.7	3.6	2.4	0.5	1.3
Cog	0.4	2.8	0.3	1.3	0.9	0.4	1.5	0.0	0.2	0.6	7.0
Twl	21.4	56.9	31.3	32.9	27.4	48.1	33.8	27.1	31.9	42.9	28.9
Pch	1.7	7.8	5.3	7.4	7.4	12.0	7.7	5.9	3.8	2.2	5.3
Mtp	0.5	10.6	4.6	4.6	6.0	13.5	10.0	2.5	1.1	2.4	5.0
Veq	2.4	34.0	20.3	36.8	16.9	22.2	32.6	12.5	13.8	2.6	80.3
Emq	1.9	16.3	13.3	14.2	8.3	20.5	15.1	9.2	12.1	7.0	6.6
Xmn	0.9	12.3	2.2	10.9	3.3	12.1	5.2	4.0	3.5	3.0	5.4
Utc	6.3	16.5	9.2	13.7	8.7	7.5	19.2	20.3	0.8	5.6	20.4
Tcm	12.0	30.7	13.8	16.3	14.7	20.0	12.4	10.4	22.4	20.3	29.7
Xsr	8.0	6.9	7.9	7.3	8.2	8.4	7.5	8.5	17.3	7.3	9.1

Table A4-30 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**SAS**										
Ric	0.7	86.6	45.2	97.9	89.0	96.2	83.4	33.1	81.6	13.1	95.2
Wgr	0.0	0.1	0.0	0.1	0.0	0.1	45.6	0.0	0.5	0.0	0.0
Vfr	0.2	1.5	1.7	21.8	0.2	8.9	1.9	0.3	0.1	0.3	0.8
Pfb	1.1	0.2	5.0	56.5	2.3	0.7	7.1	1.1	0.0	0.0	4.1
Xcr	1.4	0.3	0.1	30.5	0.5	13.3	1.3	3.1	4.6	2.1	1.6
Sgr	0.1	0.6	0.5	0.5	0.1	1.1	18.3	2.4	1.3	0.1	0.0
Bvt	0.2	0.4	1.0	1.4	0.2	1.6	3.0	0.3	3.5	0.1	0.7
Xfp	0.2	5.7	7.6	11.3	27.3	18.0	55.9	1.9	4.8	1.0	7.5
Mmp	0.1	1.3	7.3	7.5	6.3	0.6	3.3	8.2	0.6	0.2	11.2
Ffp	1.5	8.1	2.0	11.7	1.7	3.8	8.0	3.2	1.3	0.4	9.3
Cog	0.6	11.8	1.3	6.0	0.7	0.2	14.6	0.0	0.2	0.3	2.8
Twl	1.9	10.6	32.2	35.0	32.9	15.7	20.0	22.1	16.1	7.2	28.8
Pch	1.0	8.9	5.5	18.3	6.3	7.8	11.4	5.0	3.2	1.0	7.0
Mtp	0.1	16.4	9.2	10.2	5.0	6.2	3.8	2.9	0.9	0.5	2.6
Veq	0.6	6.7	13.6	17.0	12.6	3.0	6.1	6.6	7.5	1.5	0.9
Emq	0.9	9.8	5.2	10.0	3.9	5.4	8.0	2.4	2.8	1.4	3.0
Xmn	1.0	10.8	3.5	23.2	4.7	9.3	10.5	5.6	3.5	5.6	2.5
Utc	1.5	3.6	2.1	3.2	2.2	1.1	4.3	4.6	0.2	1.2	4.6
Tcm	7.3	5.4	6.7	5.9	6.1	6.4	6.8	4.3	4.6	6.3	6.2
Xsr	4.7	4.3	4.6	4.9	4.3	3.8	3.7	4.0	3.4	3.9	5.6

Table A4-30 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**SSA**										
Ric	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Wgr	0.0	6.9	0.6	0.2	0.0	0.6	4.8	0.0	0.0	0.0	0.1
Vfr	0.2	9.9	0.4	0.1	0.9	3.5	2.8	2.4	3.8	0.1	3.1
Pfb	0.1	0.0	0.0	22.5	0.3	3.4	21.7	0.0	0.0	27.3	58.5
Xcr	0.1	5.1	0.2	4.3	0.0	6.4	46.9	0.7	3.7	5.5	6.9
Sgr	0.0	0.0	54.6	0.0	0.0	0.0	1.6	0.2	0.1	0.1	0.5
Bvt	0.0	0.1	0.3	1.0	0.0	0.2	6.6	2.4	0.1	0.0	1.9
Xfp	0.0	1.2	3.5	3.5	0.3	1.4	12.4	16.0	7.1	0.1	2.5
Mmp	0.0	0.1	0.0	0.5	0.0	0.1	23.6	0.2	0.1	0.0	0.1
Ffp	0.5	4.7	0.4	6.6	0.5	1.4	19.3	1.5	0.9	0.1	1.2
Cog	0.0	2.8	0.8	0.1	0.0	11.0	45.3	5.9	21.6	5.7	1.7
Twl	0.2	0.2	3.1	0.5	0.9	0.2	3.0	2.5	0.9	0.0	2.1
Pch	0.0	0.5	1.0	0.9	0.3	0.3	5.6	1.2	0.2	1.9	5.3
Mtp	0.0	2.6	19.8	0.6	1.6	13.0	5.4	8.2	0.1	0.0	2.0
Veq	0.0	0.3	0.2	0.0	0.1	0.4	2.0	0.8	0.6	0.4	0.1
Emq	0.0	0.2	0.7	0.1	0.1	0.1	1.9	0.6	0.2	0.0	0.5
Xmn	0.1	0.5	1.0	1.3	0.2	1.3	6.0	1.0	0.2	0.0	2.2
Utc	0.1	0.3	0.4	0.4	0.2	0.3	0.6	0.3	0.3	0.2	0.3
Tcm	0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.4	0.7	0.7	0.9
Xsr	0.5	0.8	0.4	0.5	0.5	0.4	0.4	0.6	0.5	0.3	0.8

Table A4-30 (cont.)

(Percent, *fob* price, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**ROW**										
Ric	0.1	0.2	4.1	1.4	3.0	1.8	5.3	0.1	0.1	0.1	0.3
Wgr	0.2	1.1	19.3	57.1	53.9	66.3	39.6	0.5	23.1	0.3	38.9
Vfr	0.8	6.8	3.6	25.2	2.2	24.8	26.3	1.5	0.6	0.6	20.4
Pfb	12.8	64.2	4.6	2.9	56.0	4.2	18.0	2.5	1.0	5.6	15.5
Xcr	0.8	2.6	0.1	10.5	0.5	39.2	5.6	1.9	2.4	0.4	12.3
Sgr	0.3	18.4	0.8	0.6	0.1	8.2	28.7	8.1	1.3	0.9	75.0
Bvt	0.4	2.4	2.7	16.1	1.2	14.5	11.0	0.4	3.7	0.9	3.2
Xfp	0.4	30.4	17.8	30.9	12.8	38.0	8.3	2.9	6.1	1.5	25.2
Mmp	0.8	64.8	14.2	66.0	22.2	60.1	38.2	15.3	15.9	1.7	32.4
Ffp	2.4	11.7	1.8	8.8	2.9	14.3	14.9	3.7	2.7	2.6	31.4
Cog	36.1	11.8	4.4	11.5	27.9	71.6	21.4	75.4	0.2	25.0	17.6
Twl	0.7	1.2	2.9	4.6	4.6	7.0	33.1	9.2	6.3	0.6	9.9
Pch	2.1	19.3	11.0	37.2	7.6	15.6	41.8	7.7	13.2	1.7	12.6
Mtp	1.9	13.5	1.7	57.8	4.1	26.3	12.9	6.8	1.4	0.3	12.8
Veq	1.9	5.8	1.4	2.7	2.2	6.9	5.8	6.2	7.5	6.0	4.7
Emq	9.6	3.0	6.9	9.5	5.8	8.0	16.5	11.8	17.0	2.6	11.5
Xmn	1.6	3.0	12.4	5.2	9.4	10.0	21.7	5.0	3.5	2.7	15.9
Utc	5.8	15.4	21.1	17.2	39.9	29.1	12.7	12.2	1.3	28.4	12.0
Tcm	26.9	18.2	24.1	18.1	20.8	19.7	25.7	22.8	18.3	20.5	11.4
Xsr	15.2	13.4	15.3	15.0	14.5	16.7	15.8	16.0	15.1	12.4	13.1

0.0 percent of Botswana rice imports are sourced in the USA.
Source: Calculated by the author from the GTAP7 Database.

Table A4-31
Applied Tariffs on non-SADC non-EU Exports in SADC Importing Markets

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter						**USA**					
Ric	0.0	0.0	10.0	5.0	2.5	0.0	25.0	0.0	15.0	0.0	10.0
Wgr	0.0	0.0	0.2	0.0	2.8	1.9	16.1	5.0	11.4	1.4	2.5
Vfr	6.3	9.9	17.4	18.3	5.4	4.9	19.3	14.2	13.2	10.7	5.2
Pfb	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	0.0	0.0	0.0
Xcr	3.2	19.6	22.1	0.3	0.0	4.4	14.5	12.9	62.8	0.6	0.0
Sgr	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	0.0	5.3	0.0
Bvt	0.0	12.5	23.4	77.6	0.0	10.0	24.8	0.0	0.0	69.9	30.0
Xfp	13.2	5.9	18.7	6.0	8.9	8.3	24.9	18.0	25.4	7.7	7.0
Mmp	8.5	2.4	5.0	4.3	14.8	10.6	14.6	11.5	0.0	37.4	9.9
Ffp	0.0	0.0	3.3	3.0	9.7	0.1	3.9	3.5	4.9	0.0	9.6
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.0	4.5	0.1	5.5
Twl	28.6	5.5	24.5	18.3	24.2	17.7	21.8	24.2	34.5	24.3	13.9
Pch	5.7	0.6	4.8	15.1	7.4	3.2	7.1	9.9	13.3	2.2	9.5
Mtp	7.7	4.4	13.2	25.5	4.1	3.9	12.4	7.8	15.5	6.1	6.0
Veq	5.4	4.9	6.3	33.3	6.3	11.8	0.4	8.5	12.7	8.2	4.6
Emq	2.3	4.5	5.2	17.6	8.2	1.7	6.1	6.0	11.4	1.9	2.8
Xmn	8.3	4.4	12.0	29.6	23.0	3.5	23.0	17.7	19.0	16.0	10.5
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-31 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	EAS										
Ric	0.0	0.0	7.2	3.9	7.5	0.0	24.9	3.5	11.1	0.0	9.9
Wgr	0.0	0.0	0.0	0.0	0.0	3.0	24.3	4.1	0.0	3.2	0.0
Vfr	11.6	9.8	14.0	8.0	10.4	9.5	11.9	5.9	8.2	0.0	5.6
Pfb	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Xcr	8.7	0.5	0.0	11.4	5.1	11.6	1.1	15.5	79.0	8.8	15.1
Sgr	0.0	0.0	0.0	50.6	0.0	2.3	11.3	0.0	0.0	0.0	0.0
Bvt	16.5	13.7	0.0	76.0	21.4	67.5	19.8	12.8	13.7	45.8	21.7
Xfp	13.2	1.6	22.5	9.8	18.4	7.9	21.0	22.5	29.4	2.9	23.1
Mmp	0.0	3.6	0.8	26.9	23.3	13.5	12.3	3.2	0.0	20.3	8.3
Ffp	0.0	1.8	0.0	9.5	9.1	1.1	0.5	10.4	3.6	0.3	7.7
Cog	0.1	0.1	2.7	7.0	6.1	2.0	0.6	4.7	4.0	0.7	1.9
Twl	31.7	4.7	23.8	9.2	22.3	28.3	20.1	20.2	26.8	20.1	14.9
Pch	7.6	3.3	9.9	18.8	5.8	6.4	9.3	6.9	10.7	5.4	13.6
Mtp	10.2	4.0	15.0	18.5	11.3	5.9	7.6	13.5	24.4	10.7	6.9
Veq	19.2	6.4	20.4	9.6	10.5	17.7	6.9	14.7	30.1	13.0	2.3
Emq	3.6	5.3	7.5	16.6	10.3	3.0	7.5	8.2	11.6	7.4	5.3
Xmn	14.6	5.5	18.1	26.5	17.4	8.5	19.3	19.7	28.5	11.4	11.6
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-31 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**SAS**										
Ric	0.0	0.0	13.4	5.0	7.3	0.0	25.0	5.0	15.0	0.0	3.0
Wgr	0.0	0.0	0.0	0.0	8.3	0.5	5.5	0.0	5.3	0.2	0.0
Vfr	1.3	4.1	17.9	8.9	16.4	6.2	11.8	11.4	12.3	8.6	5.7
Pfb	1.0	0.0	4.9	0.0	0.0	0.4	0.0	14.7	3.8	0.0	4.2
Xcr	3.3	2.1	20.9	20.9	22.7	6.5	7.8	17.8	74.4	4.0	9.5
Sgr	3.0	11.2	8.9	43.8	6.2	7.7	24.9	0.0	0.0	0.0	6.8
Bvt	335.2	6.8	15.2	49.5	6.9	137.4	22.0	17.5	69.0	27.6	28.4
Xfp	12.4	6.8	13.8	21.4	15.0	7.9	15.6	20.9	25.8	8.4	9.4
Mmp	24.0	3.5	9.6	0.2	12.1	9.9	20.5	7.3	27.2	78.8	9.6
Ffp	0.0	0.5	2.7	9.0	4.8	0.4	3.8	2.9	1.4	0.0	10.1
Cog	0.0	0.3	1.0	0.7	2.6	0.1	2.9	5.1	4.5	0.5	3.7
Twl	27.7	6.8	17.7	7.8	23.0	23.7	18.3	17.5	26.8	23.5	15.3
Pch	4.6	2.5	9.8	13.6	6.5	4.6	7.0	9.6	9.1	5.7	9.4
Mtp	8.5	2.8	12.4	14.1	6.9	5.7	17.2	10.6	21.9	4.3	9.7
Veq	12.1	5.0	8.9	15.1	15.5	11.6	12.3	12.2	25.3	3.5	9.1
Emq	5.0	4.8	7.0	16.2	10.5	2.2	7.6	7.6	15.7	4.8	7.4
Xmn	11.8	4.5	16.0	22.6	11.8	7.0	16.2	11.6	24.5	3.1	12.5
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-31 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter	**SSA**										
Ric	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Wgr	0.0	0.4	0.0	0.0	0.0	1.0	4.8	0.0	0.0	0.0	5.4
Vfr	6.0	7.3	0.0	0.0	10.5	9.3	18.1	7.6	1.1	7.9	9.2
Pfb	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0	11.7	5.0
Xcr	2.7	0.0	0.0	0.7	2.0	9.7	17.0	0.1	14.8	9.5	10.2
Sgr	0.0	0.0	0.1	0.0	0.0	0.4	24.7	0.0	0.0	4.6	18.2
Bvt	0.0	0.0	5.7	15.9	0.0	25.5	15.4	0.2	0.0	0.0	21.5
Xfp	1.9	0.3	11.0	0.2	24.7	6.9	20.5	0.1	13.3	9.1	15.6
Mmp	0.0	0.0	0.0	0.0	0.0	14.4	22.8	5.4	0.0	0.0	8.1
Ffp	0.0	0.0	1.5	0.1	1.9	0.5	10.9	4.8	2.1	0.0	9.7
Cog	0.5	0.0	0.0	0.0	0.0	0.0	6.8	7.0	5.0	0.3	14.5
Twl	22.5	5.2	0.3	0.1	22.1	16.8	19.3	1.7	10.2	23.1	12.8
Pch	5.9	0.0	0.7	0.3	14.6	5.8	9.7	1.1	5.0	5.1	13.8
Mtp	2.2	0.7	0.1	0.3	7.8	0.1	13.9	1.3	6.2	0.5	11.0
Veq	6.1	4.9	10.8	2.9	7.3	0.7	4.8	4.9	4.3	0.8	8.1
Emq	1.7	3.1	1.9	8.7	11.6	1.1	5.9	3.4	18.4	2.4	5.3
Xmn	7.4	0.3	1.6	1.1	19.2	6.2	16.0	2.1	17.7	19.9	14.9
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-31 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Exporter						**ROW**					
Ric	0.0	0.0	8.6	4.8	7.4	0.0	24.8	1.0	6.0	0.0	3.7
Wgr	0.0	0.0	0.0	0.1	2.5	2.1	5.0	3.2	5.6	0.0	4.0
Vfr	0.0	3.3	12.3	5.1	18.2	5.3	15.2	15.6	10.9	4.7	5.2
Pfb	0.0	0.0	0.0	0.0	0.0	8.4	0.0	9.9	2.0	13.3	0.1
Xcr	2.4	0.0	21.3	14.7	20.1	12.7	4.0	8.2	61.5	1.2	10.1
Sgr	0.8	12.4	0.0	0.0	3.9	16.0	24.8	9.1	0.0	16.9	6.7
Bvt	8.0	8.0	11.4	45.9	14.4	23.5	23.3	8.4	47.2	48.7	26.2
Xfp	11.2	5.2	8.6	6.4	11.1	10.0	23.4	14.4	9.5	16.9	10.9
Mmp	0.2	3.0	9.2	1.1	22.5	17.8	20.3	12.9	30.1	39.1	9.7
Ffp	0.0	0.0	0.6	3.6	2.4	1.7	6.3	5.3	3.4	2.0	9.9
Cog	0.8	0.0	0.1	0.3	2.6	0.0	0.3	4.9	3.7	0.0	4.9
Twl	9.7	7.6	20.6	13.5	18.0	16.0	21.4	20.5	30.7	18.3	16.0
Pch	2.8	0.3	3.8	24.3	5.9	3.6	3.2	4.5	9.3	3.7	9.2
Mtp	7.1	0.9	14.6	0.5	10.9	0.9	13.5	7.9	15.8	7.3	6.4
Veq	4.1	4.5	17.6	28.3	10.2	14.7	8.3	12.8	13.3	8.4	5.4
Emq	0.9	4.6	7.2	9.7	8.5	2.3	8.6	6.5	12.5	2.5	5.9
Xmn	3.9	3.9	5.9	25.5	18.7	6.7	17.5	17.2	46.2	17.9	12.6
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Botswana grants duty-free access to rice imports from the USA.
Source: Calculated by the author from the GTAP7 Database.

Table A4-32
Exports to non-SADC non-EU Markets as Ratios to Total Exports

(Percent, volume, 2004)

Importer	**USA**										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.4	13.0	2.9	0.1	3.9	0.0	13.3	1.0	7.7	2.3	22.6
Wgr	5.1	0.6	4.7	0.0	2.9	0.2	9.1	0.4	8.0	6.2	22.6
Vfr	11.1	0.3	19.6	6.2	1.7	3.6	2.8	0.2	0.4	0.7	16.5
Pfb	5.4	0.0	1.5	0.0	0.0	0.7	0.8	0.0	0.0	0.6	0.6
Xcr	4.9	**46.0**	11.9	0.7	1.8	3.8	3.3	2.3	2.0	2.2	4.3
Sgr	2.5	1.5	5.2	2.4	**25.5**	4.5	5.1	0.0	6.3	0.1	11.2
Bvt	10.3	13.2	10.9	4.5	9.9	6.4	12.3	7.5	0.9	0.6	19.9
Xfp	1.3	0.7	2.3	1.4	1.0	4.1	3.7	0.7	1.7	1.7	6.4
Mmp	2.6	6.1	12.3	7.0	8.2	2.7	13.5	4.3	0.5	0.4	10.9
Ffp	5.4	9.2	7.9	38.4	2.6	3.4	10.9	7.7	2.5	0.8	1.3
Cog	1.7	23.5	25.2	25.3	0.1	2.0	0.5	0.7	0.8	9.6	36.7
Twl	32.8	**58.1**	**62.4**	22.0	30.4	16.3	9.5	1.5	8.4	**70.3**	15.4
Pch	1.5	11.7	3.9	5.9	0.9	8.0	5.2	0.3	2.6	2.7	**63.8**
Mtp	0.2	0.5	1.0	0.5	0.0	11.9	0.2	2.1	7.7	**50.0**	0.3
Veq	4.8	0.0	2.2	10.4	3.7	13.9	4.2	1.7	1.0	1.0	0.9
Emq	4.0	0.6	14.8	6.8	1.8	6.6	1.0	0.3	4.3	0.8	2.1
Xmn	4.8	3.9	1.4	8.8	3.7	12.0	19.1	7.8	7.9	2.9	26.9
Utc	9.1	8.8	3.3	8.2	1.5	6.2	12.8	0.7	28.5	6.8	7.9
Tcm	20.4	16.2	15.1	15.1	20.5	13.0	12.9	5.2	19.9	11.2	18.7
Xsr	17.0	34.8	12.6	14.3	22.0	16.4	29.0	17.1	28.5	15.2	26.2

Table A4-32 (cont.)

(Percent, volume, 2004)

Importer	EAS										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.4	13.4	3.1	0.1	4.2	0.0	13.8	1.1	5.0	3.0	17.6
Wgr	5.3	0.6	5.1	0.0	3.1	0.9	9.4	0.4	5.1	6.4	17.6
Vfr	10.8	0.1	18.0	6.4	0.7	6.2	1.8	0.2	0.1	7.0	12.9
Pfb	5.6	7.5	1.6	0.0	10.4	2.1	17.3	16.3	16.7	9.4	0.5
Xcr	4.5	0.7	3.6	19.6	1.3	7.6	7.9	2.1	18.7	2.2	3.0
Sgr	2.6	1.6	0.0	0.1	0.0	**23.3**	5.3	0.0	0.0	0.0	0.1
Bvt	10.7	13.7	11.7	4.9	10.8	2.2	12.7	8.2	0.5	0.6	15.5
Xfp	1.3	7.4	0.8	9.1	14.1	11.2	11.8	0.7	0.6	2.8	32.3
Mmp	2.6	10.5	13.2	7.2	8.9	3.4	14.0	4.7	0.6	2.0	8.9
Ffp	3.5	28.2	15.8	3.0	74.5	13.7	26.1	17.1	7.0	0.9	**41.3**
Cog	0.9	23.1	23.6	23.6	54.8	16.6	43.5	2.0	1.8	8.7	**46.1**
Twl	0.3	0.9	0.5	1.0	2.2	7.1	9.3	4.0	4.1	0.6	12.0
Pch	1.5	2.9	3.2	4.5	0.8	6.4	5.9	0.4	0.7	0.8	4.8
Mtp	0.2	1.3	1.0	0.6	0.3	26.0	1.6	33.2	26.5	16.4	13.4
Veq	0.0	0.0	0.6	10.2	0.0	19.8	3.3	1.9	0.2	1.3	0.7
Emq	0.1	0.0	0.0	2.4	1.2	2.6	2.0	0.3	0.5	21.2	2.6
Xmn	5.5	1.8	1.2	1.6	4.2	18.2	6.4	1.6	0.5	6.8	5.8
Utc	16.3	16.0	7.0	15.9	3.0	10.7	18.4	1.1	18.3	15.3	5.7
Tcm	10.9	13.4	13.1	13.2	9.8	14.7	9.3	6.1	12.8	11.9	13.9
Xsr	13.1	6.7	17.6	12.1	10.3	13.3	8.6	15.9	18.3	9.5	17.4

Table A4-32 (cont.)

(Percent, volume, 2004)

Importer	SAS										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.1	4.4	1.0	**90.8**	1.4	0.0	4.6	0.4	1.1	0.8	4.2
Wgr	1.8	0.2	1.6	0.0	1.0	0.8	3.2	0.1	1.1	2.1	4.2
Vfr	3.6	2.2	29.4	2.2	**77.5**	2.2	**65.6**	0.1	0.1	0.2	7.3
Pfb	1.9	19.4	12.2	**98.5**	**39.2**	**79.2**	**57.9**	20.9	**42.1**	**66.8**	**96.9**
Xcr	1.5	13.2	1.8	8.9	2.3	5.6	9.5	0.2	2.3	0.6	16.5
Sgr	0.9	0.5	0.0	0.1	0.0	7.9	4.2	0.0	0.0	0.0	0.0
Bvt	3.6	4.5	3.8	7.9	7.1	2.1	4.2	2.6	0.1	0.2	3.7
Xfp	0.4	1.3	0.5	3.4	0.7	3.0	1.9	0.2	9.6	0.6	10.9
Mmp	0.9	2.1	4.9	2.9	2.9	1.5	5.9	1.5	0.1	0.2	2.0
Ffp	1.2	1.9	3.0	2.3	3.7	5.0	11.2	19.2	16.0	0.2	0.4
Cog	0.0	11.2	11.9	11.9	3.5	1.4	12.1	21.2	3.0	3.9	2.2
Twl	0.2	0.3	0.2	1.2	1.7	2.8	8.1	0.5	0.6	0.1	2.9
Pch	0.6	13.2	2.1	2.9	0.7	6.4	9.6	0.1	3.8	0.6	2.4
Mtp	0.1	34.1	1.1	25.7	0.4	15.0	7.6	13.4	2.7	3.4	15.1
Veq	0.0	2.3	0.6	5.1	4.3	1.6	8.0	0.6	0.0	0.7	0.2
Emq	0.5	3.5	4.2	12.2	10.7	2.4	3.1	0.1	0.3	8.4	0.7
Xmn	1.7	0.2	1.8	1.6	2.1	5.6	32.7	5.5	0.2	3.9	0.3
Utc	5.6	5.5	1.3	5.5	1.0	3.3	4.9	0.3	3.9	5.2	2.4
Tcm	3.7	3.9	4.4	5.2	3.4	5.4	3.1	1.9	2.7	4.2	3.2
Xsr	5.1	4.0	4.5	5.5	5.2	4.7	4.7	5.0	3.9	5.1	4.4

Table A4-32 (cont.)

(Percent, volume, 2004)

Importer	SSA										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	0.5	17.6	4.3	0.2	3.8	3.7	91.8	2.6	0.1	0.6
Wgr	0.3	0.0	2.2	**85.4**	17.9	14.8	25.2	3.6	6.4	0.2	0.6
Vfr	0.4	0.2	1.2	3.9	0.0	1.1	0.9	0.1	0.2	0.1	0.6
Pfb	0.2	0.0	0.0	0.7	0.0	0.1	2.1	0.2	0.0	0.0	0.6
Xcr	0.2	0.1	3.3	0.5	1.1	3.2	9.3	1.4	1.8	0.3	1.4
Sgr	0.1	0.1	**37.1**	0.0	3.1	12.7	0.5	**52.1**	1.6	10.0	48.3
Bvt	0.4	0.5	11.4	7.7	3.8	5.6	9.7	17.5	15.3	0.3	3.1
Xfp	0.9	0.3	3.0	3.8	0.0	3.5	14.8	15.1	3.4	4.7	5.5
Mmp	0.1	**51.0**	0.5	**37.2**	0.3	2.9	0.7	43.5	1.0	0.4	1.5
Ffp	0.2	0.3	0.2	0.5	0.1	0.9	2.9	2.6	11.7	3.2	0.4
Cog	0.0	0.2	0.1	0.2	0.0	0.3	2.1	12.8	0.4	0.2	0.0
Twl	0.2	0.1	0.0	0.5	0.2	1.7	13.7	3.4	2.0	0.0	3.3
Pch	0.8	0.9	0.5	12.0	0.6	7.9	22.4	82.2	2.7	5.0	16.9
Mtp	0.0	0.2	0.6	9.1	0.0	2.7	2.1	0.8	0.2	0.0	4.2
Veq	0.1	0.9	1.9	7.7	1.0	1.8	25.4	15.6	5.2	0.3	9.7
Emq	1.0	1.1	0.7	5.5	0.3	8.9	21.8	13.7	14.7	0.6	14.3
Xmn	0.3	0.3	0.2	7.2	0.3	3.8	5.9	8.2	1.5	0.9	1.6
Utc	0.5	0.5	0.3	0.5	0.2	0.5	0.9	4.0	0.6	0.5	0.4
Tcm	0.4	0.7	0.7	0.6	0.4	0.7	0.4	0.2	0.4	0.5	0.5
Xsr	0.7	1.0	0.8	0.7	1.1	0.6	1.0	0.8	0.6	0.6	0.7

Table A4-32 (cont.)

(Percent, volume, 2004)

Importer	ROW										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.5	17.2	4.0	0.1	5.3	0.7	17.6	1.4	4.5	3.0	17.9
Wgr	6.8	0.8	6.4	0.0	3.9	0.9	12.3	0.5	4.8	8.4	17.8
Vfr	13.8	1.5	1.8	13.9	1.1	14.0	4.2	0.9	8.6	3.6	15.9
Pfb	7.1	7.0	8.0	0.0	0.0	1.0	8.7	22.5	1.5	0.8	0.5
Xcr	5.8	7.8	21.6	10.6	7.8	23.4	16.4	6.2	14.4	2.8	10.8
Sgr	3.3	2.2	0.3	1.0	5.8	12.9	6.7	0.0	0.1	0.0	0.4
Bvt	13.6	17.7	14.8	5.5	19.2	9.7	16.6	10.4	41.0	2.3	15.7
Xfp	1.8	1.1	3.8	4.2	3.6	11.5	12.5	1.8	1.5	12.5	10.7
Mmp	12.1	8.0	16.7	11.8	14.9	13.3	17.9	6.7	1.6	8.7	8.9
Ffp	4.9	7.9	12.1	5.2	3.1	8.2	12.7	13.5	1.1	1.3	7.6
Cog	2.2	10.1	9.6	9.6	2.9	12.5	12.9	5.3	3.1	5.4	4.1
Twl	1.6	2.0	1.2	3.3	4.4	10.5	13.8	6.3	1.8	2.3	25.6
Pch	2.1	3.9	4.4	19.7	1.7	9.9	10.0	0.7	3.4	9.0	4.2
Mtp	**65.7**	**39.0**	1.4	9.0	0.2	15.1	**43.0**	31.8	21.2	3.7	**53.0**
Veq	0.4	1.8	0.1	20.5	3.9	12.3	4.3	2.7	2.5	2.6	**74.5**
Emq	2.8	1.3	6.3	27.1	15.9	9.6	8.1	7.5	2.8	10.0	38.2
Xmn	7.0	4.5	1.8	8.0	2.3	9.2	16.9	5.2	1.9	2.2	11.5
Utc	18.2	18.5	8.3	18.8	**44.2**	22.4	22.0	2.0	16.5	19.8	**47.2**
Tcm	14.0	16.1	16.1	16.5	10.5	15.9	12.1	7.6	11.5	14.8	13.6
Xsr	18.8	20.4	21.3	17.3	19.1	19.0	19.9	22.2	16.5	15.8	18.3

0.4 percent of Botswana rice exports are destined for the USA.
Source: Calculated by the author from the GTAP7 Database.

Table A4-33
Applied Tariffs on SADC Exports in the non-SADC non-EU Importing Markets

(Percent, Imports-weighted preferential rates, 2004)

Importer	**USA**										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0
Pfb	0.0	0.0	13.3	0.0	0.0	0.0	12.8	0.0	0.0	0.0	0.0
Xcr	2.4	0.0	**51.3**	0.0	**42.9**	3.4	11.7	3.7	**67.2**	0.0	0.0
Sgr	0.0	0.0	**29.1**	**34.5**	0.0	0.1	0.0	0.0	0.0	4.9	40.7
Bvt	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	14.6	0.0	0.0
Xfp	0.0	0.2	0.0	0.1	0.0	6.3	0.1	0.0	1.9	0.0	0.1
Mmp	0.0	0.0	0.0	0.0	0.0	14.7	0.0	0.0	2.0	0.0	0.0
Ffp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Twl	0.0	0.0	0.0	0.0	0.0	0.9	1.6	3.2	5.7	0.0	10.0
Pch	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0
Mtp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0
Veq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Emq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xmn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A4-33 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	**EAS**										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**349.5**	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	3.3	0.0	0.0	9.0	0.3	0.0	2.3	10.5	0.0
Pfb	0.0	0.6	0.0	0.0	0.0	0.2	0.3	0.1	0.2	0.9	0.0
Xcr	0.0	0.5	2.3	0.4	0.0	9.2	0.6	0.1	14.2	2.1	0.0
Sgr	0.0	0.0	0.0	**45.0**	0.0	**60.2**	0.0	0.0	0.0	0.0	0.0
Bvt	0.0	0.0	0.0	3.1	0.0	20.6	0.0	0.0	0.0	6.2	0.0
Xfp	0.0	0.6	4.5	11.8	0.1	11.5	2.7	0.0	5.7	8.3	2.3
Mmp	0.0	1.2	0.0	0.0	0.0	5.2	0.0	0.0	2.3	11.4	0.0
Ffp	0.0	2.2	0.3	1.6	0.0	1.9	0.6	0.1	0.0	0.6	0.0
Cog	0.3	0.0	0.0	0.0	0.0	0.5	0.0	0.3	1.0	0.0	1.0
Twl	3.8	1.6	6.9	7.6	0.0	7.7	1.9	4.3	5.6	4.3	1.3
Pch	0.0	8.4	0.0	3.9	0.9	3.4	3.1	0.0	5.1	6.7	3.1
Mtp	0.0	2.4	0.0	2.4	0.0	1.6	2.1	0.8	3.3	2.1	0.9
Veq	0.0	7.9	0.0	0.6	0.0	2.4	3.6	0.0	0.0	1.7	0.0
Emq	0.7	0.0	0.0	2.2	0.0	3.1	1.0	0.9	0.6	6.4	6.0
Xmn	0.3	1.8	0.2	2.7	2.8	1.9	0.5	0.7	2.9	0.8	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**349.5**	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0

Table A4-33 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	SAS										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	0.0	0.0	**70.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	28.0	11.3	0.0	0.0	0.0	0.0
Vfr	0.0	31.7	28.6	4.6	30.5	11.5	30.6	0.0	22.7	11.3	15.1
Pfb	0.0	7.2	1.9	10.0	2.7	0.9	6.4	2.4	3.1	3.8	4.7
Xcr	0.0	1.3	**150.4**	3.7	19.1	24.7	33.9	7.5	28.3	0.0	33.7
Sgr	0.0	0.0	0.0	20.5	0.0	**52.8**	9.9	0.0	0.0	10.4	0.0
Bvt	0.0	0.0	0.0	**50.4**	38.9	70.5	3.4	0.0	0.0	13.2	0.0
Xfp	0.0	**43.5**	10.9	27.7	**49.7**	17.6	15.0	11.9	**59.5**	4.4	**50.0**
Mmp	0.0	0.0	3.4	1.3	0.0	12.7	6.8	0.0	0.0	2.4	0.0
Ffp	0.1	4.2	3.5	0.4	0.6	5.0	5.4	0.3	0.3	1.3	3.7
Cog	0.0	0.3	0.0	0.1	15.9	7.4	11.3	14.3	7.8	0.0	0.2
Twl	4.6	5.4	6.8	10.9	4.1	9.7	13.4	4.6	9.9	9.2	0.0
Pch	3.2	7.6	13.7	8.4	6.9	10.8	13.7	10.9	17.0	8.2	13.2
Mtp	6.4	15.9	14.6	12.8	19.3	11.8	6.0	4.5	15.0	5.4	19.5
Veq	0.0	10.0	**90.6**	38.4	24.0	10.4	14.0	0.0	0.0	21.4	0.0
Emq	13.9	1.0	13.5	7.3	1.5	8.3	10.6	3.9	7.9	6.7	2.8
Xmn	1.3	7.2	14.5	10.6	5.2	4.7	4.9	3.5	9.0	7.1	6.5
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	28.0	11.3	0.0	0.0	0.0	0.0

Table A4-33 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	SSA										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	0.0	3.0	3.9	0.0	19.5	6.2	19.9	19.2	0.0	0.0
Wgr	12.3	0.0	3.9	25.0	34.6	32.5	24.8	12.2	0.0	0.0	0.0
Vfr	0.0	0.2	0.0	38.6	0.0	25.6	27.0	28.2	7.8	32.0	9.7
Pfb	0.0	0.0	0.0	5.0	0.0	6.0	8.4	10.0	0.0	0.0	9.8
Xcr	0.0	2.4	1.9	**51.5**	14.9	17.5	14.1	14.0	4.4	13.7	14.0
Sgr	0.0	0.0	0.1	35.5	22.2	**56.8**	15.4	29.0	0.0	**43.6**	27.1
Bvt	0.0	0.0	0.0	49.7	18.1	34.3	24.8	25.3	25.9	30.8	22.6
Xfp	23.8	33.6	0.0	26.0	42.8	25.3	15.6	24.0	26.3	16.4	16.2
Mmp	3.4	10.0	0.0	3.2	0.0	22.8	8.4	20.0	9.6	11.1	11.3
Ffp	7.5	12.5	0.0	14.8	0.0	14.0	12.5	11.5	18.8	24.8	12.5
Cog	9.8	0.0	0.0	4.7	9.0	11.6	12.3	10.7	17.8	7.6	0.2
Twl	11.1	26.1	2.4	20.3	18.9	24.2	27.2	28.1	5.5	18.2	20.1
Pch	5.4	9.6	3.3	10.6	16.8	13.8	18.3	12.2	5.7	4.2	8.2
Mtp	10.2	14.5	12.9	19.7	4.2	15.0	9.5	2.6	5.1	13.1	19.3
Veq	14.3	15.7	2.6	**56.2**	11.1	12.3	15.2	11.2	10.9	13.9	23.4
Emq	12.5	15.2	2.9	7.0	14.9	10.3	9.5	11.4	20.9	14.3	19.5
Xmn	15.5	12.7	2.4	6.6	25.5	16.9	9.0	14.5	6.2	19.7	21.7
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0
Tcm	0.0	0.0	3.0	3.9	0.0	19.5	6.2	19.9	19.2	0.0	0.0
Xsr	12.3	0.0	3.9	25.0	34.6	32.5	24.8	12.2	0.0	0.0	0.0

Table A4-33 (cont.)

(Percent, Imports-weighted preferential rates, 2004)

Importer	ROW										
Exporter	**BWA**	**MDG**	**MWI**	**MUS**	**MOZ**	**ZAF**	**TZA**	**ZMB**	**ZWE**	**XSC**	**XSD**
Ric	0.0	0.0	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	15.6	0.1	0.0	0.0	0.5	0.0
Vfr	0.0	1.7	1.3	2.8	1.2	7.8	2.3	3.5	3.1	5.1	2.9
Pfb	0.0	2.5	0.0	0.0	0.0	0.0	1.4	0.0	1.0	0.0	0.0
Xcr	0.0	6.2	10.0	**56.7**	3.7	6.7	11.1	7.0	20.8	1.6	7.8
Sgr	0.0	1.9	0.0	4.9	4.8	11.9	0.0	0.0	0.0	1.1	0.0
Bvt	0.0	0.0	0.0	1.6	0.0	26.9	5.5	0.0	67.0	18.6	0.0
Xfp	0.8	0.4	1.2	3.4	6.9	10.2	11.9	4.7	3.8	12.9	26.4
Mmp	1.8	0.0	0.0	1.7	0.0	**60.5**	0.4	3.5	**54.7**	2.4	0.0
Ffp	0.3	2.9	0.0	0.0	2.4	3.7	4.4	7.9	**42.3**	6.3	9.3
Cog	5.1	0.0	0.0	0.0	0.2	2.6	1.2	0.0	3.5	1.9	5.3
Twl	10.1	2.8	2.2	10.3	4.8	9.9	4.1	0.9	8.0	3.7	3.3
Pch	1.6	5.1	2.5	1.5	14.5	5.5	3.4	9.2	2.4	1.0	4.1
Mtp	0.0	2.2	1.8	4.6	0.6	3.2	2.6	1.8	1.0	2.5	2.3
Veq	2.1	4.1	32.3	2.4	13.7	8.2	1.2	1.3	8.1	5.2	4.1
Emq	2.4	6.3	2.3	2.7	3.3	5.0	3.1	3.7	5.0	5.2	6.3
Xmn	0.5	3.9	4.3	2.6	4.7	5.2	3.3	2.6	11.9	9.4	10.5
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	15.6	0.1	0.0	0.0	0.5	0.0

The USA grants duty-free access to rice imports from Botswana.
Source: Calculated by the author from the GTAP7 Database.

11 Appendix to Chapter 6

Table A6-1
Simulated Changes in Tariffs, Sim11

(Percentage points)

	Sim11-SADC				**Sim11-EU**			
Exporter	EU				BWA	MOZ	ZAF	XSC
Importer	BWA	MOZ	ZAF	XSC	EU			
Ric	0	-4	0	0	0	0	-58	0
Wgr	0	0	-1	-1	0	0	-10	0
Vfr	0	-14	-1	-6	0	0	-1	-1
Pfb	0	0	-2	0	0	0	0	0
Xcr	0	-3	-6	-2	0	0	-2	0
Sgr	-2	-5	-4	-3	0	-48	-61	-242
Bvt	-3	-15	-5	-3	0	0	-10	0
Xfp	-1	-17	-7	-4	-4	0	-11	0
Mmp	0	-17	-33	-61	-70	0	-35	-98
Ffp	0	-9	-1	0	0	0	-3	0
Cog	0	-5	0	0	0	0	0	0
Twl	-10	-17	-11	-15	0	0	-1	0
Pch	-1	-4	-3	-3	0	0	0	0
Mtp	-2	-8	-3	-1	0	0	0	0
Veq	-18	-7	-12	-5	0	0	-3	0
Emq	-1	-7	-1	-1	0	0	0	0
Xmn	-3	-13	-4	-6	0	0	0	0

Table A6-2
Total Trade Impact

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Total Imports							
BWA	0.0	1.8	1.9	1.7	0.1	1.7	1.8	1.5
MDG	0.1	0.0	0.1	1.4	1.0	0.4	1.4	2.7
MWI	0.1	-1.0	-1.0	3.4	0.6	6.8	7.5	12.0
MUS	0.1	-1.3	-1.2	0.2	3.1	7.9	10.8	13.4
MOZ	0.8	-0.5	0.3	5.8	0.8	-0.3	0.6	6.1
ZAF	1.3	0.7	2.0	3.0	1.2	0.7	1.8	2.9
TZA	0.0	-0.3	-0.3	1.5	0.6	0.5	1.1	2.9
ZMB	0.2	-0.8	-0.5	6.7	0.8	-0.4	0.4	7.5
ZWE	0.2	-0.5	-0.3	9.5	1.0	10.4	11.4	21.7
XSC	0.1	29.4	29.9	30.1	0.0	25.5	25.9	25.9
XSD	0.0	-0.3	-0.3	0.1	0.7	-0.2	0.5	1.0
	Total Exports							
BWA	-0.3	-0.5	-0.8	-0.7	-0.3	-0.6	-0.9	-0.8
MDG	0.0	0.1	0.1	0.8	1.1	-0.7	0.3	1.1
MWI	-0.1	-1.1	-1.1	5.7	1.2	8.8	10.2	17.1
MUS	0.0	-0.6	-0.6	1.2	4.2	0.5	4.2	6.8
MOZ	1.1	-0.2	1.0	5.7	1.2	-0.3	0.9	5.6
ZAF	1.7	0.0	1.8	2.4	1.7	0.0	1.7	2.3
TZA	-0.1	-0.1	-0.2	2.8	1.6	0.4	2.0	4.8
ZMB	0.1	-0.4	-0.3	7.5	1.0	-1.0	0.0	7.7
ZWE	0.1	-0.4	-0.3	10.7	1.6	1.5	2.9	12.9
XSC	0.1	9.0	9.2	9.6	0.1	8.1	8.4	8.6
XSD	0.0	-0.1	-0.1	0.3	0.9	0.0	0.9	1.3

Note: percentage changes are calculated based on figures valued at baseline world prices.

Table A6-3
Trade with the EU

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from the EU							
BWA	9.1	4.0	13.3	14.1	8.9	4.0	13.2	14.0
MDG	-0.1	0.1	0.0	-1.7	6.3	1.5	7.8	6.1
MWI	-0.6	0.3	-0.4	-10.9	12.1	10.4	23.7	10.9
MUS	-0.1	-1.0	-1.2	-3.8	24.8	9.7	35.6	32.4
MOZ	11.8	1.6	13.6	1.3	11.7	2.1	14.0	1.7
ZAF	8.6	2.4	11.2	12.1	8.4	2.5	11.1	12.0
TZA	-0.3	0.5	0.2	-4.4	15.0	1.4	16.6	11.2
ZMB	-0.8	1.2	0.4	-9.3	12.9	2.8	16.0	4.2
ZWE	-0.9	1.6	0.7	-21.5	33.0	12.0	48.6	15.1
XSC	3.1	33.8	38.2	39.3	2.8	29.2	33.1	34.0
XSD	-0.1	0.9	0.8	-1.7	8.9	1.0	9.9	7.4
	Exports to the EU							
BWA	0.4	2.2	2.7	2.5	0.5	2.2	2.7	2.6
MDG	0.1	-0.2	-0.2	0.6	1.1	0.8	2.0	2.6
MWI	0.5	-4.0	-3.6	2.5	2.1	37.5	40.4	49.0
MUS	0.1	-3.2	-3.1	-0.9	5.1	12.2	16.8	20.9
MOZ	1.5	-0.6	0.9	4.0	1.6	-2.1	-0.5	2.4
ZAF	1.8	-0.1	1.8	0.1	2.1	-0.2	1.9	0.3
TZA	0.1	-0.8	-0.7	-0.2	1.4	2.9	4.3	4.6
ZMB	0.4	-2.2	-1.8	2.9	1.5	12.9	14.6	20.7
ZWE	0.7	-4.1	-3.4	6.4	2.3	58.9	61.6	75.0
XSC	0.9	126.9	128.7	126.8	1.1	115.6	117.8	115.1
XSD	0.0	-0.3	-0.3	0.2	1.2	0.8	2.0	2.5

Note: percentage changes are calculated based on figures valued at baseline world prices.

Table A6-4
Trade with Third Parties

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from USA							
BWA	-1.6	3.8	2.1	2.7	-1.8	3.8	2.0	2.6
MDG	0.0	-0.1	-0.1	-0.4	-0.9	1.3	0.3	0.0
MWI	-0.4	0.0	-0.4	-6.5	-2.3	8.9	6.4	0.3
MUS	0.0	-1.7	-1.8	-3.0	-5.5	11.6	5.4	4.6
MOZ	-1.3	1.5	0.1	-5.4	-1.3	2.0	0.5	-5.0
ZAF	-4.4	2.4	-2.1	-1.3	-4.5	2.4	-2.3	-1.4
TZA	-0.1	0.2	0.0	-2.8	-3.6	1.0	-2.8	-5.1
ZMB	-0.4	0.5	0.1	-3.9	-1.4	1.9	0.5	-3.5
ZWE	-0.5	1.4	0.9	-13.8	-3.7	15.3	11.0	-4.2
XSC	-1.0	34.9	34.0	35.2	-1.2	30.3	29.1	30.1
XSD	-0.1	0.6	0.5	-1.6	-4.9	0.7	-4.3	-6.1
	Exports to USA							
BWA	0.3	-5.3	-5.1	-5.3	0.4	-5.4	-5.0	-5.2
MDG	0.0	0.4	0.5	1.5	1.7	-3.0	-1.3	-0.3
MWI	0.3	0.8	1.1	7.8	1.6	-13.1	-11.8	-6.9
MUS	0.0	2.7	2.7	4.0	4.9	-15.4	-11.3	-10.5
MOZ	0.4	2.3	2.7	4.0	0.4	0.7	1.2	2.4
ZAF	2.3	-3.1	-0.8	-2.8	2.6	-3.2	-0.6	-2.6
TZA	0.1	0.1	0.1	0.5	1.2	-1.1	0.1	0.3
ZMB	0.4	-0.7	-0.2	6.4	1.7	-4.9	-3.2	3.4
ZWE	0.7	-1.5	-0.8	10.9	2.6	-19.2	-17.1	-8.0
XSC	1.7	-56.1	-55.7	-56.2	2.2	-51.5	-51.0	-51.2
XSD	0.0	-0.1	-0.1	0.3	0.8	-0.1	0.7	1.0

Table A6-4 (cont.)

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from EAS							
BWA	-2.6	3.0	0.4	1.5	-2.7	3.3	0.4	1.7
MDG	0.0	-0.1	-0.1	-1.0	-4.1	1.2	-2.9	-3.7
MWI	-0.6	0.3	-0.4	-13.6	-4.0	8.8	4.5	-8.7
MUS	-0.1	-0.5	-0.6	-2.5	-9.1	5.4	-4.7	-6.2
MOZ	-3.6	1.8	-2.0	-13.9	-3.7	2.3	-1.6	-13.5
ZAF	-5.8	2.6	-3.4	-2.6	-5.9	2.6	-3.5	-2.6
TZA	-0.2	0.3	0.1	-5.0	-4.9	1.2	-3.8	-8.2
ZMB	-0.7	1.1	0.4	-11.6	-3.0	2.9	-0.3	-11.9
ZWE	-0.8	1.3	0.5	-21.1	-7.3	12.6	4.1	-16.7
XSC	-1.6	24.6	22.8	24.1	-1.9	21.2	19.1	20.2
XSD	0.0	0.4	0.4	-0.6	-3.2	0.5	-2.8	-3.7
	Exports to EAS							
BWA	0.4	-4.4	-4.0	-4.2	0.5	-4.4	-4.0	-4.2
MDG	0.0	0.1	0.1	0.4	0.4	-1.0	-0.6	-0.2
MWI	0.2	0.4	0.6	3.0	0.9	-7.0	-6.2	-4.1
MUS	0.0	1.5	1.5	2.1	2.1	-9.2	-7.2	-6.9
MOZ	0.4	-0.9	-0.5	0.3	0.5	-1.6	-1.1	-0.3
ZAF	2.3	-3.2	-0.9	-2.8	2.6	-3.2	-0.7	-2.6
TZA	0.0	0.1	0.1	0.9	1.3	-1.1	0.2	0.8
ZMB	0.4	-0.8	-0.3	8.3	2.1	-5.7	-3.6	4.9
ZWE	0.8	-2.9	-2.0	12.3	3.1	-37.3	-35.2	-25.5
XSC	1.1	-42.5	-42.1	-42.7	1.4	-37.7	-37.1	-37.5
XSD	0.0	-0.1	-0.1	0.3	0.8	-0.1	0.7	1.0

Table A6-4 (cont.)

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from SAS							
BWA	-1.8	3.9	2.0	2.8	-2.0	4.0	2.0	2.8
MDG	0.0	-0.1	-0.1	-1.7	-3.3	1.6	-1.8	-3.3
MWI	-0.5	0.2	-0.4	-12.7	-3.2	9.1	5.6	-7.1
MUS	-0.1	-0.2	-0.3	-2.7	-9.3	4.7	-5.7	-7.6
MOZ	-2.3	2.3	-0.1	-9.2	-2.4	2.8	0.2	-8.8
ZAF	-3.8	3.1	-0.8	0.0	-3.9	3.2	-0.9	0.0
TZA	-0.1	0.5	0.4	-3.5	-3.9	1.5	-2.5	-5.9
ZMB	-0.6	1.0	0.4	-11.6	-2.8	3.3	0.3	-11.5
ZWE	-0.7	1.6	0.9	-22.4	-6.7	16.0	8.1	-15.7
XSC	-1.5	29.8	28.1	29.4	-1.7	25.7	23.8	24.9
XSD	0.0	0.6	0.6	-1.4	-5.3	0.7	-4.7	-6.4
	Exports to SAS							
BWA	0.5	-4.2	-3.8	-4.1	0.5	-4.2	-3.8	-4.0
MDG	0.0	0.2	0.1	0.3	0.3	-1.6	-1.2	-1.0
MWI	0.2	0.4	0.6	2.5	0.8	-7.5	-6.7	-5.0
MUS	0.0	2.0	2.1	2.9	2.1	-11.9	-9.9	-9.4
MOZ	0.4	-1.2	-0.8	-0.7	0.4	-1.9	-1.5	-1.4
ZAF	2.6	-3.6	-1.0	-3.2	2.9	-3.6	-0.7	-3.0
TZA	0.0	0.1	0.1	1.9	1.8	-1.3	0.4	2.0
ZMB	0.4	-0.7	-0.3	7.5	1.9	-5.4	-3.5	4.3
ZWE	0.4	-2.1	-1.7	7.6	1.6	-40.8	-39.9	-34.8
XSC	1.0	-41.3	-40.9	-41.4	1.3	-36.5	-35.8	-36.2
XSD	0.0	-0.1	-0.1	0.3	1.0	-0.2	0.8	1.2

Table A6-4 (cont.)

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from SSA							
BWA	-1.2	4.6	3.4	4.0	-1.2	4.7	3.5	4.0
MDG	0.0	-0.1	-0.1	-1.4	-2.2	1.6	-0.7	-2.0
MWI	-0.8	0.3	-0.5	-14.2	-2.8	12.7	9.5	-5.1
MUS	-0.1	-0.5	-0.5	-2.6	-5.6	7.1	0.5	-1.2
MOZ	-2.4	2.1	-0.5	-11.6	-2.5	2.6	-0.1	-11.2
ZAF	-1.5	1.8	0.2	1.2	-1.7	2.1	0.4	1.3
TZA	-0.2	0.6	0.4	-5.4	-4.7	1.8	-3.0	-8.0
ZMB	-0.7	2.0	1.2	-8.1	-2.3	3.5	1.1	-8.2
ZWE	-0.5	2.2	1.7	-14.9	-3.0	20.5	16.8	-3.3
XSC	-1.3	22.1	20.7	22.0	-1.5	20.0	18.4	19.5
XSD	-0.1	1.2	1.1	-2.7	-7.2	1.2	-6.3	-9.4
	Exports to SSA							
BWA	0.5	-6.3	-5.9	-6.2	0.6	-6.3	-5.9	-6.1
MDG	0.0	0.2	0.2	0.6	0.5	-1.3	-0.8	-0.4
MWI	0.5	-8.0	-7.6	1.9	2.6	25.2	28.2	37.9
MUS	0.0	3.8	3.9	5.3	2.9	-20.8	-18.7	-18.0
MOZ	0.4	3.5	4.0	2.7	0.5	0.1	0.6	-0.7
ZAF	2.2	-3.5	-1.3	-3.6	2.5	-3.6	-1.1	-3.6
TZA	0.0	0.2	0.2	1.0	1.6	-1.1	0.4	1.0
ZMB	0.2	-1.2	-1.0	0.5	0.9	2.0	3.0	5.3
ZWE	0.4	-1.3	-0.9	6.6	1.7	-24.7	-23.5	-18.4
XSC	1.1	-23.6	-23.1	-23.6	1.3	-20.4	-19.8	-20.1
XSD	0.0	-0.4	-0.5	0.3	2.6	-2.1	0.6	1.4

Table A6-4 (cont.)

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from ROW							
BWA	-1.8	4.0	2.1	3.0	-1.9	4.0	2.0	2.9
MDG	-0.1	-0.1	-0.2	-2.7	-1.8	1.5	-0.4	-2.9
MWI	-0.5	0.1	-0.4	-9.3	-2.9	10.2	7.0	-2.2
MUS	-0.2	-0.7	-0.8	-4.6	-7.9	8.2	-0.6	-3.9
MOZ	-1.8	1.6	-0.3	-6.4	-1.8	2.0	0.1	-6.1
ZAF	-2.3	2.2	-0.1	0.9	-2.4	2.4	-0.1	0.9
TZA	-0.2	0.5	0.3	-4.5	-4.1	1.5	-2.7	-6.9
ZMB	-0.5	1.9	1.5	-3.3	-1.5	2.0	0.4	-4.4
ZWE	-0.8	1.8	0.9	-21.1	-5.0	12.9	7.2	-15.4
XSC	-1.2	33.8	32.5	33.5	-1.5	29.2	27.6	28.4
XSD	-0.1	0.7	0.6	-1.7	-5.8	0.6	-5.3	-7.1
	Exports to ROW							
BWA	0.8	-10.0	-9.5	-9.8	0.8	-10.1	-9.6	-9.9
MDG	0.0	0.2	0.2	0.6	0.6	-1.6	-1.0	-0.5
MWI	0.4	0.8	1.2	7.3	2.0	-15.3	-13.7	-9.1
MUS	0.0	2.4	2.4	3.3	2.5	-14.0	-11.8	-11.3
MOZ	1.2	-1.1	0.1	3.4	1.3	-2.7	-1.4	1.8
ZAF	2.1	-3.0	-0.9	-2.8	2.4	-3.1	-0.8	-2.6
TZA	0.1	0.0	0.1	4.6	2.8	-1.5	1.2	5.5
ZMB	0.5	-0.8	-0.3	7.9	2.1	-5.7	-3.6	4.6
ZWE	0.8	-2.7	-1.8	11.8	3.0	-32.8	-30.8	-21.2
XSC	1.0	-40.6	-40.3	-40.7	1.3	-36.5	-36.0	-36.2
XSD	0.0	-0.2	-0.2	0.4	1.4	-0.2	1.2	1.7

Note: percentage changes are calculated based on figures valued at baseline world prices.

Table A6-5
Intra-SADC Trade

(Percentage change)

	Sim11-SADC	Sim11-EU	Sim11	Sim12	Sim21-SADC	Sim21-EU	Sim21	Sim22
	Imports from SADC							
BWA	-1.3	1.1	-0.2	-0.8	-1.2	0.8	-0.3	-1.0
MDG	1.0	0.4	1.4	24.9	0.2	-7.1	-7.0	16.0
MWI	0.8	-2.4	-1.7	20.3	-1.5	3.1	1.6	25.0
MUS	1.6	-6.1	-4.5	34.7	-8.3	6.0	-2.7	42.2
MOZ	-2.2	-3.6	-5.8	22.6	-2.0	-3.8	-5.8	22.7
ZAF	-2.4	-23.3	-25.4	-22.3	-1.8	-24.6	-26.1	-23.3
TZA	1.3	-4.3	-3.0	37.7	-3.7	-4.8	-8.5	31.0
ZMB	1.1	-2.8	-1.7	20.5	-0.8	-3.4	-4.2	18.2
ZWE	0.9	-1.9	-1.1	28.0	-2.2	8.2	5.7	36.9
XSC	-0.1	28.4	28.6	28.3	-0.1	24.7	24.9	24.4
XSD	1.6	-13.3	-11.8	20.5	-6.0	-12.4	-17.7	12.8
	Exports to SADC							
BWA	-7.4	-8.9	-15.8	-13.7	-7.9	-9.7	-17.0	-14.9
MDG	-0.3	0.8	0.4	2.1	-5.1	3.2	-2.5	-0.7
MWI	-2.3	2.5	0.0	12.5	-1.9	-7.8	-9.6	1.1
MUS	-1.0	5.2	4.1	10.0	1.0	-18.5	-17.5	-13.5
MOZ	-0.1	2.4	2.4	20.5	-0.7	12.8	12.1	30.9
ZAF	0.0	9.1	9.2	22.7	-1.6	9.5	8.0	21.7
TZA	-2.0	2.2	0.1	23.0	2.0	2.1	4.1	27.1
ZMB	-1.0	1.6	0.6	10.9	-2.0	3.2	1.3	10.6
ZWE	-1.2	5.0	3.8	13.8	-0.5	-14.4	-14.5	-5.9
XSC	-1.6	-39.4	-40.5	-37.7	-2.2	-35.3	-37.0	-33.8
XSD	-0.1	1.2	1.1	2.6	0.6	1.2	1.8	3.2

Note: percentage changes are calculated based on figures valued at baseline world prices.

Table A6-6
Price Changes for Commodity Imports, Sim11-SADC

(Percentage change, price)

	CIF Price of Imports from the EU				Domestic Price of Imports from the EU				Domestic Price of Composite Imports			
	BWA	MOZ	ZAF	XSC	BWA	MOZ	ZAF	XSC	BWA	MOZ	ZAF	XSC
Ric	-0.1	1.5	-0.1	-0.1	0.5	-1.7	0.9	0.4	0.5	0.3	0.9	0.4
Wgr	-0.2	-0.1	0.4	0.1	0.4	0.3	0.2	0.1	0.1	0.2	0.7	0.1
Vfr	-0.2	6.3	0.1	2.7	0.4	-6.4	0.1	-3.0	0.1	-0.2	0.5	-0.1
Pfb	-0.1	-0.5	0.6	0.0	0.5	-0.2	-0.2	0.5	0.5	-0.2	0.6	0.5
Xcr	-0.3	1.2	2.4	0.7	0.3	-1.2	-2.4	-0.7	0.0	-0.1	0.1	-0.1
Sgr	1.0	2.0	1.7	1.4	-0.8	-2.4	-1.5	-1.4	0.2	-0.2	0.4	0.2
Bvt	1.3	5.7	1.8	0.9	-1.0	-8.0	-2.5	-1.0	0.2	-3.0	-1.2	0.0
Xfp	0.5	8.1	2.8	1.8	-0.3	-7.1	-2.7	-2.0	0.2	-0.5	-0.2	0.0
Mmp	-0.2	7.6	12.5	23.6	0.4	-7.8	-14.1	-20.8	0.1	-0.9	-5.6	-2.2
Ffp	-0.2	3.6	0.0	-0.4	0.4	-4.5	0.1	0.0	0.3	-0.4	0.4	-0.2
Cog	0.0	0.7	0.0	0.0	0.6	-3.8	1.0	0.5	0.6	0.3	1.0	0.5
Twl	4.6	7.4	4.6	6.7	-4.5	-7.7	-4.8	-6.5	0.0	-0.8	-0.4	0.1
Pch	0.4	1.7	0.8	1.0	-0.3	-2.2	-0.7	-1.1	0.2	-0.4	0.0	0.0
Mtp	0.5	2.9	1.0	0.2	-1.2	-4.0	-0.8	-0.4	-0.5	-1.0	0.2	-0.3
Veq	6.0	2.8	3.1	1.9	-9.6	-3.6	-7.1	-2.2	-3.8	-0.9	-4.9	-0.4
Emq	0.1	1.9	0.2	0.0	0.0	-4.4	0.2	-0.1	0.0	-2.7	0.4	-0.1
Xmn	1.1	5.0	1.3	2.7	-1.1	-6.8	-1.6	-2.8	0.0	-2.1	-0.5	-0.1
Utc	-0.1	0.0	-0.2	-0.1	0.5	0.4	0.8	0.4	0.3	0.3	0.8	0.3
Tcm	-0.2	0.0	-0.2	-0.1	0.4	0.4	0.8	0.4	0.4	0.4	0.7	0.4
Xsr	-0.1	0.0	-0.3	-0.1	0.5	0.3	0.7	0.4	0.5	0.3	0.7	0.4

Note: changes in world prices are relative to the CPI for USA and changes in domestic prices are relative to the CPI for each region.

Table A6-7
Price Changes for Commodity Exports, Sim11-SADC

(Percentage change, price)

	World Price of Exports to the EU				The EU Domestic Price of SADC Exports			
	BWA	**MOZ**	**ZAF**	**XSC**	**BWA**	**MOZ**	**ZAF**	**XSC**
Ric	-0.2	0.0	-0.2	-0.2	-0.3	-0.1	-0.2	-0.2
Wgr	-0.2	0.0	-0.3	-0.2	-0.2	0.0	-0.3	-0.2
Vfr	-0.1	0.0	-0.4	-0.2	-0.2	0.0	-0.3	-0.2
Pfb	-0.3	-0.1	-0.4	-0.3	-0.3	-0.1	-0.5	-0.4
Xcr	-0.5	0.0	-0.4	-0.2	-0.5	-0.1	-0.4	-0.2
Sgr	-0.4	-0.1	-0.3	-0.2	-0.5	-0.2	-0.3	-0.2
Bvt	-0.3	0.1	-0.2	-0.2	-0.3	0.1	-0.2	-0.2
Xfp	-0.3	0.0	-0.3	-0.3	-0.3	0.0	-0.3	-0.3
Mmp	-0.2	0.1	-0.3	-0.1	-0.2	0.1	-0.3	-0.2
Ffp	-0.1	0.0	-0.2	-0.2	-0.2	0.0	-0.2	-0.2
Cog	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1
Twl	-0.2	0.1	-0.2	-0.3	-0.2	0.0	-0.3	-0.3
Pch	-0.4	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2
Mtp	-0.3	-0.2	-0.5	-0.2	-0.3	-0.2	-0.5	-0.2
Veq	3.4	-0.3	-0.4	-0.3	3.2	-0.3	-0.4	-0.4
Emq	-0.3	-0.6	-0.4	-0.2	-0.3	-0.6	-0.4	-0.2
Xmn	-0.2	0.1	-0.3	-0.2	-0.2	0.1	-0.3	-0.2
Utc	-0.2	-0.3	-0.3	-0.2	-0.2	-0.3	-0.3	-0.2
Tcm	-0.1	-0.1	-0.3	-0.1	-0.1	-0.1	-0.3	-0.2
Xsr	-0.1	0.0	-0.2	-0.1	-0.1	-0.1	-0.3	-0.2

Note: changes in world prices are relative to the CPI for USA and changes in domestic prices are relative to the CPI for each region.

Table A6-8
Price Changes for Commodity Exports, Sim11-EU

(Percentage change, price)

	World Price of Exports to the EU				The EU Domestic Price of SADC Exports			
	BWA	**MOZ**	**ZAF**	**XSC**	**BWA**	**MOZ**	**ZAF**	**XSC**
Ric	7.7	0.1	-1.8	10.5	7.8	0.2	-37.6	10.6
Wgr	4.6	0.2	6.0	14.3	4.6	0.2	-4.0	14.3
Vfr	10.3	0.2	1.3	4.2	10.3	0.3	0.1	2.6
Pfb	8.0	0.4	0.6	27.4	8.1	0.5	0.7	27.4
Xcr	20.7	0.2	1.5	18.5	20.3	0.2	-0.7	17.1
Sgr	28.8	7.6	21.7	57.5	28.9	-27.7	-26.0	-55.2
Bvt	1.4	0.1	6.4	11.0	1.4	0.2	-4.0	10.2
Xfp	3.7	0.2	6.6	14.6	-0.7	0.2	-4.4	13.3
Mmp	40.6	0.6	18.7	58.3	-18.4	0.7	-12.4	-21.4
Ffp	0.4	0.2	2.7	10.4	0.5	0.2	-0.7	8.4
Cog	0.4	0.2	0.2	4.8	0.5	0.2	0.2	4.8
Twl	1.5	0.2	0.7	14.7	1.5	0.3	0.2	14.0
Pch	2.9	0.4	0.5	11.8	3.0	0.4	0.4	11.7
Mtp	4.6	0.4	0.8	13.8	4.6	0.4	0.5	13.4
Veq	4.1	0.4	2.2	6.2	4.0	0.4	-1.1	6.3
Emq	2.2	-0.1	0.6	10.2	2.2	-0.1	0.6	9.6
Xmn	1.3	0.5	0.5	10.9	1.3	0.0	0.5	10.4
Utc	0.6	0.3	0.4	3.9	0.7	0.4	0.5	4.0
Tcm	0.9	0.1	0.3	2.8	1.0	0.2	0.4	2.9
Xsr	0.9	0.1	0.3	7.0	1.0	0.2	0.4	7.0

Note: changes in world prices are relative to the CPI for USA and changes in domestic prices are relative to the CPI for each region.

Table A6-9
Price Changes for Commodity Imports, Sim11-EU

(Percentage change, price)

	CIF Price of Imports from the EU				Domestic Price of Imports from the EU				Domestic Price of Composite Imports			
	BWA	**MOZ**	**ZAF**	**XSC**	**BWA**	**MOZ**	**ZAF**	**XSC**	**BWA**	**MOZ**	**ZAF**	**XSC**
Ric	0.2	0.0	0.3	3.5	-2.2	-0.6	-0.6	-13.3	-2.8	-0.5	-0.4	-13.7
Wgr	2.5	0.2	0.4	6.3	0.1	-0.5	-0.5	-11.0	1.2	-0.3	-0.4	-10.5
Vfr	3.5	0.4	0.5	28.8	1.0	-0.2	-0.3	7.8	1.4	0.4	0.4	7.7
Pfb	2.9	0.5	0.5	-1.4	0.5	-0.1	-0.4	-17.4	0.7	0.4	-0.1	-17.3
Xcr	1.8	0.5	0.2	14.4	-0.6	-0.2	-0.7	-4.2	-0.3	1.0	-0.5	-4.2
Sgr	0.5	-1.1	-2.8	20.7	-1.8	-1.7	-3.6	1.1	-1.8	-3.7	-11.6	0.5
Bvt	1.4	1.1	0.7	8.2	-1.0	0.4	-0.1	-9.4	0.2	3.1	1.5	-8.3
Xfp	1.4	1.0	0.7	7.6	-1.0	0.3	-0.2	-9.9	0.2	2.0	1.0	-9.2
Mmp	1.1	0.9	0.5	5.0	-1.2	0.3	-0.4	-12.1	1.0	1.9	0.5	-10.3
Ffp	13.3	1.1	1.7	16.0	10.7	0.4	0.8	-2.9	11.4	3.4	4.5	-2.2
Cog	0.3	0.0	0.2	-0.8	-2.1	-0.7	-0.7	-16.9	-1.9	-0.4	-0.6	-17.3
Twl	0.1	0.3	0.6	1.6	-2.3	-0.4	-0.3	-14.9	-1.9	0.1	0.4	-14.7
Pch	0.5	0.4	0.6	2.9	-1.9	-0.3	-0.3	-13.8	-1.5	0.4	0.6	-13.5
Mtp	0.6	0.3	0.3	2.7	-1.7	-0.3	-0.6	-14.0	-1.2	0.3	-0.4	-13.5
Veq	0.5	0.2	0.2	3.7	-1.8	-0.4	-0.7	-13.1	-1.4	-0.1	-0.7	-12.7
Emq	0.4	0.2	0.2	4.0	-1.9	-0.5	-0.7	-12.9	-1.5	-0.2	-0.6	-12.5
Xmn	0.8	0.3	0.6	4.6	-1.5	-0.4	-0.2	-12.4	-1.1	0.0	0.7	-12.1
Utc	1.0	0.0	0.3	7.3	-1.4	-0.7	-0.6	-10.1	-1.2	-0.6	-0.5	-10.0
Tcm	0.9	0.1	0.4	11.8	-1.5	-0.5	-0.5	-6.3	-1.4	-0.5	-0.5	-6.3
Xsr	0.9	0.1	0.3	8.0	-1.5	-0.6	-0.5	-9.6	-1.4	-0.5	-0.5	-9.6

Note: changes in world prices are relative to the CPI for USA and changes in domestic prices are relative to the CPI for each region.

Table A6-10
Changes in Domestic Production, Sim11-SADC

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.7	0.0	0.1	0.1	-0.1	-0.1	0.0	0.0	0.1	0.5	0.0
Wgr	0.2	0.0	0.0	-0.1	-0.2	0.2	0.0	0.0	-0.2	0.2	0.0
Vfr	-0.1	0.0	0.0	0.0	-0.2	0.4	0.0	0.0	0.1	-0.1	0.0
Pfb	0.3	0.0	-0.8	0.0	-0.1	1.1	0.0	-0.3	-0.1	1.2	0.0
Xcr	-0.3	0.0	0.3	0.0	-0.1	1.4	0.0	0.0	0.3	-0.2	0.0
Sgr	0.2	0.0	0.4	0.0	0.6	0.0	0.0	0.0	0.0	0.1	0.0
Bvt	0.1	0.0	0.1	0.0	-0.8	-0.2	0.0	0.0	0.1	-0.4	0.0
Xfp	-0.1	0.0	-0.2	0.0	-0.4	-0.2	0.0	-0.1	-0.1	0.3	0.0
Mmp	-0.1	0.0	0.0	0.0	-1.6	-1.3	0.0	0.0	-0.9	-3.2	0.0
Ffp	0.0	0.0	0.0	0.0	-0.3	-0.4	0.0	0.0	-0.3	-0.8	0.0
Cog	0.4	0.0	0.1	0.0	1.3	0.7	0.0	0.2	0.2	0.5	0.0
Twl	-0.6	0.0	-0.8	0.0	-1.9	-0.4	0.0	0.0	-0.4	0.8	0.0
Pch	-0.4	-0.1	-0.1	-0.1	-0.5	0.1	0.0	-0.1	-0.1	-0.5	0.0
Mtp	-0.6	-0.1	-0.7	0.1	1.7	2.2	-0.9	0.2	0.7	0.5	-0.2
Veq	-20.7	0.1	-6.3	-0.1	-4.9	-3.0	-0.1	-0.5	-7.5	-1.6	-0.1
Emq	0.5	0.0	-1.2	-0.1	-1.5	1.3	-0.2	-0.9	-0.8	0.0	-0.1
Xmn	-0.3	0.0	-0.7	0.1	-3.3	0.3	-0.1	-0.2	-1.0	-0.8	0.0
Utc	0.5	0.0	0.0	0.0	1.1	0.4	0.0	0.2	0.0	0.1	0.0
Tcm	-0.2	0.0	0.0	0.0	0.3	0.3	0.0	0.1	0.1	0.0	0.0
Xsr	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0

Table A6-11
Changes in Total Imports, Sim11-SADC

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-0.2	0.0	-0.2	0.0	-0.3	-0.5	0.0	0.0	-0.2	-0.3	0.0
Wgr	0.2	0.0	0.0	0.0	-0.3	-1.2	0.0	0.5	0.2	0.0	0.2
Vfr	0.2	0.1	0.0	0.2	0.4	-1.2	0.0	0.2	0.1	-0.2	0.3
Pfb	-0.3	0.1	-0.5	0.0	-2.4	-1.3	-0.1	0.1	0.3	0.0	0.0
Xcr	0.3	0.0	-0.1	0.2	0.7	-0.4	0.1	0.6	0.0	0.3	0.6
Sgr	0.0	0.5	0.0	0.8	0.0	-0.9	0.3	0.4	0.5	-0.3	0.1
Bvt	0.0	0.0	0.1	0.0	2.7	1.2	0.0	0.2	0.1	0.1	0.1
Xfp	0.1	0.0	0.0	0.1	1.0	0.3	0.0	0.4	0.2	-0.1	0.0
Mmp	0.5	0.0	0.2	0.0	2.8	24.4	0.1	0.7	1.0	6.3	0.0
Ffp	-0.1	0.0	0.1	0.3	0.6	-1.2	0.0	0.2	-0.1	-1.0	0.1
Cog	0.4	0.0	0.0	0.1	2.0	0.1	0.0	0.0	0.1	-0.2	0.1
Twl	-0.3	0.0	0.0	0.0	1.4	1.2	0.0	0.1	-0.1	0.2	0.0
Pch	0.1	0.1	0.1	0.1	0.9	0.9	0.0	0.3	0.2	0.0	0.1
Mtp	-2.1	0.1	0.3	0.1	1.2	0.4	-0.1	0.4	0.5	0.4	0.1
Veq	1.3	0.0	0.1	0.1	0.5	5.5	0.1	0.3	0.2	0.4	0.0
Emq	0.3	0.0	0.1	0.0	1.1	-0.5	0.0	0.3	0.1	0.2	0.0
Xmn	0.2	0.1	0.2	0.1	2.9	1.9	0.0	0.5	0.5	0.4	0.1
Utc	0.2	0.0	-0.2	0.0	0.0	-0.8	-0.1	-0.1	0.6	-0.4	0.0
Tcm	-0.7	0.0	-0.2	0.0	0.1	-0.8	0.0	-0.1	-0.2	-0.6	0.0
Xsr	-0.5	0.0	-0.1	0.0	-0.1	-1.0	0.0	-0.1	-0.2	-0.5	0.0

Table A6-12
Changes in Import to Total Demand Ratios, Sim11-SADC

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	0	0	0	0	0	0	0	0
Wgr	0	0	0	0	0	0	0	0	0	0	0
Vfr	0	0	0	0	0	0	0	0	0	0	0
Pfb	0	0	0	0	0	0	0	0	0	0	0
Xcr	0	0	0	0	0	0	0	0	0	0	0
Sgr	0	0	0	0	0	0	0	0	0	0	0
Bvt	0	0	0	0	0	0	0	0	0	0	0
Xfp	0	0	0	0	0	0	0	0	0	0	0
Mmp	0	0	0	0	1	1	0	0	0	1	0
Ffp	0	0	0	0	0	0	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0	0	0	0
Twl	0	0	0	0	1	0	0	0	0	0	0
Pch	0	0	0	0	0	0	0	0	0	0	0
Mtp	0	0	0	0	0	0	0	0	0	0	0
Veq	0	0	0	0	0	2	0	0	0	0	0
Emq	0	0	0	0	0	0	0	0	0	0	0
Xmn	0	0	0	0	1	0	0	0	0	0	0
Utc	0	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0	0

Table A6-13
Changes in Imports from the EU, Sim11-SADC

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-0.7	0.0	-0.3	0.0	11.0	-0.6	-0.1	-0.3	-0.3	-0.8	-0.1
Wgr	-1.3	0.0	-0.3	0.0	-0.6	2.3	-0.2	-1.1	-0.7	0.4	-0.3
Vfr	-0.9	0.0	-0.2	-0.2	27.2	0.2	-0.1	-0.3	-0.4	11.2	-0.2
Pfb	-0.6	0.0	-0.6	-0.1	-2.6	3.0	-0.1	-0.1	-1.7	-0.2	-0.1
Xcr	-2.1	0.0	-0.5	-0.2	8.0	17.5	-0.2	-0.7	-0.9	4.3	-0.4
Sgr	5.6	-0.3	-0.2	-0.6	13.4	9.8	-0.3	-0.6	-0.7	8.6	-0.2
Bvt	3.0	0.0	-0.2	0.0	15.7	4.3	-0.1	-0.2	-0.2	2.4	-0.1
Xfp	2.0	-0.1	-0.3	-0.1	44.7	14.0	-0.1	-0.5	-0.6	8.8	-0.1
Mmp	-1.8	-0.1	-0.7	-0.2	82.0	166.2	-0.3	-0.8	-0.9	469.4	-0.2
Ffp	-0.7	0.0	-0.2	-0.3	15.0	-0.2	-0.1	-0.3	-0.5	-1.5	-0.1
Cog	0.3	-0.1	-0.3	0.0	10.6	0.1	0.0	-0.1	-0.1	-0.3	0.0
Twl	40.8	-0.1	-0.4	-0.2	75.3	43.1	-0.2	-0.4	-0.7	67.2	-0.2
Pch	2.7	-0.2	-0.6	-0.1	11.4	5.5	-0.2	-0.7	-0.8	6.4	-0.2
Mtp	3.4	-0.3	-1.3	-0.5	24.9	7.8	-1.1	-1.7	-2.0	1.4	-0.5
Veq	45.2	-0.2	-0.9	-0.2	19.4	21.5	-0.2	-0.9	-0.9	12.5	-0.1
Emq	0.5	-0.1	-1.2	-0.2	17.0	1.2	-0.5	-1.5	-1.3	0.0	-0.3
Xmn	7.5	-0.2	-0.5	-0.3	42.1	9.6	-0.3	-0.7	-0.6	20.4	-0.2
Utc	-0.7	0.0	-0.3	-0.1	-0.1	-0.8	-0.1	-0.1	-0.8	-0.8	0.0
Tcm	-0.8	0.0	-0.2	0.0	0.0	-0.9	-0.1	-0.1	-0.2	-0.6	0.0
Xsr	-0.5	0.0	-0.2	0.0	-0.1	-1.1	-0.1	-0.1	-0.2	-0.6	0.0

Table A6-14
Changes in the EU Shares in SADC Markets, Sim11-SADC

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	0	0	0	0	0	0	0	0
Wgr	0	0	0	0	0	0	0	0	0	0	0
Vfr	0	0	0	0	0	0	0	0	0	0	0
Pfb	0	0	0	0	0	0	0	0	0	0	0
Xcr	0	0	0	0	0	3	0	0	0	0	0
Sgr	0	0	0	0	0	0	0	0	0	0	0
Bvt	0	0	0	0	5	2	0	0	0	0	0
Xfp	0	0	0	0	3	3	0	0	0	0	0
Mmp	0	0	0	0	6	27	0	0	0	10	0
Ffp	0	0	0	0	1	0	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0	0	0	0
Twl	1	0	0	0	6	6	0	0	0	1	0
Pch	0	0	0	0	2	2	0	0	0	0	0
Mtp	0	0	0	0	3	2	0	0	0	0	0
Veq	10	0	0	0	3	10	0	0	0	1	0
Emq	0	0	0	0	7	1	0	0	0	0	0
Xmn	1	0	0	0	8	4	0	0	0	1	0
Utc	0	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0	0

Table A6-15
Changes in South Africa Shares in SADC Markets, Sim11-SADC

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	0	0	0	0	0	0	0
Wgr	0	0	0	0	0	0	0	0	0	0
Vfr	0	0	0	0	0	0	0	0	0	0
Pfb	0	0	0	0	0	0	0	0	0	0
Xcr	0	0	0	0	0	0	0	0	0	0
Sgr	0	0	0	0	0	0	0	0	0	0
Bvt	0	0	0	0	-2	0	0	0	0	0
Xfp	0	0	0	0	-1	0	0	0	0	0
Mmp	0	0	0	0	-3	0	0	0	-10	0
Ffp	0	0	0	0	-1	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0	0	0
Twl	-1	0	0	0	-1	0	0	0	0	0
Pch	0	0	0	0	-1	0	0	0	0	0
Mtp	0	0	1	0	-2	0	1	1	0	0
Veq	-9	0	1	0	-1	0	1	1	0	0
Emq	0	0	1	0	-4	0	1	1	0	0
Xmn	0	0	0	0	-4	0	0	0	0	0
Utc	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0

Table A6-16
Changes in Domestic Production, Sim11-EU

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-28.3	0.0	0.1	17.5	-0.5	14.3	0.0	-0.5	-0.4	-23.9	-0.2
Wgr	-8.7	-0.1	0.0	1.8	0.1	2.2	0.0	0.2	1.0	-25.3	0.0
Vfr	-12.6	-0.1	1.0	5.5	0.7	2.2	0.0	0.2	0.4	60.3	0.0
Pfb	-17.6	0.0	1.6	0.7	-1.8	-1.5	0.0	0.6	-1.5	-62.6	0.1
Xcr	-22.9	0.1	1.1	12.6	-0.2	10.6	0.0	0.0	-2.4	-14.6	0.0
Sgr	-19.5	-1.3	-23.0	-30.5	111.8	-1.6	-0.9	-8.3	21.5	1056.9	-5.2
Bvt	-0.6	-0.1	-0.2	-0.2	0.7	1.5	-0.1	0.0	-0.1	-8.2	0.3
Xfp	-0.9	-0.1	1.1	3.4	1.1	2.5	0.0	0.4	1.0	-31.4	0.2
Mmp	55.4	-0.1	0.4	3.9	1.8	2.0	0.0	0.3	1.4	104.4	-0.1
Ffp	38.7	0.0	0.0	2.9	0.9	1.6	0.0	0.0	1.4	8.2	0.0
Cog	-4.5	0.1	0.2	0.6	-1.0	-0.8	0.0	0.2	-0.4	-43.1	0.0
Twl	-7.7	0.5	3.2	4.6	0.1	0.3	0.1	0.1	-0.2	-58.0	0.1
Pch	-3.4	0.3	1.1	2.7	0.9	0.8	0.4	0.0	0.1	-39.0	0.3
Mtp	-11.4	0.2	1.9	1.0	-2.6	-2.6	0.8	-0.6	-2.8	-49.0	0.4
Veq	-9.7	-0.1	1.2	1.3	1.6	0.8	0.0	0.8	-0.1	-14.2	-0.3
Emq	-12.9	-0.1	1.0	4.3	8.2	-0.7	0.3	1.3	0.3	-35.2	0.2
Xmn	-2.3	0.2	0.8	3.6	0.3	0.4	0.1	0.3	1.0	-30.4	0.6
Utc	0.8	0.0	-0.4	-0.9	-0.9	0.1	-0.1	-0.3	0.0	11.2	-0.3
Tcm	-0.6	0.0	-0.5	0.7	0.0	0.1	-0.1	-0.2	-0.3	25.1	-0.1
Xsr	-0.2	0.0	-0.1	-0.2	-0.1	0.1	0.0	-0.2	-0.1	0.4	-0.2

Table A6-17
Changes in Import to Total Demand Ratios, Sim11-EU

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	3	0	0	0	0	0	0	0	0	6	0
Wgr	2	0	0	0	0	0	0	0	0	8	0
Vfr	3	0	0	-1	0	0	0	0	0	4	0
Pfb	4	0	0	0	0	0	0	0	0	13	0
Xcr	4	0	0	-3	0	0	0	0	0	15	0
Sgr	0	0	1	0	-2	2	0	0	0	-5	1
Bvt	0	0	0	0	0	0	0	0	0	1	0
Xfp	0	0	0	-1	-1	0	0	0	0	7	0
Mmp	-1	0	0	-1	-1	0	0	0	-1	2	0
Ffp	0	0	0	0	0	0	0	0	0	2	0
Cog	0	0	0	0	0	0	0	0	0	2	0
Twl	0	0	0	-1	0	0	0	0	0	13	0
Pch	0	0	0	0	0	0	0	0	0	9	0
Mtp	2	0	0	0	0	0	0	0	0	12	0
Veq	0	0	0	0	0	0	0	0	0	5	0
Emq	0	0	0	0	0	0	0	0	0	11	0
Xmn	1	0	0	-1	0	0	0	0	0	9	0
Utc	0	0	0	0	0	0	0	0	0	1	0
Tcm	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	2	0

Table A6-18
Changes in 'Rest of SACU' Export by Destinations, Sim11-EU

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	6.3	-0.3	-0.8	0.0	0.9	-39.6	-0.1	1.5	1.1	32.2	-41.9
Wgr	-40.8	-59.6	-0.7	-52.2	-57.2	-54.3	-0.2	-2.8	-46.4	38.8	-53.9
Vfr	2.4	-11.9	-12.1	-14.6	-9.0	-8.4	-11.7	-10.5	-0.1	176.7	-10.2
Pfb	-65.5	-70.4	-70.0	-0.2	-67.9	-68.0	-70.3	-0.5	-0.1	-7.1	-68.5
Xcr	-59.1	-65.8	-0.7	-68.4	-62.4	-63.3	-65.5	-65.3	1.8	148.7	-62.8
Sgr	81.6	59.1	62.9	51.0	63.8	48.9	69.6	71.4	65.2	443.2	71.4
Bvt	-17.4	-20.9	-20.2	-20.5	-17.9	-18.7	-19.5	-17.9	-18.5	-2.6	-19.1
Xfp	-38.9	0.0	-42.9	-42.7	-42.8	-42.8	-45.9	-44.4	-43.2	-19.1	-42.5
Mmp	-52.6	-57.9	-55.9	-58.7	-54.3	-56.0	-55.1	-51.8	-53.0	-36.4	-57.7
Ffp	17.7	-25.7	-25.0	-30.0	-22.4	-22.7	-27.5	-24.8	-24.7	27.6	-23.7
Cog	-25.4	-36.8	-29.4	-27.8	-27.2	-40.4	-25.7	-41.1	-28.1	-35.2	-32.5
Twl	-62.4	-63.6	-62.9	-61.8	-61.8	-60.9	-63.2	-62.6	-61.9	-57.5	-62.3
Pch	-45.9	-47.6	-49.2	-47.4	-46.0	-47.7	-48.2	-49.4	-47.5	-37.8	-46.4
Mtp	-56.6	-0.2	-57.0	-56.8	-56.8	-59.4	-59.3	-57.8	-58.4	-49.2	-57.4
Veq	-27.7	-30.9	-30.1	-32.3	-30.0	-30.2	-31.8	-29.0	-29.8	-12.7	-33.9
Emq	-51.9	0.0	-51.2	-54.7	-53.1	-51.9	-53.5	-52.1	-51.9	-35.5	-53.3
Xmn	-44.1	-47.4	-46.5	-48.1	-46.6	-45.1	-47.1	-46.2	-45.8	-28.8	-46.4
Utc	-12.9	-15.7	-17.4	-17.3	-17.0	-16.3	-15.0	-14.8	-16.6	17.6	-14.6
Tcm	-6.9	-10.2	-11.1	-12.3	-9.6	-8.8	-10.2	-10.2	-9.8	37.4	-10.1
Xsr	-19.8	-22.7	-23.3	-24.0	-22.3	-21.6	-22.7	-22.7	-22.3	3.6	-22.6

Table A6-18 (cont.)

(Percentage change, volume)

	EU	USA	EAS	SAS	SSA	ROW
Ric	-49.3	-46.2	-46.8	0.0	0.0	0.0
Wgr	-53.6	-49.2	-51.7	-58.5	-0.1	-54.2
Vfr	-9.2	-11.1	-10.4	-11.2	-10.4	-10.5
Pfb	-70.3	-70.2	-68.9	-68.8	0.0	-70.2
Xcr	-64.3	-65.4	-65.4	-65.6	-64.2	-65.4
Sgr	3738.9	76.8	80.5	78.6	67.8	80.2
Bvt	-20.1	-20.6	-20.7	-20.7	-19.9	-20.4
Xfp	-42.2	-42.1	-43.1	-44.9	-43.4	-43.6
Mmp	567.2	-58.2	-58.1	-57.6	-57.7	-57.3
Ffp	-25.5	-25.7	-28.8	-29.8	-26.8	-27.2
Cog	-43.8	-43.8	-42.9	-42.2	-41.1	-43.9
Twl	-62.9	-62.7	-63.2	-63.2	-63.1	-62.9
Pch	-50.0	-49.5	-49.3	-48.4	-48.3	-49.8
Mtp	-59.4	-59.9	-59.7	-59.6	-58.0	-59.3
Veq	-31.4	0.0	-32.1	-32.6	-33.1	-31.3
Emq	-53.4	0.0	-54.1	-54.3	-53.9	-54.1
Xmn	-48.1	-49.2	-47.6	-47.8	-47.3	-48.5
Utc	-16.3	-16.6	-15.3	-15.6	-16.1	-16.5
Tcm	-10.2	-10.1	-10.1	-10.2	-10.1	-10.1
Xsr	-22.7	-22.6	-22.6	-22.6	-22.6	-22.6

Table A6-19
Changes in 'Rest of SACU' Export Shares by Destinations, Sim11-EU

(Percentage points)

	BWA	MDG	MOZ	ZAF	ZWE	XSD	EU	USA	EAS	SAS	SSA	ROW
Ric	0	0	0	0	0	-1	-1	0	0	1	0	2
Wgr	0	0	-1	-1	2	-1	-1	1	0	0	0	0
Vfr	0	0	0	0	0	0	0	0	0	0	0	0
Pfb	0	0	0	1	0	0	0	0	0	0	0	0
Xcr	0	0	0	0	0	0	-1	0	0	0	0	0
Sgr	0	-1	-4	-51	0	-2	67	0	0	0	-9	0
Bvt	0	0	0	0	0	0	0	0	0	0	0	0
Xfp	0	0	0	0	0	0	0	0	0	0	0	0
Mmp	-1	0	-2	-30	0	-2	47	0	-2	0	0	-8
Ffp	0	0	0	1	0	0	-1	0	0	0	0	0
Cog	0	0	0	1	0	0	-1	0	0	0	0	0
Twl	0	0	0	1	0	0	0	-1	0	0	0	0
Pch	0	0	0	0	0	0	0	0	0	0	0	0
Mtp	0	0	0	0	0	0	0	0	0	0	0	0
Veq	0	0	0	1	0	-2	0	1	0	0	0	0
Emq	0	0	0	1	0	0	0	1	-1	0	0	0
Xmn	0	0	0	1	0	0	0	0	0	0	0	0
Utc	0	0	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0	0	0

Table A6-20
Changes in Shares in the EU Markets by Exporters, Sim11-EU

(Percentage points)

	BWA	MUS	ZWE	XSC	EU	SAS	SSA	ROW
Ric	0	0	0	0	0	0	0	0
Wgr	0	0	0	0	0	0	0	0
Vfr	0	0	0	0	0	0	0	0
Pfb	0	0	0	0	0	0	0	0
Xcr	0	0	0	0	0	0	0	0
Sgr	0	-5	-1	59	-36	-2	-1	-13
Bvt	0	0	0	0	0	0	0	0
Xfp	0	0	0	0	0	0	0	0
Mmp	1	0	0	1	-1	0	0	0
Ffp	0	0	0	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0
Twl	0	0	0	0	0	0	0	0
Pch	0	0	0	0	0	0	0	0
Mtp	0	0	0	0	0	0	0	0
Veq	0	0	0	0	0	0	0	0
Emq	0	0	0	0	0	0	0	0
Xmn	0	0	0	0	0	0	0	0
Utc	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0

Table A6-21
Simulated Changes in Tariffs, Sim21

(Percentage points)

	Sim21-SADC										
Exporter	EU										
Importer	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	-3	-4	0	-8	-3	-8	0	-2
Wgr	0	0	0	0	0	-1	-6	-2	0	-1	-4
Vfr	0	-8	-5	-11	-14	-1	-12	-12	-15	-6	-7
Pfb	0	0	0	0	0	-2	0	0	0	0	-1
Xcr	0	-4	-5	-12	-3	-6	-1	-6	-4	-2	-13
Sgr	-2	-11	0	-45	-5	-4	-21	0	0	-3	-5
Bvt	-3	-3	-12	-64	-15	-5	-16	-19	-21	-3	-25
Xfp	-1	-2	-15	-9	-17	-7	-18	-19	-22	-4	-10
Mmp	0	-5	-10	-11	-17	-33	-17	-11	-23	-61	-10
Ffp	0	-1	-1	-4	-9	-1	-9	-5	-9	0	-10
Cog	0	0	-7	0	-5	0	-2	-4	-8	0	-9
Twl	-10	-6	-15	-15	-17	-11	-18	-17	-25	-15	-13
Pch	-1	-2	-2	-21	-4	-3	-6	-6	-7	-3	-9
Mtp	-2	-3	-13	-15	-8	-3	-14	-9	-13	-1	-6
Veq	-18	-6	-11	-8	-7	-12	-6	-11	-28	-5	-6
Emq	-1	-4	-7	-11	-7	-1	-6	-4	-9	-1	-4
Xmn	-3	-3	-7	-32	-13	-4	-11	-12	-18	-6	-10

Table A6-21 (cont.)

(Percentage points)

	Sim21-EU										
Exporter	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Importer	EU										
Ric	0	-37	-126	-116	0	-58	0	0	0	0	0
Wgr	0	0	0	-28	0	-10	0	0	-1	0	0
Vfr	0	0	0	-8	0	-1	0	0	-1	-1	0
Pfb	0	0	0	0	0	0	0	0	0	0	0
Xcr	0	0	0	0	0	-2	0	0	-1	0	0
Sgr	0	-112	-87	-79	-48	-61	-82	-90	-146	-242	-67
Bvt	0	0	0	-4	0	-10	0	0	0	0	0
Xfp	-4	0	0	-1	0	-11	0	0	0	0	0
Mmp	-70	0	0	-17	0	-35	0	0	-11	-98	0
Ffp	0	0	0	0	0	-3	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0	0	0	0
Twl	0	0	0	0	0	-1	0	0	0	0	0
Pch	0	0	0	0	0	0	0	0	0	0	0
Mtp	0	0	0	0	0	0	0	0	0	0	0
Veq	0	0	0	0	0	-3	0	0	0	0	0
Emq	0	0	0	0	0	0	0	-3	0	0	0
Xmn	0	0	0	0	0	0	0	0	0	0	0

Table A6-22
Changes in World Prices for Imports from the EU, Sim21-SADC

(Percentage change, *cif* price)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-0.1	0.0	-0.1	1.2	1.5	-0.1	3.1	1.1	3.1	-0.1	0.5
Wgr	-0.2	0.0	-0.1	0.2	-0.1	0.4	3.3	0.9	-0.3	0.0	1.6
Vfr	-0.2	3.2	2.2	4.3	6.3	0.0	5.0	5.3	6.5	2.6	2.4
Pfb	-0.2	-0.1	0.0	1.4	-0.5	0.5	-0.3	-0.3	-0.7	0.0	-0.1
Xcr	-0.3	1.5	2.3	4.6	1.1	2.3	0.3	2.7	1.4	0.6	4.9
Sgr	0.9	4.6	-0.1	18.2	2.0	1.6	8.3	-0.2	-0.2	1.3	1.7
Bvt	1.3	1.0	4.2	16.4	5.7	1.7	5.0	8.3	8.5	0.9	7.4
Xfp	0.5	0.9	7.0	2.9	8.1	2.8	8.5	9.1	10.0	1.8	2.7
Mmp	-0.2	1.8	4.0	4.1	7.6	12.5	6.7	4.6	9.5	23.5	3.2
Ffp	-0.2	0.2	0.2	1.2	3.6	-0.1	3.4	2.0	3.5	-0.4	2.9
Cog	0.0	0.0	0.9	0.1	0.7	0.0	0.2	1.7	0.9	0.0	1.2
Twl	4.6	2.4	7.0	6.2	7.4	4.6	7.8	7.2	10.1	6.7	4.9
Pch	0.4	0.6	0.6	7.2	1.6	0.8	2.4	2.4	3.0	0.9	2.7
Mtp	0.4	1.0	5.2	5.6	2.9	1.0	5.3	3.5	6.0	0.2	1.5
Veq	6.0	1.6	4.2	2.8	2.8	3.1	2.2	4.2	9.1	1.8	2.9
Emq	0.1	0.8	2.2	2.3	1.8	0.2	1.7	1.6	3.2	0.0	1.1
Xmn	1.0	1.1	2.2	8.6	5.0	1.3	3.6	4.8	6.2	2.7	2.8
Utc	-0.1	-0.1	-0.1	-0.4	0.0	-0.2	-0.2	-0.1	-0.3	-0.2	-0.4
Tcm	-0.2	-0.1	-0.1	-0.3	0.0	-0.2	-0.2	-0.1	-0.3	-0.2	-0.5
Xsr	-0.1	0.0	-0.1	-0.3	0.0	-0.3	-0.2	-0.1	-0.3	-0.2	-0.4

Note: changes in world prices are relative to the CPI for USA.

Table A6-23
Changes in Domestic Prices for Imports from the EU, Sim21-SADC

(Percentage change, price)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.6	0.3	0.5	0.4	-1.7	1.0	-3.5	-1.3	-3.7	0.5	0.8
Wgr	0.4	0.3	0.5	2.9	0.3	0.2	-1.9	-1.0	0.8	0.1	-0.3
Vfr	0.4	-3.9	-1.9	-3.4	-6.4	0.2	-4.9	-5.5	-6.6	-3.0	-2.2
Pfb	0.5	0.2	0.6	4.1	-0.2	-0.3	0.6	0.2	0.4	0.6	0.7
Xcr	0.3	-1.7	-2.2	-4.3	-1.2	-2.4	0.0	-2.8	-1.1	-0.7	-5.3
Sgr	-0.8	-5.5	0.5	-15.2	-2.5	-1.4	-9.1	0.3	0.9	-1.4	-1.0
Bvt	-1.0	-1.7	-6.2	-25.0	-7.9	-2.4	-8.6	-8.2	-9.1	-1.0	-11.5
Xfp	-0.3	-1.2	-6.3	-3.3	-7.1	-2.6	-7.3	-7.8	-8.3	-1.9	-4.1
Mmp	0.5	-2.3	-5.2	-3.9	-7.8	-14.0	-7.6	-5.0	-9.6	-20.8	-4.4
Ffp	0.5	-0.1	0.0	0.3	-4.5	0.2	-4.5	-2.7	-4.3	0.0	-4.2
Cog	0.7	0.3	-5.3	2.7	-3.8	1.0	-0.9	-2.0	-5.2	0.6	-4.7
Twl	-4.5	-3.1	-6.6	-4.9	-7.8	-4.8	-7.5	-7.3	-10.8	-6.4	-5.1
Pch	-0.2	-0.8	-0.5	-8.7	-2.1	-0.7	-2.9	-2.7	-2.9	-1.0	-4.1
Mtp	-1.2	-1.8	-5.8	-5.5	-4.0	-0.7	-6.4	-4.3	-5.1	-0.4	-2.4
Veq	-9.5	-3.6	-5.2	-2.3	-3.6	-7.0	-2.6	-5.3	-13.0	-2.2	-0.9
Emq	0.0	-2.9	-3.8	-5.2	-4.4	0.2	-3.1	-2.2	-4.4	0.0	-0.9
Xmn	-1.0	-1.8	-4.0	-14.9	-6.8	-1.5	-5.4	-5.5	-8.5	-2.7	-4.4
Utc	0.5	0.2	0.5	2.3	0.4	0.8	0.7	0.4	0.8	0.4	1.7
Tcm	0.5	0.2	0.5	2.4	0.4	0.8	0.7	0.4	0.8	0.4	1.7
Xsr	0.6	0.3	0.5	2.3	0.4	0.7	0.7	0.4	0.8	0.5	1.7

Note: changes in domestic prices are relative to the CPI for each region.

Table A6-24
Changes in Domestic Prices for Composite Imports, Sim21-SADC

(Percentage change, price)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.5	0.2	0.5	2.5	0.3	0.9	0.7	0.3	0.9	0.4	1.8
Wgr	0.0	0.3	0.3	2.9	0.2	0.7	0.7	-0.1	0.6	0.1	1.4
Vfr	0.1	-1.2	0.3	1.9	-0.2	0.5	0.2	-0.1	0.2	-0.1	0.9
Pfb	0.3	0.0	0.3	4.0	-0.2	0.4	0.5	0.1	0.0	0.5	1.3
Xcr	-0.1	-0.6	0.3	-0.1	-0.2	0.1	0.4	-0.2	0.5	-0.2	-1.1
Sgr	0.1	-1.1	0.4	2.0	-0.2	0.4	0.2	0.0	0.6	0.0	1.5
Bvt	0.1	-1.1	-2.2	-19.1	-3.1	-1.1	-5.8	-0.4	-1.9	-0.1	-7.0
Xfp	0.1	-0.6	-0.1	-0.5	-0.5	-0.1	-1.0	-0.5	0.1	0.0	-2.2
Mmp	0.1	-0.8	-1.8	0.3	-1.0	-5.6	-2.1	-0.5	-0.2	-2.2	-1.9
Ffp	0.3	0.0	0.3	1.8	-0.4	0.4	-1.2	-0.5	-1.7	-0.2	-0.7
Cog	0.6	0.3	0.2	2.7	0.3	1.0	0.8	0.5	1.1	0.5	0.2
Twl	-0.1	-0.9	0.1	0.4	-0.9	-0.4	-0.2	-0.5	-1.7	0.1	-0.6
Pch	0.2	-0.3	0.0	-1.7	-0.4	0.0	-0.3	-0.3	0.3	0.0	-1.8
Mtp	-0.5	-1.0	-0.4	0.6	-1.0	0.1	-1.4	-0.8	0.1	-0.3	-1.0
Veq	-3.8	-2.1	-1.4	0.2	-1.0	-4.9	-0.6	-1.2	-4.8	-0.3	1.4
Emq	0.0	-2.2	-1.7	-3.3	-2.7	0.5	-1.4	-0.7	-1.4	-0.1	0.2
Xmn	0.0	-1.1	-2.1	-8.7	-2.1	-0.4	-2.2	-0.9	-2.8	-0.1	-2.3
Utc	0.3	0.1	0.5	2.2	0.4	0.8	0.7	0.4	0.5	0.3	1.7
Tcm	0.5	0.2	0.5	2.3	0.4	0.8	0.7	0.4	0.8	0.4	1.7
Xsr	0.5	0.3	0.5	2.3	0.4	0.7	0.6	0.4	0.8	0.4	1.7

Note: changes in domestic prices are relative to the CPI for each region.

Table A6-25
Changes in World Price of Exports to the EU, Sim21-EU

(Percentage change, price)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	7.7	21.7	76.2	54.4	0.5	-1.8	0.1	0.5	4.3	9.4	-0.1
Wgr	4.6	1.1	2.0	4.0	0.9	6.3	0.2	2.0	22.0	12.9	0.0
Vfr	10.2	0.8	2.5	28.3	0.5	1.4	0.3	2.0	14.2	3.6	0.3
Pfb	6.7	0.6	3.6	1.0	0.6	0.0	0.5	1.4	16.4	23.9	0.2
Xcr	21.1	0.6	4.0	25.1	0.7	1.4	0.5	1.8	14.5	16.8	0.1
Sgr	39.8	49.2	16.4	26.6	6.7	18.5	31.8	20.9	28.9	52.9	19.8
Bvt	1.4	-0.2	1.9	4.4	0.2	6.3	0.2	0.8	6.0	9.7	0.1
Xfp	3.7	0.3	6.4	7.1	0.4	6.6	0.1	0.9	4.5	12.9	0.2
Mmp	40.6	0.5	6.7	15.6	1.2	18.7	0.1	1.8	14.0	56.1	0.1
Ffp	0.4	0.3	2.2	10.6	0.3	2.8	0.2	0.7	7.6	8.9	0.0
Cog	0.4	0.1	0.4	0.5	0.2	0.2	0.1	0.3	1.3	3.6	0.1
Twl	1.5	0.6	8.7	4.1	0.3	0.7	0.3	0.7	5.6	12.9	0.1
Pch	2.9	0.4	6.4	4.0	1.1	0.5	0.2	0.6	7.7	10.3	0.1
Mtp	4.7	0.8	6.6	1.4	0.5	0.8	0.4	0.9	6.1	12.1	0.1
Veq	4.3	0.5	3.6	2.7	0.5	2.2	0.8	1.5	9.8	5.5	0.2
Emq	2.2	0.5	4.5	4.1	0.0	0.6	0.7	1.3	10.1	9.0	0.1
Xmn	1.3	0.3	6.0	4.6	0.6	0.5	0.3	1.5	5.3	9.7	0.0
Utc	0.6	0.2	3.1	0.3	0.7	0.5	0.2	1.1	1.9	3.5	0.1
Tcm	0.9	0.3	1.7	3.1	0.2	0.3	0.2	0.6	2.6	2.5	0.1
Xsr	0.9	0.3	7.4	2.0	0.2	0.3	0.2	0.4	2.5	6.1	0.1

Note: changes in world prices are relative to the CPI for USA.

Table A6-26
Changes in Domestic Production, Sim21-SADC

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.8	-0.2	-0.2	0.6	-0.1	-0.4	0.2	0.0	-0.1	0.5	1.5
Wgr	0.2	0.5	-0.5	0.6	-0.3	0.1	-0.1	-0.2	-0.7	0.1	-0.3
Vfr	-0.1	0.0	-0.3	-0.8	-0.2	0.4	0.0	-0.2	0.1	-0.2	-0.1
Pfb	0.1	0.5	-0.9	-4.4	-0.1	0.9	2.2	0.5	0.4	1.6	-1.2
Xcr	-0.4	0.1	2.1	-0.9	-0.2	1.4	0.2	-0.1	1.3	-0.4	-0.3
Sgr	-0.1	0.0	2.4	2.4	0.3	0.0	0.0	0.5	0.7	0.1	1.9
Bvt	0.1	0.0	-0.1	-5.2	-0.8	-0.3	-0.3	-0.2	-0.4	-1.5	-1.9
Xfp	-0.2	0.1	-0.7	0.7	-0.5	-0.2	-0.1	-0.3	-0.6	0.2	-1.5
Mmp	-0.1	-0.3	-1.0	-2.9	-1.6	-1.3	-0.6	-0.2	-1.8	-3.1	-3.8
Ffp	0.0	0.0	-0.1	-0.6	-0.3	-0.4	-0.1	-0.1	-0.9	-0.8	-0.5
Cog	0.4	0.2	0.6	0.9	1.3	0.8	0.7	0.8	1.4	0.7	0.6
Twl	-0.6	2.4	0.2	9.1	-2.0	-0.4	0.5	-0.3	-1.7	1.3	-1.4
Pch	-0.6	0.5	0.2	-3.5	-0.6	0.0	-0.1	-0.2	0.5	-0.7	-2.6
Mtp	-0.9	-0.4	-0.7	3.5	1.8	2.3	3.8	1.4	3.9	0.6	-1.3
Veq	-20.9	3.2	-6.1	-2.6	-5.7	-3.0	-0.4	-2.8	-11.3	-1.8	2.2
Emq	0.2	2.2	-2.3	-5.9	-2.3	1.2	-2.4	-2.1	-0.9	-0.1	-0.4
Xmn	-0.4	0.2	-2.7	-0.4	-3.4	0.2	-2.3	-0.7	-2.6	-1.1	-2.4
Utc	0.5	0.2	0.5	0.7	1.1	0.3	0.4	0.6	0.5	0.1	0.7
Tcm	-0.2	0.4	0.3	2.5	0.3	0.3	0.3	0.3	0.6	0.0	0.3
Xsr	0.1	0.2	0.1	-0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.3

Table A6-27
Changes in Total Imports, Sim21-SADC

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-0.2	-0.4	-0.8	-1.2	-0.4	-0.6	-1.6	-0.8	-1.4	-0.5	-2.0
Wgr	0.3	0.0	-0.3	1.3	-0.3	-1.4	-1.0	0.1	-0.6	-0.2	-1.9
Vfr	0.2	2.4	-0.4	0.3	0.5	-1.3	-0.2	0.2	-0.4	-0.4	-0.9
Pfb	-0.1	0.4	0.9	7.9	-2.5	-1.1	-1.8	-0.9	-1.3	0.4	-3.4
Xcr	0.3	2.3	-0.5	3.5	1.2	-0.5	-1.0	0.6	-1.0	-0.1	4.7
Sgr	0.2	3.2	-0.1	1.2	0.1	-0.8	-0.7	0.0	0.2	-0.2	-2.1
Bvt	0.1	1.3	2.3	21.1	2.7	1.2	6.8	0.3	2.2	0.1	7.3
Xfp	0.2	0.7	0.2	0.8	1.0	0.2	1.9	1.0	0.0	-0.2	4.5
Mmp	0.7	3.0	6.8	0.8	2.9	24.1	8.9	2.1	2.5	6.2	5.6
Ffp	-0.1	0.3	-0.3	-1.4	0.6	-1.2	2.4	1.1	5.1	-1.2	1.6
Cog	0.5	0.6	0.5	0.8	2.1	0.0	0.1	0.4	1.2	-0.4	2.4
Twl	-0.3	2.1	0.1	8.0	1.5	1.1	0.1	1.4	3.4	0.1	2.8
Pch	0.1	0.8	0.2	4.6	0.9	0.8	0.5	1.2	0.8	-0.1	4.2
Mtp	-2.1	2.1	0.7	1.2	1.3	0.3	1.7	1.1	2.0	0.2	1.1
Veq	1.3	0.5	0.9	1.6	0.5	5.4	0.5	1.1	1.9	0.3	-0.2
Emq	0.4	0.5	0.8	2.7	1.1	-0.6	0.5	0.7	0.8	0.1	0.3
Xmn	0.3	3.3	3.5	10.3	3.0	1.7	4.1	2.5	6.7	0.3	6.5
Utc	0.2	-0.7	-0.5	-1.8	0.0	-0.9	-0.9	-0.4	0.1	-0.6	-2.0
Tcm	-0.8	-0.3	-0.4	-1.1	0.0	-1.0	-0.9	-0.4	-1.2	-0.8	-1.8
Xsr	-0.5	0.1	-0.5	-1.3	-0.1	-1.2	-1.0	-0.5	-1.2	-0.7	-1.6

Table A6-28
Changes in Import to Total Demand Ratios, Sim21-SADC

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	0	0	0	0	0	0	0	-1
Wgr	0	0	0	0	0	0	0	0	0	0	0
Vfr	0	0	0	0	0	0	0	0	0	0	0
Pfb	0	0	0	0	0	0	0	0	0	0	0
Xcr	0	0	0	1	0	0	0	0	0	0	0
Sgr	0	0	0	0	0	0	0	0	0	0	-1
Bvt	0	0	0	1	0	0	0	0	0	0	0
Xfp	0	0	0	0	0	0	0	0	0	0	1
Mmp	0	0	1	1	1	1	0	0	0	1	2
Ffp	0	0	0	0	0	0	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0	0	0	0
Twl	0	0	0	0	1	0	0	0	1	0	1
Pch	0	0	0	1	0	0	0	0	0	0	1
Mtp	0	0	0	0	0	0	0	0	0	0	1
Veq	0	0	0	1	0	2	0	0	0	0	0
Emq	0	0	0	1	0	0	0	0	0	0	0
Xmn	0	0	1	3	1	0	1	0	2	0	1
Utc	0	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0	0

Table A6-29
Changes in the EU Shares in SADC Markets, Sim21-SADC

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	0	0	0	0	0	0	0	0
Wgr	0	0	0	0	0	0	0	0	0	0	1
Vfr	0	4	0	1	0	0	2	1	1	0	2
Pfb	0	0	0	0	0	0	0	0	0	0	0
Xcr	0	3	0	9	0	3	0	1	0	0	10
Sgr	0	4	0	2	0	0	1	0	0	0	1
Bvt	0	1	4	16	5	2	6	1	6	0	9
Xfp	0	2	2	6	2	3	7	2	2	0	6
Mmp	0	4	9	8	6	27	14	4	5	10	11
Ffp	0	0	0	1	1	0	4	2	5	0	4
Cog	0	0	0	0	0	0	0	0	0	0	4
Twl	1	4	2	10	6	6	5	4	12	1	10
Pch	0	1	1	13	2	2	4	2	2	0	8
Mtp	0	3	2	7	3	2	7	3	2	0	6
Veq	10	5	6	7	3	10	4	5	17	1	3
Emq	0	4	6	11	7	1	6	3	8	0	5
Xmn	1	3	6	26	8	4	9	5	13	1	9
Utc	0	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0	0

Table A6-30
Changes in Domestic Production, Sim21-EU

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-28.4	0.5	12.4	-57.0	-1.2	13.8	-0.5	-1.3	-3.7	-22.0	-0.4
Wgr	-8.5	0.4	-0.2	-9.4	0.0	2.7	-0.1	0.5	-16.9	-22.7	-0.1
Vfr	-12.5	-0.2	-1.5	-25.7	0.4	2.0	-0.3	1.0	-22.1	54.5	-0.1
Pfb	-6.0	-0.3	-6.8	-2.1	-1.1	5.2	-1.1	0.1	-45.7	-56.7	0.0
Xcr	-22.1	-1.3	-17.2	-51.7	0.6	12.6	-0.1	1.3	-44.6	-13.3	-0.1
Sgr	-5.8	10.5	210.1	144.9	74.1	-1.7	6.1	92.6	694.6	918.1	19.4
Bvt	-0.6	1.0	0.1	1.5	0.9	1.5	0.0	0.1	-1.6	-7.4	0.3
Xfp	-0.8	-0.7	-3.6	-16.1	1.0	2.5	0.0	0.3	-0.3	-28.2	0.1
Mmp	55.2	0.9	-0.9	-19.3	1.6	2.0	-0.1	0.2	-12.3	122.2	-0.2
Ffp	38.7	0.5	-0.5	-15.5	0.6	1.6	0.0	0.2	4.7	13.0	-0.1
Cog	-4.4	-0.4	-3.6	-4.2	-0.5	-0.8	-0.2	-1.9	-8.0	-34.8	-0.1
Twl	-7.6	-4.0	-20.0	-24.9	0.2	0.4	-0.9	-1.3	-18.2	-53.8	0.0
Pch	-2.8	-0.6	-5.7	-13.0	1.3	0.9	0.6	0.4	-7.0	-35.4	0.4
Mtp	-12.5	-1.4	-8.6	-6.3	-3.5	-2.6	-0.9	-5.4	-32.5	-44.8	0.2
Veq	-10.2	-3.2	-5.9	-7.1	1.7	0.7	-1.0	-0.6	-17.7	-12.7	-0.4
Emq	-12.9	-3.5	-7.2	-23.1	7.5	-0.8	-0.5	-1.9	-23.7	-31.7	-0.1
Xmn	-2.1	-0.6	-4.9	-20.1	1.1	0.5	-0.6	-0.3	-13.8	-27.6	0.5
Utc	0.7	0.3	1.9	6.3	0.0	0.1	0.0	-1.5	8.5	9.5	-0.2
Tcm	-0.7	-0.5	3.4	-5.1	0.0	0.1	0.1	-0.8	0.5	21.8	-0.1
Xsr	-0.2	-0.2	-0.5	1.2	-0.1	0.1	-0.2	0.0	3.7	0.2	-0.2

Table A6-31
Changes in Total Exports, Sim21-EU

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-30.8	59.0	376.3	-58.8	1.5	15.0	-2.2	-3.7	-16.8	-36.5	-1.0
Wgr	-21.4	-0.1	-2.3	-9.7	1.7	9.3	-0.6	4.3	-25.6	-48.0	-0.5
Vfr	-17.0	-1.0	-4.5	-43.6	0.8	3.6	-0.9	3.3	-26.6	-7.4	-0.3
Pfb	-14.8	-2.0	-6.6	-2.1	-1.4	3.8	-1.3	0.1	-48.3	-62.8	-0.1
Xcr	-14.2	-3.6	-19.8	-67.0	2.6	17.1	-0.8	5.6	-52.0	-58.8	-0.7
Sgr	63.3	211.9	221.0	161.3	85.6	4.9	105.0	145.5	846.2	1085.1	57.2
Bvt	-2.8	0.1	-4.3	-3.0	0.3	5.9	-0.3	0.5	-10.1	-16.7	1.1
Xfp	-2.1	-1.4	-3.3	-22.0	1.5	10.9	-0.6	1.0	-13.4	-38.8	1.4
Mmp	263.0	-0.5	-0.9	-25.5	2.2	33.3	-2.0	0.4	-32.7	308.4	1.3
Ffp	-0.1	-0.9	-6.2	-28.7	-0.5	6.6	-0.7	-1.6	-16.6	-20.4	-0.4
Cog	-4.5	-0.5	-3.8	-4.7	-0.7	-1.2	-0.6	-1.6	-11.4	-34.9	-0.1
Twl	-7.7	-4.4	-24.1	-24.9	-0.8	-0.4	-1.2	-3.9	-30.6	-57.8	-0.6
Pch	-2.7	-1.0	-9.1	-19.7	4.8	1.7	0.5	-0.1	-13.0	-43.7	-0.1
Mtp	-14.7	-2.0	-16.0	-8.7	-3.5	-3.7	-1.4	-5.5	-33.3	-55.0	-0.5
Veq	-10.3	-3.2	-6.3	-15.6	2.3	2.7	-0.4	0.7	-21.7	-28.4	-0.5
Emq	-13.3	-3.5	-9.3	-27.4	9.8	0.0	0.6	-2.3	-25.0	-48.1	-0.7
Xmn	-4.9	-1.9	-11.9	-25.2	2.0	0.3	-1.5	1.2	-22.9	-41.8	-0.2
Utc	-2.8	-0.8	-5.1	-1.5	2.7	-0.1	-0.9	5.1	-8.2	-14.5	-0.4
Tcm	-3.4	-1.3	-6.1	-10.7	-0.8	-1.2	-0.6	-1.7	-8.1	-8.3	-0.3
Xsr	-3.4	-1.1	-2.3	-7.5	-0.9	-1.2	-0.9	-1.4	-9.2	-20.2	-0.4

Table A6-32
Changes in Exports to the EU, Sim21-EU

(Percentage change, volume)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	-40.3	122.1	746.5	-0.7	-5.3	-0.7	-2.9	-5.6	-26.1	-46.1	-1.7
Wgr	-23.3	-0.1	-11.2	-0.1	-5.9	23.6	-1.7	-11.3	-0.1	-50.3	-0.9
Vfr	-30.3	-1.4	-8.2	-40.4	-1.9	-0.4	-1.1	-5.1	-28.0	-7.7	-0.2
Pfb	-27.5	-2.2	-14.6	-0.8	-2.6	0.2	-1.7	-5.7	-50.4	-65.6	-0.8
Xcr	-0.7	-3.8	-20.2	-67.6	-3.8	6.0	-0.6	-9.7	-51.2	-60.9	-0.7
Sgr	81.3	225.9	419.0	167.5	126.3	118.7	138.8	366.8	1272.1	3257.7	144.0
Bvt	-3.5	0.0	-4.6	-1.4	0.1	9.6	-0.4	-2.1	-11.3	-18.0	-0.6
Xfp	2.6	-1.6	-0.1	-21.8	-2.1	21.8	-0.8	-4.3	-14.7	-38.6	-1.2
Mmp	392.4	1.0	1.0	9.4	1.0	182.0	-2.6	1.0	-17.4	641.8	-2.8
Ffp	-1.9	-1.4	-6.5	-29.5	-1.3	2.3	-1.0	-2.7	-22.8	-22.4	-0.5
Cog	-4.5	-0.4	-3.8	-4.7	-0.8	-1.1	-0.6	-2.7	-12.2	-35.3	0.0
Twl	-10.3	-4.6	-0.1	-25.1	-2.4	-1.3	-2.5	-4.8	-32.9	-58.4	-0.8
Pch	0.0	-2.3	0.0	-20.7	0.0	-2.4	-1.5	0.0	0.0	-45.8	0.0
Mtp	0.0	0.0	0.0	-9.1	-3.5	-3.5	-2.7	-5.9	-33.9	-54.8	-0.6
Veq	0.0	-3.4	0.0	-15.7	0.0	7.6	0.0	0.0	0.0	-28.5	0.0
Emq	-16.4	-4.3	0.0	-28.2	0.0	-4.8	0.0	0.0	0.0	-48.9	-1.0
Xmn	-8.1	-2.2	-0.1	-25.6	-0.6	-3.1	-1.8	-0.1	-26.2	-44.3	-0.4
Utc	-2.9	-0.9	-0.1	-1.6	-3.3	-2.3	-1.0	-5.2	-8.3	-14.7	-0.7
Tcm	-3.7	-1.4	-6.5	-11.0	-0.9	-1.3	-0.8	-2.4	-9.4	-9.0	-0.5
Xsr	-3.5	-1.2	-0.1	-7.5	-1.0	-1.3	-1.0	-1.5	-9.2	-20.3	-0.4

Table A6-33
Changes in Shares in the EU Markets by Exporters, Sim21-EU

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0	0	0	0	0	0	0	0	0	0	0
Wgr	0	0	0	0	0	0	0	0	0	0	0
Vfr	0	0	0	0	0	0	0	0	0	0	0
Pfb	0	0	0	0	0	0	0	0	-1	0	0
Xcr	0	0	0	0	0	0	0	0	-1	0	0
Sgr	0	0	2	7	0	0	0	1	10	42	0
Bvt	0	0	0	0	0	0	0	0	0	0	0
Xfp	0	0	0	0	0	0	0	0	0	0	0
Mmp	1	0	0	0	0	0	0	0	0	1	0
Ffp	0	0	0	0	0	0	0	0	0	0	0
Cog	0	0	0	0	0	0	0	0	0	0	0
Twl	0	0	0	0	0	0	0	0	0	0	0
Pch	0	0	0	0	0	0	0	0	0	0	0
Mtp	0	0	0	0	0	0	0	0	0	0	0
Veq	0	0	0	0	0	0	0	0	0	0	0
Emq	0	0	0	0	0	0	0	0	0	0	0
Xmn	0	0	0	0	0	0	0	0	0	0	0
Utc	0	0	0	0	0	0	0	0	0	0	0
Tcm	0	0	0	0	0	0	0	0	0	0	0
Xsr	0	0	0	0	0	0	0	0	0	0	0

Table A6-33 (cont.)

(Percentage points)

	EU	USA	EAS	SAS	SSA	ROW
Ric	0	0	0	0	0	0
Wgr	0	0	0	0	0	0
Vfr	0	0	0	0	0	0
Pfb	0	0	0	0	0	0
Xcr	0	0	0	0	0	0
Sgr	-42	0	0	-2	-1	-15
Bvt	0	0	0	0	0	0
Xfp	0	0	0	0	0	0
Mmp	-1	0	0	0	0	0
Ffp	0	0	0	0	0	0
Cog	0	0	0	0	0	0
Twl	0	0	0	0	0	0
Pch	0	0	0	0	0	0
Mtp	0	0	0	0	0	0
Veq	0	0	0	0	0	0
Emq	0	0	0	0	0	0
Xmn	0	0	0	0	0	0
Utc	0	0	0	0	0	0
Tcm	0	0	0	0	0	0
Xsr	0	0	0	0	0	0

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Table A7-1

Trade Impact (Percentage change, valued at baseline world prices)

	Alter	Alter_Sug	Alter_Sug & Doha	Alter	Alter_Sug	Alter_Sug & Doha
	Total Imports			**Total Exports**		
BWA	-2.3	-2.7	-1.9	-0.8	-0.9	-0.4
MDG	-1.2	-0.8	-0.8	-0.9	-1.0	-0.9
MWI	-6.7	-0.5	-0.6	**-8.9**	-1.1	-1.0
MUS	-12.1	-4.7	-2.8	-8.6	-4.9	-2.9
MOZ	-0.3	-0.4	-0.5	-0.4	-0.7	-0.7
ZAF	-0.7	-0.5	-0.3	-0.5	-0.5	-0.3
TZA	-1.1	-0.6	-0.6	-2.1	-1.5	-1.5
ZMB	-0.1	-0.3	-0.4	0.1	-0.5	-0.6
ZWE	-10.7	-1.2	-0.7	-4.4	-0.6	-0.4
XSC	-20.9	-4.2	-3.0	-13.5	-2.5	-1.6
XSD	-0.5	-0.7	-0.7	-0.8	-0.8	-0.8
	Imports from the EU			**Exports to the EU**		
BWA	-12.9	-12.1	-7.5	-5.2	-5.3	-2.9
MDG	-7.5	-6.2	-6.1	-3.0	-1.0	-0.9
MWI	-19.6	-11.7	-11.6	-30.6	-1.8	-1.5
MUS	-28.2	-21.7	-13.2	-22.2	-7.5	-4.7
MOZ	-12.6	-11.0	-11.0	1.4	-0.8	-0.9
ZAF	-4.8	-3.2	-2.2	0.0	-1.6	-0.9
TZA	-14.7	-13.5	-13.5	-4.7	-1.1	-1.1
ZMB	-13.8	-12.0	-12.0	-15.2	-0.9	-0.8
ZWE	-33.8	-26.3	-16.4	-45.9	-3.4	-2.2
XSC	-25.4	-7.5	-5.5	-64.7	-12.3	-8.0
XSD	-9.6	-8.6	-8.6	-2.0	-1.1	-1.1

Table A7-2
Trade with Third Parties, (Percentage change)

	Alter	Alter_Sug	Alter_Sug & Doha	Alter	Alter_Sug	Alter_Sug & Doha
	Imports from USA			**Exports to USA**		
BWA	-2.9	-2.3	-1.5	6.0	5.8	3.6
MDG	-0.3	0.9	0.9	1.2	-1.6	-1.4
MWI	-6.7	1.2	1.3	14.8	-0.7	-0.9
MUS	-7.3	3.7	2.4	14.3	-3.6	-1.8
MOZ	-1.1	0.6	0.7	-0.9	-0.2	-0.2
ZAF	-0.3	1.2	0.9	1.8	-0.2	-0.2
TZA	2.2	3.2	3.2	0.2	-1.0	-0.9
ZMB	-0.8	0.7	0.7	3.6	-0.8	-0.8
ZWE	-12.6	0.5	0.4	26.7	1.0	0.5
XSC	-22.9	-4.1	-2.7	105.1	9.3	5.9
XSD	3.9	4.7	4.7	-0.6	-0.8	-0.8
	Imports from EAS			**Exports to EAS**		
BWA	-1.7	-0.4	-0.1	5.0	4.7	2.8
MDG	2.9	4.2	4.1	0.5	-0.4	-0.4
MWI	-5.4	2.6	2.6	6.9	-0.4	-0.5
MUS	0.6	6.0	3.5	10.2	-0.1	0.2
MOZ	0.2	2.4	2.5	1.4	-0.1	-0.2
ZAF	0.6	2.3	1.7	1.9	-0.1	-0.2
TZA	3.1	4.3	4.3	0.0	-1.1	-1.1
ZMB	-0.6	1.7	1.8	4.0	-1.0	-1.1
ZWE	-7.8	3.5	2.2	62.7	1.4	0.7
XSC	-16.6	-2.2	-1.5	60.1	5.9	3.8
XSD	2.5	3.1	3.1	-0.6	-0.7	-0.7

Table A7-2 (cont.)

(Percentage change)

	Alter	Alter_Sug	Alter_Sug & Doha	Alter	Alter_Sug	Alter_Sug & Doha
	Imports from SAS			**Exports to SAS**		
BWA	-3.0	-2.2	-1.4	4.8	4.4	2.7
MDG	1.7	3.2	3.3	1.0	-0.3	-0.3
MWI	-6.2	2.0	2.1	7.3	-0.3	-0.6
MUS	1.5	6.0	3.1	14.3	0.3	0.5
MOZ	-1.3	1.3	1.4	1.8	-0.1	-0.1
ZAF	-1.3	0.8	0.6	2.1	-0.1	-0.2
TZA	1.9	3.4	3.5	-0.2	-1.5	-1.5
ZMB	-1.0	1.6	1.7	3.8	-0.9	-1.0
ZWE	-10.8	2.7	1.7	80.0	2.8	1.5
XSC	-19.7	-3.3	-2.1	57.0	5.7	3.7
XSD	4.4	5.2	5.2	-0.7	-0.9	-0.9
	Imports from SSA			**Exports to SSA**		
BWA	-4.4	-3.8	-2.5	7.3	6.9	4.2
MDG	0.7	2.2	2.1	0.7	-0.4	-0.4
MWI	-9.8	1.3	1.4	-19.2	-2.3	-2.0
MUS	-4.4	2.3	0.4	27.8	0.6	0.6
MOZ	-1.0	1.3	1.4	-0.2	-0.3	-0.3
ZAF	-1.5	0.1	0.1	2.2	-0.1	-0.2
TZA	2.1	4.0	4.0	-0.2	-1.3	-1.3
ZMB	-1.7	0.9	1.1	-2.9	-0.6	-0.6
ZWE	-14.9	0.1	0.1	38.4	1.2	0.7
XSC	-16.4	-2.9	-1.9	30.4	7.7	5.3
XSD	5.8	7.1	7.2	-0.4	-2.6	-2.6

Table A7-2 (cont.)

(Percentage change)

	Alter	Alter_Sug	Alter_Sug & Doha	Alter	Alter_Sug	Alter_Sug & Doha
	Imports from ROW			**Exports to ROW**		
BWA	-3.1	-2.1	-1.4	12.4	11.7	7.0
MDG	0.3	1.7	1.7	0.9	-0.5	-0.5
MWI	-7.2	1.7	1.8	16.8	-0.9	-1.0
MUS	-1.9	6.2	3.3	17.1	0.3	0.4
MOZ	-0.8	0.9	1.0	2.0	-0.7	-0.7
ZAF	-1.5	0.2	0.2	1.8	-0.1	-0.1
TZA	2.1	3.6	3.6	-0.8	-2.4	-2.3
ZMB	-0.9	0.6	0.7	4.0	-1.0	-1.0
ZWE	-9.4	1.7	1.3	51.6	1.0	0.5
XSC	-22.0	-3.5	-2.3	56.8	5.6	3.6
XSD	5.0	5.6	5.6	-1.0	-1.3	-1.3

Note: calculated based on figures valued at baseline world prices.

Table A7-3
Changes in Domestic Production, Alter

(Percentage change)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	40.8	0.4	5.5	140.3	1.4	-12.3	0.3	1.3	3.4	27.6	-1.0
Wgr	9.0	-1.0	0.6	10.7	0.2	-3.1	0.2	-0.3	25.5	27.2	0.3
Vfr	14.6	0.3	1.6	36.1	-0.3	-1.6	0.3	-0.8	23.2	-37.0	0.2
Pfb	3.8	-0.4	5.7	12.4	0.8	-6.2	-0.8	-1.9	95.0	129.5	1.1
Xcr	30.8	1.0	20.2	115.6	-0.5	-13.8	0.1	-0.5	83.6	16.5	0.4
Sgr	-9.0	-9.5	-66.6	-58.3	-41.9	0.2	-5.9	-48.7	-85.7	-90.2	-18.3
Bvt	0.2	-0.9	0.1	3.3	-0.3	-1.2	0.2	0.1	1.0	10.2	1.4
Xfp	0.8	0.4	4.4	17.4	-0.8	-2.5	0.1	-0.1	0.7	34.4	1.3
Mmp	-35.7	-0.5	1.9	29.2	-1.2	-2.0	0.5	-0.1	17.7	-55.3	4.2
Ffp	-28.3	-0.5	0.7	19.0	-0.6	-1.4	0.1	-0.2	-5.1	-13.2	0.6
Cog	4.2	0.2	3.1	3.9	-0.3	0.3	-0.4	1.1	7.4	50.2	-0.5
Twl	6.3	1.5	26.8	7.7	1.1	0.5	0.4	1.4	27.2	114.8	1.3
Pch	3.6	-0.1	6.0	20.7	-0.9	-1.0	-0.4	-0.2	7.1	54.5	2.0
Mtp	17.3	1.7	10.4	3.6	2.7	1.6	-3.0	4.3	44.8	81.1	1.2
Veq	30.5	0.1	11.5	12.9	2.4	2.7	1.7	2.7	35.7	16.7	-1.6
Emq	14.3	1.2	9.9	47.3	-6.7	0.1	2.7	3.1	35.4	48.4	0.4
Xmn	2.5	0.3	7.9	29.8	-3.2	-0.7	3.0	0.8	22.0	38.8	1.8
Utc	-1.4	-0.4	-2.1	-7.2	-0.7	-0.2	-0.4	1.1	-8.6	-8.8	-0.4
Tcm	0.8	0.0	-3.6	5.3	-0.3	-0.2	-0.4	0.6	-1.1	-17.8	-0.1
Xsr	0.1	0.0	0.4	-0.3	-0.1	-0.1	0.1	0.0	-4.4	-0.3	-0.1

Table A7-4
Changes in Domestic Production, Alter_Sug

(Percentage change)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	38.1	0.3	0.2	**1.4**	0.2	-4.9	-0.2	0.2	-0.1	4.1	-1.4
Wgr	9.7	-0.4	0.4	0.2	0.1	-1.5	0.1	0.0	1.5	0.6	0.3
Vfr	15.7	0.0	0.1	-0.6	0.1	-0.5	0.0	0.2	-7.4	-4.3	0.0
Pfb	19.4	-0.4	-0.5	9.7	0.3	-0.2	-1.8	-1.1	**1.4**	**14.3**	1.2
Xcr	32.8	0.0	-1.1	**0.3**	0.1	-1.6	-0.1	0.1	**-8.6**	4.4	0.3
Sgr	31.3	-0.3	-3.4	0.2	-1.5	-1.0	-0.1	-1.8	3.3	10.9	-2.8
Bvt	-0.1	0.1	0.2	4.5	0.6	-0.9	0.3	0.1	-0.4	2.0	1.7
Xfp	2.1	0.0	0.4	-3.3	0.0	-1.5	0.1	0.0	-0.3	-1.3	1.4
Mmp	-35.4	0.3	0.8	1.6	-0.3	-1.4	0.5	0.0	-3.4	-69.6	4.0
Ffp	-28.0	0.0	0.1	-0.5	0.1	-0.9	0.1	0.1	-1.3	-30.6	0.6
Cog	4.1	-0.2	-0.3	-0.2	-0.8	-0.1	-0.6	-0.4	-0.2	4.1	-0.6
Twl	8.5	-2.2	0.6	-19.0	1.9	0.9	-0.3	0.2	1.4	**10.7**	1.4
Pch	5.2	-0.6	-0.2	4.5	0.2	-0.2	0.1	0.2	-0.3	5.2	2.4
Mtp	15.4	0.4	0.1	-3.5	-0.9	-0.1	-4.4	-0.5	0.7	6.8	1.2
Veq	29.6	-2.7	4.0	4.6	4.3	2.5	0.7	1.9	10.3	1.8	-2.0
Emq	15.5	-2.0	1.7	12.2	-0.4	-0.1	2.1	1.2	3.0	5.1	0.4
Xmn	3.2	-0.2	2.5	1.9	3.2	-0.3	2.3	0.4	1.7	5.4	2.3
Utc	-1.7	-0.2	-0.4	-1.5	-0.7	-0.1	-0.4	-0.3	-0.2	-1.7	-0.6
Tcm	0.5	-0.4	-0.3	-0.2	-0.2	-0.1	-0.3	-0.1	-0.6	-0.3	-0.2
Xsr	0.0	-0.2	0.0	0.9	-0.1	0.0	-0.1	0.0	-0.5	-0.8	-0.3

Table A7-5
Changes in Domestic Production, Alter_Sug & Doha

(Percentage change)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	22.1	0.2	0.3	**1.0**	0.1	-3.2	-0.1	0.1	0.0	3.1	-1.4
Wgr	6.0	-0.4	0.4	0.2	0.1	-0.8	0.1	0.0	0.9	1.0	0.3
Vfr	9.8	0.0	0.2	-0.1	0.1	-0.3	0.0	0.1	-3.4	-2.4	0.0
Pfb	12.0	-0.4	-0.1	5.9	0.1	-0.1	-1.8	-0.8	**0.9**	**8.9**	1.2
Xcr	19.6	0.0	-1.1	**0.0**	0.1	-1.0	-0.1	0.1	**-3.7**	3.2	0.3
Sgr	18.1	-0.2	-2.7	0.3	-1.1	-0.6	-0.1	-1.4	1.5	7.2	-2.6
Bvt	-0.1	0.0	0.1	3.2	0.6	-0.4	0.3	0.1	-0.1	1.9	1.7
Xfp	1.4	-0.1	0.5	-1.1	0.1	-0.9	0.1	0.1	-0.1	0.3	1.4
Mmp	-21.2	0.3	0.8	1.6	0.4	-0.8	0.5	0.1	-1.8	-48.3	3.9
Ffp	-16.2	0.0	0.1	-0.2	0.1	-0.6	0.1	0.1	-0.6	-20.1	0.6
Cog	2.4	-0.2	-0.4	-0.1	-0.8	-0.1	-0.6	-0.4	-0.2	2.3	-0.6
Twl	4.7	-2.1	0.0	-12.3	1.6	0.5	-0.4	0.2	0.5	**6.8**	1.4
Pch	3.4	-0.6	-0.2	2.1	0.2	-0.1	0.2	0.2	0.0	3.6	2.5
Mtp	9.6	0.3	0.1	-2.3	-1.0	-0.1	-4.3	-0.5	-0.1	4.6	1.2
Veq	19.0	-2.7	1.8	3.2	2.5	1.6	0.7	1.8	6.1	1.3	-2.0
Emq	9.4	-2.6	1.6	7.4	-0.1	0.0	2.1	1.1	2.5	3.6	0.4
Xmn	2.2	-0.3	2.6	-0.6	2.6	-0.2	2.4	0.4	1.1	3.8	2.4
Utc	-1.1	-0.2	-0.4	-0.9	-0.7	-0.1	-0.4	-0.3	-0.1	-1.2	-0.6
Tcm	0.3	-0.4	-0.3	0.2	-0.2	-0.1	-0.3	-0.1	-0.4	-0.2	-0.2
Xsr	0.0	-0.2	0.0	0.7	-0.1	0.0	-0.1	0.0	-0.3	-0.5	-0.3

Table A7-6
Changes in Export Volume to the EU, Alter

(Percentage change)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	58.1	3.7	16.8	0.7	5.6	0.7	1.4	5.0	27.0	72.2	-2.2
Wgr	-3.1	0.1	11.2	0.1	6.3	-19.9	1.1	10.7	0.1	43.9	-1.0
Vfr	27.7	1.6	8.2	71.7	2.1	1.8	0.5	4.6	24.0	-6.1	-1.1
Pfb	14.7	1.4	15.2	0.7	2.5	-1.8	-0.6	4.3	80.8	140.2	0.7
Xcr	0.6	3.2	23.9	156.1	4.0	-1.1	0.5	8.4	79.9	103.8	-2.2
Sgr	-45.1	-69.3	-80.6	-61.4	-55.5	-53.6	-58.6	-79.0	-91.8	-97.0	-60.6
Bvt	-5.5	-0.2	4.5	-1.2	-0.1	-9.3	0.1	1.7	1.3	10.9	1.1
Xfp	-2.7	1.0	0.1	18.4	2.2	-18.7	0.1	3.5	7.6	45.8	0.1
Mmp	-79.5	-1.0	-1.0	-51.3	-1.0	-65.6	1.1	-1.0	-49.4	-86.7	0.8
Ffp	-15.4	1.1	6.5	17.7	1.4	2.4	0.3	2.1	7.5	0.5	-1.3
Cog	4.2	0.2	3.2	3.6	0.4	0.6	-0.2	1.5	10.0	50.7	-0.7
Twl	-7.6	1.5	0.0	0.1	2.7	2.3	0.5	3.6	29.2	101.0	-2.0
Pch	0.0	0.5	0.0	24.4	0.0	1.6	-0.2	0.0	0.0	72.3	0.0
Mtp	0.0	0.0	0.0	1.7	2.8	2.6	-3.2	4.1	43.5	113.7	-2.1
Veq	0.0	0.0	0.0	17.3	0.0	1.5	0.0	0.0	0.0	30.7	0.0
Emq	14.7	0.7	0.0	48.3	0.0	2.6	0.0	0.0	0.0	89.5	-2.9
Xmn	7.1	0.5	0.0	26.6	3.0	1.7	1.7	0.0	35.6	73.8	-1.4
Utc	2.6	-0.1	0.0	-0.4	2.4	1.6	-0.3	4.3	8.2	16.5	-1.9
Tcm	4.1	0.6	6.2	12.2	0.7	0.6	-0.3	1.7	9.4	9.5	-1.5
Xsr	3.8	0.9	0.0	9.6	0.9	0.6	0.1	1.0	9.6	24.8	-1.4

Table A7-7
Changes in Export Volume to the EU, Alter_Sug

(Percentage change)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	52.0	0.0	0.1	0.0	0.0	0.0	-1.5	-0.4	-5.5	5.8	-3.8
Wgr	-4.5	0.0	0.7	0.0	0.2	-25.5	-0.6	0.3	0.0	-20.5	-1.8
Vfr	21.3	-0.1	0.2	-10.5	0.1	0.1	-0.6	-0.1	-14.6	-9.8	-1.7
Pfb	21.3	-0.4	-0.1	-0.1	0.1	-0.1	-2.2	-0.7	-13.9	-1.2	-0.1
Xcr	-0.1	-0.1	-1.1	-19.7	0.0	0.1	-1.1	-0.2	-21.5	-5.8	-3.0
Sgr	1.2	-1.4	-3.7	0.2	-2.0	-1.8	-2.3	-2.6	3.7	11.4	-5.3
Bvt	-6.3	-0.1	-0.2	-6.3	-0.1	-10.1	-0.3	-0.1	-10.0	-7.3	0.3
Xfp	-3.7	-0.3	-0.1	-10.3	0.2	-20.7	-0.7	-0.2	-8.9	-4.2	-0.9
Mmp	-79.7	-1.2	-1.2	-69.7	-1.2	-67.8	-0.7	-1.2	-72.9	-93.0	-1.4
Ffp	-16.1	0.0	0.0	-18.0	0.2	1.4	-0.6	-0.3	-17.6	-23.9	-1.8
Cog	4.1	-0.2	-0.3	-1.1	-0.5	-0.1	-0.9	-0.5	-1.3	3.7	-0.8
Twl	-7.9	-2.8	0.0	-25.0	0.4	0.2	-2.2	-0.7	-14.4	-6.0	-2.8
Pch	0.0	-1.6	0.0	-1.6	0.0	-0.2	-1.6	0.0	0.0	1.6	0.0
Mtp	0.0	0.0	0.0	-7.8	-1.0	-0.2	-5.9	-1.1	-1.3	6.6	-2.8
Veq	0.0	-3.0	0.0	-1.2	0.0	-0.4	0.0	0.0	0.0	-2.8	0.0
Emq	14.0	-3.1	0.0	6.0	0.0	-0.6	0.0	0.0	0.0	4.0	-3.7
Xmn	5.8	-1.4	0.0	-6.9	0.4	-0.3	-0.2	0.0	-0.7	7.1	-1.8
Utc	2.0	-0.9	0.0	-2.0	-0.8	0.0	-1.2	-0.2	0.4	1.6	-2.6
Tcm	3.8	-0.6	-0.4	-0.2	-0.1	-0.2	-1.0	-0.4	-0.4	2.6	-2.0
Xsr	3.5	-0.2	0.0	1.3	-0.1	-0.2	-0.9	-0.3	0.1	2.3	-1.8

Table A7-8
Changes in Export Volume to the EU, Alter_Sug & Doha

(Percentage change)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	31.3	0.0	0.1	0.0	-0.1	0.0	-1.4	-0.5	-2.6	5.5	-3.8
Wgr	1.6	0.0	0.5	0.0	0.0	-12.9	-0.6	0.0	0.0	-8.6	-1.8
Vfr	15.1	-0.1	0.2	-4.8	0.0	0.0	-0.6	-0.1	-7.0	-3.9	-1.7
Pfb	16.1	-0.5	0.0	-0.1	-0.1	-0.1	-2.3	-0.7	-6.5	2.5	-0.1
Xcr	-0.1	-0.2	-1.3	-9.7	-0.1	0.0	-1.2	-0.3	-10.4	0.6	-3.0
Sgr	0.7	-1.1	-3.0	0.2	-1.5	-1.3	-2.0	-2.1	1.7	7.5	-4.9
Bvt	-2.6	-0.1	-0.3	-2.4	-0.1	-5.0	-0.3	-0.2	-4.9	-3.0	0.2
Xfp	-0.7	-0.4	0.0	-4.7	0.1	-10.4	-0.8	-0.2	-4.2	-0.3	-1.1
Mmp	-47.3	-0.7	-0.7	-41.8	-0.7	-41.0	-1.1	-0.7	-45.6	-64.4	-1.6
Ffp	-4.6	-0.1	0.0	-7.3	0.1	1.0	-0.6	-0.3	-7.0	-9.2	-1.8
Cog	2.3	-0.2	-0.4	-0.9	-0.5	-0.1	-0.9	-0.5	-1.3	1.9	-0.7
Twl	-5.2	-2.7	0.0	-16.2	0.4	0.0	-2.2	-0.7	-9.6	-3.7	-2.8
Pch	0.0	-1.5	0.0	-2.3	0.0	-0.3	-1.6	0.0	0.0	0.3	0.0
Mtp	0.0	0.0	0.0	-5.5	-1.0	-0.3	-5.9	-1.1	-1.9	3.7	-2.8
Veq	0.0	-3.0	0.0	-1.3	0.0	-0.4	0.0	0.0	0.0	-2.8	0.0
Emq	7.5	-3.5	0.0	2.7	0.0	-0.6	0.0	0.0	0.0	1.7	-3.8
Xmn	3.4	-1.3	0.0	-4.8	0.4	-0.3	-0.1	0.0	-1.2	4.2	-1.7
Utc	1.3	-0.9	0.0	-1.1	-0.9	0.0	-1.2	-0.4	0.2	1.0	-2.6
Tcm	2.4	-0.6	-0.4	0.3	-0.2	-0.2	-1.0	-0.4	-0.3	1.7	-2.0
Xsr	2.2	-0.2	0.0	1.0	-0.1	-0.2	-0.9	-0.3	0.0	1.5	-1.8

Table A7-9
Changes in Regions Shares in the EU Markets, Alter

(Percentage points)

	BWA	MDG	MWI	MUS	MOZ	ZAF	TZA	ZMB	ZWE	XSC	XSD
Ric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wgr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vfr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pfb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Xcr	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Sgr	0.0	-0.4	-1.7	-6.6	-0.1	-0.1	-0.3	-0.6	-10.1	-41.3	-0.1
Bvt	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0
Xfp	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
Mmp	-0.5	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	-1.0	0.0
Ffp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cog	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Twl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mtp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Veq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xmn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tcm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Xsr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0